



SELF ASSESSMENT REPORT (SAR)

UNDERGRADUATE ENGINEERING PROGRAMS (TIER - I)

B. Tech. Mechanical Engineering

First Time Accreditation



Department of Mechanical Engineering

Faculty of Engineering

DAYALBAGH EDUCATIONAL INSTITUTE

(Deemed University)

Dayalbagh, Agra 282005

February 2019

SAR
Dayalbagh Educational Institute
Department of Mechanical Engineering
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PART A : Institutional Information

1. Name and Address of the Institution:

FACULTY OF ENGINEERING
DAYALBAGH EDUCATIONAL INSTITUTE
DAYALBAGH, AGRA-282005, UTTAR PRADESH
INDIA

2. Name and Address of the Affiliating University:

DAYALBAGH EDUCATIONAL INSTITUTE (DEEMED TO BE A UNIVERSITY)
DAYALBAGH, AGRA-282005, UTTAR PRADESH
INDIA

3. Year of establishment of the Institution: 1950

4. Type of the Institution:

Institute of National Importance	<input type="checkbox"/>
University	<input type="checkbox"/>
Deemed University	<input checked="" type="checkbox"/>
Autonomous	<input type="checkbox"/>
Any other (Please specify)	<input type="checkbox"/>

5. Ownership Status:

Central Government	<input type="checkbox"/>
State Government	<input type="checkbox"/>
Government Aided	<input checked="" type="checkbox"/>
Self - Financing	<input type="checkbox"/>
Trust	<input type="checkbox"/>
Society	<input type="checkbox"/>
Section 25 Company	<input type="checkbox"/>
Any Other (Please specify)	<input type="checkbox"/>

6. Other Academic Institutions of the Trust/Society/Company etc., if any:
NOT APPLICABLE

Name of the Institution(s)	Year of Establishment	Programs of Study	Location

Table A.6

7. Details of all the programs being offered by the institution under consideration:

S. No.	Program Name	Name of the Department	Year of Start	Intake	Increase/ Decrease in intake, if any	Year of Increase/ Decrease	AICTE Approval	Accreditation Status*
1	B. Tech. (Civil Engineering)	Civil Engineering	2013	60	NIL	NA	2013	Not Eligible, Applying in 2019-2020
2	B. Tech. (Electrical Engineering)	Electrical Engineering	1950	60	Yes	2011	1994	Applying 2018-19
3	B. Tech. (Footwear Technology)	Footwear Technology	2014	60	NIL	NA	2014	Not Eligible
4	B. Tech. (Mechanical Engineering)	Mechanical Engineering	1950	60	Yes	2011	1994	Applying 2018-19
5	M. Tech. Full Time (Engineering Systems)	Electrical/ Mechanical Engineering	1992	30	Yes	2014	2014	Eligible, Not Applied
6	M. Tech. Part Time (Engineering Systems)	Electrical / Mechanical Engineering	1992	13	NIL	NA	1992	Eligible, Not Applied
7	B. Tech. Part Time (Electrical Engineering)	Electrical Engineering	2014	60	NIL	NA	2014	Not Eligible

Table A.7

8. Programs to be considered for Accreditation vide this application

S. No.	Program Name
1	B. Tech. (ELECTRICAL ENGINEERING)
2	B. Tech. (MECHANICAL ENGINEERING)

Table A.8

9. Total number of employees:

A. Regular Employees (Faculty and Staff):

Items		CAY (2018-19)		CAY _{m1} (2017-18)		CAY _{m2} (2016-17)	
		Min	Max	Min	Max	Min	Max
Faculty in Engineering	M	31	33	31	33	32	34
	F	2	2	2	2	1	1
Faculty in Maths, Science & Humanities teaching in Engineering Programs	M	24	24	24	24	25	25
	F	26	26	26	26	25	26
Non-teaching staff	M	54	56	54	56	53	56
	F	1	1	1	1	1	1

Table A.9a

B. Contractual Staff Employees (Faculty and Staff): (Not covered in Table A):

Items		CAY (2018-19)		CAY _{m1} (2017-18)		CAY _{m2} (2016-17)	
		Min	Max	Min	Max	Min	Max
Faculty in Engineering	M	7	9	1	3	3	5
	F	0	0	0	0	0	0
Faculty in Maths, Science & Humanities teaching in engineering Programs	M	3	3	2	2	3	0
	F	6	6	5	5	0	4
Non-teaching staff	M	5	17	5	17	7	8
	F	0	0	0	0	0	0

Table A.9b

10. Total number of Engineering Students:

Undergraduate

Item	CAY (2018-19)	CAYm1 (2017-18)	CAYm2 (2016-17)
Total no. of boys	616	687	655
Total no. of girls	323	315	256
Total no. of students	939	1002	911

Table A.10.1

Post-Graduate

Item	CAY (2018-19)	CAYm1 (2017-18)	CAYm2 (2016-17)
Total no. of boys	72	69	51
Total no. of girls	15	10	10
Total no. of students	87	79	61

Table A.10.2

PhD

Item	CAY (2018-19)	CAYm1 (2017-18)	CAYm2 (2016-17)
Total no. of boys	33	35	34
Total no. of girls	1	1	1
Total no. of students	34	36	35

Table A.10.3

11. Vision of the Institution:

To provide education, more education, education made perfect, which is the only “panacea for our country’s ills and evils”. DEI aims to serve as an exemplary model of education, covering the entire spectrum of knowledge and wisdom, to selflessly serve mankind by evolving a race of supermen, who possess the virtues to resolve the grave global challenges and establish a more humane and enlightened society.

12. Mission of the Institution:

The mission objective of DEI is to provide value-based, comprehensive and inter-disciplinary education to evolve a ‘*complete person*’, i.e., a well-rounded total quality person, whose hallmarks are intellectual strength, emotional maturity, truthfulness, simple living, high moral character, scientific temper, general awareness, interdisciplinary outlook and one who discharges duties and obligations and is capable of giving a fuller response to social and environmental challenges.

13. Contact Information of the Head of the Institution and NBA coordinator, if designated:

1	Name	Prof. Prem Kumar Kalra
	Designation	Director, Dayalbagh Educational Institute
	Mobile No.	9458553555
	Email id	deidirector@dei.ac.in
2	Name	Prof. K. Hansraj
	Designation	Dean, Faculty of Engineering, Dayalbagh Educational Institute
	Mobile No.	9358877956
	Email id	hansraj@dei.ac.in
3	NBA Coordinator Name	Prof. Sanjay Kumar Srivastava
	Designation	Professor, Mechanical Engineering
	Mobile No.	9412509324
	Email id	ssrivastava@dei.ac.in

PART B: Criteria Summary

Name of the Program : B.Tech Mechanical Engineering

Criteria No.	Criteria	Mark / Weightage
Program Level Criteria		
1.	Vision, Mission and Program Educational Objectives	50
2.	Program Curriculum and Teaching –Learning Processes	100
3.	Course Outcomes and Program Outcomes	175
4.	Students' Performance	100
5.	Faculty Information and Contributions	200
6.	Facilities and Technical Support	80
7.	Continuous Improvement	75
Institute Level Criteria		
8.	First Year Academics	50
9.	Student Support Systems	50
10.	Governance, Institutional Support and Financial Resources	120
	Total	1000

PART B: Program Level Criteria

CRITERION 1	Vision, Mission and Program Educational Objectives	50
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1.1. State the Vision and Mission of the Department and Institute (5)

Vision of the Institute

To provide education, more education, education made perfect, which is the only “panacea for our country’s ills and evils”. DEI aims to serve as an exemplary model of education, covering the entire spectrum of knowledge and wisdom, to selflessly serve mankind by evolving a race of supermen, who possess the virtues to resolve the grave global challenges and establish a more humane and enlightened society.

Mission of the Institute

The mission objective of DEI is to provide value-based, comprehensive and inter-disciplinary education to evolve a ‘complete person’, i.e., a well-rounded total quality person, whose hallmarks are intellectual strength, emotional maturity, truthfulness, simple living, high moral character, scientific temper, general awareness, interdisciplinary outlook and one who discharges duties and obligations and is capable of giving a fuller response to social and environmental challenges.

Vision of Department

To become a top teaching-cum-research department in Mechanical Engineering in the country through an exemplary system that lead to entrepreneurship, innovation, values and quality.

Mission of Department

To create an environment for development of students in to total quality persons (endowed with: super consciousness, super intelligence, super human, super connectivity, sensitivity to values and quality) who will help in nation building.

Mission Elements	Mission Component
M1	Nation building
M2	Super Consciousness
M3	Super Intelligence
M4	Super Human
M5	Super Networking
M6	Sensitivity Values & Quality

1.2. State the Program Educational Objectives (PEOs) (5)

PEO1	To provide a solid foundation in Basic Sciences, analytical skills and engineering fundamentals required to succeed in engineering field and to pursue research endeavors.
PEO2	To provide broad-based exposure to the state of the art in Mechanical Engineering discipline and make the students industry ready.
PEO3	To prepare students to respond to societal needs through an understanding of the Rural ethos, Indian Culture and plurality of ethnic and religious communities in the country at large.
PEO4	To train students with good scientific and practical engineering application skills to comprehend, analyze, design and create novel engineering products.
PEO5	To encourage students to develop lifelong learning skills, entrepreneurship abilities and ethical values for a successful professional career.

1.3. Indicate where the Vision, Mission and PEOs are published and disseminated among stakeholders (15)

The Mission and Vision are published at:

- Department website <https://www.dei.ac.in/dei/engineering/>
- Institute website <https://www.dei.ac.in/dei/>
- Institute Prospectus
- Faculty Notice Boards
- Class Rooms
- Faculty Library
- Dean's Office

- Curriculum Book
- Common Places in the Faculty
- Head of the Department Chamber
- Laboratories

Apart from the above, these are also disseminated to all the stakeholders of the programs through faculty meetings, student's awareness workshops, student induction programs, and parent-teacher meetings etc.

1.4. State the process for defining the Vision and Mission of the Department, and PEOs of the program (15)

1. Vision of the Institute is articulated by Most Revered Dr. M.B. Lal Saheb, Founder Director DEI (Ex-Vice Chancellor of Lucknow University).
2. Many Idea Engineering workshops are conducted to create the mission statement and DEI Strategic Plan 2012-20132 by Most Revered Prof. P.S. Satsangi, Ex-Director DEI (Emeritus Chairman Advisory Committee on Educational Institutions) by way of interaction with premier institutes of India like IIT's and IISc. A Committee at Institute-faculty-department level is formed for identification, implementation and review of Vision and Mission statements in consistency with the vision and mission statements of the institute. Various bodies like ACE (Advisory Committee on Education, AAAC (Academic and Administrative Audit Committee) are formed to advice in various matters. In departmental meetings, departmental Vision and Mission statements are reviewed by specifically considering the latest trends, industry demand etc. The proposed Vision and Mission statements are also circulated to the Alumni, Employer, Faculty and Parents and their feedback is taken. After taking into consideration of the feedback received, the Program Advisory Committee prepares draft Vision and Mission statements which are discussed and brainstormed in a meeting consisting of the entire faculty. The statements are then finalized.
3. Subsequently workshops are conducted at department level to formulate PEOs.

1.5. Establish consistency of PEOs with Mission of the Department (10)

Mission Elements	Mission Component
M1	Nation building
M2	Super Consciousness
M3	Super Intelligence
M4	Super Human
M5	Super Networking
M6	Sensitivity Values & Quality

PEO1	To provide a solid foundation in Basic Sciences, analytical skills and engineering fundamentals required to succeed in engineering field and to pursue research endeavors.
PEO2	To provide broad-based exposure to the state of the art in Mechanical Engineering discipline and make the students industry ready.
PEO3	To prepare students to respond to societal needs through an understanding of the Rural ethos, Indian Culture and plurality of ethnic and religious communities in the country at large.
PEO4	To train students with good scientific and practical engineering application skills to comprehend, analyze, design and create novel engineering products.
PEO5	To encourage students to develop lifelong learning skills, entrepreneurship abilities and ethical values for a successful professional career.

PEO Statements	M1	M2	M3	M4	M5	M6	Justification
PEO1	3	2	3	3	1	1	M1: Directly contributes to Nation Building M2: Partial development of Super consciousness M3: Directly enhances Super Intelligence M4: Moderately contributes to all round development M5: Moderately contributes to ability to connect M6: Seldom contributes to values and quality

PEO2	3	2	3	2	2	3	M1: Directly contributes to Nation Building M2: Partial development of Super consciousness M3: Directly enhances Super Intelligence M4: Moderately contributes to all round development M5: Moderately contributes to ability to connect M6: Partially contributes to values and quality
PEO3	3	3	3	3	3	3	M1: Directly contributes to Nation Building M2: Partial development of Super consciousness M3: Partially enhances Super Intelligence M4: Moderately contributes to all round development M5: Directly contributes to ability to connect M6: Directly contributes to Values and quality
PEO4	3	2	3	2	2	2	M1: Directly contributes to Nation Building M2: Partial development of Super consciousness M3: Partially enhances Super Intelligence M4: Moderately contributes to all round development M5: Directly contributes to ability to connect M6: Directly contributes to Values and quality
PEO5	3	3	2	2	1	3	M1: Directly contributes to Nation Building M2: Contributes to development of Super consciousness M3: Partially enhances Super Intelligence M4: Directly contributes to all round development M5: No connectivity contribution M6: Directly contributes to Values and quality

CRITERION 2	Program Curriculum and Teaching –Learning Processes	100
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2.1. Program Curriculum

2.1.1. State the process for designing the program curriculum (10)

An extensive multi-step process has been put in place for the design of program curriculum to ensure that the curriculum is continuously updated and stays in sync with the fast-paced changes in the industry requirements. The various Institute Bodies and mechanisms that have integrated to this end are as follows.

Feedback processes

- (i) The Department has a Proctorial System wherein every class has a Class Proctor and elected representatives viz., Class Captain, Vice-Captain and every batch (smaller subgroups in a class) has a Prefect and an Assistant Prefect. Feedback is taken from the students in Proctorial meetings.
- (ii) Parent Teachers meetings are held every year for obtaining feedback from the parents. The Institute observes January 31 every year as an Open Day wherein the portals of the Institute are thrown open to the public at large. Parents are encouraged to come and see all the Laboratories, facilities and meet the Faculty members to give their feedback.
- (iii) There is a very strong Alumni Network that meets in various places in the country. Faculty members attend these meetings to obtain feedback regarding the latest industry trends and need for curriculum changes.
- (iv) Every year a batch of students that graduated 25 years ago visits the Institute for its Silver Jubilee reunion as a tradition. Feedback is obtained from them regarding industry trends.
- (v) There is an External Exam component in every course wherein the paper is set by an Examiner from outside the Institute. This evaluation is completely transparent to the Department and is handled at the Institute level. The Examiner is requested to provide Question wise performance report and also overall report of the performance of the students in the course. These are shared

with the Departments and any significant feedback is analyzed for curriculum enhancement and corrective measures.

- (vi) The Academic and Administrative Audit Committee of the Institute that has a large number of external members including both academicians and industry personnel meets the students every year for their inputs and suggestions regarding the Curriculum contents and delivery. The report is sent to the Departments and discussed in a meeting of all the faculty members with the AAAC.
- (vii) At the apex level, guidelines are provided by the Advisory Committee on Education that is a think tank for suggesting inter alia measures for enhancing the quality of the education in the Institute. It consists of Faculty members, and eminent academicians and persons from industry. Invited members also include eminent academicians from Universities in Germany, Japan, US etc.
- (viii) Feedback is obtained from the Industry mentors who mentor the students in their compulsory Co-op training that is for a period of five months at the end of the 3rd year. This is very useful as the students typically work on live projects in the industry and the industry has sufficient time to observe any points of concern (five months). This feedback is, therefore, very helpful.

Curriculum Update Processes that receive inputs from the above feedback mechanisms and act thereupon

- (i) The Department invites proposals from the Faculty members for Curriculum changes and introduction of new courses in the Month of January every year. These are discussed in the Department meeting as a preparation for the Department Board of Studies to be held in February. The BoS also considers the feedback obtained from various sources for curriculum update.
- (ii) Every Department has a Board of Studies that consists of the HoD, all the Professors in the Department, two other Faculty members of the Department by rotation and three or more external members from outside the Institute including both Academicians and Industry Experts. The BoS meets for a full – day meeting every year in the month of February as a calendar event to consider the proposals already prepared in (i) as above.
- (iii) The proposals that are cleared by the Department Board of Studies are discussed in the Faculty Board of Studies meeting held after the Departmental BoS every year. The Faculty Board of Studies consists of the Dean, HoD, Professors in each Department, two other Faculty members

of each Department by rotation and three or more external members from outside the Institute including both Academicians and Industry Experts.

- (iv) The proposals that are cleared both by the Departmental BoS and the Faculty BoS are discussed in the meeting of the Institute Academic Council in March / April every year. The Institute Academic Council consists of Director of the Institute, Registrar, Controller Examinations, All HoDs, and external experts from Academics as well as Industry. The proposals that are cleared by the Academic Council are implemented from the next session that starts in July every year.
- (v) In case there are some proposals that arise from the Departments / Faculties that need urgent consideration there is provision for creation of the Standing Committee of the Academic Council at the Institute level that considers them. The proposals that are approved by the Standing Committee are then sent for ratification by the Academic Council.

The above process is followed every year for keeping the curriculum updated. However, periodically, there are major revisions that are carried out. These major overhauls are done only after extensive one or two day workshops with external experts from the industry and academia. Details of the last workshop are as follows.

2014 - 15

Topic of the Workshop / Seminar	Organized by	Date
Curriculum development on Civil and Mechanical Engineering	Prof. K. Hansraj	08-08-2014
Physics curriculum Redesign - Workshop	Dr. Shrioman Prakash	19-12-2014 & 20-12-2014

2015 - 16

Topic of the Workshop / Seminar	Organized by	Date
DEI-KIEL Workshop	Prof. C. Patvardhan, Prof K. Hans Raj	24 & 25-02-2016
LEAN Manufacturing Tools & Rules for Instrumentation	Prof. Rahul Caprihan	20 & 21-03-2016

2016-17

Topic of the Workshop / Seminar	Organized by	Dates
Curriculum Development workshop	Prof. D B Das, Prof. K Hans Raj	24 to 26-10-2016

2.1.2. Structure of the Curriculum

B.TECH. (MECHANICAL) FIRST SEMESTER

Course Code	Course Title	Number of contact hours					Credits
		Lecture	Tutorial	Practical	Seminar	Total	
		(L)	(T)	(P)	(S)	Hours	
HM181	APPLIED CHEMISTRY	3	0	0	0	3	3
CHM182	APPLIED CHEMISTRY LAB.	0	0	1	1	2	1
PHM181	APPLIED PHYSICS I	3	0	0	0	3	3
PHM182	APPLIED PHYSICS LAB.	0	0	2	0	2	1
MEM101	GRAPHIC SCIENCE	3	0	0	0	3	3
MEM102	ENGINEERING DRAWING I	0	0	7	0	7	3
MEM103	MANUFACTURING PROCESSES I	3	0	0	0	3	3
MEM104	WORKSHOP PRATICE I	0	0	3	0	3	1.5
MAM181	ENGINEERING MATHEMATICS I	3	0	0	0	3	3
RDC181	AGRICULTURAL OPERATIONS I	1	0	2	0	3	1.5
RDC182	SOCIAL SERVICE	0	0	2	0	2	1
GKC181	G.K. & CURRENT AFFAIRS I	1	0	0	0	1	1
Half Course							
BBH101	BUSINESS ORGANISATION	3	0	0	0	3	3
BBH102	BASIC MANAGEMENT	3	0	0	0	3	3
BOH181	ENVIRONMENTAL SCIENCES	3	0	0	0	3	3
CEH181	THEORY OF DESIGN	0	0	3	0	3	3
DBD101	BASIC STATISTICS	3	0	0	0	3	3
DPH181	ART APPRECIATION	0	0	3	0	3	3
ECH181	ESSENTIAL OF ECONOMICS	3	0	0	0	3	3
ENH181	ENGLISH I	3	0	0	0	3	3
MUH181	SANGEET KRIYATMAK I	0	0	3	0	3	3
OMH101	COMMUNICATION TECHNIQUE HINDI I	3	0	0	0	3	3
PYH181	INTRODUCTION TO COGNITION	3	0	0	0	3	3
STH102	GADYA, PADYA, VYAKARAN & ANUVAAD	3	0	0	0	3	3
TOTAL							28

B.TECH. (MECHANICAL) SECOND SEMESTER

Course Code	Course Title	Number of contact hours					Credits
		Lecture	Tutorial	Practical	Seminar	Total	
		(L)	(T)	(P)	(S)	Hours	
PHM281	APPLIED PHYSICS II	3	1	0	0	4	3
PHM282	APPLIED PHYSICS LAB.	0	0	2	0	2	1
EEM201	COMPUTER CONCEPTS & C PROGRAMMING	3	0	0	0	3	3
EEM202	BASIC ELECTRICAL ENGINEERING	3	1	0	0	4	3

MEM201	ENGINEERING THERMODYNAMICS	3	1	0	0	4	3
MEM202	ENGINEERING MECHANICS I	3	1	0	0	4	3
MEM203	ENGINEERING DRAWING II	0	0	6	0	6	3
MAM281	ENGINEERING MATHEMATICS II	3	0	0	0	3	3
EGC281	INDUSTRIAL VISITS	-	-	-	-	0	1
GKC281	SC.METH., G.K.& CURRENT AFFAIRS II	1	0	0	0	1	1
RDC281	AGRICULTURAL OPERATIONS II	0	0	2	0	2	1
RDC282	SOCIAL SERVICE	0	0	2	0	2	1
CAC281	CO-CURRICULAR ACTIVITIES	0	0	2	0	2	3
ESC281	ENVIRONMENTAL STUDIES	2	0	0	0	2	2
MEM204	WORKSHOP PRACTICE II	0	0	3	0	3	1.5
Ancillary Course							
ENH281	ENGLISH II	3	0	0	0	3	3
HSH281	HOUSEHOLD MANAGEMENT	3	0	0	0	3	3
MUH281	SANGEET KRIYATMAK II	0	0	3	0	3	3
SYH281	SOCIOLOGY OF SCIENCE	3	0	0	0	3	3
ABH281	PRINCIPLES OF ECONOMICS	3	0	0	0	3	3
BBH281	BUSINESS ORGANISATION	3	0	0	0	3	3
OMH201	COMMUNICATION TECHNIQUES HINDI II	3	0	0	0	3	3
ZOH281	BASICS OF NEUROSCIENCE	3	0	0	0	3	3
TOTAL							35.5

B.TECH. (MECHANICAL) THIRD SEMESTER

Course Code	Course Title	Number of contact hours					Credits
		Lecture	Tutorial	Practical	Seminar	Total	
		(L)	(T)	(P)	(S)	Hours	
EEM301	BASIC ELECTRONICS	3	1	0	0	4	3
EEM302	BASIC ELECTRONICS LAB.	0	0	2	0	2	1
EEM303	DATA STRUCTURES	3	0	0	0	3	3
EEM304	C PROGRAMMING LAB.	0	0	1	0	1	0.5
MEM301	ENGINEERING MECHANICS II	3	1	0	0	4	3
MEM303	MANUFACTURING PROCESSES II	3	1	0	0	4	3
MEM304	APPLIED THERMODYNAMICS	3	1	0	0	4	3
MEM305	THERMAL ENGINEERING LAB. I	0	0	1	1	2	1
MEM306	ENGINEERING DRAWING III	0	0	4	0	4	2
MAM381	ENGINEERING MATHEMATICS III	4	0	0	0	4	3
ENH381	ENGLISH III	3	0	0	0	3	3
EGC381	PRODUCT MANUFACTURING PROJECT	0	0	3	0	3	1.5
EGC382	PRACTICAL TRAINING	-	-	-	-	0	2

TOTAL						29
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B.TECH. (MECHANICAL) FOURTH SEMESTER

Course Code	Course Title	Number of contact hours					Credits
		Lecture	Tutorial	Practical	Seminar	Total	
		(L)	(T)	(P)	(S)	Hours	
ASM401	MATERIALS SCIENCE	3	0	0	0	3	3
ASM402	MATERIALS SCIENCE LAB	0	0	2	0	2	1
MEM401	INSTRUMENTATION	3	1	0	0	4	3
MEM402	MECHANICS OF SOLIDS I	3	0	0	0	3	3
MEM403	MATERIALS TESTING LAB	0	0	1	1	2	1
MEM404	MECHANICS OF MACHINES I	3	0	0	0	3	3
MEM405	MECHANICS OF MACHINES LAB	0	0	1	1	2	1
MEM406	ENGG. METROLOGY AND MEASUREMENTS	3	1	0	0	4	3
MEM409	METROLOGY LAB	0	0	2	0	2	1
MAM481	ENGINEERING MATHEMATICS IV	3	0	0	0	3	3
ENH481	ENGLISH IV	3	0	0	0	3	3
EGC481	INDUSTRIAL VISITS	-	-	-	-	0	1
GKC481	SC.METH., G.K. & CURRENT AFFAIRS IV	1	0	0	0	1	1
CAC481	CO-CURRICULAR ACTIVITIES	0	0	2	0	2	3
Work Experience Course On Chosen Subject							
ASW 401	METALLURGICAL ANALYSIS	0	0	4	0	4	2
DPW 401	COMMERCIAL ART	0	0	4	0	4	2
EEW 401	RADIO & TELEVISION REPAIR	0	0	4	0	4	2
EEW402	REPAIR OF ELECTRICAL EQUIPMENT	0	0	4	0	4	2
EEW403	PRINTING TECHNIQUES	0	0	4	0	4	2
MEW401	AUTOMOBILE ENGINEERING	0	0	4	0	4	2
MEW402	PHOTOGRAPHY	0	0	4	0	4	2
MEW403	REFRIGERATION & AIRCONDITIONING	0	0	4	0	4	2
MEW404	FURNITURE DESIGN & MANUFACTURING	0	0	4	0	4	2
TOTAL							32

B.TECH. (MECHANICAL) FIFTH SEMESTER

Course Code	Course Title	Number of contact hours					Credits
		Lecture	Tutorial	Practical	Seminar	Total	
		(L)	(T)	(P)	(S)	Hours	
MEM501	FLUID MECHANICS	3	1	0	0	4	3
MEM502	FLUID MECHANICS LAB.	0	0	1	1	2	1
MEM505	INDUSTRIAL ENGINEERING	3	1	0	0	4	3
EEM507	ELECTRICAL TECHNOLOGY	3	1	0	0	4	3

EEM508	ELECTRICAL TECHNOLOGY LAB	0	0	2	0	2	1
MAM581 / MAM582	DISCRETE MATHEMATICS / PROBABILITY AND STATISTICS	3	0	0	0	3	3
PYH581	INDUSTRIAL PSYCHOLOGY	2	0	0	0	2	2
EGC581	DESIGN ENGG./ THEME DEVELOP. PROJECT	0	0	3	0	3	1.5
EGC582	PRACTICAL TRAINING	-	-	-	-	0	2
CRC581	COMPARATIVE STUDY OF RELIGIONS	2	0	0	0	2	2
GKC581	SC. METH., G.K. & CURRENT AFFAIRS II	1	0	0	0	1	1
RDC581	AGRICULTURAL ENGINEERING	3	0	0	0	3	2.5
Mainstream Mechanical							
MEM503	MECHANICS OF SOLIDS II	3	1	0	0	4	3
MEM504	MATERIALS TESTING LAB.	0	0	1	1	2	1
Industrial Engineering Specialisation							
MEM516	VALUE ENGINEERING	3	1	0	0	4	4
Computer Science Specialisation							
EEM513	COMPUTER ARCHITECTURE	4	1	0	0	5	3
EEM514	ADVANCED PROGRAMMING LAB	0	0	2	0	2	1
TOTAL							29

B.TECH. (MECHANICAL) SIXTH SEMESTER

Course Code	Course Title	Number of contact hours					Credits
		Lecture	Tutorial	Practical	Seminar	Total	
		(L)	(T)	(P)	(S)	Hours	
MEM601	MECHANICAL ENGINEERING DESIGN I	4	0	0	0	4	4
MEM602	MECHANICAL ENGG. DESIGN PRATICE I	0	0	4	0	4	2
MEM603	METAL CUTTING & TOOL DESIGN	3	1	0	0	4	3
MEM604	PRODUCTION ENGINEERING LAB.	0	0	1	1	2	1
MEM605	HEAT TRANSFER	3	1	0	0	4	3
MEM606	HEAT TRANSFER LAB.	0	0	1	1	2	1
EEM608	CONTROL ENGINEERING	2	0	0	0	2	2
MEM609	STREAM SEMINAR	0	0	0	2	2	1
MAM681	ADVANCED OPTIMIZATION TECHNIQUES	4	0	0	0	4	3
EGC681	DESIGN ENGG./ THEME DEVELOP. PROJECT	0	0	3	0	3	1.5
RDC681	VILLAGE INDUSTRIES & ENTERPRENUERSHIP	2	1	0	0	3	2
CEC681	CULTURAL EDUCATION	2	0	0	0	2	2

CAC681	CO-CURRICULAR ACTIVITIES	0	0	2	0	2	3
Mainstream Mechanical							
MEM607	AUTOMOBILE ENGINEERING	3	1	0	0	4	3
MEM608	AUTOMOBILE ENGINEERING LAB	0	0	3	0	3	1.5
Industrial Engineering Specialization							
MEM611	STATISTICAL QUALITY CONTROL	3	1	0	0	4	3
MEM612	STATISTICAL QUALITY CONTROL LAB	0	0	3	0	3	1.5
Computer Science Specialisation							
EEM611	DESIGN & ANALYSIS OF ALGORITHMS	3	0	0	0	3	3
EEM612	COMPUTER SCIENCE LAB	0	0	3	0	3	1.5
TOTAL							33

B.TECH. (MECHANICAL) SEVENTH SEMESTER

Course Code	Course Title	Number of contact hours					Credits
		Lecture	Tutorial	Practical	Seminar	Total	
		(L)	(T)	(P)	(S)	Hours	
MEM703	REFRIGERATION AND AIR CONDITIONING	3	1	0	0	4	3
MEM704	THERMAL ENGINEERING LAB. II	0	0	1	1	2	1
MEM708	MANAGERIAL ECO. & INDUSTRIAL ORGAN.	3	1	0	0	4	3
MEH701	MECHANICAL ENGINEERING PROJECT I	0	0	6	0	6	3
MEH702	SEMINARS	0	0	0	2	2	1
EGC781	CO-OP TRAINING	-	-	-	-	0	4
GKC781	SC.METH.,G.K. & CURRENT AFFAIRS III	1	0	0	0	1	1
RDC781	RURAL ENGINEERING PROJECT	0	0	2	0	2	1
In Addition to The Above Courses							
Mainstream Mechanical							
MEM701	MECHANICS OF MACHINES II	3	1	0	0	4	3
MEM702	MECHANICS OF MACHINES LAB	0	0	1	1	2	1
MEM705	POWER PLANT ENGINEERING	3	0	0	0	3	3
MEM706	MECHANICAL ENGINEERING DESIGN II	3	1	0	0	4	3
MEM707	MECHANICAL ENGG. DESIGN PRACTICE II	0	0	4	0	4	2
Industrial Engineering Specialization							
MEM721	DESIGN & SIMULATION OF WORK SYSTEMS	3	1	0	0	4	3

MEM722	DESIGN & SIMULATION OF WORK SYSTEMS LAB	0	0	4	0	4	2
MEM725	OPERATIONS RESEARCH	3	1	0	0	4	3
MEM730	METHODS ENGINEERING & ERGONOMICS	3	1	0	0	4	3
MEM731	METHODS ENGINEERING& ERGONOMICS LAB	0	0	2	0	2	1
Computer Science Specialization							
EEM706	ELECTRO-MAGNETIC FIELD THEORY	3	1	0	0	4	3
EEM710	SOFTWARE DESIGN	4	1	0	0	5	5
*EEM720	COMPUTER NETWORKS	3	0	0	0	3	3
EEM723	SYSTEM LAB	0	0	2	0	2	2

Stream-wise FIRST optional Courses							
Mainstream Mechanical							
MEM711	MACHINE TOOL DESIGN & CONTROL	3	1	0	0	4	3
MEM712	FOUNDRY ENGINEERING	3	1	0	0	4	3
MEM714	GAS DYNAMICS	3	1	0	0	4	3
MEM715	THEORY OF ELASTICITY & PLASTICITY	3	1	0	0	4	3
MEM716	FINITE ELEMENT METHODS	3	1	0	0	4	3
MEM717	MECHANICS OF COMPOSITE MATERIALS	3	1	0	0	4	3
MEM719	STOCHASTIC PROCESSES	3	1	0	0	4	3
MEM720	MATERIALS MANAGEMENT	3	1	0	0	4	3
*MEM728	ADDITIVE MANUFACT. FOR 3D PRINTING	2	0	0	0	2	2
*MEM729	ADD. MANUFACT. FOR 3D PRINTING LAB	0	0	2	0	2	1
*EEM724	FUZZY SYSTEMS	3	0	0	0	3	3
Industrial Engineering Specialization							
MEM719	STOCHASTIC PROCESSES	3	1	0	0	4	3
MEM720	MATERIALS MANAGEMENT	3	1	0	0	4	3
MEM727	PROJECT ENGINEERING & MANAGEMENT	3	1	0	0	4	3
MEM728	ADDITIVE MANUFACT. FOR 3D PRINTING	2	0	0	0	2	2
MEM729	ADD. MANUFACT. FOR 3D PRINTING LAB	0	0	2	0	2	1
EEM724	FUZZY SYSTEMS	3	0	0	0	3	3
MEM723	INDUSTRIAL KINESIOLOGY	2	0	0	0	2	2
MEM724	INDUSTRIAL KINESIOLOGY LAB	0	0	2	0	2	1
Computer Science Specialisation							

MEM728	ADDITIVE MANUFACT. FOR 3D PRINTING	3	0	0	0	3	3
MEM729	ADD. MANUFACT. FOR 3D PRINTING LAB	0	0	2	0	2	1
EEM719	VLSI DESIGN TECHNIQUES	3	0	0	0	3	3
EEM722	DIGITAL IMAGE PROCESSING	3	0	0	0	3	3
EEM724	FUZZY SYSTEMS	3	0	0	0	3	3
TOTAL							33

B.TECH. (MECHANICAL) EIGHTH SEMESTER

Course Code	Course Title	Number of contact hours					Credits
		Lecture	Tutorial	Practical	Seminar	Total	
		(L)	(T)	(P)	(S)	Hours	
MEM801	BUSINESS MANAGEMENT	3	0	0	1	4	4
MEM802	MECHANICAL ENGINEERING PROJECT	-	-	16	-	16	8
MEH801	SEMINARS	0	0	0	2	2	1
RDC881	RURAL ENGINEERING PROJECT	0	0	2	0	2	1
GKC881	SC.METH., G.K. & CURRENT AFFAIRS IV	1	0	0	0	1	1
CAC881	CO-CURRICULAR ACTIVITIES	0	0	2	0	2	3
#	STREAM WISE CORE COURSES						
*	STREAM WISE FIRST OPTIONAL COURSES						
**	STREAM WISE SECOND OPTIONAL COURSES						
***	STREAM WISE THIRD OPTIONAL COURSES						

Stream-wise Core Courses:							
Mainstream Mechanical							
MEM818	HYDRAULIC MACHINES	2	1	0	0	3	2.5
MEM819	HYDRAULIC MACHINES & LAB	0	0	2	0	2	0.5
Industrial Engineering Specialization							
MEM813	SUPPLY CHAIN MANAGEMENT	3	1	0	0	4	3
Computer Science Specialization							
EEM812	OPERATING SYSTEMS	3	0	0	0	3	3

Stream-wise FIRST optional Courses							
Mainstream Mechanical							
*MEM820	AUTOMATED MANUFACTURING SYSTEMS	2	1	0	0	3	2
MEM821	AUTOMATED MANUFACTURING SYSTEMS LAB	0	0	2	0	2	1
*MEM822	BIO-MEDICAL ENGINEERING	2	1	0	0	3	2

MEM823	BIO-MEDICAL ENGINEERING LAB	0	0	2	0	2	1
MEM825	THERMAL TURBOMACHINES	3	1	0	0	4	3
EEM821	NEURAL NETWORKS	3	0	0	0	3	3
EEM823	SYSTEMS OPTIMIZATION USING EAS	3	0	0	0	3	3
EEM825	MOBILE COMPUTING	3	0	0	0	3	3
Stream-wise SECOND optional Courses							
Mainstream Mechanical							
MEM816	IC ENGINES & GAS TURBINES	2	1	0	0	3	2.5
MEM817	IC ENGINES & GAS TURBINES LAB	0	0	1	1	2	0.5
MEM826	INDUSTRIAL SAFETY ENGINEERING	3	1	0	0	4	3
EEM820	QUANTUM COMPUTING	3	0	0	0	3	3
Industrial Engineering Specialization							
MEM824	TOTAL QUALITY MANAGEMENT	3	1	0	0	4	3
MEM826	INDUSTRIAL SAFETY ENGINEERING	3	1	0	0	4	3
Mainstream Mechanical							
EEM817	MICROWAVE ENGINEERING	3	0	0	0	3	2.5
EEM818	MICROWAVE ENGINEERING LAB	0	0	1	1	2	0.5
EEM820	QUANTUM COMPUTING	3	0	0	0	3	3
MEM826	INDUSTRIAL SAFETY ENGINEERING	3	1	0	0	4	3

Third Optional Courses (Common to all Streams)							
EEM811	ROBOTICS	3	0	0	0	3	3
MEM809	NANO-TECHNOLOGY & NANO-COMPUTING	3	1	0	0	4	3
MEM811	FUTUROLOGY STUDY	3	1	0	0	4	3
MEM812	NON-CONVENTIONAL ENERGY ENGINEERING	3	1	0	0	4	3
MEM814	MANAGEMENT INFORMATION SYSTEMS	3	1	0	0	4	3
MEM827	OPERATIONS MANAGEMENT	3	1	0	0	4	3
TOTAL							30

2.1.3. State the components of the curriculum (5)

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total number of credits
Basic Sciences	12.12	30	30
Engineering Sciences	15.96	55	39.5
Humanities and Social Sciences	9.90	32	24.5
Program Core	23.64	79	58.5
Program Electives	13.54	47	33.5
Open Electives	4.44	13	11
Project(s)	7.07	22	17.5
Internships/Seminars	5.25	8	13
Any other	8.89	14	22
Total number of Credits			247.5

Table B.2.1.3

2.1.4. State the process used to identify extent of compliance of the curriculum for attaining the Program Outcomes and Program Specific Outcomes as mentioned in Annexure I (10)

Remarks by UGC Committee headed by Prof. M.V. Mathur that visited DEI Engineering College on 18th May 1977 “A comprehensive and integrated education with interdisciplinary approach, with the objective of not only improving the quality of existing education but also to effecting a radical change in its pattern and content so that while its academic excellence is improved upon, it produces better graduates suited to today’s needs, especially in the background of socio-economic conditions and rural reconstruction and development. The program is thus innovative.

... will present multi-disciplinary, and multi-faculty courses, integrated with other activities, work etc., which is not intended to be provide by one or two institutions only. Institutions will work in faculties, providing facilities for inter-faculty coaching of students in subjects assigned to the faculties – both as major and half subjects. In addition, all students will receive instructions as a part of curriculum in social service, Indian culture, rural problems, farming and comparative religion besides participating in relative field experience programs. It is expected that students with such a background would be able to provide in villages the much needed leadership in rural development. They would be academically better

equipped to undertake post graduate studies and majority of those who end their education at graduation level, will be able to have some independent self- employment.....”

The curriculum designed is in-line with the above innovative education and its compliance for attaining the program outcomes and program specific outcomes is listed below:

- (i) A semester system is followed in which marks and grading both are given for all the components of evaluation. Classes are regularly held and in each class the student is given a home assignment based on what was taught on that day so that he can not only revise but apply the scientific principles taught for engineering applications and retain the knowledge.
- (ii) Every week a class test is conducted for all subjects so that the students are assessed regarding the course specific outcomes.
- (iii) This continuous evaluation and feedback helps the students to identify and rectify their weakness and makes them attain the course specific outcomes and program outcomes.
- (iv) Further, the students are made to participate in group discussions and seminars and this makes them attain proficiency in the subject and helps the attainment.
- (v) Every quarter class tests are conducted and at the end of the semester final examinations are conducted which are evaluated by teachers of other reputed institutes. Thus external peer review is done on the evaluation of Course Specific Outcomes and Course Outcomes.
- (vi) Regular feedback is taken from students through class committee meetings and the meritorious students as well as weaker students are provided opportunity to improve themselves even after normal timings and during weak ends by providing extra consultation by teachers.
- (vii) During the semester teacher-student interaction is also arranged so that every parent is made aware of his ward’s performance and can gage the program outcome.

PSO1	Graduates of Mechanical Engineering will achieve excellence in product analysis, product design, innovation and entrepreneurship.
PSO2	Graduates will be able to analyze, interpret and provide solutions to the real life mechanical engineering problems.
PSO3	Graduates will be able to develop approaches to solve multidisciplinary problems of manufacturing using state of art technologies.

2.2. Teaching-Learning Processes (70)

2.2.1. Describe Processes followed to improve quality of Teaching & Learning (15)

Some of the processes / initiatives that have been put in place for improving the Quality of teaching and learning are as follows.

- (i) A rigorous process of selection with student and Department participation along with a Committee including External Experts has been put in place for faculty selection with M.Tech as the minimum requirement. All the Faculty members are encouraged to pursue PhD programme if they are not PhDs and take up some research project if they are already PhDs. This is evident from the large number of research projects pursued in the Departments.
- (ii) A rigorous continuous evaluation process keeps the students engaged in daily learning and with continuous feedback. A special unique feature of this process is the administration of the Daily Home Assignment (DHA) that is given at the end of every lecture in a theory course and enables the student to “think” and assimilate the material delivered in the lecture of the day. These are to be submitted in the next class and evaluated and returned in the subsequent class. This is continuous learning and evaluation in the truest spirit of the term.
- (iii) Teaching-Learning in DEI follows a student-centric process employing experiential, participative, problem solving and constructivist methodologies, through (a) Teaching Methodology, (b) Experience-Based Courses, (c) Different Modes of learner-centered teaching (d) a wide range of co-scholastic components and (e) Specialized Centres of Learning.

(a) Experiential and Participatory Teaching-Learning methods used include:

- Seminar cum Group Discussions
- Individual and Group Projects
- Self-Study and Dissertations
- Field work
- Case Analysis
- Presentations
- Term Papers

- Self-Study Courses
- Research Colloquia

(b) Experience-based/ Practice-oriented courses

Based on the principle of ‘Learning by Doing’ a large proportion of courses in each programme have a high practical component to provide hands on learning experience to the students:

- Multiple projects in II year, III year and IV year BTech.
- Work-Based training
- Compulsory Summer Training after BTech I year (30 days) and II year (40 days)
- Compulsory Co-operative Industrial Internship after BTech III Year (5 months)
- Performing Arts Courses
- Vocational and Skill courses
- Rural Development Core course with focus on Agricultural Operations

(c) Learner-Centred Modes of Education

Learner-Centred modes of teaching-learning are used that make learning self-paced and self-regulated:

- **Vidyaprasar** (www.vidyaprasar.dei.ac.in), an **on-line collaborative learning, live web cast and content management system** with state-of-the-art interactive learning resources. MOOCS developed by DEI and under e-PG-Pathshala and SWAYAM.
- Ten Virtual and Remote Triggered Laboratories
- Specialization streams are available for the student to choose within the Core Branch. BTech (Electrical Engineering) student can choose to specialize in Electronics or Computer Science or stay in the core discipline. The success of this approach is borne by the fact that BTech (Electrical Engineering) students have been appearing in the GATE exam in all the three disciplines i.e. Electrical Engineering, Electronics and Communications Engineering and Computer Science and scoring very high percentile

marks in all the three disciplines enabling them to join PG programmes in IISc and various IITs.

- Variety of Elective courses

(d) Co-Scholastic Learning Components

A wide range of compulsory co-scholastic learning components cater to varied learner interests and potentialities that include co-curricular activities, games and sports, yoga, community outreach, field and industrial visits, creative and problem-solving contests and Field and Industry experience. A Business Advisory Clinic provides free consultancy to Business firms and Industries facing difficulties. Faculty members and students take up real life case studies and offer appropriate guidance. More than 6,000 cases have been taken up and resolved satisfactorily.

(e) Specialized Centres of Learning

The advanced centres of learning include:

- Multi-disciplinary Quantum and Nano Systems and the Consciousness Studies Virtual Centers
- The Virtual Advanced Lab for Interactive Design, Analyze, and Test in Electronics – eVALIDATE.
- The iNFORMATION- cOMMUNICATION- nEURO- cOGNITIVE- Technologies Assisted Language Lab (I-c-n-c-TALL)
- 2G to 5G, IOT, AI and Robotics Laboratories
- Quantum Jugaad Centre and Entrepreneurship and Virtual Incubation Centre

The above teaching learning modalities ensure experiential and participatory learning leading to a holistic development of students within and beyond the classroom.

- (iv) The curriculum has the following compulsory core courses in all UG programmes specially focused on the development of human values and professional ethics:

- Cultural Education (to take pride in national ethos so that one may not lose one's moorings).
- Scientific Methodology, General Knowledge and Current Affairs: (to nurture a scientific temper and be aware of contemporary developments).
- Rural Development: (to foster a fuller understanding of the rural life with a view to appreciate properly the polity and economy of our country and social forces at work).
- Agricultural Operations (to inculcate a spirit of working with one's own hands and develop an understanding of the contribution of rural life)
- Social Service: (to engender the spirit of brotherhood of man and to facilitate establishment of casteless and classless society).
- Comparative Study of Religion: (to create a spirit of tolerance and awaken the spirit of Brotherhood of Man and Fatherhood of God).
- Co-curricular Activities (for all-round development of personality)
- Environment Studies (for environment consciousness and its impact on everyday life)

(v) Special measures taken to support relatively slow learners, are:

- Organizing Extra Classes
- Remedial and Tutorial Classes are held to prepare them for remedial exams
- Assistance from classmates and senior students is arranged
- Providing tutorial assignments
- Providing lectures uploaded on web and extra reading material to improve basic understanding of subject
- Encouraging students to study courses on developing soft skills to master understanding of language
- Encouraging students to participate in various Co-Curricular and Extra-Curricular activities to develop social skills

(vi) The Institute offers a number of opportunities for advanced learners to augment their talent and meet their learning needs:

- Under-Graduate Research Awards (UGRA): to encourage select bright UG students to undertake research projects.
- Students are encouraged to make research contributions in their major project at the PG level and publish their results in journals and also present it at National and International Conferences.
- Students are encouraged to participate in Summer Research Fellowship programmes at prestigious research institutes and laboratories in India and abroad.
- The Institute, in collaboration with the Systems Society of India, organizes various competitions and an Annual Students' Systems Conference (Paritantra) and Technical Colloquia regularly and gives prizes and awards.
- Vertical and Horizontal Progression: Provision has been made for bright students to undertake advance credit courses and integrated degree programs.
- MoUs and Collaboration: Students are encouraged to work in laboratories of National and International Institutes and Universities with MoU.
- Financial support is provided to students for participation in National and International Conferences.
- The Institute, in association with Association of Alumni and Friends of DEI (AAFDEI) registered in USA, provides financial support for boarding and lodging and travel assistance to students on their visit abroad for higher studies or for conferences.
- Earn while you learn provision has been made for students for part-time jobs in the large number of projects running in the Institute. This helps them learn state of the art techniques and also get remuneration.
- Students are encouraged to help slow learners in their class and in junior classes.

2.2.2. Quality of end semester examination, internal semester question papers, assignments and evaluation (15)

A. Evaluation

- i. Continuous evaluation is followed in the true sense in the Department. Every Theory course has components of evaluation like Class Tests 1 and 2, Daily Home Assignments (DHAs), Daily

Class Assignments (DCA), Additional Assessment and Attendance.

- ii. The weightage of the internal evaluation is 75% whereas the external end semester exam is for 25 %. The grades obtained in both the internal and the external evaluations are mentioned separately in the grade sheet. This is very important because any discrepancies will immediately come to light and the evaluation in the internals is done very seriously. It is uncommon for students to actually get better grades in external than in internal evaluation.
- iii. 5% marks are given as an incentive to attend classes and for attendance. Similarly Practical Courses / Projects / Seminars have multiple components.
- iv. All the evaluations are time bound and are made available on the Course Monitoring System (CMS) so that the students can see their marks at any time they wish.
- v. The answer books of Class tests are shown to the students after evaluation within a week of the test. Feedback is given and answers to the questions are discussed in class so that the students know what they have done right and what they have not.
- vi. Daily Home Assignments (DHAs) are given after every class and concern the matter covered in that class. These are evaluated and returned in the next class. This helps in making the class assimilate the contents delivered in the class and establishes a routine that makes them regular, disciplined and punctual. Since assignments are to be submitted in class it provides an additional incentive for regularity in attendance. Thus class attendance is typically very good. More importantly, the DHAs help in preparing the students to face daily targets which are typical in the industry. Thus they do not feel any difficulty in their jobs as they are used to regular sustained hard work.
- vii. The Daily Class Assignments are short tests held in class every week on the matter covered in the previous week. These prepare the students to pay attention to detail as they are typically quiz type in nature.
- viii. The format of the Additional Assessment is left to the teacher to decide according to the nature of the course. It could be a seminar on a topic related to the subject wherein the student may be required to dig deeper than what is possible in the course work on a particular topic. In Computer Science courses, the course teacher might prefer an implementation assignment so that the

student gets a feel for the practical details in a small application related to the course. Others might prefer some other mode of evaluation.

- ix. Every theory course has a Question Bank that is given to the students at the beginning the semester. The Question Bank clarifies the level of detail that is expected on every topic in the syllabus of the course. It is also sent to the examiner of the end semester exam. The Question Bank is very helpful in standardizing the content delivered when multiple teachers teach the same course in the same year or across different years. It establishes a basic level of coverage that is expected.
- x. Several feedback mechanisms in the form of Suggestion Box, Class Committees, Proctorial Meetings, Academic and Administrative Audit Committee meeting etc. All these mechanisms have been put in place to ensure that any discrepancies from the expected level are immediately spotted and mid course corrective measures are taken rather than as a post facto analysis.
- xi. The internal grades are proposed by the course teacher in each course. However, they are discussed in a Departmental Moderation Committee before finalizing. In this the all the course teachers teaching a particular class present their grade distributions. Any deviations from accepted norms are immediately visible. The grades in a particular course cannot be much higher or much lower than the other courses. If that happens, the course teacher has to provide a reasonable explanation or modify as per recommendation of the Committee. This is a powerful check and balance mechanism.
- xii. Attendance and performance have higher weightage in lab evaluations and projects.
- xiii. The end semester evaluation is completely transparent to the Department. Every course as a panel of examiners provided by the Department and the actual examiner in a particular year is decided centrally. So the course teacher is not aware of who it is. These examiners provide feedback about the student performance either question – wise or overall. Large discrepancy between the internal and external grades are spotted and reported to the Department for investigation and corrective measures if necessary. Some of the examiners in the last end semester examinations conducted in December, 2018 – January, 2019 include:

1. Prof Prem Kalra, Department of Computer Science, IIT, Delhi

2. Prof Puneet Mahajan, Head of the Department of Applied Mechanics, IITS, Delhi

3. Prof. R A Khan, Department of Mechanical Engineering, Jamia Millia Islamia, N Delhi.

(xiv) All the above mechanisms ensure that the quality of evaluation meets the accepted standards world- wide.

2.2.3. Quality of student projects (20)

- i. Under Graduate Research Award fellowships are available on a competitive basis in several Departments. Students of Electrical Engineering can also compete for UGRA in Physics and Computer Science Department and several students do compete and win these awards. UGRA carries Rs 10,000 to enable students to meet small expenses in the project. Larger requirements, if any, are taken care of by the respective labs.
- ii. Faculty members have sponsored Research projects from R&D Institutions and also have tie ups with industry for project work. Students who are associated with these faculty members have the additional benefit of working on live problems and, at the same time, get paid in the “Earn While You Learn” model.
- iii. Students pursue their UG Major Project after returning from a 5 month stint in the industry. In many cases they bring their project idea from the industry and continue to be in touch with their mentor in that industry. This is especially true in the case of industries which offer a pre-placement to the student.
- iv. The Department has close linkages with the other departments of the University like Electrical Engineering, Physics and Computer Science and Mathematics and also with Centres like the Centre for Consciousness Studies. This enables students who are interested in these areas to take up projects in these and widens the choices. Students have presented their findings in International Conferences in India and Abroad.
- v. Although the Department of Mechanical Engineering is named so it is a 50 year old undivided Mechanical Sciences Department i.e. it has Mechanical Engineering, Industrial Engineering and Computer Science within its ambit. This brings in synergy of different ideas and the cross fertilization of these ideas. The Department has very strong linkages with the Community of

Dayalbagh. Projects of practical utility are pursued as a result of these linkages. Some of these are:

- a. Dairy Fuzzy modelling for feed cost optimization
 - b. Truck tracking during harvesting
 - c. Solar panel tracker
 - d. Remote Monitoring of Solar Panels
 - e. Smart Dairy and Smart Agriculture
- vi. Projects are evaluated by a Departmental Committee thrice in a Semester based on written reports and a Viva-Voce examination. The Supervisor also submits his /her evaluation to the Coordinator of the Projects and all these evaluations are consolidated by the Project Coordinator.
- vii. The unique feature of the BTech curriculum at DEI is that the students complete multiple projects. Apart from the Major project in the Final Year, at the II year level, the students complete a Product Manufacturing Project that is a Workshop oriented project that requires them to work on Workshop machines. At the Third year level, they complete a Design Engineering and Theme Development Project so as to closely understand the whole process of Design and development of a new project by actually going through the steps. In the Final year they pursue a Rural Engineering Project to get a better understanding of the rural needs and opportunities in the rural sector. These multiple projects are distinctly a DEI innovation in times where some Institutes are removing even the Final Year Project from their curriculum.

In the entire course duration, the students are assigned following project work at different levels to improve their skill in various disciplines and imbibe a quality of community service for rural India in them.

Various projects assigned to the students are given below and each are of two semester duration except the Product Manufacturing Project:

- i) Product Manufacturing Project (PMP) at Second Year Level
- ii) Design Engineering & Theme Development Project (RDC-581 & RDC-681) at third Year Level
- iii) Rural Engineering Projects (RDC-782 & RDC-882) at Final Year Level

iv) Major Project (EEM-705 & EEM 803) at Final Year Level

Scheme of Evaluation for Projects work

In each project there are internal assessment and external assessment in the ratio of 75 % and 25 % respectively during the even semester whereas it is all 100% during the odd semester. Continuous Evaluation scheme is being adopted and the progress is monitored through out the semester by the project guide and a team of professors. Marks are awarded by the project guide(75%) and the committee of Professors, excluding the guide (25%). Finally during the End Semester Evaluation an external expert from reputed institute is appointed for evaluation.

S. No	Title of the Project	Name of the Students	Award	Name of the Awarding Agency	Year of Award
1	Multi-purpose Mobile Powerhouse	Abeer Saxena Mehar Saran Punarvasu Sharma Achraj Prakash	Gold Cup	Mitsubishi Electric	2018
2	Portable Printing: 3D Printer	Shailendra Shakya Agam Singhal Apar Singhal	Regional Award	Hindustan College of Science & Technology, Farah, Mathura.	2017

2.2.4. Initiatives related to industry interaction (10)

A. Patents:

1. A 3D-ECAP Die for manufacture of Bulk Nano-Structured Materials.
2. Process and apparatus for 3D circular equal channel angular pressing (Government of India Patent Office 3318/CHE/2013)

B. Consultancy Projects:

S.No.	Project Title and Funding Agency	Contribution	Status	Amount (Thousands of Rupees)
1.	Design of Winching and Mooring System for Aerostat-2000m ³ , ADRDE, DRDO.	Principal Investigator	2004-2006	994
2.	Finite Element Structural Analysis of 75 feet Inflatable Hemi-spherical structure,	Principal Investigator	2007-2009	996

3.	Study and development of processes for creating Bulk Nano materials for aero space structures, ADRDE, DRDO.	Principal Investigator	2009-2011	995
4.	Study of microstructure and mechanical properties of ultrafine grained aluminum alloy (al6061) developed using ECAP and FSP, ADRDE, DRDO.	Principal Investigator.	2010-2012	999

C. Collaborations with Industries and Corporate Sectors

S.No	Name of the Industry/Company	Date of MoU	Area of Research & Collaboration Scope of Activities & benefits accruing to DEI
1	Maruti Suzuki India Ltd.	20.04.2010	<i>Collaboration with Department of Automobile Engineering</i> <ul style="list-style-type: none"> • Workshop set up • Student Training • Staff exchange
2	Bharat Heavy Electricals Ltd.	12.08.2010	<i>Collaboration with Department of Electrical Engineering</i> <ul style="list-style-type: none"> • Student Training
3	India Yamaha Motor Pvt. Ltd.	22.10.2011 21.06.2015 09.06.2017	<i>Collaboration with Department of Automobile Engineering</i> <ul style="list-style-type: none"> • A specialized Two-Wheeler Training Workshop was set up in Department of Automobile Engineering in which the students had undergone specialized training to enhance their employment opportunities and were also awarded Certificate of Proficiency by the Company
4	Honda Motorcycle and Scooter India Pvt. Ltd., Maanesar, Gurgaon	4.12.2012	<ul style="list-style-type: none"> • Provide training to trainees and mentors of Painting and Welding Course • Provide practical teaching aids to these courses
5	TVS Motor Company Ltd., Chennai	9.08.2013	<i>Collaboration with Department of Automobile Engineering</i> <ul style="list-style-type: none"> • Student Stipend • Training and Final Placement

6	Dayal Motors Agra		<ul style="list-style-type: none"> • Providing skill –based training to students who have enrolled for vocational training at various levels
7	Mitsubishi Electric India Pvt. Ltd. Gurgaon, Haryana	17.03.2015	<ul style="list-style-type: none"> • Student Training and Placement
8	Oasis Fabrications, YamunaNagar, Haryana	3.09.2015	<ul style="list-style-type: none"> • Student Training and Placement
9	Genpact India Pvt. Ltd. Hyderabad	10.06.2016	<ul style="list-style-type: none"> • Student Training and Placement

D. Interaction of Students with Industry Experts

S. No.	Topic	Speaker	Date
1.	Career Opportunities for Engineering Students: Is Entrepreneurship a Viable Option?	Drs. Ajay Sharma CEO at ASR Ventures & President Rotary International Hague, Netherlands	28th November, 2017
2	Internship, Choices, Career	Rajendra S Pawar, Chairman & Managing Director, NIIT Ltd.	8th December, 2017

E. Inducted Personnel from Industry in various bodies

Eminent Persons from industry are inducted in Academic council, Chairman and members of Board of Governors for TEQIP Project, Institute Innovation Council, Industry Consultation Committee, etc. for closure participation in shaping the academic and administrative activities.

F. Industrial Visits

Industrial Visits for three days are organised every academic year and this activity has a 1 credit. Students of First year are divided in batches and visits industries for three days in and around Agra and within a range of 50 Km radius. Second year students also visits industries within a radius of 250 Km. Each batch is associated with teacher mentors. After the visit the students are asked to submit a visit report and the an internal viva by a group of teachers is conducted followed by an End semester external viva by an external examiner. A tentative list of the industries/Establishments visited by the students is given below:

S. No.	Industry
1	M/s. Atul Generators Pvt. Limited, Agra
2	M/s. Kotsons Transformers, Agra
3	M/s. Marsons Transformers, Agra
4	M/s. Raj Pattern Works, Agra
5	M/s. Basant Industries, Agra
6	220 kV Substation, UPPCL, Agra
7	400 kV Substation, UPPCL, Agra
8	Diesel Loco Shed, Indian Railways, Agra
9	U P Roadways Maintenance Depo, Agra
10	M/s. Prakash Agriculture Industries, Agra
11	Amar Ujala Press, Agra
12	Creambell Industry, Mathura
13	Pepsi, Mathura
14	Mathura Refinery, Mathura
15	Bhole Baba Dairy, Mathura
16	Havells India, Neemrana, Rajasthan
17	ACE, Faridabad
18	Moeserbaer, G Noida
19	YAMAHA Motors, Surajpur, G Noida
20	Maruti Suzuki, Manesar, Gurgaon
21	HVDC Power Plant, PGCIL, Dadri

Initiatives related to industry internship

Motivational lecture and Interaction Session organized a on 8th December, 2017 on **“Internship, Choices, Career”**

Rajendra S Pawar, Chairman & Managing Director, NIIT Ltd.

Rajendra S Pawar is the Chairman and Co-Founder of NIIT Group that encompasses NIIT Limited, a leading Global Talent Development Corporation, and NIIT Technologies Limited, the software and

services arm. As a co-founder of the NIIT Group, Pawar has not only revolutionized the IT training industry, but is also recognized as a global technology thought leader.

As the Chairman of India's IT industry body- National Association of Software and Service Companies (NASSCOM), Pawar has led several ICT industry initiatives, giving voice to the sector's aspirations and goals. Earlier during 1990-92, as President of MAIT (Manufacturers' Association for Information Technology), Pawar integrated MAIT's activities with other leading industry associations in India.

A Fellow member of the Computer Society of India (CSI) and the Institution of Electronic and Telecommunication Engineers (IETE), Pawar was awarded an Honorary Doctoral Degree by Rajiv Gandhi Technical University (MP) in 2005.



6. Regularly conducting Alumni meet

The 'Alumni Association of Dayalbagh Educational Institutions (AADEIs)' closely works with DEI and provides dedicated support in all activities of DEI. It has contributed significantly through financial and non-financial means during the last five years:

1. Installation of EDUSAT facilities at a number of Study Centers, establishment of ICT Centres at Delhi, Timarni and Bangalore and also upgradation of the Multimedia lab and e-class rooms at DEI.
2. Seed funds for initiating Research in the area of Astro particle Physics, which eventually matured into an MoU with TIFR, Mumbai. It has created a chair of excellence in the Music Department.
3. Under Graduate Research Awards (UGRA) to encourage undergraduate students to take up research projects.
4. Development of Instruction books for vocational courses for Open and Distance Learning.
5. Short Courses on Soft Skills, Spoken English, Personality Development and skills to face Interviews, Resume Writing, Elementary Computer Courses, TALLY ERP 9, Advanced Computer Courses on Networking regularly on campus not only to DEI students, but also for unemployed graduates.

6. Special coaching for NET, GATE and civil services examinations.
7. Sponsored International Conferences conducted by DEI.
8. Sponsored faculty and students to participate in International Conferences abroad.
9. DEI Alumni Placement Assistance Cell (DEI-APAC), a wing of AADEIs helps in placement of DEI graduates.
10. Summer training and Co-op-Internship of students. It arranges to oversee the training by assigning this duty to an alumnus working in that Organization.
11. Unique mentorship program by assigning expert alumni to guide the final year engineering students in their projects in distance mode.
12. Campus development
13. The Alumni living in USA have registered a separate Association 'AAFDEI', to help DEI in its overseas activities: financing visits of eminent scientists from USA, assistance to DEI faculty and students in USA for research and establishment of Distance Education Study Center at Colombo.
14. Active members of various academic and administrative bodies of the Institute.
15. Conduct surveys to take feedback from all stakeholders and suggest improvements.
16. Deliver invited talks, guest lectures and seminars.
17. Provide counseling to students for employment.
18. Active members of IQAC.
19. Act as judges in cultural and sports competitions.
20. Actively help in organization and management of extensive outreach activities of the Institute.
21. Provide sponsorship and support for printing of magazines, conference proceedings, and brochures.
22. Offer services as mentors of DEI distance education programmes in India and abroad.
23. Offer honorary services to teach, guide research and help in establishing ICT centres in India and abroad.
24. Serve as role models for students through distinguished services in different fields of service.
25. Helped in organizing Alumni Reunion events.

Number of Alumni Association /Chapters meetings held year wise during the last five years

2013-14	2014-15	2015-16	2016-17	2017-18
3	3	5	4	2

G. Industry-Institute Partnership Cell (IIPC).

Students are provided with ample support for enhancing their industry preparedness through various courses under the aegis of IIPC. Salient points are presented hereunder –

Industry Preparedness

- Resume Writing/checking (650 students)
- Aptitude Test Practice (246 students in 10 sessions)
- Group Discussion Sessions (206 students in 9 sessions)
- Mock Interviews, 97 students
- Career Guidance (B. Tech 6th semester 260 students)
- Guest Lectures on Expectations from the Co-Op Trainee while at Internship in the Industry, for 6th Sem., Personal Effectiveness 190 students
- Soft Skills (45 students)
- Spoken English (45 students)
- Basic IT (51 students)
- Students Projects (DE/TD, Rural Engineering and Major Projects)



H. Student Projects In Partnership with Industry

I. Student Industry Interaction for internship

This section is detailed in 2.2.5

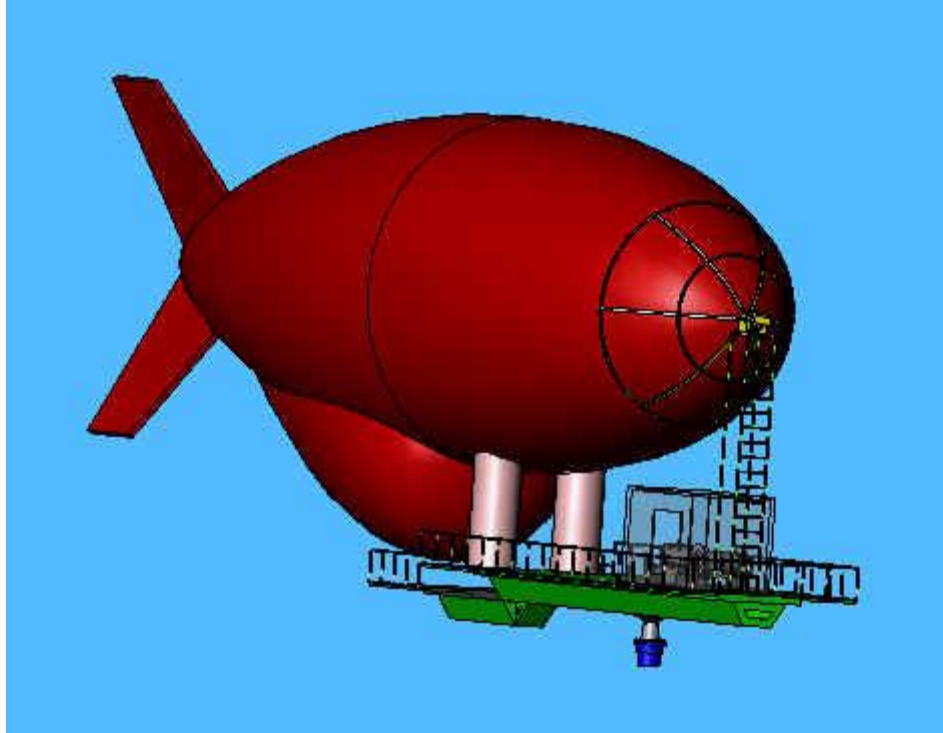
ACADEMIC ASSIGNMENTS UNDERTAKEN BY THE FACULTY OF MECHANICAL ENGINEERING:

1. Associate Editor, International Journal of Agile Manufacturing Systems.
2. Reviewed two text books on Finite Element Methods for Tata McGraw Hill Co., India.
3. Editor, D.E.I. Journal of Science and Engineering Research.
4. Member Review Panel, International Journal of Agile Manufacturing.
5. Member of Panel of Examiners - J.N.T.U., Hyderabad.
6. Member of Expert Panel Identified by Needs Analysis Workshop - AICTE & IIT Kanpur.
7. Member of Expert Panel – Dr. B.R. Ambedkar University, Agra.
8. Member Expert Panel – Aerial Delivery Research and Development Establishment, Agra.
9. Member Review Panel – Indian Journal of Engineering and Materials Science, National Institute of Science Communication, New Delhi.

10. Academic Expert, Selection Committee, CEPTEM, DRDO.
11. Reviewed a DRDO project on “Arrester Barrier System for ADRDE(DRDO), Agra.
12. Reviewed a DRDO project on “Design of Mooring System for a 250m³ Aerostat of ADRDE.
13. Reviewed a DRDO project on “Design of Winching and Mooring System for 2000m³ Aerostat.
14. Reviewed a DRDO project on “p7- Heavy vehicle drop System with Parachutes”, ADRDE.
15. Reviewed an ISRO-DRDO project “ Human Space Flight Program”, 2011.

SAMPLE ABSTRACTS OF PROJECTS RELATED TO DRDO

Design of Winching and Mooring system of an Aerostat – 2000m³



Consultancy Project

By

**K. Hans Raj
Rahul Swarup Sharma**

**Department of Mechanical Engineering
Faculty of Engineering
DAYALBAH EDUCATIONAL INSTITUTE
Dayalbagh, AGRA-282005**

For

Aerial Delivery Research & Development Establishment (ADRDE)
Govt. of India, Ministry of Defense, Defence Research & Development Organisation
P.O. Box No. 51, Station Road, Agra Cantt. - 282 001

Design of Winching and Mooring System of an Aerostat – 2000m³

I Introduction to Aerostat System and its main players

1. Introduction to Product Design
2. Design for Strength
3. Design for Manufacturing
4. Design for Environment
5. Design Optimization
6. Main Components of the system

II Mooring Sub-System

1. Introduction to Four load cases
2. Design of Mooring Tower
3. FE Results
4. Design of Central Bearing
5. Exploded views
6. FE results
7. FE Analysis of Flying Sheave
8. Cradle Assembly Design

III Winch Sub System

1. Factors of Safety
2. Conventional Design of Winch
3. Design of Capstan Assembly
4. FE Analysis of Capstan Assembly
5. Design of Level Winding Arrangement
6. FE Analysis of Winding Drum
7. Power Drives and Hydraulic System

IV Final Assembly Drawings

1. Drawing of Mooring Tower
2. Sectional Drawing of various Pipe Sections
3. Drawings of various Components of Central bearing Assembly
4. Drawings of various components of Capstan Assembly
5. Drawings of Various Components of Level Winding Assembly
6. Drawings of Cradle Assembly
7. Drawings of Trestle
8. Drawings of Working Platform
9. Drawings of Ladder
10. Drawings of Cradle and Latch Assembly

V Conclusions and Future Scope

1. Benefits of Collaboration: Technology Development at DEI and ADRDE;
2. Man Power Development; Research Publications; 16000m³ Aerostat.

VI APPENDIX

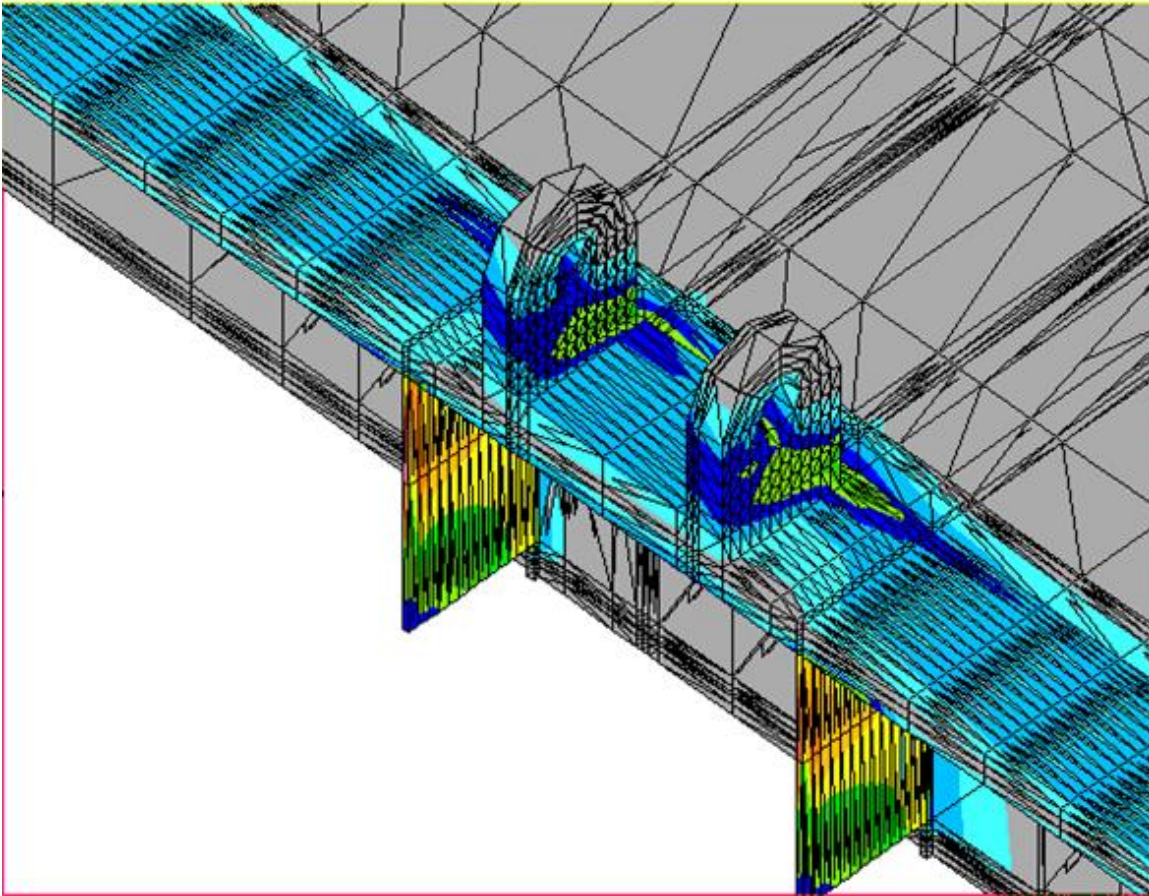
Detailed Finite Element Analysis Report of Mooring Tower (CD)

Abstract

Aerostats are unmanned, aerodynamically shaped blimps that are buoyed aloft, tethered to the ground by a single cable. The aerostat is made of a large fabric envelope that is filled with nonflammable helium/hydrogen, which provides the lifting force. The tether also serves to supply the electrical power to the aerostat systems, and for data relay between the aerostat and the ground station. The most common electronic systems to be Installed on an aerostat, include Surveillance Radar, Observation and Communication systems full and accurate data. Operation costs of an Aerostat system are a mere fraction of the costs as compared to Airborne Warning And Control System. Supports build up of database over time for Identification of irregular events provides increased coordination between Surveillance and response units. **Typical Applications and capabilities of Aerostat system are: (a)Surveillance, (b)Communications, (c)Monitoring, and (d)Broadcasting.** Aerostat systems are used by variety of organizations: Police /Border Patrols; Land Forces; Naval Forces; Coast Guard Forces; Air Forces; Environmental Agencies; Fisheries Agencies and Early Disaster Warning Centers.

Earlier ADRDE has developed Aerostats of two sizes i.e. 160m^3 volume and 250m^3 volume systems, termed as Aerostat-160 and Aerostat-250 respectively. The hoisting and de-hoisting of these aerostats at the desired altitude is accomplished by means of a flexible tether wrapped over a drum of a hydraulically operated winch. While, the tether is wrapped over the smooth surface of the spooling drum, its cross section gets deformed or flattens owing to the aerostat forces experienced by the flexible tether, the deformation of the tether cross section not only contributes to the strength degradation of the tether but it also disturbs the uniform winding of the tether when they are wrapped in multiple layers to store the tether length as long as 1200 meters and beyond. Hence this consultancy project addresses this problem and designed a new Winching and Mooring System for a heavy duty 2000m^3 that can go up to 3000meters. The solution to this problem can be achieved by using capstan drive mechanism in which helical grooved surface is provided on the capstan roller or a pair of rollers. The following document deals with the design of the mooring and winch platform for Aerostat – 2000m^3 . In succeeding paragraphs, the basic design of the winch components and its mounting accessories as well as FEM analysis of mooring structure has been discussed. Design of winch components is well supported by FEM analysis. **Note: The 2000m^3 aerostat system is now commissioned at ADRDE(DRDO) campus of Agra.**

FEM ANALYSIS OF P-7 PLATFORM STRUCTURE



Consultancy Project

By

K. Hans Raj

**Department of Mechanical Engineering
Faculty of Engineering
DAYALBAH EDUCATIONAL INSTITUTE
Dayalbagh, AGRA-282005**

For

Aerial Delivery Research & Development Establishment (ADRDE)
Govt. of India, Ministry of Defense, Defence Research & Development Organisation
P.O. Box No. 51, Station Road, Agra Cantt. - 282 001

FEM ANALYSIS OF P-7 PLATFORM STRUCTURE

Abstract

Heavy drop systems are required by various agencies like Disaster Management centers, Postal department, Air Force, Navy and many others, dropping of food and Medical supplies in flood effected areas is a typical application. Airlifting and dropping Tanks and other armored vehicles is a requirement in case of war at high altitudes and remote areas. The P-7 platform is one such heavy drop system that is developed by ADRDE and the Finite Element Analysis is carried out at Dayallbagh Educational Institute. The report below gives the detailed Finite Element analysis of various subsystems and components so that it can be manufactured at ADRDE(DRDO).

Note: The P-7 heavy drop system is now commissioned at ADRDE(DRDO), Agra.

Contents

- I Introduction to Heavy drop Systems**
- II P-7 Platform and its Sub-Systems**
- III Finite Element Modelling and Results**
- IV Final Assembly Drawings**
- V Conclusions and Future Scope**
- VI APPENDIX**

2.2.5. Initiatives related to industry internship/summer training (10)

The students are encouraged to take up intern ship programs during their semester break. Faculty members give their guidelines, suggestions and scope and contact details of an internship. They also help the students by interacting with the industrial experts, provide the students recommendation letters and other necessary supports. The alumni coordinator constantly interacts with alumni those who are working in the industries and request them to provide necessary guide lines and supports for their junior's internship.

- i. Summer training is a compulsory credit course to be completed in the summers after first and second years. The duration of the training after first year is 30 days and the duration after second year is 40 days.
- ii. Some of the industries / Institutes where the students regularly go for summer training include but are not limited to BHEL, Torrent Power, UPPCL, IIT Delhi, ADRDE, Kirloskar, DEI USIC etc.
- iii. After completing the third year, the students go for a 5 month Co-op Internship to various Industries. The duration is long enough for them to be given some live project work and most industries do take advantage. Many students also get some monetary incentives for the training period going upto Rs 25,000 per month. Some industries offer free boarding and / or lodging.
- iv. Some of the industries where the students regularly go for co-op internship include Analog Devices, Texas Instruments, Essar Steel, Maruti, IIT Delhi, Cadence Design Systems, start-ups in Bangalore / NOIDA etc.

A. Implementation details:

- i. The Department has a strong Alumni Network across the country. The Alumni not only help arranging for the Co-op Internships but also mentor the students in their internship. The Placement cell coordinates this effort and ensures that every student gets the summer training / co-op internship opportunity in some industry / educational / R&D Institution.
- ii. Training sessions are conducted in DEI by the Alumni before the students go for their Internship on the dos and donts during the Internship.

- iii. The Alumni mentors also mentor the students during the Internship so that they get the maximum benefit by working on live projects.
- iv. Faculty members are assigned students that they have to evaluate according to the geographical spread of the industries. The industries are clustered into clusters based on the geographical location and one cluster is assigned to one Faculty member. Faculty members coordinate with the Industry personnel mentoring the students in their internship and get feedback on their performance through telephone / email interaction on a regular basis. This enables mid-course correction in case some student has some performance issues. They may also visit the industries where the students are in their internship and get first hand feedback.
- v. Students are required to submit a report of the work done during their Summer training / co-op internship when they come back to the Institute after the completion of these endeavours. They need to make a presentation to a Departmental committee that is set up for the purpose and face a Viva examination.
- vi. There is an external end semester examination also where the external examiner who is typically an Industry person evaluates their performance. These evaluations ensure that the training / co-op Internships are taken up very seriously by the students.

B. Impact Analysis

- i. The industry exposure helps a lot in personality development of the students. For many students it is their first experience of staying away from home on their own. They learn to do manage. They are also exposed to industry culture and learnt to communicate with their industry mentors and perform tasks assigned within the given time frame in an industrial setting. The change in their personality is evident when they come back from the industry. They are more confident and more articulate.
- ii. Many students, who perform well, get Placement offers from the industry where they do their co-op internship. In some cases there is a request that the student be allowed to join the industry earlier than the May of next year when they complete their graduation. Requisite arrangements are made in such cases to enable the student to complete the remaining credits through online mode and come to the Department for appearing in the tests / exams. In some cases these are arranged in the DEI local centres in the city where the student works.

- iii. One big advantage that the industry gets in offering the co-op training is that they get to observe the student for a considerable period i.e. 5 months and can evaluate their strengths / weaknesses better. In case they offer placement they can also ask the student to work on the weaknesses identified in their Final Year so that they are ready to be productive from day one when they join the industry after Graduation. This has been a very successful model in many cases.
- iv. Some students get their Final Year Major project ideas from their co-op training. They continue to be in touch with their industry mentor and many work on the project under their joint supervision. This is permitted by the Department.
- v. Some students work on projects that are industry sponsored and get paid for the work done in the Final Year major project. These incentives help raise the quality of the work done.

C. Internship Data

1. Internship Data 2018

S. No	Company	Type	Area	Students
1	DISTINCTIVE HORIZON	PVT	MANUFACTURING	1
2	DRDO	GOVT	R & D	3
3	EATONS	PVT	MANUFACTURING	2
4	ELIN LEATHERS	PVT	MANUFACTURING	1
5	ESCORTS	PVT	MANUFACTURING	1
6	ESSAR STEELS	PVT	MANUFACTURING	6
7	FIAT	PVT	MANUFACTURING	3
8	HACKERS NEXT	PVT	MANUFACTURING	1
9	HONDA 2-WHEELERS	PVT	MANUFACTURING	1
10	HONDA CARS	PVT	MANUFACTURING	1
11	IFFCO	GOVT	MANUFACTURING	1
12	JOHNDEERE	PVT	MANUFACTURING	4
13	JSW	PVT	POWER	7
14	JYOTI ENGINEERS	PVT	MANUFACTURING	1
15	L & T	PVT	MANUFACTURING	6
16	M L STARTUP	PVT	MANUFACTURING	1
17	MAHINDRA	PVT	MANUFACTURING	1
18	NAVITAS EFFICENSE	PVT	MANUFACTURING	2
19	ROSA THERMAL	PVT	POWER	1
20	TATA CUMMINS	PVT	MANUFACTURING	5

21	TATA MOTORS	PVT	MANUFACTURING	2
22	TATA MOTORS	PVT	MANUFACTURING	7
23	UPSEB	GOVT	POWER	1
24	VOLVO EICHER	PVT	MANUFACTURING	3
25	YAMAHA	PVT	MANUFACTURING	6

2. Internship Data 2017

S. No	Company	Type	Area	Students
1	ADRDE	GOVT	R & D	7
2	AIR CHARTER	PVT	MANUFACTURING	1
3	DMRC	GOVT	MANUFACTURING	2
4	DRDO	GOVT	R & D	7
5	ESSAR STEELS	PVT	MANUFACTURING	3
6	FIAT	PVT	MANUFACTURING	2
7	HONDA 2-WHEELERS	PVT	MANUFACTURING	3
8	HONDA CARS	PVT	MANUFACTURING	1
9	JAMUNA AUTO	PVT	MANUFACTURING	3
10	JCB LTC	PVT	MANUFACTURING	2
11	KRISHNA MARUTI	PVT	MANUFACTURING	1
12	L & T	PVT	MANUFACTURING	6
13	L & T	PVT	MANUFACTURING	5
14	MARUTI	PVT	MANUFACTURING	2
15	METAFAB ENGINEERS	PVT	MANUFACTURING	3
16	N. RAILWAYS	GOVT	MANUFACTURING	1
17	NIFTY TECHNOLOGY	PVT	MANUFACTURING	1
18	PHILIPS	PVT	MANUFACTURING	3
19	PRETECH	PVT	MANUFACTURING	1
20	TATA CIMMUNIS	PVT	MANUFACTURING	2
21	TATA NET	PVT	MANUFACTURING	1
22	TATA NET	PVT	MANUFACTURING	7
23	VOLVO EICHER	PVT	MANUFACTURING	5
24	YAMAHA	PVT	MANUFACTURING	4

CRITERION 3	Course Outcomes and Program Outcomes	175
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3.1. Establish the correlation between the courses and the Program Outcomes (POs) & Program Specific Outcomes

- NBA defined Program Outcomes as mentioned in Annexure I and Program Specific Outcomes as defined by the Program. Six to ten matrices of core courses are to be mentioned with at least one per semester.
- Select core courses to demonstrate the mapping/correlation with all POs and PSOs.
- Number of Outcomes for a Course is expected to be around 6.

Program Articulation Matrix

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CHM18 1	2.8	2.6	2.2	2.4	1.6	1	1	1	1	1.2	1	1	2.4	2.6	2
CHM18 2	2.17	2	1.83	1.67	1.1 7	1	1	1	3	1.5	1	1	1.91 5	2	1.42
PHM18 1	2.2	2	1.4	1.4	0.4	0.2	-	-	-	1.2	0.2	1	1.7	2	0.9
PHM18 2	2.33	2.33	2.33	2.33	1.3 3	1	1	1	2.3 3	1.33	2	1.33	2.33	2.33	1.83
MEM10 1	3	1	2	2	1	-	-	-	-	-	-	1	1.5	1	1.5
MEM10 2	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
MEM10 3	3	2.2	2.4	2.2	2.4	1.6	1.8	1.8	0.6	1.6	2.4	2.2	2.3	2.2	2.3
MEM10 4	3	2.2	2.4	2.2	2.4	1.6	1.8	1.8	1.5	2	3	2.2	2.3	2.2	2.3
MAM1 81	3	3	3	1.6	0.6	0.4	-	-	0.2	1.6	0.4	1	3	3	1.1
RDC18 1	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
RDC18	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3

2															
GKC18 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
BBH10 1	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
BBH10 2	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
BOH18 1	3	3	2	2	1	3	3	3	3	1	1	3	2.5	3	1.5
CEH18 1	1	1	1	1	3	3	3	1	1	1	1	1	1	1	2
DBD10 1	3	3	1	1	3	3	1	1	1	1	3	3	2	3	2
DPH18 1	-	-	-	-	-	3	1	3	3	3	-	2	-	-	3
ECH18 1	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
ENH18 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
MUH18 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
OMH10 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
PYH18 1	3	3	3	2	3	2	2	1	1	3	1	3	3	3	2.5
STH102	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
PYH10 2	3	3	3	3	2	3	-	3	3	3	3	3	3	3	2.5
PHM28 1	2.4	2.2	1.6	1.8	0.6	0.4	-	-	-	1.2	0.2	1.2	1.9	2.2	1.2
PHM28 2	2.33	2.33	2.67	2.67	1.3 3	1	1	1	2.3 3	1.33	2	1.33	2.5	2.33	2
EEM20 1	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
EEM20 2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
MAM2 81	3	3	3	2.2	1	0.6	-	-	-	1.6	0.2	1.2	3	3	1.6

MEM20 1	3	2.17	1.67	1.83	-	0.17	0.17	-	-	-	-	1	1.92	2.17	1.83
MEM20 2	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
MEM20 3	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
MAM2 81	3	3	3	2.2	1.2 5	1.5	-	-	-	1.6	1	1.2	3	3	1.72 5
EGC28 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
GKC28 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
RDC28 1	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
RDC28 2	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
CAC28 1	2	2	1	1	1	2	-	3	3	2	1	3	1.5	2	1
MEM20 4	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
EEM30 1	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
EEM30 2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
EEM30 3	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
EEM30 4	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
MEM30 1	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
MEM30 2	2.8	2.8	2.2	2.2	1.4	1.2	2	2	2	1.8	1.2	2.4	2.5	2.8	1.8
MEM30 3	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8
MEM30 4	3	3	2	2	-	-	-	-	-	-	-	1	2.5	3	2
MEM30 5	3	3	1.2	1.4	-	-	-	-	-	-	-	1	2.1	3	1.4

MEM30 6	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
MAM3 81	2.8	2.4	2.2	2	1.3	1	-	-	-	1.2	1	1.2	2.3	2.4	1.65
ENH38 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
EGC38 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
EGC38 2	2.75	2.75	2.25	2.25	1.5	1.5	2.25	2.25	2.25	2.25	1.5	2.75	2.5	2.75	1.875
ASM40 1	3	2.8	2.2	2.2	1	-	1.8	1.4	2	1.2	-	1.6	2.5	2.8	1.6
ASM40 2	2.5	2.5	2.5	2.5	2	2	2.5	2.5	2.5	2.5	2	2.5	2.5	2.5	2.25
MEM40 1	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
MEM40 2	3	3	3	3	-	1	1	-	1.2	-	-	1.25	3	3	3
MEM40 3	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8
MEM40 4	3	3	3	3	2	1	1	1	1	1	2	2	3	3	2.5
MEM40 5	2.8	2.6	2	2.2	2.2	2.8	1.2	2.8	2.8	2.8	1.2	2.6	2.3	2.6	2.2
MEM40 6	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8
MEM40 9	2.8	2.6	2	2.2	2.2	2.8	1.2	2.8	2.8	2.8	1.2	2.6	2.3	2.6	2.2
MAM4 81	3	3	3	3	1.8	1.8	-	-	-	1.2	1	1.2	3	3	2.4
ENH48 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
EGC48 1	1	1	1	3	2	3	1	2	2	3	1	3	1	1	2.5
GKC48 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
CAC48 1	2	2	1	1	1	2	-	3	3	2	1	3	1.5	2	1

ASW40 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
DPW40 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
EEW40 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
EEW40 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
EEW40 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEW4 01	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEW4 02	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEW4 03	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEW4 04	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEM50 1	3	2.6	2.6	2.6	0.6	1.2	2.2	0.4	1.6	1.2	-	1.4	2.6	2.6	1.6
MEM50 2	3	3	3	3	2	3	2	-	2	1	1	2	3	3	2.5
MEM50 5	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MAM5 81	3	2.2	1.6	1.8	0.6	1.2	-	-	-	1.2	0.2	1.2	1.9	2.2	1.2
MAM5 82	3	2.6	1.6	1.8	0.6	0.4	-	0.4	-	1.2	0.2	1.2	2.1	2.6	1.2
EGC58 1	3	3	3	3	2	3	2	1	3	3	3	2	3	3	2.5
CRC58 1	-	-	-	-	-	2	2	3	2	2	1	2	-	-	3
GKC58 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
RDC58 1	3	3	3	2	3	3	3	3	3	1	2	2	3	3	2.5
MEM50 3	3	3	2.25	-	-	1	-	-	1	1	-	1	2.62 5	3	2.25

MEM50 4	2.33	1.67	1.67	0.33	-	-	-	-	1	2.33	-	0.67	1.67	1.67	0.33
MEM51 6	2.6	2.6	2.6	2.6	2.8	2.4	2.6	2.2	2.4	2.6	1.8	2.6	2.6	2.6	2.7
MEM60 1	3	3	2.6	1.8	0.8	0.8	0.8	0.8	2.6	-	-	1	2.8	3	1.3
MEM60 2	2.33 3	1.66 7	1.66 7	0.66 7	-	0.66 7	0.66 7	0.66 7	1	2.66 7	-	0.66 7	1.66 7	1.66 7	0.66 7
MEM60 3	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEM60 5	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8
MEM60 6	2.6	2.6	2.6	2.6	2.8	2.4	2.6	2.2	2.4	2.6	1.8	2.6	2.6	2.6	2.7
MEM60 9	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MAM6 81	2.4	2.2	1.6	1.8	0.6	0.4	-	-	-	1.2	0.2	1.2	1.9	2.2	1.2
EGC68 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
CEC68 1	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
MEM60 7	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEM60 8	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
MEM61 1	2.6	2.6	2.6	2.6	2.8	2.4	2.6	2.2	2.4	2.6	1.8	2.6	2.6	2.6	2.7
MEM61 2	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
MEM70 2	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
MEM70 3	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
MEM70 4	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEM70 5	3	2.2	2.4	2.2	2.2	1.6	1.8	1.8	-	1.25	-	2.8	2.3	2.2	2.2

MEM70 6	2.5	2.5	2.5	1.67	1	1.17	1.17	1.17	2.5	-	-	1	2.5	2.5	1.33 5
MEM70 7	2.33	1.67	1.67	0.67	-	0.67	0.67	0.67	1	2.67	-	0.67	1.67	1.67	0.67
MEM71 1	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8
MEM71 2	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEM71 4	2.6	2	2.4	1.6	3	1.8	2.2	2	1.5	2.4	2.8	3	2.2	2	2.3
MEM71 5	2.6	1.6	2.4	1.4	3	1.2	2	1.8	1	1.8	2.4	3	2	1.6	2.2
MEM71 6	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEM71 7	2.6	1.8	2.4	1.6	3	1.2	2	1.8	1	1.8	2.4	3	2.1	1.8	2.3
MEM71 9	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEM72 0	3	2.2	2	1.8	-	3	-	-	2.5	2	-	1	2.1	2.2	1.8
MEM72 1	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8
MEM72 2	2.6	1.6	2.4	1.4	3	1.2	2	1.8	1	1.8	2.4	3	2	1.6	2.2
MEM72 3	2.4	2.6	2.4	2.4	2.6	2.6	2.4	2.2	2.2	2.4	2	2.8	2.5	2.6	2.5
MEM72 4	2.4	2.4	2.8	2.6	2.6	2.6	3	2	2	1	1	1.8	2.6	2.4	2.6
MEM72 5	2.6	2.4	2	1.75	5	-	-	-	-	-	1.2 5	1.2	2.2	2.4	3.37 5
MEM72 7	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
MEM72 8	2.6	1.6	2.4	1.4	3	2	2	1.8	1	1.8	2.4	3	2	1.6	2.2
MEM72 9	3	2.67	3	2.67	3	1	2	2.67	3	1	3	2.67	2.83 5	2.67	2.83 5
MEM73 0	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8

MEH70 1	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEH70 2	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
EEM71 0	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8
EEM72 0	2.6	2	2.4	1.4	3	1.2	2	1.8	1	1.8	2.4	3	2.2	2	2.2
RDC78 1	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEM80 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
MEM81 2	3	2.6	2.2	2.2	2.2	1.6	1.6	1.2	-	1	-	3	2.4	2.6	2.2
MEM81 4	2.6	1.6	1.6	1.6	2	2	1.6	1.4	1	1.6	1.6	1.8	1.6	1.6	1.8
MEM81 6	3	2.6	2.2	2.2	2.2	1.6	1.6	1.2	-	1	-	3	2.4	2.6	2.2
MEM81 8	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2	2.5	2.8	2.2
MEM81 9	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8	2.5	2.8	1.8
MEM82 2	2.4	2.8	2.6	2.6	2.8	2.8	2.6	2.4	2.4	1.6	1.2	1.8	2.7	2.8	2.7
MEM82 3	2.4	2.4	2.8	2.8	2.4	2.4	2.4	1.8	1.8	1.2	1.2	1.8	2.6	2.4	2.6
MEM82 4	3	3	2.4	2	2.2	2	2	2.4	2.2	2.2	2.2	1.6	2.7	3	2.1
MEM82 7	3	3	2	2	1	-	-	-	-	-	1	1	2.5	3	1.5

Table B.3.1a

Course Outcomes

I-Semester

PHM181	Applied Physics I
CO1	Develop skills in observation, interpretation, reasoning, generalizing, predicting, and questioning as a way to learn new knowledge

CO2	Apply the mathematical abstractions to solve physical problems.
CO3	Understand the basic physics associated with waves and oscillations and apply it to acoustics
CO4	Familiarize with the basic physics of electromagnetic waves and photons
CO5	Identify wave characteristics of light such as interference, diffraction and polarization

PHM182	Applied Physics Lab
CO1	Correlate between theory and experimental results, directly see the proof of principles and theories through practical knowledge
CO2	Gain interest for science, technology and innovative research, Bring new ideas and research problems
CO3	Capable of performing independently as well as in a team

CHM181	Applied Chemistry
CO1	Hardness of water: disadvantages, removal by internal and external treatment by various softening methods used in industry
CO2	Knowledge about various types fuels (solid, liquid and gaseous) like coal, coke, diesel, natural gas etc., their manufacturing, refinement and uses
CO3	Information about lubricants, viscosity and other properties, polymers and their uses in various engineering operations, refractory materials and application
CO4	Knowledge about extraction and purification methods metallurgical process for non-ferrous metals and their alloys
CO5	Information about iron, metallurgy, alloys like cast iron

CHM182	Applied Chemistry Lab
CO1	Imparting practical knowledge about estimation of hardness by volumetric HCl method
CO2	Practical knowledge about estimation of total, permanent and temporary hardness of a given water sample by EDTA method
CO3	Estimation of various alkalinities present in the water sample by volumetric titration linked with theory
CO4	Observing the effect of temperature on the viscosity of a given oil sample used for lubrication
CO5	Estimation of flash and fire points of given oil sample to gain knowledge about suitability of lubricant at operating temperature
CO6	Seminar and group discussion for imparting proficiency of presentation and communication skills

MAM181	Engineering Mathematics I
CO1	Able to solve qualitative problems based on vector analysis and matrix analysis such as linear independence and dependence of vectors, rank etc.

CO2	Understand the concepts of limit theory and nth order differential equations and their applications to our daily life
CO3	Able to solve the problems of differentiation of functions of two variables and know about the maximization and minimization of functions of several variables.
CO4	Come to know the applications of double and triple integration in finding the area and volume
CO5	Know about qualitative applications of Gauss , Stoke's and Green's theorem

MEM101	Graphics Science
CO1	Understand plane geometry by drawing different engineering curves like ellipse, epicycloids, hypocycloid Archimedean spiral, involute etc.
CO2	Understand projection methods with specific focus on orthographic projections
CO3	Draw orthographic projections of lines, planes and solids.
CO4	Draw sections of solids including cylinders, cones, prisms and pyramids.
CO5	Draw inter section of solids and development of surfaces. Construct isometric scale, isometric projections and views.

MEM102	Engineering Drawing - I
CO1	At the end of the course a student will be able to understand the concepts of Engineering Drawing & Standard Practice to be adopted in Engineering Drawing by the Students of Engineering.
CO2	The student will have the basic understanding projection of Points, Lines, Planes and Solids.
CO3	The student will be able to understand & draw the section of solids, intersection of surfaces and development of surfaces and learn about their physical significance.
CO4	The student will have a working knowledge of isometric projections and plane geometry consisting of various curves such as parabola, ellipse, Hyperbola, Involute, cycloids and helix.
CO5	The student will be able to apply the learned concepts of engineering Drawing in the industries. as well as use it for visual representation of their Engineering Ideas.

MEM103	Manufacturing Processes I
CO1	The student will be having the capability of selecting suitable manufacturing processes to manufacture the products optimally.
CO2	The student will be able to recommend the appropriate design of casting process systems, forming processes, welding process and machining (metal cutting) processes.
CO3	The student will be able to develop simplified manufacturing processes with the aim of reduction of cost and manpower.
CO4	The student will be able to identify/control the appropriate process parameters, and possible defects of manufacturing processes so as to remove them.
CO5	To student will be able to increase technical understanding and broaden perspective of the manufacturing world in which he will contribute talents and leadership

MEM104	Workshop practice 1
CO1	To be able to make different molds from patterns of (A) bevel gear (B) Fan-back cover (C) Pulley (D) Final handle
CO2	To be able to practice casting process
CO3	To be able to be aware of fitting tools & learn practically the process of filing, hexing, making, cutting, measuring, etc. on mild steel pieces.
CO4	To be aware of carpentry tools & learn planning, marking measuring, cutting by different chisels, sawing on wood.
CO5	To be able to learn making different wooden Joints.

II-Semester

MEM281	Applied Physics II
CO1	Gain further experience in using the tools, methodologies, language and conventions of physics to test and communicate ideas and explanations
CO2	Understand the concept of relativity, frame of reference, mass-energy equivalence
CO3	Visualize uncertainty principle, wave-particle duality of light
CO4	Capable of applying quantum mechanics to the problems of atomic physics
CO5	Understand applications of quantum mechanics to transistors, semi-conductors and other related systems.

MEM282	Applied Physics Lab II
CO1	Correlate between theory and experimental results, directly see the proof of principles and theories through practical knowledge
CO2	Understand the basic electrical circuit, current, magnetic field
CO3	Capable of performing independently as well as in a team

MAM281	Engineering Mathematics II
CO1	Come to know about the ordinary differential equations and its applications also able to develop a mathematical model of linear differential equations. And also students learn about how to find the solution of designed model.
CO2	Know about necessary and sufficient condition for total differential equations
CO3	Further students know about second order differential equations and their transformations and solutions through methods.
CO4	able to solve basic engineering models through partial differential equations such as wave equation, heat conduction equation etc..
CO5	Know about fourier series initial conditions and its applications to different engineering models

MEM201	Engineering Thermodynamics
CO1	To understand basic concept of thermodynamics and its properties

CO2	To generate the ability to differentiate different forms of energy i.e. heat and work
CO3	To apply first law of thermodynamics to closed and flow systems.
CO4	To realize the need of second law of thermodynamics, spontaneity and irreversibility in nature.
CO5	To learn basic concepts of real gases and working of external and internal combustion engines.

MEM202	Engineering Mechanics-1
CO1	To develop ability to model and analysis of mechanical engineering systems using vectoral representation of forces and moments.
CO2	To be able to draw the free body diagrams of mechanical components and systems.
CO3	Ability to draw shear force diagram and bending moment for different types of beams taking
CO4	To understand the phenomenon of friction and ability to solve problem related to the same.
CO5	To develop the understandings of fundamental principles of fluid statics and buoyancy.

CAC281	
CO1	To inculcate habit of participation in sports and games and to develop sportsmen spirit and competitiveness
CO2	Same as I in various literary social and cultural activity for working as a team and innovate ideas into useful creativity.

MEM203	Engineering Drawing - II
CO1	At the end of the course a student will be able to understand and apply the underlying basic principles Engineering Drawing –II comprising of Machine Elements and graphic statics
CO2	The student will be able to draw and learn about various types of riveted joints, welded joints, bolted joints, pins and cotters, knuckle and cotter joints screw threads, screw and screwed fastenings, pipes and pipe joints and understand the various conventions and notations used.
CO3	The student will be able to understand and draw the various Bearings and brackets used in engineering practice.
CO4	The student will be able to draw free hand sketch various steam engine parts such as stuffing box, cross- head, Connecting Rod and Crank, Eccentric and Slide valve for practicing the concepts learned in the course. This will hone & enhance the visualizing skills of the students.
CO5	The student will be able to understand and apply concepts of graphic statics.

MEM204	
CO1	To be able to practice of different operations of lathe machines (a) Facing (b) Tapper Turning © Plain Turning (d) Step Turning etc.
CO2	To be able to practice of making vee-block on Shaping Machine on C.I. Casting.
CO3	To be able to practice of making different shapes from cylindrical rod on milling machine (a) Hexagonal (b) Square © Triangular & practice of indexing.
CO4	To learn about different pattern allowances and practice of pattern of Vee Block by fixing allowances

CO5	To be able to practice different smithy operations like upsetting, drawing down, setting down, bending and riveting.
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III-Semester

MAM381	Engineering Mathematics III
CO1	Students learn about the how to solve mathematical model with Laplace Transform and error functions and their applications.
CO2	Gain knowledge of Finite and Infinite Fourier Transforms and applications.
CO3	Familiarize with the concept of analytic function, C-R equations and its uses.
CO4	Learn about Cauchy's theorem and its uses in complex integration. Taylor's and Laurent's series in complex form.
CO5	Learn about Cauchy Residues theorem and contour integrations.

MEM-301	Engineering Mechanics-2
CO1	To develop the understanding of modeling dynamic systems of engineering using vectoral approach and ability to model the engineering components as particles to study their Kinematics.
CO2	Application of Newton's laws to particles and systems of particles. Application of work energy principle, work momentum principle to particles and systems of particles. To study satellite motion using Kepler's Law and to understanding the principles of central force motion.
CO3	Modeling and analysis of forces systems acting on rigid bodies to evaluate position velocity and acceleration. To be able to draw the kinematic diagrams and kinetic diagrams.
CO4	Application of Newton's laws, Euler's laws, Work energy principles and impulse momentum principles as rigid bodies and systems of rigid bodies.
CO5	Fundamental understanding of mechanical vibrations and finding out natural frequency for mechanical systems. Application of free damped and forced vibrations on mechanical systems.

MEM 302	Engineering Mech. Lab.
CO1	To be able to learn the concept of friction through inclined plain experiment.
CO2	To be able to understand application of friction in bearing.
CO3	To be able to understand practical application of mechanical advantages.
CO4	To be able to understand fundamental principal underlying different types of gearing.
CO5	To be able to understand the concept of fluctuation of energy and its practical use during mechanical energy storage process.

MEM-303	MANUFACTURING PROCESSES – II
CO1	To give detailed knowledge of cutting tool & their geometry, nomenclature, tool materials, their properties and detailed study of production & CNC lathes
CO2	To impart detailed knowledge about the powder metallurgy, metal powders. Plastics and plastic moulding methods. This will also provide knowledge about various methods of gear

	manufacturing and milling indexing etc.
CO3	: A detailed knowledge of various finishing and super finishing processes such as grinding, honing, lapping and high-speed machining will be imparted to the students.
CO4	To understand the Knowledge & various modern welding techniques such as arc, resistance welding techniques. Atomic hydrogen, TIG, MIG, thermit, friction & inertia, friction stir welding, under water welding & welding of various materials will be imparted to the students.
CO5	Detailed knowledge of modern machining process unconventional in nature such as EDM, EBM, ECM. LBM, PAM etc. and hybrid machining will be provided to the students.

MEM304	Applied Thermodynamics
CO1	Understand power producing cycles and refrigeration cycles with vapor and air as fluids.
CO2	Understand different processes in IC Engines, calculate BP, IP, FP and prepare Heat Balance Sheet.
CO3	Understand different laws governing gases and their mixtures
CO4	Understand steam boilers and their performance
CO5	Understand steam turbines and their performance, Understand compressors and condensers and their performance

MEM305	Thermal Lab. I
CO1	At the end of the course a student will be able to understand the concepts of practical aspects of the working of IC Engines, Compressors, Boilers and Steam Power Plant.
CO2	The student will learn the working of various boilers along with their mountings and accessories.
CO3	The student will be able to draw Valve Timing Diagram of a diesel engine.
CO4	The student will learn to conduct performance test of a diesel engine. The student will understand the working of the ignition circuit of a petrol engine
CO5	. The student will be able to determine efficiency of both single and multi-cylinder Reciprocating Air Compressors and learn about their applications.

MEM306	Engineering Drawing-III
CO1	Draw the assembly drawings (orthographic views of assembled object) of machine assemblies, boiler mountings & accessories, couplings, etc. from the part drawings (orthographic views of individual parts) as per their specified sequence of assembly.
CO2	Representation of materials used (Part or item list) in machine drawing.
CO3	Understanding the concept of limits, fits, tolerances and surface finish and their utility in the industrial context. The representation of limits, fits, tolerances, surface finish, and machining symbols in machine drawing as per BIS norms.
CO4	Draw the detailed drawings of parts with dimensions of the given assembled object and various dimensioned views of the assembly.
CO5	Exposure of CAD tools in machine drawing.

MEM307	Mechanics of Solids & Fluids
CO1	At the end of the course a student will be able to understand the underlying basic principles Mechanics of Solids & Fluids
CO2	The student will have the basic understanding of stress, strain & Deformation, Bending, Bending Stress in axially loaded members and also learn to apply torsion, shear stress and twist in shafts subjected to torque. He will also be able to understand the behavior columns under different end conditions.
CO3	The student will be able to understand various types of flows in fluids and types of energies associated with the flow of fluids.
CO4	The student will be able to have a understanding of some flow measurement systems viz. mouthpiece, notches, orifices.
CO5	The student will be able to understand concepts of flow through pipes and open channels.

MEM308	Mechanics of Solids & Fluids Lab
CO1	To learn practical knowledge on variation of discharge with drop in head at orifice-meter.
CO2	To be able to conceptualize and realize the concept of frictional co-efficient in a pipe flow.
CO3	To be able to estimate co-efficient of discharge of venturi meter and its effect and actual discharge rate.
CO4	To be able to estimate co-efficient of discharge at different heads of cylindrical mouth piece and its practical application.
CO5	To be able to estimate co-efficient of discharge at different heads of various notches and orifices and its practical application.
MEM310	Thermal Engineering Lab.
CO1	To be able to understand a boiler and its mountains.
CO2	To be practically realize a utility of wall timing in a diesel engine.
CO3	To understand ignition circuit for multi-cylinder engine.
CO4	To be able to learn the concept of performance testing of a few hydraulic machines like centrifugal pump, Pelton wheel, Francis turbine.
CO5	To be able to learn the performance test of compressors and its utility in real life

EGC382	Practical Training
CO1	To undergo practical training in industries to get acquainted with various shop floor activity
CO2	To undergo practical training in industries to get acquainted with industrial environment and the problems faced in industries.

GKC381	Sc. Meth., G.K. & Current affairs III
CO1	To be aware about our solar systems, earth rotation and revolution latitude and longitude. World-Continents. Oceans. Seas. Islands. Highest Peaks. Major Rivers.
CO2	To be aware of Main civilization of ancient times and their main features. World Wars- First and

	Second-Causes. Some important world & Indian personalities (Historical & Political).
CO3	To be able to aware about Important Indian newspapers, various political parties in India.
CO4	To be able to be aware about Some important International monetary organizations. Currencies of different countries.
CO5	To be able to aware about Important Indian writers and their works.
CO6	To be able to aware about Current affairs from newspapers.

IV Semester

MAM481	Engineering Mathematics IV
CO1	Able to solve the problems of higher order and transcendental equations analytically with the help of iterations techniques their error analysis. also able to solve problems computationally.
CO2	Come to know about different methods for solving simultaneous system of linear equations with the help of elimination methods , iterative methods, power methods etc.
CO3	Clarification about Interpolation(different difference table) and its applications.
CO4	Learn about different techniques for numerical differentiation and integration.
CO5	Clarification of numerical solutions of ordinary and partial differential equations.

ASM401	Material Science
CO1	Understand the classification of materials, bonding and the crystal structure.
CO2	Identify and understand defects in crystals.
CO3	Interpret and understand the phase diagrams of materials, transformation across various regions, pearlite transformation, TTT Diagram.
CO4	Select suitable heat-treatment process to achieve desired properties of metals and alloys.
CO5	Understand the basic mechanisms of diffusion and the factors governing them. Develop an understanding on the properties and applications of different steels in engineering applications.

ASM402	Material Science Lab.
CO1	To be able to determine the strength of Cu in an unknown CuSo4 solution with the help of photochemical colorimeter
CO2	To able to study various types of cubic unit cells and Bravais lattices with the help of plastic models.
CO3	To be able to study the various symmetry elements in the seven basic crystal systems.
CO4	To be able to study the crystal structures of some materials metals, Ionic compounds and covalent compounds with the help of plastic models.
CO5	To be able to determine the crystal structure of a given cubic crystalline material with the help of a powder pattern obtained from the debye-scherrer camera.
CO6	To be able to study the cooling curves of a given alloy
CO7	To be able to study the micro-structure of various alloys using image analysis system.
CO8	To be able to study the effect of heat treatment on cast iron and carbon steels.

MEM401	Instrumentation
CO1	At the end of the course a student will be able to understand different instruments and processes theoretically as well as experimentally.
CO2	The student will have the basic understanding of different characteristics of instruments viz. accuracy, precision etc.
CO3	The student will be able to understand various parameters for measurements and various measuring instruments.
CO4	The student will be able to have a philosophical understanding of some advanced measurement systems viz. mechanical and electrical actuators, X-ray diffraction etc.
CO5	The student will be able to apply the learned concepts in the industries as well as use different instruments for measurements.

MEM402	Mechanics Of Solids - I
CO1	Course Objectives
CO2	To learn the fundamental concepts of stress, strain, and deformation of solids with applications to bars, beams, and columns. Detailed study of engineering properties of materials. Understanding of the fundamental concepts of applying equilibrium, compatibility, and force deformation relationships to structural elements with basic analysis and design skills.
CO3	Apply the fundamental concepts of principle of superposition, equilibrium, compatibility, force deformation, and stress-strain relationships to basic engineering structures
CO4	Develop a solid knowledge about deformation of axial members by physical insight into distribution of stresses and strains in structural members by determining stress, strain, and deformation of bars, trusses, and beams, and performing stress and strain transformations
CO5	Basic understanding of the method of superposition, flexibility method, and stiffness method as applied to statically determinate and indeterminate axial and torsional members, thin-walled tubes, bending of beams and buckling of columns.

MEM403	Material Testing Lab I
CO1	To understand property of hardness of different materials and be able to use Rockwell hardness testing machine for hardness test.
CO2	To be able to measure stiffness of various compositions of helical spring system.
CO3	To be able to use tensiometer for tensile test of sheet metal.
CO4	To understand the concept of impact and tested effects on a notched M.S. Specimen by Izod Impact Test.
CO5	To be able to understand deformation of a specimen by torsion.

MEM405	Mechanics of Machines – I Lab.
CO1	Understand the concept of Friction In Bearing and make analysis through experiment to find out

	its numerical value.
CO2	Analysis of Worm & Worm Wheel system and to find out different influencing parameters viz., mechanical advantage, velocity ratio, efficiency etc.
CO3	Analysis of differential wheel & axle system and to find out different influencing parameters viz., mechanical advantage, velocity ratio, efficiency etc.
CO4	Understand the concept of Moment of Inertia of Flywheel and make analysis to find out its numerical value.
CO5	Understand the concept of Friction In Screw Jack and movement of a block on inclined plane and make analysis through experiment to find out its numerical value.

MEM406	Engineering Metrology & Measurements
CO1	To understand the basic purpose of measurements, and the role of existing national and international standards in engineering metrology.
CO2	To know about line standards, end standards, calibration of length bars and various types of comparators.
CO3	To know measuring important dimensions of screw threads, and surface finish including roughness, waviness etc.
CO4	To understand acceptance tests of machine tools including alignment tests and performance tests, and to know the working of various instruments used in acceptance tests.
CO5	To learn the statistical quality control and quality assurance tools, and to know their applications in industries.

MEM409	Metrology Lab.
CO1	To understand working and utility of various measuring instruments, and to impart practical knowledge of measurements.
CO2	To be able to measure the ovality of a round bar using mechanical comparator
CO3	To be able to measure angle of a V-block.
CO4	To be able to check concentricity error and spacing of a gear.
CO5	To be able to use tool maker's microscope to measure various parameters of a screw thread

MEW401	
CO1	1. To be able to work and understand and experience the chasses and various major assemblies of automobiles.
CO2	To be able to assemble piston and connecting rod over a crank-shaft.
CO3	To study the gear train of an automobile engines.
CO4	To feel and experience lubrication system of automobile engines.
CO5	To have hands on experience of the working of brakes system of an automobile.

MEW402	
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CO1	To be able to handle various photographic cameras and having functional knowledge of shutter speed diafram and variation of aperchers in pofessional photographic.
CO2	To have working of photographic films and developers.
CO3	To have working knowledge of developing and fixing negatives.
CO4	To have learn about various greats of photographic papers.
CO5	To have initial working knowledge of a colour photographic.

MEW403	Refrigeration & Air conditioning
CO1	To be able to have working knowledge of tools used in repair & maintenance of Refrigerator& Air conditioner.
CO2	To be able to understand assembly & components refrigeration & air conditioner like condensers, cooling coil etc.
CO3	To be able to practice gas welding & soldering
CO4	To be able to change gas in refrigerators
CO5	To have working knowledge of electric circuit in Refrigerator & Air conditioner.
CO6	To troubleshoot problem in refrigeration& Air conditioning
CO7	To be able to test for leakage etc. in refrigerators and air conditioners

MEW404	
CO1	To learn general manufacturing of principals of wooden & tubler steel furniture
CO2	To be able to work with different types of joints and caning polishing and finishing of wooden furniture
CO3	To learn intricacies of tubler steel furniture including tube bending, welding, spray painting and finishing.

GKC481	General Knowledge and Current Affairs
CO1	To be aware and learn about capitals, languages, major crops and mineral wealth of major countries of world
CO2	To be able to be aware of important event in the world history
CO3	To have knowledge about UNO, alliances and associations.
CO4	To be able to be aware about various literary works and their authors
CO5	To be able to learn various abbreviations, superlatives, sobriquets. And day to day current affairs

CAC481	
CO1	To inculcate habit of participation in sports and games and to develop sportsmen sprit and competitiveness
CO2	Same as I in various literary social and cultural activity for working as a team and innovate ideas into useful creativity.

EGC381	Product manufacturing project
CO1	To be able to identify the products for the project.
CO2	To check the technical feasibility and financial viability of the project.
CO3	To discuss the above during brain solving session.
CO4	To prepare utility article as furniture jigs & fixtures. Science and Engineering models for demonstration.

EGC481	Industrial Visits
CO1	To learn and understand organizational setup of various industries in real life
CO2	To be acquainted with various manufacturing processes in real life in various industries
CO3	To learn and experience various kinds of working layouts in industries

DPW401	Commercial Art
CO1	To be able to understand and apply for the concept of visualization theory
CO2	To be able to understand and apply for the concept of story board
CO3	To be able to understand and apply for the concept of packaging
CO4	To be able to understand and apply for the concept of copywriting
CO5	To be able to understand and apply for the concept of advertising theory

V-Semester

MAM581	Discrete Mathematics
CO1	Develop the skill of logical reasoning
CO2	Details of set theory which is basic of all sciences
CO3	Able to understand the group , rings and their properties
CO4	Know about the concept of permutation and combination and applications
CO5	Come to know about discretisation of functions and their recurrence relations

MAM582	Probability and Statistics
CO1	Understand the problems of probability and able to solve them. Also come to know the problems of measures of central tendency
CO2	Come to know about binomial, Poisson and normal distributions and their applications in different engineering, science and social science fields etc.
CO3	Clarification about sampling distribution and point and interval estimation using z and t distribution
CO4	Able to solve the statistical model with different statistical techniques like chi square distribution.
CO5	Understand the problems and solve them with correlation and regression analysis

MEM501	Fluid Mechanics
CO1	Understand the fundamental concepts of viscosity, surface tension, pressure (absolute and gage), flow visualization using path-lines, streak-lines, and stream-lines.
CO2	Understand the kinematics of fluid particles, including the concepts of local and convective accelerations, stream functions, velocity potentials, vorticity and circulation.
CO3	Apply conservation laws like Bernoulli's equations, conservation of mass, momentum to fluid flow problems in engineering applications. Understand the concepts of viscous boundary layers and compute drag and lift coefficients using the theory of boundary layer flows.
CO4	Determine flow rates, pressure changes, minor and major head losses for viscous flows through pipes and power transmission through pipes.
CO5	Analyze and design most economical section: Rectangular Trapezoidal and Circular sections in channel flow. Formulate and solve one dimensional compressible fluid flow problems.
MEM502	Fluid Mechanics Lab
CO1	To be able to determine coefficient of discharge at 60 to 90 degree V- Notch.
CO2	To be able to determine coefficient of discharge for GI pipes and to compare it from Moody's Chart
CO3	To be able to determine coefficient of friction for GI pipes and to compare it from Moody's Chart
MEM503	Mechanical of Solids II
CO1	Develop the ability to analyse 3-D stresses and strains
CO2	Develop understanding of failure theories and their application, to study stresses in axisymmetric problems
CO3	Develop the ability to apply energy methods to analyse simple structures, and to learn about inelastic behavior in bending and torsion
CO4	Develop understanding about unsymmetric and curved beams under bending, and non-circular bars and thin walled tubes under torsion
CO5	Develop understanding of the similarities and differences in behavior of isotropic materials and fiber reinforced laminated composite materials
MEM504	Materials Testing Lab.
CO1	To understand various material properties and conduct experiments to determine the same
CO2	To develop ability to create reports on experiments conducted
CO3	To develop ability to make presentations
MEM505	Industrial Engineering
CO1	To understand basic concepts of industrial engineering, productivity models in manufacturing and service organization, product/service decision, capacity planning, and case studies.
CO2	To make suitable decisions regarding location of the organization as well as layout of the

	department/work-stations within the organization.
CO3	To know about conducting method study, motion study, work sampling time study, and method time measurements
CO4	To have necessary skills and knowledge for operating decisions such as demand forecasting, inventory planning and control, production planning, job sequencing etc.
CO5	To plan, schedule and control the project work of an organization.

EGC581	Design Engineering/ Theme Development Project
CO1	To study & apply design methods and design process for development of design of identify concept
CO2	To develop the concept and study economics in the developed design concept.
CO3	To study reliability aspects and design development.
CO4	To prepare the design report of design development concept.
CO5	To inculcate innovative thinking in students

RDC581	Agricultural Engineering
CO1	To learn and understand the construction & working of primary & secondary Tillage implement, pleating, seeding implements, harvesting equipments and combine.
CO2	To be able to understand the concept of Farm power & mechanics of farm tractors.
CO3	To understand & learn theories of grain drawing & concept of deeps & shallow bins.
CO4	To have knowledge about milk and its properties & various processes of milk preservation.
CO5	To learn basic concept of Irrigation channel design and sprinkle & drip Irrigation System
CRC581	Comparative study of Religions
CO1	To be able to learn about meaning and history of religions and understand conceptual analogy and difference between religion and science and faith & religion.
CO2	To be able to learn & understand Hinduism, Buddhism, Jainism.
CO3	To be able to learn & understand Judaism, Christianity and Islam
CO4	To be able to understand the saint tradition in India and to learn about various religious moments like arya-samaj, brahma-samaj
CO5	To be able to learn lesson from comparative religion and inter-religion understanding

GKC581	Sc. Meth., G. K. & Current Affairs II
CO1	To be able to learn about demographic and geographical data of Indian state and union territories.
CO2	To be able to learn about history of Indian Independence and famous historical places in India.
CO3	To be able to learn about Indian constitution, some important amendments, general elections, defense organization and rewards in India.
CO4	To be able to have knowledge about industrial development in India and its financial institutions. To be able to have knowledge about Indian Space Program and development of atomic energy in India.

CO5	To be able to have knowledge about various games like cricket, table tennis, football etc. and various Indian and International records made by players and teams. To be able to have knowledge about day to day current affairs.
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PHY581	Industrial Psychology
CO1	To be able to understand human factors in work and efficiency
CO2	To be able to understand various type of Psychological tests and its benefits in Industry.
CO3	To be able to understand human relations & work Environment.
CO4	To be able to learn & understand Psychological factor in unionization.
CO5	To be able to understand Mental health factor in mal-adjustments, absenteeism and accident and importance of personal counselling.

MEM516	Value Engineering
CO1	To understand the basic concepts of value engineering (VE), value analysis, VE benefits to organizations, and to learn VE history, professional societies of VE, and certification programs.
CO2	To learn different aspects of value, cost, lifecycle cost, and to be able to carry out function analysis of a product or system using different techniques, and to know about
CO3	To be able to make optimum decision under risk and under uncertainty, and to understand marginal contribution for decision making, break even analysis, and return on investment
CO4	To learn to make job plan for value improvement, and to learn brainstorming, ABC analysis and methodology of VE.
CO5	To learn system reliability with element in series or parallel or both, failure and repair times, and to be able to determine mean time between failures.

VI-Semester

MEM601	Mechanical Engineering Design 1
CO1	To be able to understand fundamentals of design including material selection and axial retainment of rotating parts
CO2	To be able to design various joints, screwed connections, shafts, keys and couplings
CO3	To develop understanding of stress concentration and fatigue and apply the same
CO4	To be able to design levers, belt drives, pulleys, flywheels and hoisting machine elements
CO5	To develop an ability to design brakes and clutches

MEM603	Metal Cutting & Tool Design
CO1	imparts the detailed knowledge of Mechanism of metal cutting, nomenclature of single & multipoint cutting tools, mechanism of chip formation, built up edges, mechanics of orthogonal & oblique cutting, cutting forces, factors affecting tool force, cutting speed, feed & depth of cut, surface finish and temperature distribution at tool chip interface.
CO2	gives the detailed knowledge of tool wear and machinability which includes theories of wear,

	cutting fluids, tool life & factors governing tool life and machinability. imparts the knowledge of Multipoint tools, its design considerations, power & force requirements for drilling, milling, broaches, chatter & its significance and surface roughness.
CO3	It also gives the knowledge of Economics of metal machining which includes single & multi-pass machining operations and criteria & restrictions for selecting economic conditions. Gives the detailed knowledge of jigs and fixtures (viz. design principles, locators & clamps, hydraulic & pneumatic clamping devices, jig bushing). Types and design of drilling jigs & fixtures, Poka yoke- fool proofing and concepts.
CO4	This unit also gives the Casting design which includes theory of gate & riser design and application of design consideration.
CO5	To impart the knowledge of presses and press design which consist of selection of press, classification, different operations such as blanking, piercing, bending, deep drawing & force requirements for these operations. Progressive & compound dies etc.

MEM604	Production Engineering Lab.
CO1	Study of machinability. Determination of its index for five commonly used industrial materials.
CO2	Study of cutting forces exerted in various machining processes and their determination.
CO3	Turning tool testing.
CO4	Testing of sand-moulds and cores for determining the mechanical properties/characteristics.
CO5	Sand testing for determining the GFN.

MEM605	Heat Transfer
CO1	To be able to understand various model of heat transfer in solid liquid and gas
CO2	To be able to learn understand and apply general heat conduction equation in Cartesian and cylindrical co-ordinates to simple problems.
CO3	To learn and understand heat flow through composite plane wall and sphere and two-dimensional steady state conduction.
CO4	To understand and learn various concepts of forced convection, momentum equation and its solution for hydrodynamic boundary layer over a flat plate.
CO5	To learn and understand thermal radiation in black, grey and real surfaces. Planks distribution law, Wein's law, Stefan's law, Boltzmann law, Kirchhoff's law, radiations shield and shape factors and understand basic concept and types of heat exchanges and their recent applications.

MEM606	Heat Transfer Lab
CO1	To learn and understand the surface heat transfer coefficient for a horizontal plate losing heat by natural convection

CO2	To be able to understand comparison of horizontal and vertical flat plate heat transfer in free convection.
CO3	To learn and understand the local surface heat transfer coefficient of a pipe losing heat by forced convection. To be able to understand heat exchanger as parallel flow and find temperature distribution in heat exchangers, overall heat transfer coefficient and efficiencies.
CO4	To learn and understand the superconductivity characteristics of heat pipe and plot graph temperature vs. time of three pipes. To learn and understand heat exchangers as counter flow and find temperature distribution, overall heat transfer coefficient and efficiencies.
CO5	To be able to understand the emissivity of black plate that is equal to one.

MEM607	Automobile Engineering
CO1	Basic Understanding of automobile and its terminology.
CO2	Understanding of various types of power generating devices
CO3	Application of engineering principles to automotive performance
CO4	Understanding of Automobile sub systems e.g. power train, brakes, suspension etc.
CO5	Differentiate between types of clutch, gear box, rear axle drives, wheels and tyres, and their specific applications.

MEM608	Automobile Engineering Lab
CO1	To identify various subsystems of chassis
CO2	To identify engine components and its subsystems such as cooling, lubrication fuel supply system
CO3	To introduce students to steering, suspension, braking systems.
CO4	To understand importance of tyre size and other specifications
CO5	To understand working of various types of power transmission systems

MEM611	Statistical Quality Control
CO1	Given a set of process data, characterize the process behavior using descriptive statistics.
CO2	Understand the relevance and importance of discrete & continuous probability distributions in the context of statistical quality control.
CO3	Design, use, and interpret control charts for variables and attributes.
CO4	Design a Single / Double / Multiple sampling plan, construct its OC curve and evaluate its effectiveness for a given process.
CO5	Understand the relevance and importance of reliability concepts in the context of modern quality systems. Understand the philosophy and basic concepts of quality assurance.

MEM609	Stream Seminar
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CO1	To be able to review literature on a given advance topic related to the specific stream.
CO2	To be able to prepare a summary of various concepts, theories, models, applications and methodology, related to the concerned topics
CO3	To be able to present and discuss the concept & conclusion in an open seminar.
CO4	To be able to present technical report as per specified norms.

MEM612	SQC (Statistical Quality Control) LAB
CO1	To be able to draw operating characteristic curve on the basis of determined produces and consumes
CO2	To be able to draw control chart for given data.
CO3	To be able to draw control chart for attributes.
CO4	To be able to draw AOQ in a given single sampling plan.
CO5	To be able to perform quality circles in small groups.

RDC681	Village Industries And Entrepreneurship
CO1	To learn about history and experiment in rural industries. (rural and small)
CO2	To classify and distinguish between small large and medium industries.
CO3	To be able to understand entrepreneurship related industrial policies, motivational and psychological facts.
CO4	To be able to understand economic environment supply and demand characteristic, product specification, market survey and analysis and selecting a product for small industries and apply process flow chart quality standard and apply process flow chart quality standard and control for small business product.
CO5	To be able to evaluate cost of project, cost of production, break even analysis, cash flow analysis, working capital requirement and profitability and to have knowledge about goal of various financial and control agencies

EGC681	Design Engineering and theme development project
CO1	To be able to understand and apply design Engineering Concept to a real-life industrial problem.
CO2	To be able to conceptualize and synthesize the project idea through brain storming and sensitivity analysis and
CO3	To be able to innovate and propose development concept to realise the idea and To be able to develop a working model or program for the conceptualize idea.
CO4	To be able to prepare a technical report of the developed theme or concept with suitable conclusion.
CO5	To be able to defend the outcome during evaluation process

CEC681	CULTURAL EDUCATION
CO1	To be able to understand meaning, scope and nature of Indian culture
CO2	To have knowledge of pervade Harappan culture.
CO3	To be able to learn various concept about Indian and Vedic languages and essence of epics and pureness. To be able to learn about authors in Sanskrit, Buddhist, Pali, Jain and main current Bhakti literature
CO4	. To be able to understand and learn various Organizations, tradition of state and society. To be able to understand concept of arts in architectures temples, palaces, stupas, Viharas, sculptures, paintings, music and dance, art of warfare.
CO5	To be able to conceptualize Non-Aryan, west Asian, Aryan and European elements in unity in diversity.

VII-Semester:

MAM781	Advanced operation research
CO1	Understand the problems of mathematical programming and related theorems
CO2	Learn about simplex method and its uses in various fields
CO3	Learn about non linear programming, Frank-Wolfe method etc.
CO4	Able to solve the dynamic problems and L.P.P as a case of dynamic problem.
CO5	Learn about quadratic programming and its uses

MEM701	Mechanics of Machines
CO1	Understand the causes and effects of vibration in mechanical systems. Understand the role of damping, stiffness and inertia in mechanical systems
CO2	Develop schematic models for physical systems and formulate governing equations of motion. Understand forced vibrations, vibration isolators and absorbers, whirling of shafts and Analyze torsional systems, 2 rotor, 3 rotor and geared systems.
CO3	Understanding to solve problems using Rayleigh's, Dunkerley's and Holzer's methods
CO4	Understand the gyroscopic effects in ships, aero planes and road vehicles. Analyze balancing problems in rotating and reciprocating machinery.
CO5	. Design cams and followers for specified motion profiles.

MEM702	Mechanics of Machines – II Lab.
CO1	Understand the concept of Whirling of Shaft in different end conditions. Understand the Universal Vibration Apparatus to get knowledge of vibration in single degree as well as in multiple degree conditions.
CO2	Understand the concept of functioning of Gyroscope.
CO3	Understand the working and functioning of Porter Governor
CO4	Understand the concept of Vibration in different machine components with the help of Exciter.

CO5	Understand the Universal Vibration Apparatus to get knowledge of vibration in single degree as well as in multiple degree conditions.
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MEM703	Refrigeration & Air Conditioning
CO1	Understand the theory and concept of various types of Refrigeration systems
CO2	Understanding of types of compressors, condensers, expansion devices
CO3	Understanding of comfort and Industrial air conditioning
CO4	Use of types of insulating materials and refrigerants
CO5	Estimation of cooling load

MEM704	Refrigeration & Air Conditioning Lab.
CO1	To expose the students to the basic knowledge of thermal equipment and to develop experimental skills
CO2	Identification of various components of cooling devices
CO3	Understand the working of Heat pump
CO4	Calculate the cooling load of air conditioning systems
CO5	Understand the working of Cooling tower, cold storage, ice plants
MEM 705	Power Plant Engineering
CO1	Describe various energy resources and energy systems available to produce electric power.
CO2	Explain the basic principles of diesel, thermal and nuclear power plants.
CO3	Describe non-conventional energy sources and energy clean coal technologies
CO4	Carry out cost analysis and calculate various tariffs
CO5	Describe about vehicular and industrial pollution, its control and emission standards

MEM706	Mechanical Engineering Design II
CO1	To be able to understand application and design of springs, pressure vessels, etc.
CO2	To understand and apply lubrication theory to design of journal bearings
CO3	To be able to select rolling element bearing for a given application
CO4	To be able to design spur gears, helical gears, bevel gears and worm sets
CO5	To be able to design various engine parts like piston, connecting rod and valve gear mechanism and to understand introductory concepts of design for manufacturing & assembly, design for environment

MEM 707	Mechanical Engineering Design Practice II
CO1	To develop the ability to create production drawing of assemblies and components of IC Engine parts, Press, Pulleys, etc.
CO2	To develop the ability to create a well-documented report on designs made
CO3	To develop the ability to make presentations on reports and designs created

MEM 708	Managerial Economics & Industrial Organization
CO1	It gives detailed knowledge of Circular flow of economic activity, Nature of firm, Concept of economic profit, Economics and decision making, Functional relationships and Economic Models; Total Average and Marginal functions; Money, Bank and Exchange.
CO2	It describes the Demand Analysis, its type, Determinants, elasticities and Factors influencing demand
CO3	It imparts detailed knowledge of Production Function (Input-output relationship; least cost combination of inputs), Factor productivities and Return to scale and Managerial uses of production function
CO4	It gives knowledge of Cost Analysis, Economic concept of cost, Production and Cost; Cost functions. Second part of this unit impart the knowledge of Market structure which includes Perfect Competition, Monopoly, Profit maximization price and output in short run & long run. It imparts the detailed knowledge of Pricing, its Determinants and Pricing under different market structures

MEM711	Machine Tool Design and Control
CO1	To have knowledge of given equipment of machine tools and its design principle
CO2	To be able to understand kinematics of machine tools and its appropriate to design of stepped and stepless drives including electric, mechanical and hydraulic drives
CO3	To be able to understand design of bearings and slide ways in relation to force & wear etc.
CO4	To be able to have knowledge of function of various machine tool controls for slide & feed movement
CO5	To be able to have basic knowledge of principle, working and performing of numerical control machine & system

MEM712	Foundry Engineering
1	To have knowledge and understanding of the effect of moulding&moulds variables on solidification process
2	To have comparative knowledge between sand clays and additives and be able to have working knowledge for selection of materials for mould& dies for various process
3	To apply theory of gate & riser design to actual casting
4	To be able to apply industrial engineering principle in foundry for modern developments in foundry processes. To be able to have knowledge parameters for testing of sand
5	To have knowledge of selection and control of melting process& the latest trends in cupola design and to have working knowledge of inspection & quality control in castings

MEM714	Gas Dynamics
1	To be able to understand the basic concept of inviscid Compressible one-dimensional flow, Karman's rule of supersonic flows and stagnation condition.
2	To be able to understand and learn about shocks waves and flow in shock waves
3	To be able to understand and learn the concept of flow through various nozzles and ducts, various relatd governing rules and heat transfer phenomenon.

MEM715	Theory of Elasticity and Plasticity
1	To be able to comprehend and analyse 3-D stress, infinitesimal & finite stress and compatibility criterion
2	To be able to comprehend and analyse plane problem in cartesian and polar coordinates.
3	To be able to understand and analyse theories of failure and yield criteria as an elements of plasticity
4	To be able to understand and analyse plastic stress strain relations in incremental plasticity and slip line field theory.

MEM717	Mechanics of Composite Materials
1	To be able tocomprehendbehavioral difference of composites to conventional material
2	To be able tocomprehend and analysis laminate behavior of composites through constitute relation matrices
3	To be able to test and assess quality of composites
4	To be able to have knowledge of lamina behavior of composites
5	To be able to compressfailure and damage mechanism of composites

MEM719	Stochastic Processes
1	To understand and comprehend Benjis theorem & lawof large number
2	To comprehendanalyse and apply concept of random numbers through random variables moment generating function&poission process
3	To be able to comprehend, analyse and apply concepts of continues Markov Chain
4	To be able to comprehend and analysis Brownian Motion, weakly stationary processes & its application to business engineering

MEM720	MATERIALS MANAGEMENT
1	Student will gain the understanding of the role of a materials department in an organization.
2	Student will be able to analyze, compare and execute the activities of inventory management and control.

3	Student will be able to improve performance planning through use of MRP techniques with in capacity constraints.
4	Student will be able to identify materials requirement through various forecasting methods.

MEM721	Design and Simulation of work System
1	To be able to compare between description and prescriptive model of manufacturing system
2	To compared and analysis basic Factory Dynamics
3	To be able to understand concepts in simulation model of and hypothesis testing including Chi-square and kolmogorovsmirnov Goodness of Fit tests.
4	To be able to model and analyse work system using ARENA and SIMIO systems
5	To be able to model analyse design and simulate push and pull based system including CONWIP and KANBAN

MEM722	Design and Simulation of work System Lab.
1	To be able to simulate and model single and multi-server queuing system as a practical industrial problem
2	To verify Little's Law in simple/complex work systems
3	To be able to design and analysis simple and complex production work system using ARENA/ Simio as a practical study.
4	To be able to design and analysis push and pull based system using ARENA & SIMIO as a practical can study

MEM723	Industrial Kinesiology
1	To learn the meaning, scope, and industrial applications of kinesiology, developments in biomechanical modelling and anatomy and physiology of musculoskeletal system.
2	To learn anthropometric data for kinesiologicalapplications and mechanical work capacity evaluation.
3	To learn human motion analysis, muscles activity measurements, single body model and two-body segment model, and models for simple industrial tasks.
4	To learn and understand classification and evaluation of manual work, work analysis system, job analysis, musculoskeletal injury problems, risk factors and use of EMG in job evaluation.
5	To learn NIOSH guide for manual lifting, pulling and pushing, lifting limits, and to know general considerations related to sitting postures.

MEM724	Industrial Kinesiology Lab
1	To determine the grip strength of both hands using hand dynamometer.

2	To perform EMG analysis of hamstrings during common rehabilitation exercises to determine the superior one.
3	To measure angular movement of limbs (wrist flexion/extension etc.) using twin axis goniometer.
4	To measure heel and toe strike activity during walking.
5	To measure acceleration in three axes during slow movements of body parts.

MEM 725	Operations Research
1	Student will be able to understand the basic concepts of operations research, modelling approaches and Formulate and solve engineering and managerial situations as Linear Programming Problem (LPP).
2	Student will learn Decision theories and will be able to apply decision tree analysis to solve decision problems for selecting best alternative.
3	Student will develop the ability to solve two-person zero sum games using algebraic and graphical methods.
4	Student will be able to understand queuing models and apply queuing theory for performance evaluation of engineering and management problems.
5	Student will be able to solve Integer Programming problems for complete and mixed type integer solution using graphical and simplex approach.

MEM727	Project Engineering and Management
1	To acquire introductory knowledge of network planning and algorithms
2	To learn and apply time cost trade off procedures in scheduling computations
3	To understand and apply PERT model and precedence diagramming network to practical problems
4	To understand and apply concepts of resource constraint in project scheduling
5	To understand GERT and apply it for Project Cost Control

MEM 728	ADDITIVE MANUFACTURING FOR 3D PRINTING
1	Demonstrate the knowledge of Additive Manufacturing (AM).
2	Understand the operating principles, capabilities, and limitations of state-of-the-art AM methods and compare and contrast additive processes with conventional manufacturing methods in terms of rate, quality, cost, and flexibility.
3	Gain hands-on experience with desktop AM machines and understand the complete process by designing, fabricating, and measuring example parts.
4	Realize applications of AM across major industries and potential implications of AM technologies on product development.
5	Place AM in the context of the evolving manufacturing infrastructure.

MEM 729	ADDITIVE MANUFACTURING FOR 3D PRINTING LAB
1	Gain hands on experience with AM machines.
2	Understand the complete process by designing, fabricating and measuring example parts.
3	Understand the operating principles, capabilities and limitations of Additive Manufacturing.

MEM730	Method Engineering & Ergonomics
1	At the end of the course a student will be able to understand different principles and application of Method Engineering and Ergonomics applied for enhancement for productivity at work place.
2	The student will have the basic understanding of different approaches and tools used for method Engineering.
3	The student will be able to understand various Concepts and techniques applied for work measurement.
4	The student will be able to have a philosophical understanding of some advanced time and motion study techniques viz. PMTS, MTA, WFS, (MTM1, MTM2, MTM3 & other MTM systems)
5	The student will be able to understand various Concepts of Ergonomics, occupational ergonomics and human factor engineering and be able to apply the learned concepts in the industry.

MEH701	Mechanical Engineering Project I
1	To be able to formulate a practical ... problem in real life to explore for its possible solution after suitable review of literature.
2	To be able to analysis the given problem and suggest suitable solution on the basis of background engineering knowledge
3	To be able to synthesise the outcome of the problem and validate findings on the basis of experimentation
4	To produce scientific content in the form of report writing as per the standard norms

MEH702	Seminars
1	To be able to conduct review of literature to arrive at selected advances topic for seminar.
2	To be able to summarise the concept of the chosen topic systematically after considerable study of the content from primary as well as secondary sources
3	To be able to write and present a technical report with suitable conclusion as per international standards
4	To be able to discuss and defend the outcome of the report in a seminar

RDC781	Rural Engineering Project
1	To be able to apply knowledge of engineering Agriculture Engineering and Entrepreneurship to a logically chosen problem for Rural Development
2	To be able to prepare complete feasibility report for hypothetical small entrepreneurship project.
3	To be able to synthesise the findings to a suitable conclusion
4	To present the findings in the form of a technical report

MEM716	Finite Elements Methods
1	To develop understanding of numerical modeling and analysis
2	ability to solve engineering problems using direct FEM methods
3	model and solve engineering problems using variational methods
4	model and solve engineering problems using weighted residual methods
5	2D and 3D solid mechanic problem formulation and analysis with FEM

VIII-Semester:

MEM 801	BUSINESS MANAGEMENT
1	give the Introduction to the business management and Historical evolution. It also gives the knowledge of characteristics, function, importance and Forms of Business Ownership.
2	consists of Strategic Management which includes Strategy Planning, Business Vision, different Business Strategies, Levels of Strategy and Porter's Generic Strategies and Core Competencies.
3	Another part of this unit gives the detailed knowledge of Business Organization, Organizational Structure. Types of Organizational Structures (Functional, Divisional, Line and Matrix) and Authority.
4	imparts the knowledge of Inventory Management (Principles, Economic Order Quantity), Integrated Logistics and Supply Chain Management. The Value Chain Concept. Information technology for Inventory Management. ERP, MI and DSS, Quality Management and ISO 9000 specification.
5	The understanding of Marketing Management, Human Resource Management, Leadership & Motivation, Incentives for Effective Performance, Financial & Accounting Management

MEH802	Mechanical Engineering Project I
1	To be able to formulate a practical ... problem in real life to explore for its possible solution after suitable review of literature.
2	To be able to analysis the given problem and safest suitable solution on the bans of background engineering knowledge

3	To be able to synthesise the outcome of the problem and validate findings on the basis of experimentation
4	To produce scientific content in the form of report writing as per the standard norms

MEM809	Nano-Technology & Nano-Computing
1	To introduce and provide a broad view of the nascent field of nanoscience and nanotechnology to undergraduates
2	Describe the basic science behind the properties of materials at the nanometer scale, and the principles behind advanced experimental and computational techniques for studying nanomaterials.
3	Be able to critique journal papers on nanoscience/nanotechnology
4	Understand basic and advanced concepts of Nanoelectronic devices, sensors
5	Understand the applications of nanotechnology and nanoelectronics

MEM811	Futures Study
1	Introductory concept of futures study as decision making process.
2	To learn technology forecasting and assessment with reference to time series and fuzzy time series analysis
3	To be able to understand consensus making approach and its measure
4	To learned and apply SWOT analysis, idea engineering, scenario building methodology and fuzzy Delphi method for future planning and to be able Leser Advance Techniques of hierarchical Modeling and conflict resolution
5	Basic concept of Neural Networks, System Dynamics & quantum computing, Blue ocean and white mountain strategy for futuristic planning

MEM 812	Non-Conventional Energy Engineering
1	Understand global and Indian energy scenario and importance of non-conventional energy sources.
2	Analyze solar energy collection, storage and conversion systems
3	Understand the working principles of various non-conventional energy conversion systems like bio energy, geothermal energy etc.
4	Understand other direct energy conversion systems like fuel cells
5	Evaluate methods for generation of hydrogen power and production of hydrogen

MEM813	SUPPLY CHAIN MANAGEMENT
1	Identify the goal of a supply chain and evaluate the impact of supply chain decisions on the success of a company.

2	Understand the importance of inventory in the supply chain context; develop skills to manage inventory in the presence of uncertainty; and appreciate the concept of 'Risk Pooling' in minimizing the impact of variability in a supply chain.
3	Explain the "bullwhip effect", and illustrate through examples, the flow of material between supply chain partners.
4	Dwell on the concepts of strategic partnering and Vendor Managed Inventory and explain the importance of Design for Logistics in reducing variability across supply chains.
5	Categorize the performance measures that are relevant to a supply chain and Compare the major applications of supply chain information technology.

MEM814	MANAGEMENT INFORMATION SYSTEMS
1	Need and importance of Information Systems in management.
2	Role of MIS in various functional areas of organization in decision-making.
3	Activities and analysis to design information system and necessary steps for acquiring an Information System in an organization.
4	Aware of various Information System solutions like ERP, CRM, Data warehouses and the issues in successful implementation of these technology solutions in any organization.

MEM 816 & MEM 817	I.C. Engine and Gas Turbine
1	Describe the combustion phenomenon in SI and CI engines
2	Identify fuel metering and fuel supply systems for different types of engines
3	Explain and analyze rotary compressors
4	Carry out thermodynamic analysis of simple and improved gas turbine cycles
5	Explain jet propulsion system and their fuels

MEM 818	Hydraulic Machines
1	To know the application of momentum principles and analyze the forces exerted by a jet of fluid on vanes of different shapes, either stationary or moving. Also student will be able to use dimensional analysis in solving fluid problems and plan hydraulic similitude studies.
2	Study and analyze the construction features and working principles of different classes of hydraulic turbines and be able to analyze the performance characteristic curves of hydraulic turbines and their selection criteria
3	To understand different classes of pumps, their constructions features and further analyze their performance. Also to understand the constructional features of rotodynamic pumps as well as to analyses the performance of these pumps and their selection criteria.
4	To understand the of pumps. To understand the constructional features of positive displacement pumps as well as to analyses the performance of these pumps and selection criteria..

5	Understand the working principles of various hydraulic systems, hydraulic control systems and hydraulic transmission system
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MEM819	Hydraulic Machines Lab.
1	To be able to test the performance of centrifugal pump
2	To be able to determine coefficient of friction in disc friction app
3	To be conversant with testing procedures of Pelton Turbine and perform such test
4	To be able to conduct load test on Francis Turbine and draw efficiency curves

MEM820	Automated Manufacturing Systems
1	Manufacturing automation and its building blocks; The product cycle; Plant configurations; Economies of Scales and Scope; Performance measures; CAD/CAM; Current trends.
2	CAM: NC/CNC/DNC systems, Axes of motion, Interpolation schemes, Coordinate-, zero-, coding-, control-, positioning- and dimensioning- systems; CNC programming using languages such as the APT, G&M codes, ADAPT, EXAPT; Hierarchical NC. CAD/CAM synthesis. CAPP.
3	Manufacturing Systems' Control & Architecture: Manufacturing software review; Factory floor information systems; Control system architecture; Factory communication systems using MAP; The factory DBMS; PLCs.
4	Manufacturing flexibility; Controlled Strategies; FMS, HMS, CIMS; and Factories of the future.
5	Computer controlled machines; Automated Inspection and MHSs and their design; Robot programming using MCL, VAL-II, APT, etc.

MEM821	Automated Manufacturing Systems Lab
1	Study of CNC TC and MC along with the operations to be performed.
2	Preparation of CNC programs for 3 different jobs on CNC TC and manufacture them on FC Steels. Live production runs on the above machine tools after dry runs and simulations.
3	Preparation of CNC programs for 3 different jobs on CNC MC and manufacture them on FC Steels. Live production runs on the above machine tools after dry runs and simulations.
4	Develop a robot program for different pick-and-place positions of job in FMC. Live demonstration on robot.
5	Study of PLCs used in FMSs.

MEM 822	Bio-Medical Engineering
1	To learn about objectives, scope and application fields of biomedical engineering and modern health care system and to know anatomical and physiological aspects of human body
2	To learn various transducers and bioelectric potential and their applications in EEG, ECG & EMG etc.

3	To comprehend and understand physiology and engineering of cardiovascular system and to learn working principle of sphygmomanometer, plethysmography & defibrillator
4	To learn and understand respiration process, physiology of respiratory system, lungs volumes, biomechanics of breathing and working of spirometer
5	To learn biomechanics of human movement, musculoskeletal system, tissues, skeletal muscles, joints, applied electromyography and use of X-Ray machine.

MEM823	Bio-Medical Engineering Lab
1	To perform heart rate analysis of subjects using Bio-harness machine.
2	To measure nerve conduction velocities (SNC & MNC tests) of subjects using EMG machine.
3	To measure forced vital capacity, slow vital capacity & maximum ventilatory volume of lungs of subjects using Spirometer
4	To perform visual evoked potential (VEP)/ brainstem auditory evoked potentials (BAEP) tests of subjects using EMG machine.
5	To measure pulse rate and oxygen saturation level of subjects using pulse-oximeter

MEM824	Total Quality Management
1	Develop an understanding on quality management philosophies and frameworks.
2	Adopt TQM methodologies for continuous process improvement. Measure the cost of poor quality, process effectiveness and efficiency to identify areas for improvement.
3	Apply benchmarking, QFD, FMEA and business process reengineering to improve management processes.
4	Determine the set of indicators to evaluate performance excellence of an organization like ISO 9000, ISO 9001, ISO 14001.
5	Understand the basic concepts of Taguchi's Quality Engineering.

MEM825	Thermal Turbo Machines
1	To be able to learn about history and introductory concept of turbo machines
2	To be able to learn principle, governing rules, slip factor, degree of reaction etc. for centrifugal and axial compressor
3	To have elementary knowledge about axial flow turbine, energy diagram, estimation of stage performance and characteristic curves
4	To be able to understand and learn about constructional details and working of steam turbine, pumps, cavitation and control
5	To be able to learn about various turbine control system

MEM826	Industrial Safety Engineering
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1	To have introductory concept of safety, safety consciousness & its necessity.
2	To be able to learn about various types of industrial hazards and accident classification causes, analysis & merchants
3	To be able to learn about basics of safety engineering
4	To be able to learn about various acts and standards related to legal aspects of safety
5	To be able to learn about petro-chemical safety engineering & fire safety engineering

MEM827	OPERATIONS MANAGEMENT
1	Student will understand the strategic role of operations management in creating and enhancing a firm's competitive advantages
2	Student will understand key concepts and issues of OM in both manufacturing and service organizations
3	Student will understand the interdependence of the operations function with the other key functional areas of a firm
4	Student will apply analytical skills and problem-solving tools to the analysis of the operations problems
MEH801	Seminars
1	To be able to conduct review of literature to arrive at selected advances topic for seminar.
2	To be able to summaries the concept of the chosen topic systematically after considerable study of the content from primary as well as secondary sources
3	To be able to write and present a technical report with suitable conclusion as per international standards
4	To be able to discuss and depend the outcome of the report in a seminar

RDC881	Rural Engineering Project
1	To be able to apply knowledge of engineering Agriculture Engineering and Entrepreneurship to a logically chosen problem for Rural Development
2	To be able to prepare complete feasibility report for hypothetical small entrepreneurship project.
3	To be able to synthesize the findings to a suitable conclusion
4	To present the findings in the form of a technical report

GKC881	Sc. Meth., G.K. & Current affairs III
1	To be aware about Capitals, languages, religion & location of major countries of the world
2	To be aware to major crops, mineral wealth and their producer countries.
3	To be able to aware about glossary of economics terms
4	To be able to be aware about literature, well known books with their authors.

5	To be able to aware about miscellaneous abbreviations& superlatives and be aware about Current affairs from newspapers.
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CAC881	Co-curricular Activity
1	To inculcate habit of compulsory participation in sports and games to developed sports men sprit and competitiveness
2	Same as I in various literary Social and cultural activity for working as a team and innovate ideas into useful creativity.

Course Articulation Matrix

Course	CO	Program Outcome(POs)												PSO		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CHM181 Applied Chemistry	CO 1	3	3	3	3	1	1	1	1	1	2	1	1	3	3	2
	CO 2	3	2	2	2	2	1	1	1	1	1	1	1	2	2	2
	CO 3	3	3	2	3	2	1	1	1	1	1	1	1	2.5	3	2.5
	CO 4	3	3	2	2	1	1	1	1	1	1	1	1	2.5	3	1.5
	CO 5	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2
CHM182 Applied Chemistry Lab	CO 1	3	3	2	3	1	1	1	1	3	2	1	1	2.5	3	2
	CO 2	2	2	2	2	1	1	1	1	3	1	1	1	2	2	1.5
	CO 3	2	2	2	1	2	1	1	1	3	1	1	1	2	2	1.5
	CO 4	2	2	2	1	1	1	1	1	3	1	1	1	2	2	1
	CO 5	3	2	2	2	1	1	1	1	3	1	1	1	2	2	1.5
	CO6	1	1	1	1	1	1	1	1	3	3	1	1	1	1	1
PHM181 Applied Physics I	CO 1	3	2	2	2	1	1	-	-	-	2	-	1	2	2	1.5
	CO 2	2	2	2	2	1	-	-	-	-	1	1	1	2	2	1.5
	CO 3	2	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
	CO 4	2	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
	CO 5	2	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
PHM182 Applied Physics Lab.	CO 1	3	3	3	3	2	1	1	1	2	2	2	2	3	3	2.5
	CO 2	2	2	2	2	1	1	1	1	2	1	2	1	2	2	1.5
	CO 3	2	2	2	2	1	1	1	1	3	1	2	1	2	2	1.5
MEM101 Graphics Science	CO 1	3	1	2	2	1	-	-	-	-	-	-	1	1.5	1	1.5
	CO 2	3	1	2	2	1	-	-	-	-	-	-	1	1.5	1	1.5
	CO 3	3	1	2	2	1	-	-	-	-	-	-	1	1.5	1	1.5
	CO 4	3	1	2	2	1	-	-	-	-	-	-	1	1.5	1	1.5
	CO 5	3	1	2	2	1	-	-	-	-	-	-	1	1.5	1	1.5
MEM102 Engineering Drawing 1	CO 1	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
	CO 2	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
	CO 3	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
	CO 4	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
	CO 5	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
MEM103 Manufacturing Process 1	CO 1	3	1	2	1	1	1	1	1				1	1.5	1	1
	CO 2	3	2	2	2	2	2	2	2		1	3	3	2	2	2
	CO 3	3	3	3	3	3	1	2	1		1	3	1	3	3	3

	CO 4	3	3	3	3	3	1	1	2	1	3	3	3	3	3	3
	CO 5	3	2	2	2	3	3	3	3	2	3	3	3	2	2	2.5
MEM104 Workshop Practice 1	CO 1	3	1	2	1	1	1	1	1	-	-	-	1	1.5	1	1
	CO 2	3	2	2	2	2	2	2	2	-	1	3	3	2	2	2
	CO 3	3	3	3	3	3	1	2	1	-	1	3	1	3	3	3
	CO 4	3	3	3	3	3	1	1	2	1	3	3	3	3	3	3
	CO 5	3	2	2	2	3	3	3	3	2	3	3	3	2	2	2.5
MAM181 Engineering Mathematics 1	CO 1	3	3	3	2	2	1	-	-	1	2	1	1	3	3	2
	CO 2	3	3	3	2	1	1	-	-	-	2	1	1	3	3	1.5
	CO 3	3	3	3	2	-	-	-	-	-	1	-	1	3	3	2
	CO 4	3	3	3	1	-	-	-	-	-	2	-	1	3	3	1
	CO 5	3	3	3	1	-	-	-	-	-	1	-	1	3	3	1
RDC181 Agricultural Operation 1	CO 1	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
	CO 2	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
	CO 3	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
	CO 4	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
	CO 5	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
RDC182 Social Service	CO 1	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
	CO 2	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
	CO 3	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
	CO 4	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
	CO 5	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
GKC181 G.K and Current Affairs1	CO 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 2	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 3	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 4	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 5	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
BBH101 Business Organisation	CO 1	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 2	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 3	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 4	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 5	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
BBH102 Basic Management	CO 1	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 2	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 3	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 4	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 5	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
BOH181	CO 1	3	3	2	2	1	3	3	3	3	1	1	3	2.5	3	1.5

Environmental Sciences	CO 2	3	3	2	2	1	3	3	3	3	1	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	3	3	3	3	1	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	3	3	3	3	1	1	3	2.5	3	1.5
	CO 5	3	3	2	2	1	3	3	3	3	1	1	3	2.5	3	1.5
CEH181 Theory of Design	CO 1	1	1	1	1	3	3	3	1	1	1	1	1	1	1	2
	CO 2	1	1	1	1	3	3	3	1	1	1	1	1	1	1	2
	CO 3	1	1	1	1	3	3	3	1	1	1	1	1	1	1	2
	CO 4	1	1	1	1	3	3	3	1	1	1	1	1	1	1	2
	CO 5	1	1	1	1	3	3	3	1	1	1	1	1	1	1	2
DBD101 Basic Statistics	CO 1	3	3	1	1	3	3	1	1	1	1	3	3	2	3	2
	CO 2	3	3	1	1	3	3	1	1	1	1	3	3	2	3	2
	CO 3	3	3	1	1	3	3	1	1	1	1	3	3	2	3	2
	CO 4	3	3	1	1	3	3	1	1	1	1	3	3	2	3	2
	CO 5	3	3	1	1	3	3	1	1	1	1	3	3	2	3	2
DPH181 Art Appreciation	CO 1	-	-	-	-	-	3	1	3	3	3	-	2	-	-	3
	CO 2	-	-	-	-	-	3	1	3	3	3	-	2	-	-	3
	CO 3	-	-	-	-	-	3	1	3	3	3	-	2	-	-	3
	CO 4	-	-	-	-	-	3	1	3	3	3	-	2	-	-	3
	CO 5	-	-	-	-	-	3	1	3	3	3	-	2	-	-	3
ECH181 Essential Of Economics	CO 1	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 2	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 3	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 4	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
	CO 5	1	3	3	2	3	2	3	2	2	2	3	3	3	3	2.5
ENH181 English I	CO 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 2	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 3	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 4	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 5	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
MUH181 Sangeet Kriyatmak I	CO 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 2	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 3	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 4	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 5	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
OMH101 Communication Technique Hindi I	CO 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 2	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 3	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 4	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3

	CO 5	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
PYH181 Introduction to Cognition	CO 1	3	3	3	2	3	2	2	1	1	3	1	3	3	3	2.5
	CO 2	3	3	3	2	3	2	2	1	1	3	1	3	3	3	2.5
	CO 3	3	3	3	2	3	2	2	1	1	3	1	3	3	3	2.5
	CO 4	3	3	3	2	3	2	2	1	1	3	1	3	3	3	2.5
	CO 5	3	3	3	2	3	2	2	1	1	3	1	3	3	3	2.5
STH102 Gadya, VAdya, Anukaran & Anuvad	CO 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 2	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 3	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 4	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 5	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
PYH102 Applied Psychology	CO 1	3	3	3	3	2	3	-	3	3	3	3	3	3	3	2.5
	CO 2	3	3	3	3	2	3	-	3	3	3	3	3	3	3	2.5
	CO 3	3	3	3	3	2	3	-	3	3	3	3	3	3	3	2.5
	CO 4	3	3	3	3	2	3	-	3	3	3	3	3	3	3	2.5
	CO 5	3	3	3	3	2	3	-	-	3	3	3	3	3	3	2.5
PHM281 Applied Physics II	CO 1	3	3	2	3	1	1	-	-	-	2	-	1	2.5	3	2
	CO 2	2	2	2	2	1	-	-	-	-	1	1	1	2	2	1.5
	CO 3	2	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
	CO 4	2	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
	CO 5	3	2	2	2	1	1	-	-	-	1	-	2	2	2	1.5
PHM282 Applied Physics II Lab	CO 1	3	3	3	3	2	1	1	1	2	2	2	2	3	3	2.5
	CO 2	2	2	3	3	1	1	1	1	2	1	2	1	2.5	2	2
	CO 3	2	2	2	2	1	1	1	1	3	1	2	1	2	2	1.5
	CO 4	3	3	3	3	2	1	1	1	2	2	2	2	3	3	2.5
EEM201 Computer concepts & C Programming	CO 1	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 3	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 4	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 5	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
EEM202 BASIC ELECTRICAL ENGINEERING	CO 1	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 3	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 4	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 5	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
MEM201 Engineering Thermodynamics	CO 1	3	2	2	1	-	-	-	-	-	-	-	1	2	2	1
	CO 2	3	2	2	1	-	-	-	-	-	-	-	1	2	2	1
	CO 3	3	3	-	3	-	-	-	-	-	-	-	1	3	3	3

	CO 4	3	2	2	2	-	-	-	-	-	-	-	1	2	2	2
	CO 5	3	2	2	2	-	-	-	-	-	-	-	1	2	2	2
MEM202 Engineering Mechanics I	CO 1	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 2	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 3	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 4	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 5	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
MEM203 Engineering Drawing II	CO 1	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
	CO 2	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
	CO 3	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
	CO 4	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
	CO 5	3	2	1	1	1	-	-	-	-	-	-	1	1.5	2	1
MAM281 Engineering Mathematics II	CO 1	3	3	3	3	2	2	-	-	-	2	-	1	3	3	2.5
	CO 2	3	3	3	2	1	-	-	-	-	1	1	1	3	3	1.5
	CO 3	3	3	3	2	1	-	-	-	-	2	-	1	3	3	1.5
	CO 4	3	3	3	2	-	-	-	-	-	1	-	1	3	3	2
	CO 5	3	3	3	2	1	1	-	-	-	2	-	2	3	3	1.5
EGC281 Industrial Visits	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 5	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
GKC281 Sc.Meth., G.K. & Current affairs II	CO 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 2	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 3	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 4	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 5	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 6	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
RDC281 Agricultural Operations II	CO 1	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
	CO 2	2	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
	CO 3	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
	CO 4	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
	CO 5	3	3	3	2	3	3	3	3	3	2	2	3	3	3	2.5
RDC282 Social Service	CO 1	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
	CO 2	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
	CO 3	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
	CO 4	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3
	CO 5	-	-	-	-	3	3	3	3	3	3	2	3	-	-	3

CAC281 Co-Curricular Activities	CO 1	2	2	1	1	1	2	-	3	3	2	1	3	1.5	2	1
	CO 2	2	2	1	1	1	2	-	3	3	2	1	3	1.5	2	1
MEM204 Workshop Practice II	CO 1	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 2	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 3	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 4	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 5	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
EEM301 Basic Electronics	CO 1	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 3	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 4	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 5	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
EEM302 Basic Electronics Lab.	CO 1	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 3	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 4	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 5	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 6	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
EEM303 Data Structures	CO 1	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 3	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
EEM304 C Programming Lab.	CO 1	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 2	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 3	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 4	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
	CO 5	3	3	3	3	3	1	1	1	1	2	1	2	3	3	3
MEM301 Engineering Mechanics II	CO 1	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 2	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 3	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 4	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 5	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
MEM302 Engineering Mechanics II Lab	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
	CO 5	3	3	2	2	1	-	1	1	1	-	-	1	2.5	3	1.5
MEM303 Manufacturing Processes II	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5

	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
MEM304 Applied Thermodynamics	CO 1	3	3	2	2	-	-	-	-	-	-	-	1	2.5	3	2
	CO 2	3	3	2	2	-	-	-	-	-	-	-	1	2.5	3	2
	CO 3	3	3	2	2	-	-	-	-	-	-	-	1	2.5	3	2
	CO 4	3	3	2	2	-	-	-	-	-	-	-	1	2.5	3	2
	CO 5	3	3	2	2	-	-	-	-	-	-	-	1	2.5	3	2
	CO 6	3	3	2	2	-	-	-	-	-	-	-	1	2.5	3	2
MEM305 Thermal Engineering Lab. I	CO 1	3	3	-	1	-	-	-	-	-	-	-	1	3	3	1
	CO 2	3	3	-	2	-	-	-	-	-	-	-	1	3	3	2
	CO 3	3	3	-	-	-	-	-	-	-	-	-	1	3	3	-
	CO 4	3	3	3	2	-	-	-	-	-	-	-	1	3	3	2
	CO 5	3	3	3	2	-	-	-	-	-	-	-	1	3	3	2
MEM306 Engineering Drawing III	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
MAM381 Engineering Mathematics III	CO 1	3	2	3	3	2	1	-	-	-	2	-	1	2.5	2	2.5
	CO 2	2	2	2	2	1	-	-	-	-	1	1	1	2	2	1.5
	CO 3	3	3	2	2	-	-	-	-	-	1	-	1	2.5	3	2
	CO 4	3	3	2	1	-	-	-	-	-	1	-	1	2.5	3	1
	CO 5	3	2	2	2	1	1	-	-	-	1	-	2	2	2	1.5
ENH381 English III	CO 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 2	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 3	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 4	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 5	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
EGC381 Product Manufacturing Project	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 5	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
EGC382 Practical Training	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3

ASM401 Materials Science	CO 1	3	3	2	2	1	-	1	1	1	-	-	1	2.5	3	1.5
	CO 2	3	3	2	2	1	-	2	1	1	-	-	1	2.5	3	1.5
	CO 3	3	3	3	3	1	-	2	1	2	2	-	2	3	3	2
	CO 4	3	3	3	3	1	-	2	2	3	2	-	2	3	3	2
	CO 5	3	2	1	1	1	-	2	2	3	2	-	2	1.5	2	1
ASM402 Materials Science Lab	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
	CO 6	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
	CO 7	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
	CO 8	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
MEM401 Instrumentation	CO 1	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 2	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 3	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 4	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 5	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
MEM402 Mechanics Of Solids I	CO 1	3	3	3	3	-	1	1	-	2	-	-	1	3	3	3
	CO 2	3	3	3	3	-	1	1	-	2	-	-	1	3	3	3
	CO 3	3	3	3	3	-	2	2	-	1	-	-	2	3	3	3
	CO 4	3	3	3	3	-	1	1	-	1	-	-	1	3	3	3
	CO 5	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
MEM403 Materials Testing Lab	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
MEM404 Mechanics Of Machines I	CO 1	3	3	3	3	2	1	1	1	1	1	2	2	3	3	2.5
	CO 2	3	3	3	3	2	1	1	1	1	1	2	2	3	3	2.5
	CO 3	3	3	3	3	2	1	1	1	1	1	2	2	3	3	2.5
MEM405 Mechanics Of Machines Lab	CO 1	3	3	2	2	2	3	1	3	3	3	1	3	2.5	3	2
	CO 2	3	3	2	2	2	3	1	3	3	3	1	3	2.5	3	2
	CO 3	3	2	2	2	2	3	1	3	3	3	1	3	2	2	2
	CO 4	2	3	3	2	2	3	1	3	3	3	1	3	3	3	2
	CO 5	3	2	1	3	3	2	2	2	2	2	2	1	1.5	2	3
MEM406 Engg. Metrology And	CO 1	5	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5

Measurements	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
MEM409 Metrology Lab	CO 1	3	3	2	2	2	3	1	3	3	3	1	3	2.5	3	2
	CO 2	3	3	2	2	2	3	1	3	3	3	1	3	2.5	3	2
	CO 3	3	2	2	2	2	3	1	3	3	3	1	3	2	2	2
	CO 4	2	3	3	2	2	3	1	3	3	3	1	3	3	3	2
	CO 5	3	2	1	3	3	2	2	2	2	2	2	1	1.5	2	3
MAM481 Engineering Mathematics Iv	CO 1	3	3	3	3	3	3	-	-	-	2	-	1	3	3	3
	CO 2	3	3	3	3	2	2	-	-	-	1	1	1	3	3	2.5
	CO 3	3	3	3	3	2	2	-	-	-	1	-	1	3	3	2.5
	CO 4	3	3	3	3	1	1	-	-	-	1	-	1	3	3	2
	CO 5	3	3	3	3	1	1	-	-	-	1	-	2	3	3	2
ENH481 English IV	CO 1	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 2	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 3	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 4	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
	CO 5	-	-	-	-	-	3	1	3	-	3	1	2	-	-	3
EGC481 Industrial Visits	CO 1	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 2	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 3	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 4	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
	CO 5	3	3	3	3	3	3	1	-	2	3	1	3	3	3	3
GKC481 Sc.Meth., G.K. & Current Affairs IV	CO 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 2	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 3	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 4	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 5	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
CAC481 Co-Curricular Activities	CO 1	2	2	1	1	1	2	-	3	3	2	1	3	1.5	2	1
	CO 2	2	2	1	1	1	2	-	3	3	2	1	3	1.5	2	1
ASW401 Metallurgical Analysis	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 5	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
DPW401 Commercial Art	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5

	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 5	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
EEW401 Radio & Television Repair	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
EEW402 Repair Of Electrical Equipment	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
EEW403 Printing Techniques	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 5	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEW401 Automobile Engineering	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 5	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEW402 Photography	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 4	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 5	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEW403 Refrigeration & Airconditioning	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEW404 Furniture Design & Manufacturing	CO 1	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 2	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
	CO 3	3	3	2	2	3	2	1	3	3	2	3	3	2.5	3	2.5
MEM501 Fluid Mechanics	CO 1	3	2	2	2	-	1	1	-	1	-	-	1	2	2	2
	CO 2	3	2	2	2	-	1	1	-	1	-	-	1	2	2	2
	CO 3	3	3	3	3	1	2	3	-	2	2	-	2	3	3	2
	CO 4	3	3	3	3	1	1	3	-	2	2	-	2	3	3	2
	CO 5	3	3	3	3	1	1	3	2	2	2	-	1	3	3	2
MEM502 Fluid Mechanics Lab	CO 1	3	3	3	3	2	3	2	-	2	1	1	2	3	3	2.5
	CO 2	3	3	3	3	2	3	2	-	2	1	1	2	3	3	2.5

	CO 3	3	3	3	3	2	3	2	-	2	1	1	2	3	3	2.5
	CO 4	3	3	3	3	2	3	2	-	2	1	1	2	3	3	2.5
	CO 5	3	3	3	3	2	3	2	-	2	1	1	2	3	3	2.5
MEM505 Industrial Engineering	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MAM581 Engineering Mathematics V	CO 1	3	3	2	3	1	2	-	-	-	2	-	1	2.5	3	2
	CO 2	3	2	2	2	1	1	-	-	-	1	1	1	2	2	1.5
	CO 3	3	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
	CO 4	3	2	1	1	-	2	-	-	-	1	-	1	1.5	2	1
	CO 5	3	2	2	2	1	1	-	-	-	1	-	2	2	2	1.5
MAM582 Probability And Statistics	CO 1	3	3	2	3	1	1	-	-	-	2	-	1	2.5	3	2
	CO 2	3	3	2	2	1	-	-	-	-	1	1	1	2.5	3	1.5
	CO 3	3	3	1	1	-	-	-	1	-	1	-	1	2	3	1
	CO 4	3	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
	CO 5	3	2	2	2	1	1	-	1	-	1	-	2	2	2	1.5
EGC581 Design Engg / Theme Development Project	CO 1	3	3	3	3	2	3	2	1	3	3	3	2	3	3	2.5
	CO 2	3	3	3	3	2	3	2	1	3	3	3	2	3	3	2.5
	CO 3	3	3	3	3	2	3	2	1	3	3	3	2	3	3	2.5
	CO 4	3	3	3	3	2	3	2	1	3	3	3	2	3	3	2.5
	CO 5	3	3	3	3	2	3	2	1	3	3	3	2	3	3	2.5
CRC581 Comparative Study of Religion	CO 1	-	-	-	-	-	2	2	3	2	2	1	2	-	-	3
	CO 2	-	-	-	-	-	2	2	3	2	2	1	2	-	-	3
	CO 3	-	-	-	-	-	2	2	3	2	2	1	2	-	-	3
	CO 4	-	-	-	-	-	2	2	3	2	2	1	2	-	-	3
	CO 5	-	-	-	-	-	2	2	3	2	2	1	2	-	-	3
GKC581 Sc. Methods, GK & Current Affairs	CO 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 2	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 3	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 4	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 5	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
RDC581 Agricultural Engineering	CO 1	3	3	3	2	3	3	3	3	3	1	2	2	3	3	2.5
	CO 2	3	3	3	2	3	3	3	3	3	1	2	2	3	3	2.5
	CO 3	3	3	3	2	3	3	3	3	3	1	2	2	3	3	2.5
	CO 4	3	3	3	2	3	3	3	3	3	1	2	2	3	3	2.5
	CO 5	3	3	3	2	3	3	3	3	3	1	2	2	3	3	2.5

MEM503 Mechanics Of Solids	CO 1	3	3	3	-	-	1	-	-	1	1	-	1	3	3	3
	CO 2	3	3	2	-	-	1	-	-	1	1	-	1	2.5	3	3
	CO 3	3	3	2	-	-	1	-	-	1	1	-	1	2.5	3	3
	CO 4	3	3	2	-	-	1	-	-	1	1	-	1	2.5	3	3
	CO 5	3	3	3	-	-	1	-	-	1	1	-	1	3	3	3
MEM504 Material Testing Lab	CO 1	3	1	1	-	-	-	-	-	1	1	-	0	1	1	-
	CO 2	2	3	3	1	-	-	-	-	1	3	-	1	3	3	1
	CO 3	2	1	1	-	-	-	-	-	1	3	-	1	1	1	-
MEM516 Value Engineering	CO 1	2	2	2	2	2	2	3	3	2	2	1	3	2	2	2
	CO 2	3	3	3	3	3	3	2	2	3	3	2	3	3	3	3
	CO 3	3	3	3	3	3	3	2	2	3	3	1	2	3	3	3
	CO 4	2	3	3	2	3	2	3	1	2	3	2	2	3	3	2.5
	CO 5	3	2	2	3	3	2	3	3	2	2	3	3	2	2	3
														-		-
MEM601 Mechanical Engineering Design 1	CO 1	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
	CO 2	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
	CO 3	3	3	1	1	-	-	-	-	1	-	-	1	2	3	1
	CO 4	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
	CO 5	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
MEM602 Mechanical Engineering Design Practice 1	CO 1	3	1	1	-	-	-	-	-	1	2	-	-	1	1	-
	CO 2	2	3	3	2	-	1	1	1	1	3	-	1	3	3	2
	CO 3	2	1	1	0	-	1	1	1	1	3	-	1	1	1	0
MEM603 Metal Cutting & Tool Design	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEM604 Production Engineering Lab	CO 1	3	2	2	2	1	1	1	1	2	1	1	3	2	2	1.5
	CO 2	3	3	2	2	2	2	2	2	2	1	1	3	2.5	3	2
	CO 3	3	3	2	2	2	1	1	1	2	1	1	3	2.5	3	2
	CO 4	3	3	3	3	3	1	1	1	2	1	1	3	3	3	3
	CO 5	3	2	2	2	3	3	3	1	2	1	1	3	2	2	2.5
MEM605 Heat Transfer	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
MEM606	CO 1	2	2	2	2	2	2	3	3	2	2	1	3	2	2	2

Heat Transfer Lab	CO 2	3	3	3	3	3	3	2	2	3	3	2	3	3	3	3
	CO 3	3	3	3	3	3	3	2	2	3	3	1	2	3	3	3
	CO 4	2	3	3	2	3	2	3	1	2	3	2	2	3	3	2.5
	CO 5	3	2	2	3	3	2	3	3	2	2	3	3	2	2	3
MEM609 Stream Seminar	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MAM681 Advanced Operation Research	CO 1	3	3	2	3	1	1	-	-	-	2	-	1	2.5	3	2
	CO 2	2	2	2	2	1	-	-	-	-	1	1	1	2	2	1.5
	CO 3	2	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
	CO 4	2	2	1	1	-	-	-	-	-	1	-	1	1.5	2	1
	CO 5	3	2	2	2	1	1	-	-	-	1	-	2	2	2	1.5
EGC681 Design Engineering & Theme Development Project	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
CEC681 Cultural Education	CO 1	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
	CO 2	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 3	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 4	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 5	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
MEM607 Automobile Engineering	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEM608 Automobile Engineering Lab	CO 1	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
	CO 2	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 3	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 4	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 5	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
MEM611 Statistical Quality Control	CO 1	2	2	2	2	2	2	3	3	2	2	1	3	2	2	2
	CO 2	3	3	3	3	3	3	2	2	3	3	2	3	3	3	3
	CO 3	3	3	3	3	3	3	2	2	3	3	1	2	3	3	3
	CO 4	2	3	3	2	3	2	3	1	2	3	2	2	3	3	2.5

	CO 5	3	2	2	3	3	2	3	3	2	2	3	3	2	2	3
MEM612 Statistical Quality Control Lab	CO 1	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
	CO 2	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 3	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 4	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 5	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
														-		-
MEM703 Refrigeration And Air Conditioning	CO 1	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
	CO 2	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 3	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 4	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 5	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
MEM704 Thermal Engineering Lab. II	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEM708 Managerial Eco. & Industrial Organ.	CO 1	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
	CO 2	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 3	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 4	3	3	2	1	3	1	-	3	1	1	-	1	2.5	3	2
	CO 5	3	3	3	1	3	1	-	3	1	1	-	1	3	3	2
MEH701 Mechanical Engineering Project I	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEH702 Seminars	CO 1	3	3	-	2	-	1	-	2	0	2	-	1	3	3	2
	CO 2	3	3	-	2	-	1	-	2	0	2	-	1	3	3	2
	CO 3	3	3	-	2	-	1	-	2	0	2	-	1	3	3	2
	CO 4	3	3	-	2	-	1	-	2	0	2	-	1	3	3	2
GKC781 Sc.Meth.,G.K.& Current Affairs III	CO 1	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 2	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 3	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 4	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
	CO 5	-	-	2	-	3	3	3	2	2	3	1	3	2	-	3
RDC781 Rural Engineering Project	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2

	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEM701 Mechanics Of Machines II	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEM702 Mechanics Of Machines Lab.	CO 1	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
	CO 2	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
	CO 3	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
	CO 4	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
MEM705 Power Plant Engineering	CO 1	3	1	2	1	1	1	1	1	-	-	-	2	1.5	1	1
	CO 2	3	3	2	2	2	2	2	2	-	1	-	3	2.5	3	2
	CO 3	3	2	3	3	2	1	2	1	-	1	-	3	2.5	2	2.5
	CO 4	3	3	3	3	3	1	1	2	-	1	-	3	3	3	3
	CO 5	3	2	2	2	3	3	3	3	-	2	-	3	2	2	2.5
MEM706 Mechanical Engineering Design II	CO 1	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
	CO 2	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
	CO 3	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
	CO 4	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
	CO 5	3	3	3	2	1	1	1	1	3	-	-	1	3	3	1.5
MEM707 Mechanical Engg. Design Practice II	CO 1	3	1	1	-	-	-	-	-	1	2	-	-	1	1	-
	CO 2	2	3	3	2	-	1	1	1	1	3	-	-	3	3	2
	CO 3	2	1	1	-	-	1	1	1	1	3	-	1	1	1	-
MEM721 Design & Simulation Of Work Systems	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
MEM722 Dsgn&Simulation Of Work Systems Lab	CO 1	3		3		3			2		3		3	3		3
	CO 2	3	3	3	3	3		3	3	2		3	3	3	3	3
	CO 3	3	3	3	3	3		3		2		3	3	3	3	3
	CO 4	3	1	2	1	3	3	3	3	1	3	3	3	1.5	1	2
	CO 5	1	1	1		3	3	1	1		3	3	3	1	1	3
MEM725 Operations Research	CO 1	3	3	3	-	-	1	-	-	1	1	-	1	3	3	3
	CO 2	3	3	2	-	-	1	-	-	1	1	-	1	2.5	3	3
	CO 3	3	3	2	-	-	1	-	-	1	1	-	1	2.5	3	3

	CO 4	3	3	2	-	-	1	-	-	1	1	-	1	2.5	3	3
	CO 5	3	3	3	-	-	1	-	-	1	1	-	1	3	3	3
MEM730 Methods Engineering & Ergonomics	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
EEM710 Software Design	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
*EEM720 Computer Networks	CO 1	3	-	3	-	3	-	-	2	-	3	-	3	3	-	3
	CO 2	3	3	3	3	3	-	3	3	2	-	3	3	3	3	3
	CO 3	3	3	3	3	3	-	3		2	-	3	3	3	3	3
	CO 4	3	1	2	1	3	3	3	3	1	3	3	3	1.5	1	2
	CO 5	1	1	1		3	3	1	1	-	3	3	3	1	1	3
MEM711 Machine Tool Design & Control	CO 1	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
MEM712 Foundry Engineering	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEM714 Gas Dynamics	CO 1	3	2	3	1	3	1	1	2	1	3	2	3	2.5	2	2
	CO 2	3	3	3	3	3	1	3	3	2	2	3	3	3	3	3
	CO 3	3	3	3	3	3	1	3	1	2	1	3	3	3	3	3
	CO 4	3	1	2	1	3	3	3	3	1	3	3	3	1.5	1	2
	CO 5	1	1	1	-	3	3	1	1	-	3	3	3	1	1	3
MEM715 Theory Of Elasticity & Plasticity	CO 1	3	-	3	-	3	-	-	2	-	3		3	3	-	3
	CO 2	3	3	3	3	3	-	3	3	2	-	3	3	3	3	3
	CO 3	3	3	3	3	3	-	3	-	2	-	3	3	3	3	3
	CO 4	3	1	2	1	3	3	3	3	1	3	3	3	1.5	1	2
	CO 5	1	1	1	-	3	3	1	1	-	3	3	3	1	1	3
*MEM716	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2

Finite Element Methods	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
*MEM717 Mechanics Of Composite Materials	CO 1	3	1	3	1	3	-	-	2	-	3	-	3	2	1	2
	CO 2	3	3	3	3	3	-	3	3	2	-	3	3	3	3	3
	CO 3	3	3	3	3	3	-	3	-	2	-	3	3	3	3	3
	CO 4	3	1	2	1	3	3	3	3	1	3	3	3	1.5	1	2
*MEM719 Stochastic Processes	CO 5	1	1	1	-	3	3	1	1	-	3	3	3	1	1	3
	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
*MEM720 MATERIALS MANAGEMENT	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
	CO 1	3	2	2	1	-	-	-	-	-	-	-	1	2	2	1
	CO 2	3	2	2	1	-	3	-	-	3		-	1	2	2	1
*MEM728 Additive Manufact. For 3d Printing	CO 3	3	3	-	3	-	-	-	-	-	-	-	1	3	3	3
	CO 4	3	2	2	2	-	-	-	-	-	-	-	1	2	2	2
	CO 5	3	2	2	2	-	-	-	-	2	2	-	1	2	2	2
	CO 1	3	-	3	-	3	-	-	2	-	3	-	3	3	-	3
MEM729 Additive Manufact. For 3d Printing Lab	CO 2	3	3	3	3	3	-	3	3	2	-	3	3	3	3	3
	CO 3	3	3	3	3	3		3		2		3	3	3	3	3
	CO 4	3	1	2	1	3	3	3	3	1	3	3	3	1.5	1	2
	CO 5	1	1	1		3	3	1	1		3	3	3	1	1	3
MEM724 Industrial Kinesiology	CO 1	3	2	3	2	3	2	2	1	3	1	3	3	2.5	2	2.5
	CO 2	3	3	3	3	3	1	1	1	3	2	3	3	3	3	3
	CO 3	3	3	3	3	3		3	3	3		3	2	3	3	3
MEM723 Industrial Kinesiology	CO 4	3	3	3	2	2	2	3	2	2	1	1	2	3	3	2
	CO 5	2	2	3	3	3	3	3	2	2	1	1	2	2.5	2	3
	CO 1	2	2	2	2	3	2	3	3	2	2	1	3	2	2	2.5
	CO 2	3	3	2	3	2	3	2	2	3	3	2	3	2.5	3	2.5
	CO 3	2	3	3	2	3	2	2	2	2	2	2	2	3	3	2.5
	CO 4	3	2	2	3	2	3	3	2	2	2	3	3	2	2	2.5
	CO 5	2	3	3	2	3	3	2	2	2	3	2	3	3	3	2.5
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MEM 801 Business Management	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
		2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEH 802 Mechanical Engineering Project I	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
MEM 809 Nano Technology & Nano Computing	CO 1	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
	CO 2	3	2	2	2	1	1	1	1	1	1	1	3	2	2	1.5
	CO 3	3	3	2	2	2	2	2	2	1	1	1	3	2.5	3	2
	CO 4	3	3	2	2	2	1	1	1	1	1	1	3	2.5	3	2
	CO 5	3	3	3	3	3	1	1	1	1	1	1	3	3	3	3
MEM 811 Futures Study	CO 1	3	2	2	2	3	3	3	1	1	1	1	3	2	2	2.5
	CO 2	3	2	3	1	3	1	1	2	1	3	2	3	2.5	2	2
	CO 3	3	3	3	3	3	1	3	3	2	2	3	3	3	3	3
	CO 4	3	3	3	3	3	1	3	1	2	1	3	3	3	3	3
	CO 5	3	1	2	1	3	3	3	3	1	3	3	3	1.5	1	2
MEM 813 Supply Chain Management	CO 1	1	1	1		3	3	1	1		3	3	3	1	1	3
	CO 2	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
MEM 814 Management Information System	CO 1	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
	CO 2	3	2	2	2	1	1	1	1	1	1	1	3	2	2	1.5
	CO 3	3	3	2	2	2	2	2	2	1	1	1	3	2.5	3	2
	CO 4	3	3	2	2	2	1	1	1	1	1	1	3	2.5	3	2
	CO 5	3	3	3	3	3	1	1	1	1	1	1	3	3	3	3
MEM 818 Hydraulic Machines	CO 1	3	2	2	2	3	3	3	1	1	1	1	3	2	2	2.5
	CO 2	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
MEM 819 Hydraulic Machines Lab	CO 1	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
	CO 2	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 3	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5

	CO 4	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
	CO 5	3	3	2	2	1	1	2	2	2	2	1	3	2.5	3	1.5
MEM816 I.C. Engine & Gas Turbine	CO 1	2	2	3	3	3	3	3	3	3	3	3	2	2.5	2	3
	CO 2	3	2	2	2	1	1	1	1	-	1	-	3	2	2	1.5
	CO 3	3	3	2	2	2	2	2	2	-	1	-	3	2.5	3	2
	CO 4	3	3	2	2	2	1	1	1	-	1	-	3	2.5	3	2
	CO 5	3	3	3	3	3	1	1	1	-	1	-	3	3	3	3
	CO 1	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
MEM817 I.C. Engine & Gas Turbine Lab	CO 2	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
	CO 3	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
	CO 4	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
	CO 5	3	3	-	2	-	1	-	2	-	2	-	1	3	3	2
	CO 1	3	2	2	2	1	1	1	1	-	1	-	3	2	2	1.5
MEM812 Non--Conventional Energy Engineering	CO 2	3	3	2	2	2	2	2	2	-	1	-	3	2.5	3	2
	CO 3	3	3	2	2	2	1	1	1	-	1	-	3	2.5	3	2
	CO 4	3	3	2	2	2	1	1	1	-	1	-	3	2.5	3	2
	CO 5	3	3	2	2	2	1	1	1	-	1	-	3	2.5	3	2
	CO 1	2	3	2	2	3	3	3	2	2	2	1	2	2.5	3	2.5
MEM822 Biomedical Engineering	CO 2	3	2	3	3	3	3	2	2	2	2	1	2	2.5	2	3
	CO 3	2	3	3	3	3	2	2	2	2	1	2	2	3	3	3
	CO 4	3	3	2	3	3	3	3	3	3	2	1	1	2.5	3	3
	CO 5	2	3	3	2	2	3	3	3	3	1	1	2	3	3	2
	CO 1	2	2	3	3	2	3	3	2	2	1	1	2	2.5	2	2.5
MEM823 Biomedical Engineering Lab	CO 2	2	2	3	3	3	3	3	2	2	1	1	2	2.5	2	3
	CO 3	2	2	3	3	3	3	3	2	2	1	1	2	2.5	2	3
	CO 4	3	3	2	2	2	1	1	1	1	1	1	2	2.5	3	2
	CO 5	3	3	3	3	2	2	2	2	2	2	2	1	3	3	2.5
	CO 1	3	3	2	1	1	-	-	2	2	2	2	2	2.5	3	1
MEM824 Total Quality Management	CO 2	3	3	3	2	3	1	-	2	2	2	2	2	3	3	2.5
	CO 3	3	3	3	2	3	2	-	3	3	2	2	1	3	3	2.5
	CO 4	3	3	2	2	2	3	2	3	2	3	3	2	2.5	3	2
	CO 5	3	3	2	3	2	-	-	2	2	2	2	1	2.5	3	2.5
	CO 1	3	2	2	2	1	1	1	1	1	1	1	3	2	2	1.5
MEM 820 Automated Manufacturing Systems	CO 2	3	3	2	2	2	2	2	2	1	1	1	3	2.5	3	2
	CO 3	3	3	2	2	2	1	1	1	1	1	1	3	2.5	3	2
	CO 4	3	3	3	3	3	1	1	1	1	1	1	3	3	3	3
	CO 5	3	2	2	2	3	3	3	1	1	1	1	3	2	2	2.5
	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
MEM 821	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2

Automatid Manufacturing Systems Lab	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEM 825 Thermal Turbo Machines	CO 1	3	2	2	2	1	1	1	1	2	1	-	3	2	2	1.5
	CO 2	3	3	2	2	2	2	2	2	2	1	-	3	2.5	3	2
	CO 3	3	3	2	2	2	1	1	1	2	1	-	3	2.5	3	2
	CO 4	3	3	3	3	3	1	1	1	2	1	-	3	3	3	3
	CO 5	3	2	2	2	3	3	3	1	2	1	-	3	2	2	2.5
MEM 826 Industrial Safety Engineering	CO 1	3	2	2	2	1	1	1	1	1	1	1	3	2	2	1.5
	CO 2	3	3	2	2	2	2	2	2	1	1	1	3	2.5	3	2
	CO 3	3	3	2	2	2	1	1	1	1	1	1	3	2.5	3	2
	CO 4	3	3	3	3	3	1	1	1	1	1	1	3	3	3	3
	CO 5	3	2	2	2	3	3	3	1	1	1	1	3	2	2	2.5
MEM 827 Operations Management	CO 1	3	3	2	2	2	2	3	3	2	2	1	2	2.5	3	2
	CO 2	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 3	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 4	3	3	2	2	2	2	3	3	2	3	1	2	2.5	3	2
	CO 5	2	2	3	3	3	3	2	2	3	3	3	3	2.5	2	3
MEH 801 Seminars	CO 1	3	2	2	2	1	1	1	1	1	1	2	3	2	2	1.5
	CO 2	3	3	2	2	2	2	2	2	1	1	2	3	2.5	3	2
	CO 3	3	3	2	2	2	1	1	1	1	1	2	3	2.5	3	2
	CO 4	3	3	3	3	3	1	1	1	1	1	2	3	3	3	3
	CO 5	3	2	2	2	3	3	3	1	1	1	2	3	2	2	2.5
RDC 881 Rural Engineering Projects	CO 1	3	2	2	2	1	1	1	1	2	1	2	3	2	2	1.5
	CO 2	3	3	2	2	2	2	2	2	2	1	2	3	2.5	3	2
	CO 3	3	3	2	2	2	1	1	1	2	1	2	3	2.5	3	2
	CO 4	3	3	3	3	3	1	1	1	2	1	2	3	3	3	3
	CO 5	3	2	2	2	3	3	3	1	2	1	2	3	2	2	2.5
GKC 881 Sc.Meth., G.K. & Current Affairs III	CO 1	3	1	2	2	1	1	1	1	3	1	1	3	1.5	1	1.5
	CO 2	3	1	2	2	2	2	2	2	3	1	1	3	1.5	1	2
	CO 3	3	1	2	2	2	1	1	1	3	1	1	3	1.5	1	2
	CO 4	3	1	3	3	3	1	1	1	3	1	1	3	2	1	3
	CO 5	3	1	2	2	3	3	3	1	3	1	1	3	1.5	1	2.5
CAC 881 Co Curricular Activities	CO 1	3	2	2	2	1	1	1	1	1	1	1	3	2	2	1.5
	CO 2	3	3	2	2	2	2	2	2	1	1	1	3	2.5	3	2
	CO 3	3	3	2	2	2	1	1	1	1	1	1	3	2.5	3	2
	CO 4	3	3	3	3	3	1	1	1	1	1	1	3	3	3	3

	CO 5	3	2	2	2	3	3	3	1	1	1	1	3	2	2	2.5
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3.1 Attainment of Course Outcomes (75)

3.2.1. Describe the assessment tools and processes used to gather the data upon which the evaluation of Course Outcome is based (10)

- i. An elaborate continuous evaluation system is in place including the following components.

Theory Course: Class Test1, Class Test2, Daily Home Assignments, Daily Class Assignments, Additional Assessment and Attendance for Internal Evaluation and one External End semester examination

Practical Course / Project: PV1, PV2, PV3, Attendance. PVs are Internal mid-term evaluations by Lab Course teacher / Project Supervisor and Departmental Committee and they are followed by an external end-semester examination.

Theory Courses	Practical Courses
(i) Class Tests	(i) Record-cum-Home Assignments
(ii) Daily Home Assignments	(ii) Practical Tests
(iii) Additional Assignments	(iii) Viva-voce
(iv) Seminars & Group Discussions	(iv) Attendance
(v) Attendance	(v) Semester/Module End-Semester Examination
(vi) Semester/Module End-Semester Examination	

- ii. In a Theory Course the Syllabus is divided into 5 units. The Class Test1 is typically based on the first three units and the Class Test2 is based on Units 3 to 5. These two reflect the performance in the corresponding units. Similarly DHA1 is based on the Daily Home Assignment1 is typically based on the performance in the DHAs and DCAs upto the CT1 and DHA2 is based on the performance in these evaluations after CT2. Typically 10 DHAs and 5 DCAs are there in each phase. These ensure regularity in the learning process and also ensure that the student gets a regular feedback on the performance in each course.

- iii. The Daily Assignments being in a sense of punctuality and regularity and inculcate in the student a habit of meeting daily targets which stand them in good stead when they join the industry because that is exactly what the industry demands.
- iv. The End-Semester is completely transparent to the Department and is conducted by an external Examiner unknown to the Department out of the panel constituted for the same with inputs from the Department. The performance on all five units of the syllabus is checked in the End-semester examination because the student has to answer one question from each unit.
- v. The Lab evaluation is also done on a regular basis. Lab records are to be submitted on the next turn describing the work done on the previous turn. Credit is given for performance and regularity. An A Grade in Lab assessment indicates regular and good performance in terms of submissions and viva examinations.
- vi. Similarly in the Projects the regularity and performance in the Departmental evaluation is considered apart from the evaluation of the Supervisor. Students are encouraged to produce Research Papers / working projects and demonstratable results and credit is given to them. An A grade in a Project typically indicates one or more of these outcomes.
- vii. An attempt has been made to analyze the marks obtained in various tests and examinations and find out the learning outcomes from the level of achievement in these tests and examinations and assignments. Marks obtained by the students in the various components in each course are available on the Course Monitoring System. Marks have been obtained from there and have been analyzed to determine the learning outcomes.

i. Record the attainment of Course Outcomes of all courses with respect to set attainment levels (65)

Percentage Distribution of Components to COs For Theory Subjects							
Component	CT1	CT2	DH1/DA1	DHA/DA2	AA	ATT	EXT
Marks	40	40	40	40	20	10	50
CO1	40		20	20	20	20	20
CO2	40		20	20	20	20	20
CO3	20	20	20	20	20	20	20
CO4		40	20	20	20	20	20
CO5		40	20	20	20	20	20

Assesment Criteria	
Criertia	Attainment Level
80 % Students scoring more than 50 % marks	3
50 % Students scoring more than 50 % marks	2
50 % Students scoring less than 50 % marks	1

Course Attainment of Theory Subjects For The 2018 Passed Out Batch

First Year

Course	CO1	CO2	CO3	CO4	CO5
BOH181	2	2	2	2	2
CHM181	3	3	3	2	2
EEM201	1	1	1	1	1
EEM202	1	1	1	1	1
ENH181	3	3	2	2	2
ENH281	2	2	2	2	2
HSH281	2	2	2	3	3
MAM181	2	2	2	2	2
MAM281	2	2	2	2	2
MEM101	2	2	2	2	2
MEM103	2	2	2	2	2
MEM201	2	2	2	2	2
MEM202	2	2	2	2	2
PHM181	2	2	2	2	2
PHM281	2	2	1	1	1
SYH281	3	3	3	1	1

Second Year

Course	CO1	CO2	CO3	CO4	CO5
ASM401	3	3	3	3	3
ENH381	3	3	3	3	3
ENH481	3	3	3	3	3
MAM381	3	3	3	3	3
MAM481	3	3	3	3	3
MEM301	3	3	3	3	3
MEM303	3	3	3	3	3
MEM304	3	3	3	3	3

MEM401	3	3	3	3	3
MEM402	3	3	3	3	3
MEM404	3	3	3	3	3
MEM406	3	3	3	3	3

Third Year

Course	CO1	CO2	CO3	CO4	CO5
EEM507	3	3	3	3	3
EEM513	3	3	3	3	3
EEM608	3	3	3	3	3
EEM611	3	3	3	3	3
MAM581	3	3	3	3	3
MAM681	3	3	3	3	3
MEM501	3	3	3	3	3
MEM503	3	3	3	2	2
MEM505	3	3	3	3	3
MEM515	3	3	3	3	3
MEM601	3	3	3	3	3
MEM603	3	3	3	3	3
MEM605	3	3	3	3	3
MEM607	3	3	3	3	3
MEM611	3	3	3	3	3
PYH581	3	3	3	3	3
RDC581	3	3	3	3	3
RDC681	3	3	3	3	3

Final Year

Course	CO1	CO2	CO3	CO4	CO5
EEM706	3	3	3	3	3
EEM720	3	3	3	3	3
EEM722	3	3	3	3	3
EEM812	3	3	3	3	3
EEM820	3	3	3	2	2
EEM825	3	3	3	3	3
MEM701	3	3	3	3	3
MEM703	3	3	3	3	3
MEM705	3	3	3	3	3
MEM706	3	3	3	3	3

MEM708	3	3	3	3	3
MEM719	3	3	3	3	3
MEM720	3	3	3	3	3
MEM721	3	3	3	3	3
MEM725	3	3	3	3	3
MEM727	3	3	3	2	2
MEM730	3	3	3	3	3
MEM801	3	3	3	3	3
MEM809	3	3	3	3	3
MEM812	3	3	3	3	3
MEM813	3	3	3	2	2
MEM816	3	3	3	3	3
MEM818	3	3	3	3	3
MEM820	3	3	3	3	3
MEM822	3	3	3	3	3
MEM824	3	3	3	2	2
MEM826	3	3	3	3	3
MEM827	3	3	3	3	3

3.3. Attainment of Program Outcomes and Program Specific Outcomes (75)

3.3.1. Describe assessment tools and processes used for measuring the attainment of each Program Outcome and Program Specific Outcomes (10)

- i. First the mapping between the individual Courses or subjects and the learning outcomes in terms of program Outcomes and Program Specific Outcomes has been carried out.
- ii. Performance in these courses is then analyzed in detail to measure the degree to which the Program Outcomes and Program Specific Outcomes are attained.
- iii. For example, there are various Projects based courses wherein the idea is to complete projects by going through all the phases from realization of need to the final making of the product. The performance in these projects is indicative of the level of attainment of Program outcomes like Engineering problem solving and Design.
- iv. Performance in theory courses is measured according to the Grades obtained by the students in the Internal and External evaluation. These are shown separately in the Grade cards of the students so that the evaluation is independently performed by a least two different persons for the same course and provide an excellent basis for validation. The internal evaluation

completely transparent to the student as they can see the corrected answer books and check the evaluation. In case they feel that they deserve more than what they have got they can approach the course teacher for their redressal.

- v. Performance in Seminar Courses is indicative of the communication skills. Students are required to give seminar on a topic of their choice. The topic should be related to their discipline but can be something that is not directly related to the classroom work. These courses provide excellent platform for self study on topic of choice of the student and create the habit of life long and independent learning.

3.3.2. Provide results of evaluation of each PO & PSO (65)

Direct Assesment

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
CHM181	2.8	2.6	2.2	2.4	1.6	1	1	1	1	1.2	1	1		2.4	2.6	2
PHM181	2.2	2	1.4	1.4	1	1	-	-	-	1.2	1	1		1.7	2	1.2
MEM101	3	1	2	2	1	-	-	-	-	-	-	1		1.5	1	1.5
MEM103	3	2.2	2.4	2.2	2.4	1.6	1.8	1.8	1.5	2	3	2.2		2.3	2.2	2.3
MAM181	3	3	3	1.6	1.5	1	-	-	1	1.6	1	1		3	3	1.55
BOH181	3	3	2	2	1	3	3	3	3	1	1	3		2.5	3	1.5
ENH181	-	-	-	-	-	3	1	3	-	3	1	2		-	-	3
PHM281	2.4	2.2	1.6	1.8	1	1	-	-	-	1.2	1	1.2		1.9	2.2	1.4
EEM201	3	3	3	3	3	1	1	1	1	2	1	2		3	3	3
EEM202	3	3	3	3	3	1	1	1	1	2	1	2		3	3	3
MEM201	3	2.2	2	1.8	-	-	-	-	-	-	-	1		2.1	2.2	1.8
MEM202	3	3	3	3	3	3	1	-	2	3	1	3		3	3	3
MAM281	3	3	3	2.2	1.25	1.5	-	-	-	1.6	1	1.2		3	3	1.725
MEM301	3	3	3	3	3	3	1	-	2	3	1	3		3	3	3
MEM303	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8		2.5	2.8	1.8
MEM304	3	3	2	2	-	-	-	-	-	-	-	1		2.5	3	2
MAM381	2.8	2.4	2.2	2	1.33	1	-	-	-	1.2	1	1.2		2.3	2.4	1.665
ENH381	-	-	-	-	-	3	1	3	-	3	1	2		-	-	3

ASM401	3	2.8	2.2	2.2	1	-	1.8	1.4	2	2	-	1.6		2.5	2.8	1.6
MEM401	3	3	3	3	3	3	1	-	2	3	1	3		3	3	3
MEM402	3	3	3	3	-	1	1	-	1.2	-	-	1		3	3	3
MEM404	3	3	2.6	2.6	2	1.8	1	1.8	1.8	1.8	1.6	2.4		2.8	3	2.3
MEM406	3.2	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8		2.5	2.8	1.8
MAM481	3	3	3	3	1.8	1.8	-	-	-	1.2	0.2	1.2		3	3	2.4
ENH481	-	-	-	-	-	3	1	3	-	3	1	2		-	-	3
MEM501	3	2.6	2.6	2.6	1	1.2	2.2	2	1.6	2	-	1.4		2.6	2.6	1.8
MEM505	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2		2.5	2.8	2.2
MAM581	3	2.2	1.6	1.8	0.6	1.2	-	-	-	1.2	0.2	1.2		1.9	2.2	1.2
RDC581	1.8	1.8	1.8	1.2	1.8	1.8	1.8	1.8	1.8	0.6	1.2	1.2		1.8	1.8	1.5
MEM503	3	3	2.4	-	-	1	-	-	1	1	-	1		2.7	3	3
MEM516	2.6	2.6	2.6	2.6	2.8	2.4	2.6	2.2	2.4	2.6	1.8	2.6		2.6	2.6	2.7
MEM601	3	3	2.6	1.8	1	1	1	1	2.6	-	-	1		2.8	3	1.4
MEM603	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2		2.5	2.8	2.2
MEM605	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8		2.5	2.8	1.8
MAM681	2.4	2.2	1.6	1.8	0.6	0.4	-	-	-	1.2	0.2	1.2		1.9	2.2	1.2
MEM607	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2		2.5	2.8	2.2
MEM611	2.6	2.6	2.6	2.6	2.8	2.4	2.6	2.2	2.4	2.6	1.8	2.6		2.6	2.6	2.7
MEM703	3	3	2.4	1	3	1	-	3	1	1	-	1		2.7	3	2
MEM708	3	3	2.4	1	3	1	-	3	1	1	-	1		2.7	3	2
MEM701	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2		2.5	2.8	2.2
MEM705	3	2.2	2.4	2.2	2.2	1.6	1.8	1.8	-	1	-	2.8		2.3	2.2	2.2
MEM706	3	3	3	2	1	1	1	1	3	-	-	1		3	3	1.5
MEM721	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8		2.5	2.8	1.8
MEM725	3	3	2.4	-	-	1	-	-	1	1	-	1		2.7	3	3
MEM730	2.8	2.8	2.2	2.2	1.4	1.4	2.2	2.2	2.2	2.2	1.4	2.8		2.5	2.8	1.8
MEM719	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2		2.5	2.8	2.2
MEM720	3	2.2	1.6	1.8	-	0.6	-	-	1	0.4	-	1		1.9	2.2	1.8
MEM801	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2		2.5	2.8	2.2
MEM809	2.8	2.6	2.4	2.4	2.2	1.6	1.4	1.4	1.4	1.4	1.4	3		2.5	2.6	2.3
MEM813	2.6	2.6	1.8	1.6	2.2	2.2	2.6	2.6	1.6	2.8	1.4	2.2		2.2	2.6	1.9
MEM818	3	2.8	2	2	2.2	2.2	3	2.6	1.8	2.4	1	2.2		2.4	2.8	2.1
MEM816	2.8	2.6	2.4	2.4	2.2	1.6	1.6	1.6	0.6	1.4	0.6	2.8		2.5	2.6	2.3
MEM812	3	2.8	2	2	1.8	1.2	1.2	1.2	-	1	-	3		2.4	2.8	1.9
MEM822	2.4	2.8	2.6	2.6	2.8	2.8	2.6	2.4	2.4	1.6	1.2	1.8		2.7	2.8	2.7

MEM824	3	3	2.4	2	2.2	1.2	0.4	2.4	2.2	2.2	2.2	1.6		2.7	3	2.1
MEM820	3	2.6	2.2	2.2	2.2	1.6	1.6	1.2	1	1	1	3		2.4	2.6	2.2
MEM826	3	2.6	2.2	2.2	2.2	1.6	1.6	1.2	1	1	1	3		2.4	2.6	2.2
MEM827	2.8	2.8	2.2	2.2	2.2	2.2	2.8	2.8	2.2	2.8	1.4	2.2		2.5	2.8	2.2
Direct Assessment	2.9	2.7	2.3	2.2	1.9	1.7	1.8	2.1	1.8	1.9	1.2	1.9		2.53	2.7	2.14

Survey	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Survey 1	3	3	3	3	2	2	2	3	3	1	3	2
Survey 2	3	3	3	3	2	2	2	3	3	1	3	2
Survey 3	3	3	3	3	2	2	2	3	3	1	3	2
Indirect Attainment	3	3	3	3	2	2	2	3	3	1	3	2

Table B.3.3.2b

Note: Add more columns as needed for *PSOs*.

Mention the type of survey conducted and the location of its source:

Survey is conducted on Alumni who visit the faculty after completing 25 years after exit from faculty for an Alumni meet/Re-union.

Survey is conducted by Alumni Association of Dayalbagh Educational Institutions (AADEIs) and feedback is provided to the faculty.

In addition the highly reputed companies visit campus for campus placement and give feedback regarding performance of previous batch students every year.

Example: MEM101, MEM102 are indicative courses in the first semester. Similarly, MEM404 is a fourth semester course. First two alphabets indicate that it is Mechanical Engineering Program. The third alphabet M denotes that it is a major course, H denotes that it is a Half Course.

Direct attainment level of a PO/PSO is determined by taking average across all courses addressing that PO/PSO.

- Indirect attainment level of a PO/PSO is determined based on the student exit surveys, employer surveys, co-curricular activities, extracurricular activities etc.

CRITERION 4	Students' Performance	100
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Item	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
Sanctioned intake of the program (<i>N</i>)	60	60	60
Total number of students admitted in first year <i>minus</i> number of students migrated to other programs/institutions, plus no. of students migrated to this program (<i>N1</i>)	72	72	65
Number of students admitted in 2nd year in the same batch via lateral entry (<i>N2</i>)	0	12	12
Separate division students, if applicable (<i>N3</i>)	0	0	0
Total number of students admitted in the Program (<i>N1</i> + <i>N2</i> + <i>N3</i>)	72	84	77

Table B.4a

Year of entry	<i>N1</i> + <i>N2</i> + <i>N3</i>	Number of students who have successfully graduated without backlogs in any semester/year of study			
		I Year	II Year	III Year	IV Year
CAY	72				
CAYm1	71+12(LE)+1(Migration to branch)	71			
CAYm2	64+12(LE)	62	64+12(LE)		
CAYm3	60+9(LE)	56	59+9	60+9	
CAYm4 (LYG)	59+9(LE)	57	58+9	55+9	59+9
CAYm5 (LYGm1)	45+9 (LE)	41	43+9	42+9	45+9
CAYm6 (LYGm2)	45+9 (LE)+1(Migration to branch)+1 (readmitted)	40	42+9	46+9	47+9

Table B.4b

Year of entry	N1 + N2 + N3	Number of students who have successfully graduated (Students with backlog in stipulated period of study)			
		I Year	II Year	III Year	IV Year
CAY	72				
CAYm1	71+12(LE)+1(Migration to branch)	0			
CAYm2	64+12(LE)	2	0		
CAYm3	60+9(LE)	4	1	0	
CAYm4 (LYG)	59+9(LE)	2	1	4	0
CAYm5 (LYGm1)	45+9 (LE)	4	2	3	0
CAYm6 (LYGm2)	45+9 (LE)+1(Migration to branch)+1 (readmitted)	5	5	1	0

Table B.4c

4.1. Enrolment Ratio (20)

$$\text{Enrolment Ratio} = N1/N = \frac{71+69+69}{180} = 116.1 \%$$

Item (Students enrolled at the First Year Level on average basis during the previous three academic years starting from current academic year)	Marks
>=90% students enrolled	20
>=80% students enrolled	18
>=70% students enrolled	16
>=60% students enrolled	14
Otherwise	0

Table B.4.1

4.2. Success Rate in the stipulated period of the program (20)

4.2.1. Success rate without backlogs in any semester/year of study (15)

Item	Last Year of Graduate , LYG	Last Year of Graduate minus 1, LYGm1	Last Year of Graduate minus 2, LYGm2
Number of students admitted in the	68	54	56

corresponding First Year + admitted in 2nd year via lateral entry and separate division, if applicable			
Number of students who have graduated without backlogs in the stipulated period	67	54	56
Success Index (SI)	0.99	1	1
Average Success Index	0.99		
Success Rate	4.9		

Table B.4.2.1

4.2.2. Success rate with backlog in stipulated period of study (5)

Item	Last Year of Graduate, LYG (CAYm4)	Last Year of Graduate minus 1, LYGm1 (CAYm5)	Last Year of Graduate minus 2, LYGm2 (CAYm6)
Number of students admitted in the corresponding First Year + admitted in 2nd year via lateral entry and separate division, if applicable	68	54	56
Number of students who have graduated with backlogs in the stipulated period	7	9	11
Success Index (SI)	1	1	1
Average Success Index	1		
Success Rate	1		

Table B.4.2.2

4.3. Academic Performance in Second Year (10)

Academic Performance	CAYm1 2017-2018	CAYm2 2016-2017	CAYm3 2015-2016
Mean of CGPA or Mean Percentage of all successful students (X)	7.40	7.97	7.98
Total no. of successful students (Y)	72	69	61
Total no. of students appeared in the examination (Z)	72	69	61
API = $X * (Y/Z)$	7.40	7.97	7.98
Average API = $(AP1 + AP2 + AP3)/3$	7.79		

Table B.4.3

4.4. Placement, Higher Studies and Entrepreneurship (30)

Item	CAYm1 2017-2018	CAYm2 2016-2017	CAYm3 2015-2016
Total No. of Final Year Students (N)	68	54	56
No. of students placed in companies or Government Sector (x)	29	12	19
No. of students admitted to higher studies with valid qualifying scores (GATE or equivalent State or National Level Tests, GRE, GMAT etc.) (y)	17	24	25
No. of students turned entrepreneur in engineering/technology (z)	0	0	0
$x + y + z =$	46	36	44
Placement Index : $(x + y + z) / N$	0.676	0.562	0.666
Average placement = $(P1 + P2 + P3) / 3$	0.634		
Assessment Points = $30 \times \text{average placement}$	19.0		

Table B.4.4

4.4a. Provide the placement data in the below mentioned format with the name of the program and the assessment year: Students have received offer letters / appointment letters individually and institute has received the consolidated list.

B.Tech Mechanical 2017 - 2018				
S.No.	Roll No	Name of the student	Name of the Employer	Salary Offered (In Lacs)
1	126198	PRABHAT PATHAK	CG	5.2
2	136351	KUMAR SHABD	DCM SRIRAM SUGAR	4.5
3	144094	PIYUSH YADAV	MARUTI	6.5
4	144116	AARTA PRASAD	TCS	3.25
5	144118	AGAM THIND	TCS	3.25
6	144120	AMAN YADAV	TCS	3.25
7	144122	AMOL AGARWAL	TCS	3.25
8	144123	ANAND SHARMA	FIAT	6.6
9	144124	ANAND SWARUP NIGAM	MARUTI	6.5
10	144125	ARCHIT AGARWAL	TCS	3.25
11	144127	AYUSH AGRAWAL	MARUTI	6.5
12	144128	B.PUNEET	TCS	3.25
13	144129	DEEPAK KUMAR RAWAT	TCS	3.25
14	144135	GAURAV KUSHWAH	TCS	3.25

15	144137	HARPREET KAUR	ISGEC, NOIDA	6.5
16	144139	JAY SACHDEVA	POLYPLEX	4.5
17	144140	JUHI SINGH	ISGEC, NOIDA	6.5
18	144144	MADHAVI SRIVASTAVA	TCS	3.25
19	144145	MAHIMA SHARMA	FIAT	6.6
20	144147	MOHIT CHOUDHARY	POLYPLEX	4.5
21	144152	NEERAJ GAUTAM	TCS	3.25
22	144156	PRAKHAR GUPTA	TCS	3.25
23	144157	PREKSHA GUPTA	HERO MOTO CORP	6.5
24	144158	PRIYA VERMA	FIAT	6.6
25	144161	RAVI KANT	TCS	3.25
26	144164	SHASHANK GARG	FIAT	6.6
27	144169	SHUBHAM MAHAJAN	POLYPLEX	4.5
28	144173	SUMIR TYAGI	CG	5.2
29	144176	VIVEK KUMAR SONI	TCS	3.25

B.Tech Mechanical 2016-17				
S.No.	Roll No	Name of the student	Name of the Employer	Salary Offered (In Lacs)
1	126028	RAJESH SHARMA	MARUTI SUZUKI	6.5
2	134125	AKANSH MITTAL	MARUTI SUZUKI	6.5
3	134127	ANKIT PALI	TCS	3.5
4	134128	ASHISH MITTAL	TCS	3.5
5	134134	HARENDER SINGH	TCS	3.5
6	134136	HARSHIT K GUPTA	TCS	3.5
7	134143	PURANJAY KHETARPAL	FIAT	6.6
8	134145	RAHUL SINGH	CROMPTON GREAVES	4.5
9	134150	RISHABH SHAH	NLMK INDIA SERVICE CENTRE PVT. LTD.	2.4
10	134151	ROHIT KUMAR GAUTAM	TCS	3.5
11	134156	SONIK GARG	TCS	3.5
12	134159	UTSAV KAPOOR	INDIA SPORTS FLASHES PVT. LTD.	2.8

B.Tech Mechanical 2015-2016

Roll No	Roll No	Roll No	Name of the Employer	Salary Offered (in Lacs)
1	106108	VISHAL SHARMA	TCS	3.2
2	114065	JITENDRA KUMAR CHAURASIYA	TCS	3.2
3	124057	TUSHAR SINGH	HONDA	3.4
4	124061	AJAY KUMAR PATHAK	MARUTI SUZUKI	6.4
5	124062	AMIT AGARWAL	FIAT INDIA	4.4
6	124066	BISHWAS C GUPTA	TCS	3.2
7	124074	KULDEEP TRIVEDI	TCS	3.2
8	124076	MEHAR CHOWDHRY	MARUTI SUZUKI	6.4
9	124080	PALLAV SAHAI MATHUR	TVS	3.6
10	124082	PRASHANT KUMAR	TVS	3.6
11	124085	PULAVARTHI ATCHYUT PREETHAM	HEADSTRONG	3.6
12	124086	RAGHAV MAHESHWARI	MARUTI SUZUKI	6.4
13	124088	RAHUL KUMAR	TVS	3.6
14	124092	RAJUL RAY	FIAT INDIA	4.4
15	124094	SACHIN YADAV	TCS	3.2
16	124097	SHABD PRAKASH	TCS	3.2
17	124099	SIDDHARTH PUNDIR	FIAT INDIA	4.4
18	124100	SUMIT MITTAL	MARUTI SUZUKI	6.4
19	124103	UTKARSH MISHRA	TCS	3.2

4.5. Professional Activities (20)

4.5.1. Professional societies/chapters and organizing engineering events (5)

A. Professional Societies/Chapters

1. System Society of India

The National Systems Conference is organized every year through the Systems Society of India. All regular faculty members of the Department are members of this society. It promotes advancement of theory, research, application & practice keeping in view the holistic systems approach for the advancement of humankind. All regular faculty members of the Department are members of this society.

S.No	Conference	Location	Date
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1	41 st NSC	Dayalbagh Educational Institute, Agra	1 - 3 Dec, 2017
2	42 nd NSC	Vikram Sarabhai Space Centre, Trivandrum	27 - 29 Dec, 2018
3	43 rd NSC	IIT Roorkee	6 - 8 Dec, 2019

2. Students Chapter of Institution of Engineers India (IEI)

Mechanical Engineering department runs a Students' Chapter of Institution of Engineers (India). All students admitting to the department joins the students' chapter. The students' chapter of IEI holds various activities round the year to aware the students about mechanical engineering fraternity and latest updates in the field. Activities like invited talks, competitions viz. quiz, essay writing, poster and model making are being held time to time.

S.No	Competition	Date		
		CAY (2018-19)	CAYm1 (2017-18)	CAYm2 (2016-17)
1	Essay Competition	3-9- 2018	1-9- 2017	8-9- 2016
2	Poster Making	3-9-2018	1-9-2017	8-9-2016
3	Quiz	4-9-2018	2-9-2017	9-9-2016
4	Model Making	5-9-2018	4-9-2017	10-9-2016

3. International Society of Agile Manufacturing

Prof. K. Hans Raj is the Chairman of ISAM and Prof. Subramaniam Ganesan is the President of ISAM. The society conducts national conferences in collaboration with Oakland University, Michigan, USA., once in two years. It also publishes a journal: International Journal of Advanced Manufacturing Systems.

B. Annual Engineering Events

1. Engineers Day

The Students' Chapter celebrates 'Engineers Day' on 15th September every year in the institute. A renowned engineering personality is facilitated on this auspicious occasion. The student winners of various competitions, being held round the year are awarded on this day.

2. Sampravah

It is a technical-cum-cultural festival organised every year for all the students of Dayalbagh Educational Institute as well as students of other institutions. Sampravah is a platform for the students to develop their skills and showcase their technological and aptitude and scientific abilities.

4.5.2. Publication of technical magazines, newsletters, etc. (5)

DEI News is published monthly. The magazine is edited by staff from all faculties of the Institute. From the Faculty of Engineering, Dr. V. Soamidas and Dr. Ashok Yadav are the concerned members. It contains information about

- a. Technical and other events organised in the Institute
- b. Conferences, workshops or other events attended by faculty members and students
- c. Prizes and awards won by staff and students
- d. Papers published by staff and students
- e. Any other matter concerning the Institute

4.5.3 Participation in inter-institute events by students of the program of study (10)

S.No	Technical Event	Venue	Dates	No. of Participants
1	MOOD INDIGO	IIT Mumbai	27-30 December, 2018	25
2	THOMSO	IIT Roorkee	26-28 October, 2018	20
3	SMART INDIA HACKATHON	BHU, Varanasi	30-31 March, 2018	6
4	COGNIZANCE	IIT Roorkee	23-25 March, 2018	7
5	TECHKRITI	IIT Kanpur	15-18 March, 2018	11
6	MITSUBISHI GOLDCUP	Nirma University	15-17 February, 2018	4
7	THOMSO	IIT Roorkee	27-29 October, 2017	30
8	WORLD FOOD HACKATHON	World Habitat Centre, New Delhi	27-28 October, 2017	4
9	SMART INDIA HACKATHON	Jaipur	1-2 April, 2017	6

Students' Achievements at National Level

1. **Second PRIZE (Rs. 2.5 Lakh), Students' Innovation Pavilion, GRIDTECH 2015:5th International Exhibition and Conference** on April 8-10, 2015 at Pragati Maidan, organized by POWERGRID with the support of Ministry of Power and in association with CBI&P and IEEMA.
2. **First prize (Mitsubishi Gold Cup and Rs. 1.0 Lakh) and The Most Popular Team Award at Mitsubishi Electric Cup 2016** : A National Level Automation Competition, organized by Mitsubishi Electric in Pune.
3. Participation in **Rashtrapati Bhawan Code for India Hackathon for Social Innovations** held at President's Estate, New Delhi, India (March 2016)



4. **First prize (Mitsubishi Gold Cup and Rs. 1.0 Lakh) and The Most Popular Team Award at Mitsubishi Electric Cup 2018** : A National Level Automation Competition, organized by Mitsubishi Electric in Pune. The participating Team and the Mentor visited Mitsubishi Industries, Japan for 5-day Trip.
5. **Champion 2017 : Best Solar Skills Training Institute**, Renewable Energy India Expo, September 21, 2017, Greater Noida.



6. **IEEE xTREME National Rankings 4, 28, 29**
7. **Selected for participation at National Level in ACM ICPC 2014,2015**
8. **Best Graduate Engineer Trainee/ Best New Comer/ Star Performer of the Year/ Best Analyst/ Best Team** at Maruti Udyog, HCL, TCS, ST Microelectronics, Accenture, ACC Ltd., Siemens India
9. **Google Code Jam 2015** : International ranking 3275
10. **Prizes won at National Level Essay Writing**

CRITERION 5	Faculty Information and Contributions	200 Marks
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S.No	Name of the Faculty Member	Qualification			Association with the Institution	Designation	Date on which Designated as Professor/ Associate Professor	Date of Joining the Institution	Department	Specialization	Academic Research			Currently Associated (Y/N) Date of Leaving (In case Currently Associated is (No)	Nature of Association (Regular/Contract)
		Degree (highest degree)	University	Year of attaining higher qualification							Research Paper Publications	Ph.D. Guidance	Faculty Receiving Ph.D. during the Assessment Years		
1	K. Hans Raj	Ph.D.	DEI	1992	1986	P	12-07-2007	12-08-1986	ME	Intelligent and Agile Manufacturing	50	7	No	Yes	Regular
2	V Maharaj Kumar	Ph.D.	IIT Delhi	1975	1960	EM	12-07-2007	06-01-1978	ME	Fatigue	10	3	No	Yes	Emeritus
3	Ranjit Singh	Ph.D.	DEI	1995	1973	EM	01-07-2003	01-11-1973	ME	Production Engineering, Automated Manufacturing	75	7	No	Yes	Emeritus
4	Dayal Saran Mishra	Ph.D.	University of Roorkey	1977	1978	EM	07-01-2002	01-11-1973	ME	Energy systems	55	2	No	Yes	Emeritus
5	Sant Kumar Gaur	Ph.D.	DEI	1996	1981	P	28-11-2008	04-07-1983	ME	Systems Engineering	25	2	No	Yes	Regular
6	D. Ganeshwar Rao	Ph.D.	DEI	1999	1981	P	13-02-2012	05-07-1985	ME	Thermal Engineering	15	2	No	Yes	Regular
7	R. Caprihan	Ph.D.	DEI	1996	1988	P	06-03-2010	19-08-1988	ME	Industrial & Production	110	3	No	Yes	Regular
8	Sanjay K Srivastava	Ph.D.	DEI	2000	1983	P	11-02-2012	27-10-1989	ME	Industrial Engineering & Biomedical Engineering	35	8	No	Yes	Regular
9	Vuppulury Soami Das	Ph.D.	IIT MADRAS	1990	1994	P	11-02-2012	16-02-1994	ME	Machine Dynamics, Composite Materials	20	1	No	Yes	Regular
10	Rahul Swarup Sharma	Ph.D.	DEI	2009	1997	P	18-05-2017	02-09-1999	ME	Additive Manufacturing, Frugal Innovations	62	2	No	Yes	Regular
11	Ram Chand Gupta	M.Tech	DEI	1996	1992	ACP	11-10-2016	26-11-1992	ME	Thermal Engineering	0	0	No	Yes	Regular
12	Anami Saran	M.Tech	DEI	2007	1995	AP	NA	15/9/2003	ME	Automobile Engineering	0	0	No	Yes	Regular
13	Ankit Sahai	Ph.D.	DEI	2017	2009	AP	NA	27-03-2010	ME	Material Science and Fluid Mechanics	10	2	No	Yes	Regular
14	Bhupesh K Satsangi	M.Tech	DEI	2009	2006	AP	NA	10-03-2010	ME	System Engineering	8	0	No	Yes	Regular
15	Gurumukh Das	Ph.D.	DEI	2018	2005	AP	NA	15-05-2010	ME	Production & Industrial Engineering	10	0	Yes	Yes	Regular
16	Ashok Yadav	Ph.D.	UPTU	2012	2011	AP	NA	19-07-2011	ME	Thermal / biofuel	33	4	No	Yes	Regular
17	Rajat Setia	Ph.D.	DEI	2013	2007	AP	NA	24-10-2012	ME	Soft Computation	14	1	No	Yes	Regular
18	Kumar Ratnakar	M.Tech	DEI	2010	1997	AP	NA	16/11/2012	ME	Manufacturing, Thermal, Operations Management	5	0	No	Yes	Regular
19	Atul Suri	M.Tech	DEI	2012	1996	AP	17-11-2014	27-10-2003	ME	Friction Stir Welding/ metal forming	8	0	No	Yes	Regular
20	Anurag Gupta	M.Tech	DEI	2012	1997	AP	NA	07/04/2016	ME	Fluid mechanics, Hydraulic machines, Renewable fuels	5	0	No	Yes	Regular
21	Manoj Dixit	Ph.D.	IIT Delhi	2017	2017	AP	NA	06-02-2017	ME	Thermal Engineering	7	0	No	Yes	Contract
22	Aditya	Ph.D.	IIITDM Jabalpur	2017	2017	AP	NA	17-02-2017	ME	Condition Monitoring, Machine Design, Mechanical	17	0	Yes	Yes	Contract
23	Manoj Kumar	M.Tech	IIT Roorkee	2016	2017	AP	NA	29-07-2017	ME	Thermal Engineering	2	0	No	No	Contract

5.1. Student-Faculty Ratio (SFR) (20)

Mechanical 2018-2019

No. of UG Programs in the Department (n): **01**

No. of PG Programs in the Department (m): **01**

No. of Students in UG 2nd Year= **83**

No. of Students in UG 3rd Year= **76**

No. of Students in UG 4th Year= **62**

No. of Students in PG 1st Year= **17**

No. of Students in PG 2nd Year= **22**

Mechanical 2017-2018

No. of UG Programs in the Department (n): **01**

No. of PG Programs in the Department (m): **01**

No. of Students in UG 2nd Year= **77**

No. of Students in UG 3rd Year= **69**

No. of Students in UG 4th Year= **68**

No. of Students in PG 1st Year= **22**

No. of Students in PG 2nd Year= **17**

Mechanical 2016-2017

No. of UG Programs in the Department (n): **01**

No. of PG Programs in the Department (m): **01**

No. of Students in UG 2nd Year= **69**

No. of Students in UG 3rd Year= **70**

No. of Students in UG 4th Year= **54**

No. of Students in PG 1st Year= **17**

No. of Students in PG 2nd Year= **14**

No. of Students = Sanctioned Intake + Actual admitted lateral entry students

Student Faculty Ratio (SFR) = S / F

Year	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
u1.1	83	77	69
u1.2	76	69	70
u1.3	68	68	54
UG1	221	214	193
p1.1	17	22	17
p1.2	22	17	14
PG1	39	39	31
Total No. of Students in the Department (S)	260	255	224
No. of Faculty in the Department (F)	20	20	19
Student Faculty Ratio (SFR)	13	12.75	11.78
Average SFR	SFR=(SFR1+SFR2+SFR3)/3		12.51

Table B.5.1

5.1.1. Provide the information about the regular and contractual faculty as per the format mentioned below:

Year	Total number of regular faculty in the department	Total number of contractual faculty in the department
CAY 2018-2019	17	3
CAYm1 2017-2018	17	3
CAYm2 2016-2017	17	2

Table 5.1.1

5.2. Faculty Cadre Proportion (20)

Year	Professors		Associate Professors		Assistant Professors	
	Required F1	Available	Required F2	Available	Required F3	Available
CAY 2018-2019	1.43	7	2.46	1	8.58	12
CAYm1 2017-2018	1.4	7	2.86	1	8.415	12
CAYm2 2016-2017	1.29	6	2.6	2	7.77	11
Average Numbers	RF1 = 1.37	AF1 = 6.66	RF2 = 2.64	AF2 = 1.33	RF3 = 8.25	AF3 = 11.66

Table B.5.2

$$AF1/RF1 = 6.66/1.37 = 4.86; 1.33/2.64 = 0.5; 11.66/8.25 = 1.41;$$

$$\text{Cadre proportion marks} = ((4.86) + (0.5 \times 0.6) + (1.41 \times 0.4)) \times 10 = 57.2 = 20$$

5.3. Faculty Qualification (20)

	X	Y	F	$FQ = 2.0 \times [(10X + 4Y)/F]$
CAY 2018-2019	11	6	13	$2.0 \times [(10 \times 11 + 4 \times 6)/13] = 20.6$
CAYm1 2017-2018	10	7	12.75	$2.0 \times [(10 \times 10 + 4 \times 7)/12.75] = 20.15$
CAYm2 2016-2017	9	8	11.78	$2.0 \times [(10 \times 9 + 4 \times 8)/11.78] = 20.71$
Average Assessment				20.48

Table B.5.3

5.4. Faculty Retention (10)

Item	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
No. of regular faculty members in	17	17	17

Item (% of faculty retained during the period of assessment keeping CAYm3 as base year)	Marks
100% of faculty retained during the period of assessment keeping CAYm3 2015-2016 as base year	10

Table B.5.4

5.5. Faculty competencies in correlation to Program Specific Criteria (10)

Faculty	PSO1	PSO2	PSO3
K. Hans Raj	√	√	√
Sant Kumar Gaur		√	√
D. Ganeshwar Rao		√	
R. Caprihan	√		√
Sanjay K Srivastava	√	√	
Vuppulury Soami Das		√	√
Rahul Swarup Sharma	√		
Ram Chand Gupta		√	
Anami Saran			√
Ankit Sahai		√	√
Bhupesh K Satsangi			√
Gurumukh Das	√		√
Ashok Yadav		√	√
Rajat Setia	√		
Kumar Ratnakar		√	√
Atul Suri		√	√
Anurag Gupta		√	√
Manoj Dixit		√	√
Aditya	√	√	√
Manoj Kumar			√

5.6. Innovations by the Faculty in Teaching and Learning (10)

A. Teaching

- The Institute has about 30 e-classrooms from where the lectures can be transmitted and also can be received with 2-way communication as both sides can see each other. Students have the possibility of attending lectures given from even remote locations.
- There is a system of Daily Home Assignments which are given at the end of every theory class. These provide an opportunity to further dig deeper into the content covered in the class on a particular and / or provide an opportunity to reflect on the material. These are evaluated and returned to the students in the next class so that they get immediate feedback on what they have understood and what they have not understood properly. This is continuous evaluation at its best and inculcates regularity and punctuality on the students.
- Some teachers use on-line evaluation tools for continuous evaluation and administering the DHAs.
- Several courses are available on the Vidyaprasar portal that is the Institute's portal. These lectures provide for anytime, anywhere learning.
- The students are required to undergo a five month internship at the end of Third year in an industry or research establishment. This provides a first hand feel for the job environment and makes them industry ready. Many students get the Pre-Placement offer from the organization where they complete their internship.
- The Institute offers some Core Courses for all UG students cutting across disciplines. These include courses like Indian Culture, Comparative Study of Religion, NSS, Agriculture Operations, Co-Curricular Activities (duly evaluated as a Credit Course), General Knowledge and Current Affairs etc. These courses ensure the development of a well rounded person with a value system that stands the graduate in good stead all through their life. This has been repeatedly stressed by the Alumni in their feedback given in informal as well as formal surveys.
- All the students have to go through Work Experience Courses that provide hands on training in areas like Photography and Video editing, Radio and TV repair, PCB Design etc. These inculcate the capacity to work with their own hands that is very important for an engineer.

- Many Institutes across the country are dispensing with the Final Year Major project with a plea that the students are no longer interested in pursuing these. The DEI curriculum actually includes multiple projects in II, III and IV year so that the students are well versed with practical problem solving that is very important for an engineer.
- Faculty members who are on leave are encouraged to take their classes in video-conferencing mode from wherever they are. The Institute has e-classrooms to facilitate this.
- Students are provided with video lectures for some courses that they can complete while they are away from the Institute for their Internship programme. This has enabled the Institute to include a five months internship programme without extending the duration of the BTech programme.
- Students are encouraged to take up work in live projects and Community assistance projects taken up by Faculty members. Where possible they are provided incentives under earn while you learn scheme.
- The Department has an Under Graduate Research Award with a cash incentive for selected students to pursue their Major Project under this scheme. This is to inculcate research culture in the students.

B. Learning Programmes

- Mechanical Engineering Department* has introduced a Co-operative Programme in which students join selected Industries for one semester and return to Department for the next. At the Industry, students study online courses in video-conferencing mode and take up industrial projects on which they continue to work after returning to DEI. This contributes to their major projects at DEI. Students benefit by working on real life problems and getting good placements, while the industry benefits in selecting potential students after their studies. This innovative program has created *win-win-win propositions for institute, students and industry*.
- The *Business Advisory Clinic* brings the problems of small and medium business organizations to students as case studies giving exposure to real life problems.
- Under MoUs students get an opportunity to credit joint courses *with IITs*, undertake *PhD under joint supervision of DEI and IIT faculty*. They also get opportunities to visit and

work in the Laboratories of Institutes of higher learning both in India and abroad. A number of Research scholars and Engineering students have benefitted by studying in Universities of Maryland, Missouri and Waterloo.

- iv. Students are also encouraged to credit open courses floated by Stanford and MIT and suitable facilities are provided.
- v. Students are encouraged to undertake various *Summer Fellowships* offered by the science academies and research institutes in India and abroad.
- vi. Vidyaprasar: The DEI Open Course Portal: www.vidyaprasar.dei.ac.in), an *on-line collaborative learning, live web cast and content management system*, to provide students with state-of-the-art learning resources. Vidyaprasar provides course web publishing, file storage and sharing facilities through a web-based connection to the Internet thus providing full portability. Vidyaprasar presently *hosts course websites with learning resources such as indexed lecture videos, lecture notes, question banks, quizzes, long tests and Wiki for courses in Computer Science and Engineering*.
- vii. Under-Graduate Research Awards (UGRA) Department in association with the Alumni Association has initiated these awards to encourage selected bright science and engineering students at the UG level to undertake research projects. This programme is in the process of being extended to other faculties as well.
- viii. Research Colloquia and Extension Lectures Regular weekly research colloquia are organized in different departments, to encourage faculty and research scholars to present their latest research work. Besides, Conferences, Workshops and Seminars organized by various departments, special seminars and extension lectures are organized.
- ix. Entrepreneurship Virtual Incubation Cell (EVIC) The Institute has established EVIC that aims to adopt an inter-disciplinary systemic approach, to encourage students to think and take up novel challenging ideas that can be incubated in-house. The objective is to nurture social entrepreneurs who can focus on providing low-cost solutions in the following primary domains: *Education (Culture, Values and Quality), Energy, Health, Water and Waste Management*. The EVIC provides all possible assistance to promote creative thinking and an entrepreneurial mindset among the students so as to help convert socially relevant innovative ideas into market accepted products. It also organizes various

competitions throughout the year to encourage students.

- x. 'Each-one Teach-one' Programme To help the academically weak students, to catch up with their colleagues, the '*Each-one Teach-one*' programme has been successfully operational in the department and has also been introduced at the under-graduate level very successfully. In this scheme, bright students of the same class or senior classes act as mentors to weak students and help them in learning, under the supervision of teachers.
- xi. *DEI Mechanical Engineering Department is pioneer in simulation based teaching and learning. Mechanical Engineering Department has developed Metal Forming Virtual Simulation Lab. Open access available at: <http://14.139.245.214/mfvlab/>*
- xii. *Mechanical Engineering Department has developed e-learning material for the UG Faculty Core Course on Manufacturing Processes (MEM-103). Under all four quadrant approach. It may be accessed through following link. (User name: mem, password: mem). http://14.139.245.200/mfvlab/mem103_18/mem103.php*
- xiii. *Mechanical Engineering Department collaborates Quantum-Nano Systems Centre and the Centre for Consciousness Studies to facilitate multidisciplinary teaching and research activities.*
- xiv. Developed course on 3D Printing for Additive Manufacturing
- xv. Developed lab course on 3D Printing for Additive Manufacturing
- xvi. Developed version 1.0, 2.0, 3.0, 4.0, 5.0 & 6.0 of 3D printer
- xvii. Teaching Models for MEM-402 Mechanics of Solids - I
- xviii. Manuals for assembly of 3D Printers version 1.0, 2.0, 3.0, 4.0, 5.0 & 6.0
- xix. monograph on Fabrication Techniques
- xx. Transparent Models for Kinematics of Machine for teaching theory of machine course.
- xxi. Experimental facility and test bench for 3D Printing technologies
- xxii. Experimental facility for Severe Plastic Deformation with conventional die sets, modified die sets, 3-D ECAP die sets
- xxiii. State of the art FE analysis computational setup with FORGE2011 (16 core and 4 core) and ABAQUS.
- xxiv. Students provided with self-learning printed material, question banks and access to reference material

- xxv. Designed and developed a rotary-tool attachment for Dry EDM. With the help of this Green-EDM technique, demonstrated the machining of extremely hard two-phased composites with improved performance parameters.
- xxvi. Earn while you Learn Provision has been made for UG, PG and Research students for part-time jobs within the large number of research projects operational in the Institute, to help them learn state-of-the-art techniques and also get remuneration.
- xxvii. Classes are conducted in the core course on Scientific Methodology, General Knowledge and Current Affairs, to apprise students of career options and prepare them to successfully compete in interviews and competitive tests.
- xxviii. The compulsory component of Seminar-cum-Group Discussion in each course helps students to enhance oral expression and presentation skills.
- xxix. The Institute alongwith the Alumni Association (AADEIs) has set up a cell in the Institute that specially offers courses on Soft Skills, Computer Skills, English Speaking and organizes workshops on 'Career Counseling', 'How to face interviews' and 'Resume writing' from time to time for the benefit of all students.
- xxx. Tutorial classes on individual courses and also for competitive exams such as Civil Services, NET and GATE provide students an opportunity for personal development.
- xxxi. Department of Mechanical Engineering has been at the forefront in deploying and harnessing the potential of ICT in education, collaboration and outreach.
- xxxii. Conducts various courses to enhance employability. Some representative courses are as listed in the Table below:

S.No	Course Title/Activity
1.	Computer Basics & Microsoft Office
2.	Tally ERP 9*
3.	Microsoft Access
4.	Unix and Perl with sequel
5.	C-Programming
6.	An Intro to Networking and Network Admn.
7.	Software Testing

8.	An Introduction to Java
9.	Data Based Management Systems
10.	Soft Skills
11.	Spoken English
12.	Placement Preparation
13.	GATE Preparation and Practice Sessions
	<i>1. Interview Skills</i>
	<i>2. Personality Development</i>
	<i>3. Communication Skills</i>
	<i>4. (MS) Excel</i>
	<i>5. Time Management</i>
	<i>6. Presentation Skills</i>

5.7. Faculty as participants in Faculty development/training activities/STTPs (15)

Name of the Faculty	Max. 5 per Faculty		
	CAYm1 2017-2018	CAYm2 2016-17	CAYm3 2015-16
K. Hans Raj	3	3	1
Sant Kumar Gaur			
D. Ganeshwar Rao	2	1	1
R. Caprihan			
Sanjay K Srivastava	1		
Vuppulury Soami Das	1		
Rahul Swarup Sharma	3	3	3
Ram Chand Gupta	1		
Anami Saran	1		
Ankit Sahai	3		
Bhupesh K Satsangi	1		
Gurumukh Das	3	1	3
Ashok Yadav	1		
Rajat Setia	1	1	

Kumar Ratnakar	2	1	
Atul Suri	2	1	2
Anurag Gupta	3	1	
Manoj Dixit			
Aditya			
Manoj Kumar			
Sum	27	12	10
RF= Number of Faculty required to comply with 20:1 Student-Faculty ratio as per 5.1	13	12.75	11.78
Assessment = $3 \times (\text{Sum}/0.5 \text{ RF})$ (Marks limited to 15)	12.46	5.64	5.09
Average assessment over last three years (Marks limited to 15) = 15			8

Table B.5.7

Year	Name of teachers who attended	Title of the professional development Programme	Date and Duration
2013	Dr. Gurumukh Das	Orientation Program	03/07/2013 – 30/07/2013
2015	Dr. Ashok Yadav	Refresher Program	27/02/2015 - 20/03/2015
2015	Dr. Gurumukh Das	Refresher Program	27/02/2015 - 20/03/2015
2015	Prof. Rahul Swarup Sharma	Dissemination workshop on 3D Printing One Week Winter Camp	24-31 December 2015
2015	Prof. Rahul Swarup Sharma	Low Cost ‘Bhartiya Swadeshi’ (Indigenous) 3D Printer @ DEI: International school on Quantum and nano computing Systems and applications–	November 2015
2015	Prof. Rahul Swarup Sharma	Conducted Virtual Lab workshop at Skyline Institute of Engineering & Technology, Greater Noida	20 October 2015
2015	Prof. Rahul Swarup Sharma	CBCS workshop / Seminar at BHU. Credit framework for skill development UGC CBCS Workshop, BHU	April 2015
2016	Prof. K. Hans Raj	Organized workshop on Agile Manufacturing at International Conference on Numerical Modelling of Industrial Forming Processes (NUMIFORM 2016) at University of Troyes, France	4th-7th July 2016
2016	Prof. K. Hans Raj	Organized workshop on Agile Manufacturing at Centre for Material Forming (CEMEF), Sophia Antipolis, France on Agile Manufacturing, July 2016	2016
2016	Dr. Ankit Sahai	GIAN course on “Applied Fatigue and Fracture Mechanics”, IIT Ropar	16/05/16 – 21/05/2016
2016	Dr. Ankit Sahai	Course on “Electron Microscopy & Microanalysis of Materials,	01/08/16 –

		EMMM -2016", IIT Kanpur	5/08/2016
2016	Dr. Atul Suri	GIAN course on "Applied Fatigue and Fracture Mechanics", IIT Ropar	16/05/16 – 21/05/2016
2016	Mr. Atul Suri	Refresher Program, JNV University Jodhpur	21/11/16 - 19/12/16
2016	Mr. Atul Suri	MNIT Allahabad	April 2016
2016	Prof. Rahul Swarup Sharma	Skill Based Education of 3-D Printing Technologies @ DEI: Bringing Additive Manufacturing to the Classroom International School on Quantum And Nano Computing Systems and applications–	November 2016
2016	Prof. Rahul Swarup Sharma	Hands on Workshop on 3D Printing (Engineering Science Quest @ Workshops)	March 21-April 1, 2016
2017	Prof. K. Hans Raj	Organized training session on application soft computing based optimization in material forming at Centre for Material Forming (CEMEF), Sophia Antipolis, France on Agile Manufacturing, May 2017	2017
2017	Prof. K. Hans Raj	Organized seminar on Soft Computing based Optimization at University of Kiel, Germany, June 2017	2017
2017	Dr Rajat Setia	Orientation Program, DU, Delhi	21/11/17 - 10/12/17
2017	Mr. Atul Suri	Orientation Program, DU, Delhi	21/11/17 - 10/12/17
2017	Prof. Rahul Swarup Sharma	Co-chaired a session on Smart Systems in IEEE Sponsored National Systems Conference,	1-3 December 2017
2017	Prof. Rahul Swarup Sharma	3D Printing: Summer School in Science for High School Students (with Engineering Science Quest @ Workshops)	March 14-18 2017
2018	Prof. K. Hans Raj	Organized Training program on Agile Manufacturing under the aegis of Institution of Engineers, Agra Local Chapter	2018
2018	Prof. K. Hans Raj	Organized training session on application soft computing approaches in Agile Manufacturing at Centre for Material Forming (CEMEF), Sophia Antipolis, France on Agile Manufacturing, June 2018	2018
2018	Prof. K. Hans Raj	Organized seminar session on Hyper Graphs at University of Kiel, Germany	2018
2018	Mr. Kumar Ratnakar	Refresher Program	23/07/2018 – 17/08/2018
2018	Dr Rajat Setia	Refresher Program	23/07/2018 – 17/08/2018
2018	Mr. Anurag Gupta	Refresher Program	4/9/2018 – 25/9/2018
2018	Mr. Anurag Gupta	Orientation Program	31/1/2018 – 28/2/2018
2018	Mr. Anurag Gupta	NSS Training, ETI Lucknow	April 2016
2018	Dr. Ankit Sahai	Refresher Program	4/9/2018 – 25/9/2018
2018	Prof. V. Soami Das	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018

2018	Prof. D.G. Rao	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Prof. S.K. Srivastava	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Shri RC Gupta	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Shri Bhupesh Kr Satsangi	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Dr. Ankit Sahai	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Shri Gurmukh Das	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Shri Anami Saran	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Shri Kumar Ratnakar	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Shri Atul Suri	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Shri Anurag Gupta	TEQIP sponsored Summer Training Program on Active Learning for Senior Faculty at KIT, IIT Kanpur	21/5/2018 – 25/5/2018
2018	Dr. Ankit Sahai	TEQIP workshop in Additive Manufacturing, IIT Kanpur	3/02/2018 – 7/02/2018
2018	Prof. Rahul Swarup Sharma	Participated in the Nobel Prize Series, 2018 at Kala Academy, Goa	February 1 to 2, 2018

5.8. Research and Development (75)

5.8.1. Academic Research (20)

- DEI's research activities are governed by Research Promotion Policy. These are displayed on its website and communicated to all.
- It creates an enabling environment to foster research culture and provides required infrastructure and support.
- The IQAC facilitates dissemination of information related to Schemes, Awards, Fellowships etc.
- The Research Planning & Monitoring Committee provides advice and evaluates progress of funded projects to improve research outcome.
- Seed money is provided to young faculty to enable them to conduct their research activities.
- DEI has numerous research projects funded by major Science & Technology organizations.

- DEI has set up an Entrepreneurship and Virtual Incubation Cell, to facilitate students and entrepreneurs to start their own venture.
- DEI has facilitated faculty and students to market their products from Rural Economic Zones to International Economic Zones.
- DEI promotes faculty engagement in authoring books, publications, newsletters and organizing and participating in national and international seminars, conferences, workshops, consultancy and training.
- DEI follows its Code of Ethics to check Plagiarism and uses Urkund plagiarism software.

Academic research includes research paper publications, Ph.D. guidance, and faculty receiving Ph.D., Collaborations with Universities during the assessment period.

A. Number of quality publications in refereed/SCI Journals, citations, Books/Book Chapters etc.
(15)

S. No	Title of paper	Name of the author/s	Name of journal	Year of publication
1	Quantum seeded evolutionary computational technique for constrained optimization in engineering design and manufacturing	K. Hans Raj, Rajat Setia	Journal of Structural Multidisciplinary Optimization, Springer-Verlag	2016
2	Hybrid Evolutionary Computational Algorithm for Mechanical Design	K. Hans Raj and Astuti V	Transactions on Engineering and Sciences	2016
3	Optimization of Straight Cylindrical Turning Using Artificial Bee Colony (ABC) Algorithm	R.S.S Prasanth., K.Hans Raj	Journal of The Institution of Engineers(India	2016
4	Thermodynamic and thermoeconomic analyses of two stage hybrid absorption compression refrigeration system	Dixit, M., Arora, A., Kaushik, S.C	Applied Thermal Engineering	2016
5	Energy and exergy analysis of waste heat driven cycle for triple effect refrigeration	Dixit, M., Arora, A., Kaushik, S.C	Journal of Thermal Engineering	2016
6	Energy and exergy analysis of absorption-compression cascade refrigeration system	Dixit, M., Kaushik, S.C., Arora, A	Journal of Thermal Engineering	2016
7	Computation of optimum parameters of a half effect	Arora, A., Dixit, M.,	Journal of Thermal Engineering	2016

	water-lithium bromide vapour absorption refrigeration system	Kaushik, S.C		
8	Energy and exergy analysis of a double effect parallel flow LiBr/H ₂ O absorption refrigeration system	Arora, A., Dixit, M., Kaushik, S.C	Journal of Thermal Engineering	2016
9	Novel ensemble techniques for classification of rolling element bearing faults	Aditya Sharma, M. Amarnath, Pavan Kumar Kankar	Journal of the Brazilian Society of Mechanical Sciences and Engineering	2016
10	Feature extraction and fault severity classification in ball bearings	Aditya Sharma, M. Amarnath, Pavan Kumar Kankar	Journal of Vibration and Control	2016
11	Shape optimization of forming dies	Rahul Swarup Sharma	LAP Lambert Academic Publishing ISBN-13: 978-3-659-92966-3	2016
12	Technology enabled learning of metal forming processes for engineering graduates using virtual simulation lab	Rahul Swarup Sharma	International Journal of Mechanical Engineering Education https://doi.org/10.1177/0306419016640436	2016
13	Manufacturing Processes	Rahul Swarup Sharma	e-book	2016
14	Desirable Traits of a Conscious Leader: An Empirical Survey	P. Bhatnagar, S. Nigam, P. Prashant and R. Caprihan	<i>The Delhi University Journal of the Humanities and the Social Sciences,</i>	2016
15	Hardness variation on longitudinal and transverse section of Al 2024 specimen processed by friction stir processing	Atul Suri	National Conference on Mechanical Engineering, Ideas, Innovations and Initiatives	2016
16	Process Improvement Through Six Sigma- A Case Study Of Agra Foundry	Ranjit Singh	IEEE-HTC CONFERENCE	2016
17	An Adaptable Fuzzy Control Strategy for a Semi- Automated Flexible Manufacturing System with Routing Flexibility	Rahul Caprihan	<i>8th IFAC Conference on Manufacturing Modelling, Management & Control</i> University of Technology of Troyes, Troyes, France	2016
18	Operation Analysis of a Virtual Cellular Manufacturing Shop: A Simulation Study	Gurumukh Das and Rahul Caprihan	Proceedings of the International Conference on Recent Trends in	2016

			Engineering and Materials Science, Jaipur National University, Jaipur, India	
19	Hybrid Evolutionary Computational Algorithm for Mechanical Design	K. Hans Raj and Astuti, V.	Transactions on Engineering and Sciences, 4(3), 2016	2016
20	Optimization of Straight Cylindrical Turning Using Artificial Bee Colony (ABC) Algorithm	R.S.S. Prasanth and K. Hans Raj	Journal of The Institution of Engineers(India), Series C(2016), Springer 'Online First' 18th June 2016, DOI 10.1007/s40032-016-0263-8	2016
21	Mechanical Behaviour and Surface Profile Analysis of Al6061 alloy processed by Equal Channel Angular Extrusion	Ankit Sahai, K. HansRaj, NK Gupta	Procedia Engineering (Elsevier)	2017
22	Determination of optimal process parameters of friction stir welding to join dissimilar aluminum alloys using artificial bee colony algorithm	R.S.S Prasanth., K.Hans Raj	Transactions of the Indian Institute of Metals	2017
23	Energy, exergy, environment and economic analyses of two stage absorption compression combined refrigeration system	Dixit, M., Arora, A., Kaushik, S.C	Clean Technologies and Environmental Policy	2017
24	Performance enhancement of a rotary furnace: a harbinger to pollution free castings	Ranjit Singh, Ashok Yadav, Dilip Kumar	IJARSE	2017
25	Productivity Improvement And Capacity Enhancement Of An Auto Mobile Industry: A Case Study	Ranjit Singh, Mayank Agrawal	IJERT	2017
26	Performance enhancement of a rotary furnace: A harbinger to pollution free castings	Ashok Yadav, Dileep Kumar	International Journal of Advance Research in Science and Engineering	2017
27	Industrial Pollution, Friction Stir Welding and its comparison with conventional Tungsten inert gas welding	Atul Suri	Urbanization and Environment-Issues and Challenges, Himanshu Publication, Hiran Magri, Udaipur-1	2017
28	Production Control Using POLCA: A Simulation Study	Rahul Caprihan	National Systems Conference, Agra	2017
29	Performance enhancement for rotary furnace: a harbinger to pollution free castings	Ranjit Singh	IETE, CHANDIGARH	2017
30	Determination of optimal process parameters of	R.S.S. Prasanth and	Transactions of the Indian Institute	2017

	friction stir welding to join dissimilar aluminum alloys using artificial bee colony algorithm”,	K. Hans Raj	of Metals	
31	Fault diagnosis of rolling element bearings using fractional linear prediction and AI techniques	Aditya Sharma, Sharad Bhardwaj and Pavan Kumar Kankar	Life Cycle Reliability and Safety Engineering	2018
32	Life assessment and health monitoring of rolling element bearings: an experimental study	Aditya Sharma, M. Amarnath, Pavan Kumar Kankar	Life Cycle Reliability and Safety Engineering	2018
33	Nonlinear dynamic investigations on rolling element bearings: a review	Aditya Sharma, Nitin Upadhyay, Pavan Kumar Kankar, M. Amarnath	Advances in Mechanical Engineering	2018
34	Use of feature ranking techniques for defect severity estimation of rolling element bearing	Aditya Sharma, M. Amarnath, Pavan Kumar Kankar	International Journal of Acoustics and Vibration	2018
35	Electromyographic analysis of selected shoulder muscles during rehabilitation exercises	Mukesh Kumar, Sanjay Srivastava, V Soamidas	Journal of Back and Musculoskeletal Rehabilitation.	2018
36	Effects of selected rehabilitative exercises on external rotator muscles and trapezius muscles of masonry workers	Greesh Kumar Singh, Sanjay Srivastava, Mukesh Kumar, Shellyka Ratnakar,	WORK: A Journal of Prevention, Assessment & Rehabilitation. Vol. 60, no. 3, pp 437-444.	2018
37	Preferential strengthening of VMO muscle during selected biomechanical rehabilitative exercises of automotive workers with patellofemoral pain syndrome	Greesh Kumar Singh, Sanjay Srivastava	WORK: A Journal of Prevention, Assessment & Rehabilitation. Vol. 60, no. 1, pp. 135-141.	2018
38	Grip strength of occupational workers in relation to carpal tunnel syndrome and individual factors	Greesh Kumar Singh, Sanjay Srivastava	International Journal of Occupational Safety and Ergonomics.	2018
39	Innovative Training Framework for Additive Manufacturing Ecosystem to Accelerate Adoption of Three-Dimensional Printing Technologies	Rahul Swarup Sharma, I Singhal, S Gupta	3D Printing and Additive Manufacturing Mary Ann Liebert, Inc. https://doi.org/10.1089/3dp.2017.0003	2018
40	Comprehensive study of effect of process parameters in equal channel angular pressing	A Dayal, Ankit Sahai, KH Raj, Rahul	Indian Journal of Engineering & Materials Sciences	2018

		Swarup Sharma		
41	Investigation of ECAP process for enhancing process efficiency	A Dayal, KH Raj, Rahul Swarup Sharma	Materials Today: Proceedings https://doi.org/10.1016/j.matpr.2017.11.160	2018
42	ECAP Die Design for Minimising Corner Gap	A Dayal, KH Raj, Rahul Swarup Sharma	Materials Today: Proceedings https://doi.org/10.1016/j.matpr.2017.11.264	2018
43	Designing safe lifting of centrifugal-pump casing in a medium scale factory in Agra.	S.K. Srivastava	Proc. of International Conference on Humanizing Work & Work Environment, IIT Bombay. pp 380-385.	2018
44	Determination of safe asymmetric lifting of hand-pump body	S.K. Srivastava	Conference on Humanizing Work & Work Environment, IIT Bombay. pp. 368-373.	2018
45	Effect of build orientation and infill density on mechanical properties of 3D printed parts by Fused Deposition Modeling	Pushpendra Yadav, Shashank Kapoor, Ishant Singhal, Ankit Sahai, Rahul Swarup Sharma	34th National Convention of Mechanical Engineers, Institution of Engineers, 7-8 th Sept, 2018, New Delhi	2018
46	Experimentation of different aerofoil profiles in Wind Tunnel and its aerodynamic performance	Shashank Garg, Ishant Kumar, Rahul Swarup Sharma, Ankit Sahai	International Conference on Frontiers in Engineering and Technology, NIT Trichy, 27-28 th April, 2018	2018
47	Intensifying Hands-On Learning And Experimentation Of Fused Deposition Modeling Three Dimensional Printers	Pushpendra Yadav, Ishant Singhal, Ankit Sahai, Rahul Swarup Sharma	7th International And 28th All India Manufacturing Technology, Design And Research Conference 2018 (AIMTDR 2018) 11638	2018
48	Towards Extending ECAP Technology From Lab Scale To Manufacturing By Enhanced Multi-Pass Continuous ECAP Process	Ankit Sahai, Atul Dayal, Rahul Swarup Sharma	7th International And 28th All India Manufacturing Technology, Design And Research Conference 2018 (AIMTDR 2018) 11390	2018
49	Complementing Learning Of Metal Forming Processes Via Virtual Simulation Lab	Rahul Swarup Sharma, Ankit Sahai	7th International And 28th All India Manufacturing Technology, Design And Research Conference	2018

			2018 (AIMTDR 2018) 11699	
50	Three Turn Ecap Processing Of Aa6061 Alloy: Microstructure And Mechanical Properties	Atul Dayal, Ankit Sahai, R. S. Sharma, K. Hans Raj	7th International And 28th All India Manufacturing Technology, Design And Research Conference 2018 (AIMTDR 2018) 11497	2018

B. Ph.D. guided /Ph.D. awarded during the assessment period while working in the institute (5)

Name	Supervisor	Thesis Title	Year of Start	Year of Award
Mukesh Kumar	Prof. Sanjay Kumar Srivastava Prof. V Soami Das	Biomedical engineering optimization problems : An investigation with meta-heuristics	2010	2016
Ankit Sahai	Prof. K. Hans Raj Prof. NK Gupta (IITD)	Finite Element Modeling, Optimization and Experimentation of ECAP Process for Development of Ultra Fine Grain Materials	2010	2017
Greesh Kumar Singh	Prof. Sanjay Kumar Srivastava	Biomechanics of human movements in occupational tasks with ergonomics considerations	2012	2017
Atul Dayal	Prof. Rahul Swarup Sharma Prof. K. Hans Raj	Research Studies On Equal Channel Angular Pressing	2012	2018
Ravi Bansal	Prof. Sanjay Kumar Srivastava	Designing safe lifting tasks for occupational workers	2013	2018
Gurumukh Das	Prof. Rahul Caprihan	Design and Operational Analysis of Virtual Cellular Manufacturing Systems	2012	2018

C. Awards and Recognitions

S. No	Title of the innovation	Name of the Awardee	Name of the Awarding Agency with contact details	Year of Award
1	Swami Vivekanand Award	Mr. Kumar Ratnakar	NSS, DEI	2018
2	Vikram Award	Prof. K. Hans Raj	System Society of India	2017
3	Best paper award for a Journal paper	Prof. K. Hans Raj	International Journal of Computer Sciences and Engineering	2017
4	Swami Vivekanand Award	Mr. Gurumukh Das	NSS, DEI	2016
5	Leader of Technology and Innovation Award	Prof. K. Hans Raj	University of Oakland, MI, USA	2015

6	Invited Speaker	Prof. K. Hans Raj	VALEDU, DEI	2015
7	Lifetime Achievement Award	Prof. K. Hans Raj	University of Oakland, MI, USA	2014
8	Best Paper Award	Prof. K. Hans Raj	University of Oakland, MI, USA	2014
9	Best Service Award	Prof. K. Hans Raj	University of Oakland, MI, USA	2014
10	INDO US Fellowship	Dr. Rahul Swaroop Sharma	College of Engineering, University of Louisiana, LA, USA	2014
11	Guest of Honors	Prof. K. Hans Raj	Eshan college of Engineering, Mathura	2013
12	Guest of Honors	Prof. K. Hans Raj	MAIT, Ghaziabad	2013
13	Invited Speaker	Prof. K. Hans Raj	Indo – German workshop, DEI	2013
14	Fellow	Prof. Rahul Caprihan	Institution of Engineers	2013
15	Award of Appreciation for Low Power VLSI Design	Prof. K. Hans Raj	ICATET in Arya College of Engineering, Jaipur	2013

D. Present Collaborations

DEI has signed as many as 53 MoUs and Statement of Intents with international and national institutions, universities, industries and corporate houses for academic and research collaborations.

1. International Collaborations

S.No	Name of the University/Institute	Date of MoU	Area of Research & Collaboration and Scope of Activities & Benefits accruing to DEI
1.	University of Waterloo, Canada	17.7.2008	<i>Quantum Computing, Silicon Photonics with Departments of Mechanical Engineering, Electrical Engineering, Physics & Computer Science</i> <ul style="list-style-type: none"> • Publication of Books • Utilization of Experimental Facilities • Establishment of Centre for Quantum and Nano Computing
2.	University of Maryland, College Park, U.S.A.	3.12.2011	<i>Nano-structured materials for photo-electro-chemical splitting of water to generate Hydrogen with Department of Chemistry, Physics & Computer Science and Electrical Engineering</i> <ul style="list-style-type: none"> • DST-NSF Research grant • Joint Research Publications Exchange visits • One joint Course each Semester from University

			of Maryland in Computer Science
3.	Michigan State University, USA	14.2.2011	<i>International Agreement for Academic Cooperation with College of Engineering , College of Agriculture and Natural Resources, College of Education and Biometrics with Department of Physics & Computer Science</i> <ul style="list-style-type: none"> • Faculty Visits • Research Collaboration on UIDAI • Provisions for exchange of materials in education and research • Publications • Academic information • Exchange of Faculty and research scholars • Joint Research and meetings for education • Research and outreach • Technical assistance • Student exchanges • Joint curriculum development in support of K-12 education and joint development of innovative teaching methods
4.	University of Missouri, USA	3.11.2011	<ul style="list-style-type: none"> • Research Collaboration • Initiation of research on natural products for cancer treatment
5.	Consciousness Quotient Institute (CQ-i), Romania	2013	<ul style="list-style-type: none"> • Joint Publications • Collaborative Project (CQ-i) • Travel Grant awarded by CQ-i to CQ-i related research at TSC 2015 held in Finland • One of the faculty member (Education) is member of CQ-i team (since 2014) and one of the alumni of Faculty of Education is also member of CQ-I team

6.	Simon Fraser University, Vancouver	2017	<ul style="list-style-type: none"> • Visit of faculty for PDF
7.	HAN University of Applied Sciences, Netherland	17.10.2014	<ul style="list-style-type: none"> • Production and Operations Management, Lean Manufacturing
8.	Vocational Training Authority of Sri Lanka, Colombo, Sri Lanka	20.10.2014	
9.	Irwin and John Jacob School of Engineering, University of California, San Diego	31.12.2014	
10.	Oakland University, Rochester, Michigan, USA	16.04.2015	<ul style="list-style-type: none"> • Jointly organized two conferences: ICAM 2014 at Oakland University and ICAM 2015 at KNIT Sultanpur and now are in the process of organizing a third conference ICAM 2017 at IIT BHU Varanasi in December 2017.
11.	Nano Characterization Unit, National Institute for Materials Science, Japan	16.5.2016	<p><i>Express the understanding of the parties to strengthen and promote research collaboration between the parties based upon the principles of equality, reciprocity, mutual respect, best effort and frequent interactions to</i></p> <ul style="list-style-type: none"> • Strengthen and promote institutional exchange of personnel • Promote institutional exchange of scientific and technical information • Organize symposia, Conferences and workshops • Encourage joint research activities and other activities in the field of Materials Science
12.	Christian Albrecht University of Kiel (CAU) , Germany (Letter of Intent)	17.2.2015 13.12. 2016	<ul style="list-style-type: none"> • Joint Projects • Joint Lecture Series • Exchange Visits • Joint Publications • Joint Ph.D. Supervision • Shared Curricula and Courses

13.	University of Arkansas	27.4.17	<ul style="list-style-type: none"> • Exchange of Information • Exchange of Students and Faculty • Collaborative Programmes, Research and Seminars
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2. Collaboration with National Universities and Institutes

S.No	Name of the University/Institute	Date of MoU	Area of Research & Collaboration Scope of Activities & benefits accruing to DEI
1.	Indian Institute of Technology, Delhi	17.09.2007	<i>Computer Science, Nano-science and Management with Departments of Physics and Computer Science Electrical Engineering Management</i> <ul style="list-style-type: none"> • Ph.D. under joint supervision • Joint courses every Semester taught jointly by both
2.	TIFR, Mumbai	13.10.2007	<i>Astro-particle Physics, Nano-photonics with Department of Physics and Computer Science</i> <ul style="list-style-type: none"> • R & D • Utilization of Experimental Facilities • Joint Experiments • Joint Publications
3.	Indian Institute of Technology, Kanpur		<i>Quantum and Nano Computing with Departments of Mechanical Engineering Physics and Computer Science</i> <ul style="list-style-type: none"> • Publication of books as joint authors • Organization of Joint International Conferences
4.	International Centre for Genetic Engineering (ICGEB), New Delhi	27.4.2012	<i>Biotechnology with Departments of Chemistry Zoology, Botany</i> <ul style="list-style-type: none"> • Research Experiments • Establishing Post Graduate Diploma in Environmental Biotechnology
5.	Indian Institute of Management, Bangalore	24.5.2014	<i>Supply Chain Management Center, IIM Bangalore with Department of Management</i> <ul style="list-style-type: none"> • Joint research papers in Supply Chain Management Programme • Faculty Exchange • Faculty Visits
6.	Centre for Development of Advanced Computing		<i>Algorithms for recognition of similar trademarks with Department of Mechanical Engineering</i>

	(CDAC), Pune		<ul style="list-style-type: none"> • Technology transfer to CDAC for Commercialization
7.	Tata Institute of Social Sciences, Mumbai	24.05.2015	<i>Collaboration in the areas of Management, Sociology and Political Science</i> <ul style="list-style-type: none"> • Joint Curriculum Workshop • Joint research supervision • Faculty Exchange • Faculty Visits
8.	Mahatma Gandhi Chitrakoot Gramoudhyog Vishavidyalaya, Chitrakoot, Satna, M.P	4.09.2015	
9.	ICAR- National Dairy Research Institute Karnal, Haryana	3.10.2015	<ul style="list-style-type: none"> • Visit and Special Lectures by experts • Student Internship
10.	Indian Institute of Technology, New Delhi	07.09.2016	<i>Collaboration with Management, Physics and Computer Science and Electrical Engineering</i> <ul style="list-style-type: none"> • Joint Courses • Joint supervision
11.	Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan	16.02.2016	<i>Major emphasis on faculty development, remote sensing, nanotechnology, biotechnology, natural products development, analysis of food and natural products, solar energy utilization, student exchange under sandwich programmes and development of a model farm near Nainatikka by DEI</i> <ul style="list-style-type: none"> • Research in the areas of mutual interest in areas of (1) Horticulture (2) Value-based agriculture and food processing, (3) Cultivation of medicinal Plants, (4) Floriculture, and (5) Remote sensing • Joint programmes of study through video conferencing and other multimedia facilities. • Promote collaborations between individual scientists in terms of research and project undertakings. • Providing opportunities to the academic staff to

			collaborate for the purposes of research, teaching and other outreach activities.
12.	Jain Irrigation Systems Ltd. Jalgaon, Maharastra	31.03.2017	
13.	School of Planning and Architecture, Delhi	May, 2017	<i>Collaboration in the Fields of Architecture, Urban Planning and Civil Engineering</i> <ul style="list-style-type: none"> • Exchange Programs • Joint Courses • Curriculum Workshops
14.	Telecom Sector Skill Council		<i>Introducing Skill Based Training (Additional) in all the Colleges and Institutions of DEI as a part of Curricula of various Post Graduate (PG) and Under Graduate (UG) Courses/Programs</i>
15.	BeejSheetal Research Pvt. Ltd. Jalna, Maharastra	5.5.2017	<ul style="list-style-type: none"> • Training of students of UG in B.Voc Agricultural technology and Water sanitation & solid waste management Stream and other students of DEI • Joint supervision of Dissertation Project • Provide knowledge for capacity building and human resource development • Deliver Lectures/Invited Talks
16.	National University Education Planning and Administration		<ul style="list-style-type: none"> • Mutual Experts , Resource Persons
17.	NCERT		<ul style="list-style-type: none"> • Mutual Experts , Resource Persons
18.	University of Allahabad Kurushetra University Central Institute of Education Aligarh Muslim University		<ul style="list-style-type: none"> • Mutual Experts , Resource Persons, Examiners
19.	National Council for Technical Education, NCTE		<ul style="list-style-type: none"> • Members Peer Group Verification Teams

3. Collaborations with Ministries and National Missions

S.No	Name	Date of MoU	Area of Research & Collaboration Scope of Activities & benefits accruing to DEI
1.	Madhya Pradesh Bamboo Mission, Bhopal Centre for Green Mission Building Material and Technology, Bengaluru	02.03.2014	<i>9-week modular course offered in the six Study Centres of M. P. including Timarni, Rajaborari Study Centres in the tribal belt of Harda district of M.P.</i> <ul style="list-style-type: none"> • Start a modular course in Bamboo Application Technology • Over 100 artisans were sponsored by MPSBM and they successfully completed the course during the 2014-15 session
2.	UP Skill Development Society	13.08.2015	
3.	Ministry of Micro, Small and Medium Enterprises, New Delhi	23.09.2015	<ul style="list-style-type: none"> • Student Training
4.	The Ministry of Textiles (*MOT*), R.K.Puram, New Delhi	19.05.2017	<i>Link with Department of Drawing and Painting</i> <ul style="list-style-type: none"> • Upgrading and Imparting skills in different trade of Handicrafts • Provide an opportunity for the artisans to upgrade their skills, interact with other craftsmen • Create livelihood opportunity

4. Collaborations with Industries and Corporate Sectors

S.No	Name of the Industry/Company	Date of MoU	Area of Research & Collaboration Scope of Activities & benefits accruing to DEI
1.	Indian Oil Corporation, Faridabad	10.10.2014	<i>Indian Oil Corporation (R&D Centre) Faridabad with Department of Chemistry</i> <ul style="list-style-type: none"> • For scaling up solar hydrogen generation by photo-electrochemical splitting of water • Scaling up of photoelectrode from 1x1 to 3x3 has been standardized while 6x6 is the final target
2.	Maruti Suzuki India Ltd.	20.04.2010	<i>Collaboration with Department of Automobile Engineering</i> <ul style="list-style-type: none"> • Workshop set up

			<ul style="list-style-type: none"> • Student Training • Staff exchange
3.	Bharat Heavy Electricals Ltd.	12.08.2010	<i>Collaboration with Department of Electrical Engineering</i> <ul style="list-style-type: none"> • Student Training
4.	India Yamaha Motor Pvt. Ltd.	22.10.2011 21.06.2015 09.06.2017	<i>Collaboration with Department of Automobile Engineering</i> <ul style="list-style-type: none"> • A specialized Two-Wheeler Training Workshop was set up in Department of Automobile Engineering in which the students had undergone specialized training to enhance their employment opportunities and were also awarded Certificate of Proficiency by the Company
5.	Honda Motorcycle and Scooter India Pvt. Ltd., Maanesar, Gurgaon	4.12.2012	<ul style="list-style-type: none"> • Provide training to trainees and mentors of Painting and Welding Course • Provide practical teaching aids to these courses
6.	TVS Motor Company Ltd., Chennai	9.08.2013	<i>Collaboration with Department of Automobile Engineering</i> <ul style="list-style-type: none"> • Student Stipend • Training and Final Placement
7.	Dayal Motors Agra		<ul style="list-style-type: none"> • Providing skill –based training to students who have enrolled for vocational training at various levels
8.	Mitsubishi Electric India Pvt. Ltd. Gurgaon, Haryana	17.03.2015	<ul style="list-style-type: none"> • Student Training and Placement
9.	Oasis Fabrications, YamunaNagar, Haryana	3.09.2015	<ul style="list-style-type: none"> • Student Training and Placement
10.	Genpact India Pvt. Ltd. Hyderabad	10.06.2016	<ul style="list-style-type: none"> • Student Training and Placement

5.8.2. Sponsored Research (20)

	Project Title	Funding Agency	Amount Lacs	Duration
CAYm1 2017-2018	UGC - EMERITUS FELLOSHIP	UGC	9.44	2017-2019
	MODROBS	AICTE	4.5	2017-18
CAYm2 2016-2017	A 25meter radius Semi Spherical Air inflatable Hanger	ADRDE DRDO	9.99	2016-2019
	Metal Forming Virtual Simulation Lab	MHRD - NMEICT	11.84	2016 - 2017
	UGC- SAP Mechanical Engineering	UGC	33.5	2012-17
	DST – FIST Mechanical Engineering	DST	127	2012-17
CAYm3 2015-2016	Modelling, Simulation and Optimization of Friction Stir Welding using Quantum Inspired Evolutionary Algorithms	AICTE	13.50	2015 - 2016
	Development of River Bank Filtration across Yamuna as a sustainable solution for meeting quality and quantity problems of drinking water.	DST – Water Technology	211	2014-18
	Metal Forming Virtual Simulation – Integration & Outreach	MHRD - NMEICT	18.256	2014 - 2016
	UGC- SAP Mechanical Engineering	UGC	33.5	2012-17
	DST – FIST Mechanical Engineering	DST	127	2012-17

5.8.3. Development activities (15)

A. Product Development

Developed Bhartiya Swadeshi 3D Printer Version 1.0	2015-2015
Developed Bhartiya Swadeshi 3D Printer Ver. 2.0, 3.0	2016-2017
Developed Bhartiya Swadeshi 3D Printer Ver. 4.0, 5.0	2017-2018

B. Instructional materials

- **Question Banks** comprising of indicative set of questions are given to students in all theory courses as mandatory practice
- Lab Manual of lab courses

- Instructional material in theory courses
- Metal Forming Virtual Simulation. It is hosted on National Portal of Government of India. <http://msvs-dei.vlabs.ac.in/>

C. Working models/charts/monograms etc.

Several working models and charts for performing experiments are being displayed in the department and laboratories.

D. Research laboratories

1. Multimedia Laboratory
2. Instrumentation Laboratory
3. Quantum Computing Laboratory
4. Material Testing Laboratory
5. State of the art 3D Rapid Prototyping Laboratory
6. CNC Laboratory
7. Computer-Aided Design Laboratory
8. Automobile Workshop
9. Mechanical Workshop
10. Experimental facility and test bench for 3D Printing technologies
11. Experimental facility for Severe Plastic Deformation with conventional die sets, modified die sets, 3-D ECAP die sets
12. State of the art FE analysis computational setup with FORGE2011 (16 core and 4 core) and ABAQUS.
13. High Performance Computing A 24 Blade, Dual Xeon, 6 core, processor based high performance computing cluster has been setup at the Multimedia Laboratory at DEI. With specialized software such as multiuser MATLAB and connection to the Institute LAN, the cluster is accessed by students and faculty members across the University for research involving parallel computing and compute intensive simulations. One of the blades is also a CUDA™ parallel computing platform.

5.8.4. Consultancy (from Industry) (20)

	CAYm1 2017-2018	CAYm2 2016-17	CAYm3 2015-16
Funding Amount	597900	443100	361550

A. CAYm1 (2017-2018)

S.No	Client Organization	Date	Title of Consultancy of project	Amount (Rs)
1	M/s Narendra Dev	25/04/17	Material Testing	13000
2	M/s Hari Mohan Sharma	25/04/17	Material Testing	13000
3	M/s R.C. Mangla & Co.	25/05/2017	Material Testing	1950
4	M/s Godhan Singh Tyagi,	16 June 2017	Material Testing	4600
5	M/s Godhan Singh Tyagi,	16 June 2017	Material Testing	4600
6	M/s Godhan Singh Tyagi,	16 June 2017	Material Testing	4600
7	M/s Munna Lal Gupta	14 July 2017	Material Testing	4600
8	M/s Godhan Singh Tyagi	10 July 2017	Material Testing	4600
9	M/s Ansaldo Construction, Noida.	4 August 2017	Material Testing	500
10	NCR PU/CNB	4 August 2017	Material Testing	1500
11	M/s TCIL	10 August 2017	Material Testing	1200
12	M/s TCIL	10 August 2017	Material Testing	4250
13	M/s TCIL	10 August 2017	Material Testing	4600
14	NCR PU/CNB	21/11/2017	Material Testing	2500
15	UPRNN SUDA Unit	21/11/2017	Material Testing	4250
16	M/s Shree Ganesh Construction Co.	28/12/2017	Material Testing	4600
17	M/s Ram Gopal Pathak	11 jan 2018	Material Testing	600
18	M/s Subhash Gautam	11 jan 2018	Material Testing	600
19	M/s Balaji Construction	11 Jan 2018	Material Testing	13000
20	M/s Shree Ganesh Construction Company	16 Jan 2018	Material Testing	4600
21	M/s Govind Singh	16 Jan 2018	Material Testing	4600
22	M/s Govind Singh	16 Jan 2018	Material Testing	4600
23	M/s Govind Singh	16 Jan 2018	Material Testing	4600
24	M/s Munna Lal Gupta	03/02/2018	Material Testing	4600
25	M/s Govind Singh	05/02/2018	Material Testing	4600

26	M/s Girraji Stone Crushers Pvt. Ltd.	12 Feb 2018	Material Testing	4600
27	M/s S&P –GC (JV)	12 Feb 2018	Material Testing	4600
28	M/s Creative Minerals Pvt. Ltd.	13 Feb 2018	Material Testing	4600
29	M/s Creative Minerals Pvt. Ltd.	13 Feb 2018	Material Testing	4600
30	M/s Creative Minerals Pvt. Ltd.	13 Feb 2018	Material Testing	4600
31	M/s Creative Minerals Pvt. Ltd.	13 Feb 2018	Material Testing	4600
32	M/s Creative Minerals Pvt. Ltd	15 Feb 2018	Material Testing	4600
33	M/s Govind Singh	15 Feb 2018	Material Testing	4600
34	Ms Girraji Stone Crushers Pvt. Ltd.	15 Feb 2018	Material Testing	4600
35	M/s Creative Minerals Pvt. Ltd	15 Feb 2018	Material Testing	4600
36	M/s Deepak & Company	15 Feb 2018	Material Testing	5200
37	M/s Krishna Construction	23 Feb 2018	Material Testing	5200
38	M/s Girraji Stone Crushers Pvt. Ltd	23 Feb 2018	Material Testing	5200
39	M/s Aryan Construction	23 Feb 2018	Material Testing	20300
40	M/s Girraji Stone Crushers Pvt. Ltd	26 Feb 2018	Material Testing	4600
41	M/s Creative Minerals Pvt.Ltd.	26 Feb 2018	Material Testing	4600
42	M/s Creative Minerals Pvt.Ltd.	26 Feb 2018	Material Testing	4600
43	M/s Creative Minerals Pvt.Ltd.	26 Feb 2018	Material Testing	4600
44	M/s Creative Minerals Pvt.Ltd.	26 Feb 2018	Material Testing	4600
45	M/s Munna Lal & Deepak CO.	26 Feb 2018	Material Testing	5200
46	M/s Ansaldo Construction, Noida.	27 Feb 2018	Material Testing	500
47	M/s Hari Om Construction Co. Agra	27 Feb 2018	Material Testing	1200
48	M/s Aryan Construction	27 Feb 2018	Material Testing	1600
49	M/s Aryan Construction	27 Feb 2018	Material Testing	2500
50	M/s Munna Lal Gupta	27 Feb 2018	Material Testing	5200
51	M/s S&P –GC (JV) 40/G, Sidharth Enclave, Mau Road Agra	28 Feb 2018	Material Testing	4600
52	M/s Creative Minerals Pvt. Ltd	28 Feb 2018	Material Testing	4600
53	M/s Girraji Stone Crushers Pvt. Ltd	28 Feb 2018	Material Testing	4600
54	M/s Munna Lal Gupta- M/s Deepak & Co.(J.V.)	12 March 2018	Material Testing	4600
55	M/s Girraji Stone Crushers Pvt. Ltd	12 March 2018	Material Testing	4600

56	M/s Girraji Stone Crushers Pvt. Ltd	12 March 2018	Material Testing	4600
57	M/s R.D. Cost. Gurgaon	12 March 2018	Material Testing	4600
58	M/s Creative Minerals Pvt. Ltd	12 March 2018	Material Testing	4600
59	M/s Creative Minerals Pvt. Ltd	12 March 2018	Material Testing	4600
60	M/s Girraji Stone Crushers Pvt. Ltd	12 March 2018	Material Testing	5200
61	M/s Creative Minerals Pvt. Ltd	12 March 2018	Material Testing	5200
62	M/s NC Railway Aligarh	13 March 2018	Material Testing	600
63	M/s Girraji Stone Crushers Pvt. Ltd	13 March 2018	Material Testing	4600
64	M/s Girraji Stone Crushers Pvt. Ltd	13 March 2018	Material Testing	4600
65	M/s R.D. Cost. Gurgaon	13 March 2018	Material Testing	4600
66	M/s R.D. Cost. Gurgaon	13 March 2018	Material Testing	4600
67	M/s R.D. Cost. Gurgaon	13 March 2018	Material Testing	4600
68	M/s Creative Minerals Pvt. Ltd	17 March 2018	Material Testing	4600
69	M/s S&P –GC (JV) 40/G, Sidharth Enclave, Mau Road Agra	22 March 2018	Material Testing	22200
70	M/s Creative Minerals Pvt. Ltd	4 April 2018	Material Testing	5200
71	M/s Girraji Stone Crushers Pvt. Ltd	9 April 2018	Material Testing	5200
72	M/s PCC SC Agarwal	18 April 2018	Material Testing	600
73	M/s Girraji Stone Crushers Pvt. Ltd	23 April 2018	Material Testing	4600
74	M/s Creative Minerals Pvt. Ltd	23 April 2018	Material Testing	4600
75	M/s Creative Minerals Pvt. Ltd	23 April 2018	Material Testing	4600
76	M/s Creative Minerals Pvt. Ltd	01 May 2018	Material Testing	4600
77	M/s Creative Minerals Pvt. Ltd	01 May 2018	Material Testing	4600
78	M/s Creative Minerals Pvt. Ltd	01 May 2018	Material Testing	4600
79	M/s Girraji Stone Crushers Pvt. Ltd	08/May 2018	Material Testing	4600
80	M/s Girraji Stone Crushers Pvt. Ltd	08 May 2018	Material Testing	4600
81	M/s Girraji Stone Crushers Pvt. Ltd	08 May 2018	Material Testing	4600
82	M/s Girraji Stone Crushers Pvt. Ltd	08 May 2018	Material Testing	4600
83	M/sMunna Lal Gupta Deepak & Company (JV)	09 May 2018	Material Testing	4600
84	M/s Jagdish & Company	09 May 2018	Material Testing	4600
85	M/s Girraji Stone Crushers Pvt. Ltd	09 May 2018	Material Testing	4600

86	M/s Girraji Stone Crushers Pvt. Ltd	09 May 2018	Material Testing	4600
87	M/s Girraji Stone Crushers Pvt. Ltd	09 May 2018	Material Testing	4600
88	M/s Creative Minerals Pvt. Ltd.	09 May 2018	Material Testing	4600
89	M/s Creative Minerals Pvt. Ltd.	09 May 2018	Material Testing	4600
90	M/s Creative Minerals Pvt. Ltd.	09 May 2018	Material Testing	4600
91	M/s Creative Minerals Pvt. Ltd.	09 May 2018	Material Testing	4600
92	M/s Creative Minerals Pvt. Ltd.	09 May 2018	Material Testing	4600
93	M/s Girraji Stone Crushers Pvt. Ltd	9 May 2018	Material Testing	4600
94	M/s Creative Minerals Pvt. Ltd.	9 May 2018	Material Testing	4600
95	M/s Creative Minerals Pvt. Ltd.	9 May 2018	Material Testing	4600
96	M/s Creative Minerals Pvt. Ltd.	9 May 2018	Material Testing	4600
97	M/s Creative Minerals Pvt. Ltd.	9 May 2018	Material Testing	4600
98	M/s Creative Minerals Pvt. Ltd.	25 May 2018	Material Testing	4600
99	M/s Girraji Stone Crushers Pvt. Ltd	25 May 2018	Material Testing	4600
100	M/s Girraji Stone Crushers Pvt. Ltd	25 May 2018	Material Testing	4600
101	M/s Girraji Stone Crushers Pvt. Ltd	25 May 2018	Material Testing	4600
102	UPRNSS	28 May 2018	Material Testing	600
103	UPRNSS	28 May 2018	Material Testing	600
104	UPRNSS	28 May 2018	Material Testing	600
105	UPRNSS	28 May 2018	Material Testing	750
106	UPRNSS	28 May 2018	Material Testing	750
107	M/s Bansal Brothers	28 May 2018	Material Testing	1350
108	M/s Creative Minerals Pvt. Ltd.	11 June 2018	Material Testing	4600
109	M/s Creative Minerals Pvt. Ltd.	11 June 2018	Material Testing	4600
110	M/s Creative Minerals Pvt. Ltd.	11 June 2018	Material Testing	4600
111	M/s Creative Minerals Pvt. Ltd.	11 June 2018	Material Testing	4600
112	M/s Creative Minerals Pvt. Ltd.	11 June 2018	Material Testing	4600
113	M/s Hari Om construction Co.	29 June 2018	Material Testing	600
114	M/s Hari Om construction Co.	29 June 2018	Material Testing	13000
115	M/s Narendra Dev	2 July 2018	Material Testing	13000
116	M/s Creative Minerals Pvt. Ltd.	3 July 2018	Material Testing	4600

117	M/s Creative Minerals Pvt. Ltd.	3 July 2018	Material Testing	4600
118	M/s Girraji Stone Crushers Pvt. Ltd	3 July 2018	Material Testing	4600
119	M/s Girraji Stone Crushers Pvt. Ltd	3 July 2018	Material Testing	4600
120	M/s Girraji Stone Crushers Pvt. Ltd	3 July 2018	Material Testing	4600
121	M/s Girraji Stone Crushers Pvt. Ltd	3 July 2018	Material Testing	4600
122	M/s Munna Lal Gupta & Deepak & Co. JV	3 July 2018	Material Testing	4600
123	M/s Munna Lal Gupta & Deepak & Co. JV	3 July 2018	Material Testing	4600
124	M/s Creative Minerals Pvt. Ltd.	3 July 2018	Material Testing	4600
125	M/s Girraji Stone Crushers Pvt. Ltd	3 July 2018	Material Testing	4600
126	M/s Girraji Stone Crushers Pvt. Ltd	3 July 2018	Material Testing	4600
127	M/s Girraji Stone Crushers Pvt. Ltd	24 July 2018	Material Testing	4600
128	M/s Girraji Stone Crushers Pvt. Ltd	24 July 2018	Material Testing	4600
	Total			597900

B. CAYm2 (2016-2017)

S.No	Client Organization	Title of Consultancy of project	Amount (Rs)
1	M/s Godhan singh	Testing of Railway ballast	4500
2	M/s SM construction	Testing of Railway ballast	5600
3	M/s Quality Fabricator	Testing of Sand	600
4	M/s Quality Fabricator	Testing of Sand	600
5	M/s Yadav stone Co.	Testing of Railway ballast	5600
6	M/s Yadav stone Co.	Testing of Railway ballast	5600
7	M/s Dinesh Singh	Testing of Concrete design	20650
8	M/S Jagdish Co	Testing of Railway ballast	5200
9	M/s Krishan lal	Testing of Railway ballast	5200
10	M/s UP RNN ltd.	Testing of Stone	14800
11	M/S Jagdish Co	Testing of Railway ballast	4600
12	M/s Asoka Construction	Testing of Railway ballast	4600
13	M/s Munna lal	Testing of Railway ballast	5200
14	M/s Shri Ganesh	Testing of Railway ballast	4600

15	M/s Subhash Gautam	Testing of Railway ballast	600
16	U.P. Rajkiya Nirman Nigam Ltd. Agra Unit-1 Agra	Testing of Stone	11000
17	U.P. Rajkiya Nirman Nigam Ltd. Agra Unit-1 Agra	Testing of Stone	11000
18	U.P. Rajkiya Nirman Nigam Ltd. Agra Unit	Testing of Stone	22000
19	U.P. Rajkiya Nirman Nigam Ltd. Agra Unit-1	Testing of Stone	80800
20	M/s JAGDISH & COMPANY	Testing of Railway ballast	5200
21	M/s JAGDISH & COMPANY	Testing of Railway ballast	4600
22	U.P. Rajkiya Nirman Nigam Ltd. Agra Unit	Testing of Stone	58800
23	M/s Hari Om Const. Co.	Testing of Mix Design of M25	13000
24	M/s Hari Om Const. Co.	Testing of Paver Block	1000
25	M/s Uday Traders, Gautam Agra Road Tundla Firozabad	Testing and consultancy	3250
26	M/s Uday Traders, Gautam Agra Road Tundla Firozabad	Testing and consultancy	2250
27	M/s Kapil Kumar	Testing and consultancy	3000
28	M/s JAGDISH & COMPANY Co.	Testing and consultancy	4600
29	M/s Shri Ram Construction, 222/40 Sukhdeo Nahar, Mathura.	Testing and consultancy	4600
30	M/s Uday Traders, Gautam Agra Road Tundla Firozabad	Testing and consultancy	2950
31	M/s Uday Traders, Gautam Agra Road Tundla Firozabad	Testing and consultancy	750
32	M/s Hari Om Construction Co. Agra	Testing and consultancy	500
33	M/s Hari Om Construction Co. Agra	Testing and consultancy	500
34	M/s Akariti Construction Agra.	Testing and consultancy	500
35	M/s RIC Project Pvt. Ltd.	Testing and consultancy	52000
36	Section Engineer (Works) Hathras City. NE Railway M/s Hari Om Construction Co. Agra	Testing and consultancy	1000
37	M/s Narendra Dev	Testing and consultancy	13000

38	M/s Hari Mohan Sharma	Testing and consultancy	13000
39	M/s R.C. Mangla & Co.	Testing and consultancy	1950
40	M/s Aryan Construction	Testing and consultancy	20300
41	M/s Deepak & Company	Testing and consultancy	5200
42	M/s Munna Lal Gupta Contractor	Testing and consultancy	4600
43	M/s Godhan Singh Tyagi,	Testing and consultancy	4600
44	M/s Godhan Singh Tyagi,	Testing and consultancy	4600
45	M/s Godhan Singh Tyagi,	Testing and consultancy	4600
	Total		443100

C. CAYm2 (2016-2017)

S.No	Client Organization	Title of Consultancy of project	Amount (Rs)
1	M/s Anurag Agarwal	Sand Aggregate	20800
2	M/s Jeevan construction	Sand Aggregate	9500
3	M/s Gyandera Construction co.	Design of M20	13000
4	M/s Pramanand Co. Kanpur	Railway Ballast	5100
5	M/s OM Construction Co.	Mis Design of M15, M25, M35	42250
6	M/s Shri Hari Om construction	Design of M15, M25 , Cement Testing	51700
7	M/s Balaji Cnstruction	Testing of Brick	3200
8	M/s Shri Hari Om construction	Design of Concrete	16250
9	M/s Shri Hari Om construction	Testing of Cement	4200
10	M/s Durga Co.	Testing of Brick	1600
11	UP RNN	Testing of Cement Sand Aggregate	13750
12	M/s tara Chand	Design of M45	22250
13	M/s Sushil Kumar Co.	Testing of Brick	2200
14	M/s Durga Co.	Testing of Concrete Cube	1000
15	M/s RC Mangla	Water absorption of Tile	500
16	UP RNN	Stone	31000
17	M/s RC Mangla	Tile	1800
18	M/s Sanjeev & Co	Design of Concrete, water	33000
19	M/s Shri Hari Om construction	Paver Block	500

20	M/s Godhan singh	Railway ballast	4500
21	M/s SM construction	Railway ballast	5600
22	M/s Quality Fabricator	Sand	1200
23	M/s Yadav stone Co.	Railway ballast	11200
24	M/s Dinesh Singh	Concrete design	20650
25	M/S Jagdish Co	Railway ballast	9800
26	M/s Krishan lal	Railway ballast	5200
27	M/s UP RNN ltd.	Stone	14800
28	M/s Asoka Construction	Railway ballast	4600
29	M/s Munna lal	Railway ballast	5200
30	M/s Shri Ganesh	Railway ballast	4600
31	M/s Subhash Gautam	Railway ballast	600
	Total		361550

The broad areas of consultancy services provided during the last three years are as follows:

- Aerostat and Arrester Barrier System Design
- Virtual Labs
- Solar Power Utilization for Energy Conservation
- Computer Algorithm Minimization
- Recovery of Ailing Businesses and establishment of new businesses
- Design of Educational Curricula
- Agriculture and Farming
- ICT in Educational Services

5.9. Faculty Performance Appraisal and Development System (FPADS) (10)

A. System for Faculty Appraisal

1. Focus on Quality

Using the medium of an innovative, comprehensive and flexible education policy, DEI attempts to chisel out the total quality person through a persistent focus on imparting

quality education. In its pursuit of quality education, DEI has instituted an Internal Quality Assurance Cell (IQAC) based on the specific guidelines of the National Assessment and Accreditation Council, an autonomous body set up by the UGC. The activities of the IQAC envelop the University central administrative structure, University departments, P.G. centres and every component of the University system.

DEI relentlessly strives towards an institutionalized quality control process through the following quality focused approach: Admission Criteria -> Curriculum Design -> Programme Selection -> Curriculum Implementation -> Evaluation -> Employability.

The Internal Quality Assurance Cell of Dayalbagh Educational Institute was constituted on 16 September, 1995. It is performing following tasks on regular basis:

1. Improvement in quality of teaching and research by regular inputs to all concerned based on feedback from students.
2. Providing inputs for best practices in administration for efficient resource utilization and better services to students and staff.
3. Providing inputs for Academic and Administrative Audit and analysis of results for improvement in areas found weak.

Students and staff give their feedback and suggestion on teaching and administrative performance by dropping their views in the Suggestion Box located in DEI Computer Centre, or through email to the Coordinator, IQAC at iqac@dei.ac.in.

B. Assessment of the performance

1. Teaching, learning and evaluation related activities

Teaching : (Classes taught includes session tutorials, lab and other teaching related activities): (regular and punctuality to class, remedial teaching, clarifying doubts, counselling and mentoring, additional teaching etc.)

2. Examination, Evaluation Activities and Administrative Support & Participation in Students' Research, Co-curricular & Extra-curricular Activities:

- (a) Administrative responsibilities such as Head/ Chairperson /Dean/ Director/ Co-

ordinator, Warden etc.

- (b) Examination and evaluation duties assigned by the University or attending the examination paper evaluation.
- (c) Student related co-curricular, extension and field based activities such as students clubs, career counselling, study visits, students seminars and other events, cultural, sports, NCC, NSS and community services.
- (d) Organising seminars/conferences/workshops, other universities activities.
- (e) Evidence of actively involved in guiding Ph.D. students.
- (f) Conducting minor or major research project sponsored by national or international agencies.
- (g) At least one single or joint publication in peer reviewed or UGC list of Journals.
- (h) Presentation of papers and chairing of sessions
- (i) Guiding and carrying out research projects and publishing the research output in national and international journals

C. Implementation

Department of Mechanical Engineering has well-defined system for faculty appraisal for every academic year.

- The Department follows the **UGC approved self-appraisal method** to evaluate teachers regarding research and other activities.
- A well-defined Proforma of self- appraisal report for the faculty is available on the institute web site. It consists of academic, research, curricular and extra-curricular contributions for the academic year. The faculty submits self- appraisal reports for the academic year which is evaluated by the head of the department.
- The contents of the self-appraisal are mentioned below:
 - i. Steps taken to advance technical knowledge
 - ii. Research contribution & other publications
 - iii. Capacity to guide research UG/PG/Ph.D.
 - iv. Development work in the Lab/Workshop

- v. Contributions to the Department/College
- vi. Any other additional information related to their academic excellence.
- A Key Performance Indicators (KPI) system has been introduced in the Department of Mechanical Engineering to align teachers' initiatives in teaching, research and administration areas.
- In the **Key Performance Indicators System**, an additional self-appraisal is undertaken for continuous quality enhancement.
- Reviewed by the Head and Dean.
- Teachers are individually apprised of their strengths and weaknesses by their respective Heads and encouraged to achieve higher goals.
- The appraisals also help to assess the merit of the faculty members in applying for personal promotions.
- The **IQAC** regularly monitors and collects the annual self-appraisals in the prescribed format from each Faculty member, duly forwarded by the Head of the Departments and respective Deans.

5.10. Visiting/Adjunct/Emeritus Faculty etc. (10)

S.No.	Name	Designation	Hours* / year		
			CAYm1	CAYm2	CAYm3
1.	Prof. V.M. Kumar	Emeritus Professor	180	180	180
2.	Prof. DS Mishra	Emeritus Professor	200	200	200
3.	Prof. Ranjeet Singh	Emeritus Faculty	100	100	100
4.	Brig. P.D.Gupta	Adjunct Faculty	50	0	0
5.	Sh. V. Prem Swarup	Adjunct Faculty	50	50	50
	Placement Activities				
6.	Sh. Padam Das	Honorary Faculty	70	70	70
	Workshop and Projects				
7.	Mrs. Poonam Prakash	Honorary Faculty	400	400	400
	Employability skills & Career Guidance				
8.	Sahab Das	Honorary Faculty	100	100	100
	Training and Placement				

CRITERION 6	Facilities and Technical Support	80
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6.1 Adequate and well equipped laboratories, and technical manpower (40)

S.No	Name of the Laboratory	No. of students per setup (Batch Size)	Name of the Important equipment	Weekly utilization status	Technical Manpower support		
					Name of the technical staff	Designation	Qualification
1.	Machine Shop	Mechanical - 25 Electrical -25 Civil- 25 Footwear- 25	Lathe , Milling , Shaper, Hydrocpoing, Drilling, Radial Drilling, Turret Lathe	9 hours	N L Mahato	W. Superintendent	M.Tech
					Anil Kumar Satasangi	Instructor	B.Tech
					Mohit	Mechanic Grade A1	B.tech
					Chetan	Mechanic Grade A2	2 years Fitter course
					Anand	Mechanic Grade A2	Diploma
2.	Production Engineering	Mechanical - 20 Electrical -20	Lathe Machine & Drilling Machine	3 hours	N L Mahato	W. superintendent	M.tech
					Anil Kumar Satasangi	Instructor	B.Tech
					Mohit	Mechanic Grade A1	B.tech
					Chetan	Mechanic Grade A2	2 years Fitter course
					Anand	Mechanic Grade A2	Diploma
3.	Carpentry Shop	Mechanical - 25 Electrical -25	Wood Turning Lathe, Grinder, Mortising, Universal Wood Cutter, Band Saw, Groove Cutting Machine, Jig Saw	21 hours	Sushil Kumar Satsangi	Demonstrator	M.Tech
					Om Prakash	Mechanic	Intermediate
4.	Smithy Shop	Mechanical - 28 Electrical -28	Open Hearth Furnace, blower, Anvil	9 hours	Sh. Dinker Johri	JTA	Diploma In Mechanical
					Sh. Pratap Singh	STA	PHD(Pursuing) MTech
5.	Fitting Shop	Mechanical - 28 Electrical -28	Bench Vice, Surface Plate, Fitting Tools	9 hours	Sh Rajeev Yadav	Mechanic	PHD(Pursuing) MTech
6.	Moulding Shop	Mechanical - 20 Electrical -20	Pit Furnace, Sand Muller, Reaming Machine Hand Tools	9 hours	Sh. Dinker Johri	JTA	Diploma In Mechanical
7.	Production Engineering Lab	Mechanical - 20 Electrical -20	Permeability Meter, Sieve Shaker , Core And Mould Hardness Tester	6 hours	Sh. Dinker Johri	JTA	Diploma In Mechanical
					Sh. Pratap Singh	STA	PHD(Pursuing) MTECH
8.	Thermal Lab 1	Electrical=28 Mechanical=28	Boiler Model , Mounting And Accessories, Mini Steam Power Plant Model, Condenser Model, Air	6 hours	Sh. Satya Prakash	Demonstrator	B.Tech Mechanical
				6 hours	Sh. Shabad Swaroop	Mechanical Grade (B)	Diploma In Auto
				4 hours	Sh Gur Das	Lab Assistant	Intermediate+ Mum

			Compressor(2-Stage)				
9.	IC Engine Lab	Mechanical=25	Skoda 90 Hp Diesel Engine Ruston Diesel Engine Skoda 1000rhp Diesel Engine	4 hours	Sh. Satya Prakash	Demonstrator	B.Tech Mechanical
					Sh. Shabad Swaroop	Mechanical Grade (B)	Diploma In Auto
					Sh Gur Das	Lab Assistant	Intermediate+Mum
10	R And AC Lab	Mechanical=25	Sealed Unit Domestic Refrigerator, Open Unit Domestic Refrigerator, Air And Water Heat Pump , Vapor Absorption Trainer, Ice Plant Test Rig, Vapor Compression Test Rig For Air Conditioner, Cascade Refrigeration Test Rig	6 hours	Shanti Swaroop Sharma	Technician Grade -A	M.Tech
11	Wec-R&AC	Mechanical=20		6 hours	Shanti Swaroop Sharma	Technician Grade -A	M.Tech
12.	Auto Mobile Lab	Mechanical 35	1. Cutting Section Working Model Of 4 Cylinder Petrol Engine Gear Boxes 1. Sliding Mesh 2. Constant Mesh Model Of Differential(Cut Section) Chassis System An Automobile Single Cylinder ,4 Stroke Transparent Engine Braking System	6 hours	Sh. Satya Prakash	Demonstrator	B.Tech. In Mechanical
					Sh. Shabd Swaroopp	Mechanic Grade B	Diploma In Automobile
					Sh. Gurdas	Lab Assistant	Motor Vehicle Mechanic +Intermediate
13.	Material Science Laboratory	Girls 15, M1 35, M2 35	Photo-Colorimeter, Image System Analysis, Polishing Machine, Rough Grinder Machine, Metallurgical Microscope's	6 hours	Mr. Anurag Gupta	Demonstrator	Dip. In Mechanical Engineering.
14.	3D Printing Laboratory	Girls09, M1=25 M2=25	Cartesian 3D Printer, Polar3D Printer, Delta 3D Printer, Version 1.0,2.0,3.0,4.0,And Silicon 3D Printer	6 hours	Mr. Anurag Gupta	Demonstrator	Dip. In Mechanical Engineering.
15	Fluid Mechanics Lab	Mech-67, Civil-70 Electr.-78	Turbine Pelton Wheel, Orifice meter, Venturimeter, Orifice Testing, Pipe Friction Apparatus, Mouthpiece Testing V-Notch Testing, Sub-Sonic Wind Tunnel, Centrifugal Pump Testing, Disk Friction	18 hours	Mr. Bhupesh Kant.	Demonstrator	M.Tech., B.Tech.(ME)
					Mr. Abhijeet Kumar	Tech. Grade III	Dip. In Mechanical Engineering.
16	Hydraulic Machines	Mech- 47 Civil-70	Turbine Pelton Wheel, Orifice meter,	12 hours	Mr. S. S. Gupta	Demonstrator	Dip. In Automobile

	Lab		Venturimeter, Orifice Testing, Pipe Friction Apparatus, Mouthpiece Testing V-Notch Testing, Sub-Sonic Wind Tunnel, Centrifugal Pump Testing, Disk Friction				Engineering.
					Mr. Abhijeet Kumar	Tech. Grade III	Dip. In Mechanical Engineering.
19.	Material Testing Lab I	Mech-84 Elect-72	Izod Impact Test, Cement Test, Torsion Test, Tensile Test , Spring Test, Rockwell Hardness Test	6 hours	Mr. Rajesh	STA	B.Tech
					Mr. Sikandar	Lab Assistant	Matriculation
20.	Material Testing Lab II	Mechanical - 67	Sheet Metal Test , Tinus Olsen Stiffness Tester . Creep Deformation Of Lead /Solder Wire, Notch Bar Test, Computerized Universal Testing Machine	6 hours	Mr. Rajesh	STA	B.Tech
					Mr. Sikandar	Lab Assistant	Matriculation
21.	Mechanics Of Machine Lab I	Mechanical-84	Friction In -bearing Smooth Inclined Plane. Wheel & Differential Axle, Worm & Worm Wheel , Screw Jack , Moment Of Inertia Of Flywheel	6 hours	Mr. Rajesh	STA	B.Tech
					Mr. Sikandar	Lab Assistant	Matriculation
22.	Mechanics Of Machine Lab II	Mechanical-46	Motorized Gyroscope , Universal Vibration Apparatus , Porter Governor , Vibration Exciter Equipment Whirling Speed Of Shaft	3 Times	Rajesh	STA	B.Tech
					Mr. Sikandar	Lab Assistant	Matriculation

Table B.6.1

6.2 Laboratories maintenance and overall ambiance (10)

All the laboratories used for teaching (UG/PG) and research are well maintained with adequate number of instruments/equipment for the students. All the labs have sufficient space for conducting experiments and are properly ventilated and illuminated. Regular maintenance budget is provided by the institute for maintaining the Labs. Apart from the budget provided by the institute, the department also receives

several research & development grant for upgradation of the labs.

Since 2009, after the installation of 520 kWp solar power plant (now around 700 kWp) in the campus there is no power breakdown since then. In case of emergencies a standby 125 kVA Diesel Generator can be used. The institute has its own 33 kV substation with 1.5 MVA transformer and a dedicated line from the power utility.

PG and part time students are also trained and helps in conducting experiment under “Earn while you Learn” scheme of the institute. Several students have been benefitted by this scheme in the past and which had also helped them to acquire skills.

6.3. Safety measures in laboratories (10)

Sr. No.	Name of the Laboratory	Safety Measures
1	Machine Shop	Earthing Properly
		Provide Gloves Helmet Goggles And Fire Safety Equipment
		Safety Guards On Machines
2	Carpentry Shop	Apron , Hand Gloves , Goggles , Fire Safety Equipment
3	Smithy Shop	Apron , Hand Gloves , Goggles , Fire Safety Equipment
4	Fitting Shop	Apron Hand Gloves Goggles
5	Moulding Shop	Earthing Cable, Fire Safety Instruments, Helmet, Gloves Goggles Etc
6	Production Engineering Lab	Earthing Cable, Fire Safety Instruments, Helmet, Gloves Goggles Etc

Table B.6.2

1.4. Project laboratory (20)

A. Courses and Manuals

1. Developed theory and laboratory courses for 3D Printing for Additive Manufacturing
2. Manuals for assembly of 3D Printers version 1.0, 2.0, 3.0, 4.0, 5.0 & 6.0

B. Experimental Setup

1. Transparent Models for Kinematics of Machine for teaching theory of machine course.
2. Experimental facility and test bench for 3D Printing technologies
3. Monograph on Fabrication Techniques

4. Experimental facility for Severe Plastic Deformation with conventional die sets, modified die sets, 3-D ECAP die sets
5. Experimental facility and test bench for 3D Printing technologies
6. Experimental facility for Severe Plastic Deformation with conventional die sets, modified die sets, 3-D ECAP die sets
7. State of the art FE analysis computational setup with FORGE2011 (16 core and 4 core) and ABAQUS.
8. High Performance Computing A 24 Blade, Dual Xeon, 6 core, processor based high performance computing cluster has been setup at the Multimedia Laboratory at DEI. With specialized software such as multiuser MATLAB and connection to the Institute LAN, the cluster is accessed by students and faculty members across the University for research involving parallel computing and compute intensive simulations. One of the blades is also a CUDA™ parallel computing platform.

C. Research Laboratories

1. Metal Forming Virtual Simulation Lab (in association with MHRD)
2. Multimedia Laboratory
3. Instrumentation Laboratory
4. Quantum Computing Laboratory
5. Material Testing Laboratory
6. State of the art 3D Rapid Prototyping Laboratory
7. CNC Laboratory
8. Computer-Aided Design Laboratory
9. Automobile Workshop
10. Mechanical Workshop

D. Product Development

Product	Year
Developed Bhartiya Swadeshi 3D Printer Version 1.0	2015-2015

Developed Bhartiya Swadeshi 3D Printer Ver. 2.0, 3.0	2016-2017
Developed Bhartiya Swadeshi 3D Printer Ver. 4.0, 5.0	2017-2018

E. Project Facilities

For projects the following major facilities are available to the students:

1. 24 X 7 uninterrupted power supply
2. 24 x 7 Wi-Fi connections in the campus
3. Subscriptions to e-Journals
4. MoUs with institutions of Higher Learning for Joint/collaborative project guidance
5. MoUs with the industries for Joint Guidance
6. High Speed latest computers
7. State of the art equipment are available in the departments
8. Students are free to utilise any faculties under supervision.
9. More than 75 % utilization of the equipment available
10. Sufficient Funds for the project whenever required
11. Opportunity for the students to display their project to Public on every 31st January celebrated as Founders Day (Open Day)

CRITERION 7	Continuous Improvement	75
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7.1. Actions taken based on the results of evaluation of each of the COs, POs & PSOs (30)

A. Remedial Coaching

Any student found to have a below par performance is given remedial coaching in the relevant subjects for a period of around three weeks. After going through the remedial coaching, the student's performance is re-evaluated through remedial tests and, if the performance is found satisfactory, he/she is promoted to the next higher class.

B. Improvement in PO

POs & PSOs Attainment Levels and Actions for improvement – CAY only

POs	Target Level	Attainment Level	Observations
PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
PO1	2.5	2.9	Target achieved
(i) Physics course has been strengthened and modernized to include Quantum Physics. (ii) Syllabus of Mathematics courses has been revamped to strengthen the Math base and Applications. (iii) Students have been encouraged to take up specialization in Electronics or Computer Science to develop additional skills apart from a strong background in the core Electrical Engineering subjects. (iv) Curriculum updates are taken up every year basis to spruce up the curriculum with the latest trends in Engineering. Several new Electives have been started and old one spruced up in the last four years. These include a new electives on 3D Printing, Mobile Computing, quantum computing, work experience course on IoT etc.			
A strong Alumni connect has been created to enable students to pursue their 5 months co-op training in the progressive industries which offer them live projects. These projects give a very good training and exposure to the students who derive a lot of benefit. Some students are also pursuing their training in Advanced Labs internationally in schemes like MITACS and otherwise through referrals			

and applications.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO2	2.5	2.7	Target achieved
<p>(i) The Department has instituted the Under Graduate Research Award (UGRA) wherein some of the selected UG students are given cash incentive to pursue a well formulated research problem as their Major project with the help of an assigned Faculty mentor. The students can take up these projects in other departments also e.g. Department of Physics and Computer Science if they are interested. These strengthen their Problem Analysis Skills.</p> <p>(ii) Students have been encouraged to participate in the sponsored R&D Projects being carried out in the Department. They are also given incentive under “Earn while you learn” scheme for this work. These provide practical real-life situations for improving problem analysis skills.</p> <p>(iii) Several Community related real-life projects are being taken up in the Department with the full participation of the students.</p>			

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO3	2.2	2.3	Target achieved
<p>(i) All the students are required to complete a Design Engineering and Theme Development project in which the emphasis is on learning to follow the complete Design Engineering process from identification of need, problem formulation, generation of ideas, analysis of solutions, preliminary design, verifying technological feasibility and economic viability, detailed design and implementation.</p> <p>(ii) All the students are required to complete a Rural Engineering Project wherein they formulate a plan for setting up an industry in a rural setting using locally available resources. This helps in developing an understanding the practical needs of the rural areas and formulating solutions.</p> <p>(iii) Students have been encouraged to participate in the sponsored R&D Projects being carried out in the Department. They are also given incentive under “Earn while you learn” scheme for this</p>			

work. These provide practical real-life situations for improving skills for Design / development of solutions.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO4	2.2	2.2	Target achieved
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(i) All the students are required to complete a Design Engineering and Theme Development project in which the emphasis is on learning to follow the complete Design Engineering process from identification of need, problem formulation, generation of ideas, analysis of solutions, preliminary design, verifying technological feasibility and economic viability, detailed design and implementation.

(ii) All the students are required to complete a Rural Engineering Project wherein they formulate a plan for setting up an industry in a rural setting using locally available resources. This helps in developing an understanding the practical needs of the rural areas and formulating solutions.

(iii) Students have been encouraged to participate in the sponsored R&D Projects being carried out in the Department. They are also given incentive under “Earn while you learn” scheme for this work. These provide practical real life situations for improving skills for Design / development of solutions.

(iv) Several Community related real life projects are being taken up in the Department with the full participation of the students. These provide practical real life situations for improving skills for conducting investigations of complex problems.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO5	2.2	1.9	Deficiency
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(i) The Department has received FIST II grant through which modern lab facilities have been set up for the students to perform experimentation.

(ii) The Department is a recipient of UGC SAP grant through which modern lab facilities have been set up for the students to perform experimentation.

(iii) The TEQIP grant has given some state of the art equipment and latest desk top systems.

(iv) The University has a Cluster Computing Facility that the students can use for learning and implementing Parallel Computing.

(v) The students are encouraged to use the Vidyaprasar portal of the Institute where complete videos and other resources of several courses are available.

(vi) Teachers are also using on-line teaching & evaluation software and the students get familiar with them.

PO6 : The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO6	1.5	1.7	Target achieved
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(i) All the students are required to complete a Design Engineering and Theme Development project in which the emphasis is on learning to follow the complete Design Engineering process from identification of need, problem formulation, generation of ideas, analysis of solutions, preliminary design, verifying technological feasibility and economic viability, detailed design and implementation.

(ii) All the students are required to complete a Rural Engineering Project wherein they formulate a plan for setting up an industry in a rural setting using locally available resources. This helps in developing an understanding the practical needs of the rural areas and formulating solutions.

(iii) Several Community related real life projects are being taken up in the Department with the full participation of the students. These provide practical real life situations for understanding responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO7	1.5	1.8	Target achieved
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(i) A compulsory course on Environmental Science has been introduced for better understanding of the environmental issues and how engineering solutions to the problems can be devised

(ii) DEI has been ranked 5th cleanest University in 2017.

(iii) DEI has won several awards for implementing the Clean Energy initiatives ...

(iv) The Institute promotes a culture wherein air conditioners are utilized only in absolutely essential labs and not as a means of luxury / comfort with resulting energy savings.

(v) Dayalbagh Community follows a way of life that is geared towards sustainability and has been declared as an Eco-village by MNRE.

- (vi) The Institution has increased the involvement of its staff and students in several environment-related activities with the active participation of students and faculty and through the outreach programmes.
- (vii) Tree planting in the campus and in the adopted villages is done regularly as part of the activities of NSS volunteers.
- (viii) Energy conservation is practised by the installation of LED Lamps and LED tube light and energy efficient fans.
- (ix) Water conservation is adopted through rain water harvesting mechanisms

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO8	2	2.1	Target achieved
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- (i) All the students have to undergo courses on Indian Culture and Comparative Study of religion as a means of promoting harmony and understanding of the Unity in diversity of the country's polity.
- (ii) Ethical practices are promoted by the ethos of Dayalbagh. The day starts with prayer in the assembly in which all students participate.
- (iii) Uniform is compulsory for students for promoting equality and eliminating class consciousness.
- (iv) Students participate in NSS activities and learn that Service to the Society is an important part of professional life.
- (v) Participation in Co-Curricular activities and Games is compulsory and promote commitment to ethical principles and an understanding of sportsmanship and that participation is more important than winning.
- (vi) A comprehensive continuous evaluation system including Daily Home Assignments and Daily Class Assignments inculcates the culture of regularity and punctuality.

PO9 : Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO9	1.8	1.8	Target Achieved
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- (i) The students have to complete several courses involving team projects like Design Engineering /Theme Development in III year, Rural Engineering Project (REP) in Final year. These teams cut across Departments and enable students to learn to work in teams and in multidisciplinary settings.

(ii) Student coordinators contribute to the Placement activities and learn leadership skills.			
(iii) The Faculty organizes an Annual Fest called “Sampravah” that is completely managed by the students. Participation is of the order of couple of thousand students across various faculties of the University and this requires good management skills to organize.			
(iv) The Department has a Proctorial System with Batch Prefects and Assistant Prefects being elected representatives of the batch. Similarly there are Class captains and Vice-Captains who take up various responsibilities and learn to lead.			
(v) The Final Year Major project may also be taken up as an individual or a Group activity depending on the project and the students learn to work in teams.			
PO10 : Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.			
PO10	1.8	1.9	Target Achieved
(i) The students are required to complete two Seminar based courses – one in Third year and the other in final year. They give presentations on latest technological topics and these may go beyond the syllabus of theory courses and promote self learning as well as communications skills.			
(ii) All the Lab and Project courses have Viva – voce examinations which are both internal and external and promote good communication skills.			
(iii) Students regularly participate in tech fests outside the Institute and present their papers in Student Contests. The Institute also funds such endeavors.			
(iv) The students are required to submit detailed reports on their Project work, lab work and Seminar courses for promoting written communication skills			
PO11 : Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.			
PO11	1	1.2	Target achieved
(i) The students have to complete several courses involving team projects like Design Engineering /Theme Development in III year, Rural Engineering Project (REP) in Final year. These teams cut across Departments and enable students to learn to work in teams and in multidisciplinary settings.			
(ii) Student coordinators contribute to the Placement activities and learn leadership skills.			
(iii) The Faculty organizes an Annual Fest called “Sampravah” that is completely managed by			

the students. Participation is of the order of couple of thousand students across various faculties of the University and this requires good management skills to organize.

(iv) The Final Year Major project may also be taken up as an individual or a Group activity depending on the project and the students learn to work in teams.

PO12 : Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO12	1.5	1.9	Target achieved
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(i) The students are required to complete two Seminar based courses – one in Third year and the other in final year. They give presentations on latest technological topics and these may go beyond the syllabus of theory courses and promote self learning and prepare students for lifelong learning.

(ii) Practical Training at the end of I and II year and co-op Internship at the end of Third year enable students to pursue independent projects in an industrial setting with limited mentorship and prepare for lifelong learning.

Table B.7.1

PSO1	3	3	Target achieved
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(i) The Department has instituted the Under Graduate Research Award (UGRA) wherein some of the selected UG students are given cash incentive to pursue a well formulated research problem as their Major project with the help of an assigned Faculty mentor. The students can take up these projects in other departments also e.g. Department of Physics and Computer Science if they are interested. These provide practical real life situations for improving skills for Design / development of solutions.

(ii) Students have been encouraged to participate in the sponsored R&D Projects being carried out in the Department. They are also given incentive under “Earn while you learn” scheme for this work. These provide practical real-life situations for improving skills for Design / development of solutions.

(iii) Several Community related real life projects are being taken up in the Department with the full participation of the students. These provide practical real-life situations for improving skills for Design / development of solutions.

PSO1 :Statement as mentioned in Annexure I

PSO2	3	3	Target achieved
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(i) The time spent in internship by a student has been significantly increased to provide adequate exposure to industry environment through summer internships and Cooperative Education training. The Coop training serves dual purpose of providing exposure to industry as well as opportunity to work on real life industry standard problems

PSO3 :Statement as mentioned in Annexure I

PSO3	3	3	Target achieved	
<p>(i) The students can take up the projects in other departments also e.g. Department of Physics and Computer Science if they are interested. These provide practical real life situations for improving skills for Design / development of solutions.</p> <p>(ii) Students have been encouraged to participate in the sponsored R&D Projects being carried out in the Department. They are also given incentive under “Earn while you learn” scheme for this work. These provide practical real-life situations for improving skills for Design / development of solutions.</p> <p>(iii) Several Community related real life projects are being taken up in the Department with the full participation of the students. These provide practical real-life situations for improving skills for Design / development of solutions.</p>				

7.2. Academic Audit and actions taken thereof during the period of Assessment (15)

(Academic Audit system/process and its implementation in relation to Continuous Improvement)

Academic audit was conducted in the institution by an internal expert committee (AAAC: Academic & Administration Audit Committee) constituted by the Director. The academic audit team meets PG and UG students for taking their feedback about the teaching, research and infrastructure. The committee also meet the teaching and Non-teaching staff to confirm the students’ feedback and any other issues of the faculty.

The academic audit focuses on:

- Assuring quality of learning process
- Determining desired learning outcomes
- Assessing course content and curriculum
- Assessing teaching and learning process
- Implementing quality education
- Student assessment and evaluation

The academic audit is based on

- Annual Reports of the Departments
- Annual Quality Assurance Report AQAR of the institution
- Feedback from stakeholders

- Visits to Departments
- Presentation of Achievements by the Departments

The following documents are made available to the AAAC committee.

- Copy of the Time Table
- Course File
- Lab. Equipment Details
- Students Projects
- Various Grants received by the Institute/Department
- Internal evaluation marks
- Details of Remedial classes
- Result Analysis

The institution has an Internal Quality Assurance Cell (IQAC) to monitor and maintain the standard of academic affairs of the institution. The cell is chaired by the Vice-Chancellor and the activities of the cell are being planned, executed and co-ordinated by a senior professor with the assistance of representative members of faculty from each domain. The details of IQAC cell is provided on institute website www.dei.ac.in with various actions taken.

The Internal Quality Assurance Cell of Dayalbagh Educational Institute is performing following tasks on regular basis:

1. Improvement in quality of teaching and research by regular inputs to all concerned based on feedback from students.
2. Providing inputs for best practices in administration for efficient resource utilization and better services to students and staff.
3. Providing inputs for Academic and Administrative Audit and analysis of results for improvement in areas found weak.

Students and staff give their feedback and suggestion on teaching and administrative performance by dropping their views in the Suggestion Box located in DEI Computer Centre, or through email to the Coordinator, IQAC at iqac@dei.ac.in.

Minutes of IQAC meetings and the annual reports are available on institute website

The major activities of IQAC are

- Documentation of all academic and outreach programmes activities
- Prepare the annual report to be sent to the UGC (All AQARs prepared till the academic year 2015-2016 has been submitted to the National Accreditation and Assessment Council (NAAC) and the same has been uploaded in the institution's website)
- Preparation of periodic reports to be read by the Vice Chancellor in the BoM meetings
- Conducting academic audit
- Documentation of the self appraisal reports of the faculty members
- Documentation of annual staff and student feedback reports
- Documentation of completed projects with Utilization Certificate
- Documentation of Ph.D. Thesis abstracts
- Planning and execution of quality assurance measures in academic and curricular aspects
- Preparation of report for Thanks Giving day of the Institution
- Provision of data to be published in the News letter (half –yearly)
- Documentation of minutes of RAC meetings
- Organizing seminars/workshops related to quality assurance aspects of the University

TQM Framework

DEI has put in place Total Quality Management in its education system based on the following four cardinal objectives :

1. Innovation
2. Creativity
3. Initiative
4. Excellence

Monitoring at various levels and introduction of standards and accountability at all levels are ensured in this setup. A conceptual model of the total quality system in Higher Education adopted in DEI is

depicted in the figure.

The three main committees that oversee and ensure TQM at DEI are (i) IQAC (ii) Academic and Administrative Audit Committee (AAAC) and (iii) Advisory Committee on Education (ACE) comprising distinguished intellectuals from academia and industry and faculty of DEI meets every two months to review the progress of the Institute and make valuable recommendations. It plays only an advisory role and acts like an external quality assurance cell.

Recent Feedback Mechanism on Daily Basis: Daily Home and Class Assignments (DHA/CAs)
Recent research in cognitive science and psychology shows that the frequent process of recalling information fosters deep learning. [A.M. Paul, Scientific American, August 1, 2015]. Inspired by these studies, DEI has initiated short DHAs or CAs in all courses on topics covered in each class to improve the quality of teaching-learning experience.

Other important factors that contribute to the practice are the following:

- Disciplined, Eco-friendly and Serene Atmosphere
- Dedicated Faculty
- Weightage of Attendance, Discipline, Co-curricular Activities, Sports and Social Service
- Simple Student Dress Code
- Morning Assembly
- Variety of Community Outreach Activities for under-privileged
- Daily Agricultural Operations to instill Dignity of Labor
- Research emphasis on Environment, Ecology, Nature-Inspired Engineering and Consciousness Studies

All students are apprised of the objectives and expected outcomes on admission during the compulsory Orientation programmes and at the beginning of each course by instructors. Students are provided with the detailed syllabus and course outcomes in each course. Faculty and students can also readily access programme specific outcomes and course outcomes listed on the DEI website.

The variety of elements for continuous assessment and feedback mechanisms in DEI enable effective direct and indirect monitoring and measurement of outcomes and appropriately identify and address gaps. The learning outcomes are also reviewed regularly by external examiners and external experts in the Departmental and Faculty Board of Studies Meetings, Academic and Administrative Audit Committee (AAAC), IQAC and the Advisory Committee on Education.

Evidence of Success

Evidence of the tremendous success of DEI's value-based and quality education is through the following:

1. Recognition as the USP of Education at DEI by Statutory Regulatory Authorities
2. Positive feedback on this aspect from all stakeholders
3. Improvement in teaching-learning experience
4. Higher number of women enrolments
5. Higher number of women staff
6. Award of ISO 9001:2015 certification

7.3. Improvement in Placement, Higher Studies and Entrepreneurship (10)

Assessment is based on improvement in:

- *Placement: number, quality placement, core industry, pay packages etc.*
- *Higher studies: performance in GATE, GRE, GMAT, CAT etc., and admissions in premier institutions*
- *Entrepreneurs*

Item	CAYm1	CAYm2	CAYm3
Total No. of Final Year Students	68	54	56
No. of students placed in companies or Government Sector	29	12	19
No. of students admitted to higher studies with valid qualifying scores (GATE, GRE, GMAT etc.)	19	17	22
No. of students turned entrepreneur in engineering/technology (z)	0	1	0
Number of Students engaged in further career	68	54	56

7.4. Improvement in the quality of students admitted to the program (20)

Item	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
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National Level Entrance Examination (Name of the Entrance Examination)	No. of Students admitted	180	197	179
	Opening Score/Rank	142	239	159
	Closing Score/Rank	18	8	20
State/Institute/Level Entrance Examination/Others (Name of the Entrance Examination)	No. of Students admitted	232	262	308
	Opening Score/Rank	86.76	87.16	86.65
	Closing Score/Rank	39.28	40.02	40.28
Name of the Entrance Examination for Lateral Entry or lateral entry details	No. of Students admitted	12	12	12
	Opening Score/Rank			
	Closing Score/Rank			
Average CBSE/Any other Board Result of admitted students (Physics, Chemistry & Mathematics)		75%	75%	75%

Table B.7.4.

CRITERION 8	First Year Academics	50
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8.1. First Year Student-Faculty Ratio (FYSFR) (5)

Data for first year courses to calculate the FYSFR:

Year	Number of students (approved intake strength)	Number of faculty members (considering fractional load)	FYSFR	*Assessment = $(5 \times 20)/$ FYSFR (Limited to Max. 5)
CAY	60	8	7.5	5
CAY _{m1}	60	8	7.5	5
CAY _{m2}	60	8	7.5	5
Average	60	8	7.5	5

Table B.8.1.

***Note:** If FYSFR is greater than 25, then assessment equal to zero.

8.2. Qualification of Faculty Teaching First Year Common Courses (5)

Assessment of qualification = $(5x + 3y)/RF$, x = Number of Regular Faculty with Ph.D., y = Number of Regular Faculty with Post-graduate qualification RF = Number of faculty members required as per SFR of 20:1, Faculty definition as defined in 5.1

Year	x	Y	RF	Assessment of faculty qualification $(5x + 3y)/RF$
CAY	4	4	3	12
CAY _{m1}	4	4	3	12
CAY _{m2}	4	4	3	12
Average Assessment				12

Table B.8.2

8.3. First Year Academic Performance (10)

Academic Performance	CAY _{m1} 2017-2018
Mean of CGPA or Mean Percentage of all successful students	7.76
Total no. of successful students (Y)	65

8.4. Attainment of Course Outcomes of first year courses (10)

8.4.1. Describe the assessment processes used to gather the data upon which the evaluation of Course Outcomes of first year is done (5)

- i. An elaborate continuous evaluation system is in place including the following components.
- Theory Course: Class Test1, Class Test2, Daily Home Assignments, Daily Class Assignments, Additional Assessment and Attendance for Internal Evaluation and one External End semester examination

Practical Course / Project: PV1, PV2, PV3, Attendance. PVs are Internal mid-term evaluations by Lab Course teacher / Project Supervisor and Departmental Committee and they are followed by an external end-semester examination.

Theory Courses	Practical Courses
(i) Class Tests	(i) Record-cum-Home Assignments
(ii) Daily Home Assignments	(ii) Practical Tests
(iii) Additional Assignments	(iii) Viva-voce
(iv) Seminars & Group Discussions	(iv) Attendance
(v) Attendance	(v) Semester/Module End-Semester Examination
(vi) Semester/Module End-Semester Examination	

- ii. In a Theory Course the Syllabus is divided into 5 units. The Class Test1 is typically based on the first three units and the Class Test2 is based on Units 3 to 5. These two reflect the performance in the corresponding units. Similarly DHA1 is based on the Daily Home Assignment1 is typically based on the performance in the DHAs and DCAs upto the CT1 and DHA2 is based on the performance in these evaluations after CT2. Typically 10 DHAs and 5 DCAs are there in each phase. These ensure regularity in the learning process and also ensure that the student gets a regular feedback on the performance in each course.
- iii. The Daily Assignments being in a sense of punctuality and regularity and inculcate in the student a habit of meeting daily targets which stand them in good stead when they join the industry because that is exactly what the industry demands.

- iv. The End-Semester is completely transparent to the Department and is conducted by an external Examiner unknown to the Department out of the panel constituted for the same with inputs from the Department. The performance on all five units of the syllabus is checked in the End-semester examination because the student has to answer one question from each unit.
- v. The Lab evaluation is also done on a regular basis. Lab records are to be submitted on the next turn describing the work done on the previous turn. Credit is given for performance and regularity. An A Grade in Lab assessment indicates regular and good performance in terms of submissions and viva examinations.
- vi. Similarly in the Projects the regularity and performance in the Departmental evaluation is considered apart from the evaluation of the Supervisor. Students are encouraged to produce Research Papers / working projects and demonstratable results and credit is given to them. An A grade in a Project typically indicates one or more of these outcomes.
- vii. An attempt has been made to analyze the marks obtained in various tests and examinations and find out the learning outcomes from the level of achievement in these tests and examinations and assignments. Marks obtained by the students in the various components in each course are available on the Course Monitoring System. Marks have been obtained from there and have been analyzed to determine the learning outcomes.

8.4.2. Record the attainment of Course Outcomes of all first year courses (5)

Percentage Distribution of Components to COs For Theory Subjects							
Component	CT1	CT2	DH1/DA1	DHA/DA2	AA	ATT	EXT
Marks	40	40	40	40	20	10	50
CO1	40		20	20	20	20	20
CO2	40		20	20	20	20	20
CO3	20	20	20	20	20	20	20
CO4		40	20	20	20	20	20
CO5		40	20	20	20	20	20

Assesment Criteria	
Criertia	Attainment Level
80 % Students scoring more than 50 % marks	3
50 % Students scoring more than 50 % marks	2

Course Attainment of Theory Subjects For The 2018 Passed Out Batch**First Year**

Course	CO1	CO2	CO3	CO4	CO5
BOH181	2	2	2	2	2
CHM181	3	3	3	2	2
EEM201	1	1	1	1	1
EEM202	1	1	1	1	1
ENH181	3	3	2	2	2
ENH281	2	2	2	2	2
HSH281	2	2	2	3	3
MAM181	2	2	2	2	2
MAM281	2	2	2	2	2
MEM101	2	2	2	2	2
MEM103	2	2	2	2	2
MEM201	2	2	2	2	2
MEM202	2	2	2	2	2
PHM181	2	2	2	2	2
PHM281	2	2	1	1	1
SYH281	3	3	3	1	1

8.5. Attainment of Program Outcomes from first year courses (20)**8.5.1. Indicate results of evaluation of each relevant PO and/or PSO if applicable (10)**

Course No.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
CHM181	2.8	2.6	2.2	2.4	1.6	1	1	1	1	1.2	1	1		2.4	2.6	2
PHM181	2.2	2	1.4	1.4	1	1	-	-	-	1.2	1	1		1.7	2	1.2
MEM101	3	1	2	2	1	-	-	-	-	-	-	1		1.5	1	1.5
MEM103	3	2.2	2.4	2.2	2.4	1.6	1.8	1.8	1.5	2	3	2.2		2.3	2.2	2.3
MAM181	3	3	3	1.6	1.5	1	-	-	1	1.6	1	1		3	3	1.55
BOH181	3	3	2	2	1	3	3	3	3	1	1	3		2.5	3	1.5
ENH181	-	-	-	-	-	3	1	3	-	3	1	2		3	3	3
PHM281	2.4	2.2	1.6	1.8	1	1	-	-	-	1.2	1	1.2		1.9	2.2	1.4

EEM201	3	3	3	3	3	1	1	1	1	2	1	2		3	3	3
EEM202	3	3	3	3	3	1	1	1	1	2	1	2		3	3	3
MEM201	3	2.2	2	1.8	-	-	-	-	-	-	-	1		2.1	2.2	1.8
MEM202	3	3	3	3	3	3	1	-	2	3	1	3		3	3	3
MAM281	3	3	3	2.2	1.25	1.5	-	-	-	1.6	1	1.2		3	3	1.72
Average	2.87	2.52	2.38	2.20	1.80	1.65	1.40	1.80	1.50	1.80	1.18	1.66		2.49	2.55	2.08

Table B.8.5.1.

8.5.2. Actions taken based on the results of evaluation of relevant POs and PSOs (10)

PO Attainment Levels and Actions for improvement – CAY only – Mention for relevant POs

POs	Target Level	Attainment Level	Observations
PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
PO1	2.8	2.87	Target achieved
(i) Physics course has been strengthened and modernized to include Quantum Physics.			
(ii) Syllabus of Mathematics courses has been revamped to strengthen the Math base and Applications.			
PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.			
PO2	2.5	2.52	Target achieved
Several Community related real-life projects are being taken up in the Department with the full participation of the students.			
PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.			
PO3	2.2	2.38	Target achieved
Students are given ample exposure to community needs. This exposure helps fresh entrant to realize specific needs of the society. The introductory courses on Workshop and manufacturing process provide technical inputs to realize the solutions			

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.			
PO4	2.2	2.2	Target achieved
Students are encouraged to participate in technical competitions right from the beginning of the course			
PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.			
PO5	1.8	1.8	Deficiency will be rectified
Action 1: Latest computers and equipment are getting procured from TEQIP. Action 2: Latest software tools and training are being provided to students. Laboratories are being modernized through TEQIP Grant, DST FIST and UGC SAP grants.			
PO6 : The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.			
PO6	1.5	1.65	Target achieved
Participation in NSS camp, Agricultural Operations, Social Service enables them to appreciate societal problems and possibility of engineering solutions.			
PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.			
PO7	1.5	1.4	Deficiency will be rectified by
(i) Introduced course on Environmental Sciences (ESC281) (ii) Tree planting in the campus and in the adopted villages is done regularly as part of the activities of NSS volunteers.			

(iii) Energy conservation is practised by the installation of LED Lamps and LED tube light and energy efficient fans.			
(iv) Water conservation is adopted through rain water harvesting mechanisms			
PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
PO8	1.5	1.8	Target achieved
Component on professional ethics and human values included in the induction training programme.			
PO9 : Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			
PO9	1.5	1.5	Target achieved
Compulsory participation in group activities like Agricultural Operations, Social Service, Games, Co-curricular Activities and Marchpast helps the student to understand importance of team work.			
PO10 : Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.			
PO10	1.8	1.8	Target achieved
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.			
PO11 : Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.			
PO11	1	1.18	Target achieved
Students are encouraged to participate in technical competitions right from the beginning of the course to acquire project management skills.			

PO12 : Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.				
PO12	1.5	1.66	Target achieved	
Practical Training at the end of I and II year and co-op Internship at the end of Third year enable students to pursue independent projects in an industrial setting with limited mentorship and prepare for lifelong learning.				

Table B.8.5.2

PSO1 : Graduates of Mechanical Engineering will achieve excellence in product analysis, product design, innovation and entrepreneurship.				
PSO1	2.5	2.5	Target achieved	
Action 1: More communication courses are being introduced				
Action N:				
PSO2 : Graduates will be able to analyze, interpret and provide solutions to the real life mechanical engineering problems.				
PSO2	2.5	2.7	Target achieved	
Action 1:				
Action N:				
PSO3 : Graduates will be able to develop approaches to solve multidisciplinary problems of manufacturing using state of art technologies.				
PSO3	2	2.14	Target achieved	

CRITERION 9	Student Support Systems	50
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9.1 Mentoring system to help at individual level (5)

Proctorial System

- The Institute has a proctorial system under which a senior staff is deputed as the Chief Proctor. Each class is divided into batches of about 30 students and a teacher is deputed as the Proctor for the batch to act as the mentor. Each batch of students elects a Prefect and an Assistant Prefect from among themselves.
- To understand the problems of students, the concerned Proctor remains in regular contact with the Prefect and the Assistant Prefect. He also conducts quarterly Class Committee meetings. During these meetings Class Proctors discuss various issues with the students of their batches and provide necessary counselling.
- The details such as student's address, his parents details, contact numbers, economic background etc. are kept in record.
- During the Class Committee meeting Performance in internal and final examinations, attendance in class, special achievements by the student etc, are discussed.
- In addition to this, Batch Proctor takes regular feedback from the students and Class Representatives about the difficulties and problems of students and discuss with the Dean and Head periodically. He verifies the statement of marks and attendance of the students every quarter before informing to the parents. He also interacts with parents/guardians of the students as and when necessary.
- Normally, the Batch proctor has the fair idea of the performance, skill and attitude of a student. He informs the Dean if any student is not attending the classes/practical/tests etc. The Proctor with the help of prefect and Assistant Prefect monitors the implementation of Institute rules such as dress code.

Responsibilities of the Batch Proctor as a counselor includes:

- Identifying strengths and weaknesses of the student and work for his strengths.
- Providing guidance in selecting the job/higher education.

- Motivating the students to take GATE examination and go for higher studies.
- Guiding the students to excel.
- On completion of the course, recording the future plans and communicate to the placement cell.
- Motivating the students to take up minor research work/article writing/community service/field studies/ industrial training etc. which will ensure value addition and provide competitive edge.
- Organize small educational tours, class level cultural activities, sports, literary and academic programmes to break the monotony of the class.
- Recognize the students with learning difficulties and chalk out programmes to assist them.
- Any other related matter.

Outcome of mentoring system

- Students who perform badly in initials tests are able to improve due to the assignments given, question paper solving and effective guidance.
- The motivation right from the first year to prepare for GATE encourages the students to perform well.
- Regular mentoring is helping the students in selecting post graduate programme specialization.
- Over the years number of students who clear GATE has increased.
- Students who loose focus and interest are counseled and motivated.

Other details are as follows:

- Projects, Seminars, Industrial visits, Internships for B.Tech., B.Voc., MBA and Diploma students.
- Participatory learning activities are adopted by the faculty to facilitate student-centric learning, apart from class room instructions.
- Seminar, case study, group discussion and demonstration, conceptual quiz, role-play, mini project, dissertation work, internship, industrial visits, and hands on-/field training form an integral part of participatory learning methodologies.
- All models of the curriculum meant for the UG and PG students incorporate one or more of such participatory techniques in the teaching learning process as a compulsory component.
- Students and scholars are involved and given responsibilities in organising events such as

association meetings, seminars, conferences, workshops during the period of study and hence are provided an opportunity to develop/enhance administrative and leadership traits.

- The institution encourages e-learning by enabling access to online resources (e-books/journals/databases) and digitized resources made available in the central library.
- The wi-fi environment of the campus makes it as a 24x7 learning spot, especially for post graduate students and scholars.
- To enable slow learners overcome the learning disabilities remedial classes are being conducted and individual care is taken to bring out the inherent talents of each and every individual student and for the overall development of the students to make them as a valuable citizens.
- Tutor-Ward meets are being conducted fortnightly which a major forum for the teacher student's interaction apart from classroom where a wide variety of aspects are discussed and grievances of the students are sorted out by the class tutor.
- Project work is integral part of all post graduate courses and faculty members provide guidance and evaluate the thesis too.
- As a whole, the Teaching –Learning process advocates principles of Life Long Dynamic Learning by the inclusion of
 - i. Mentored learning
 - ii. Stimulated learning
 - iii. Experiential learning
 - iv. Self-Paced learning
 - v. Learning by research
 - vi. Self-learning
 - vii. Interdisciplinary and Multidisciplinary learning
 - viii. Culturally inclusive learning
- Where ever required, technology is incorporated into teaching-learning process. E-Class rooms, Projectors etc.
- ICT based instructional strategies find a definite place in the teaching process to augment chalk and talk method for enhanced visualization of concepts.
- The following ICT facilities are available in the institution for technology enhanced learning are

utilized in addition with

- i. Video Conferencing Facilities (EDUSAT, A-view, NPTEL and NKN facilities)
 - ii. DELNET/INFLIBNET
 - iii. Virtual and ICT enabled classrooms
 - iv. Working models
 - v. Simulated software
 - vi. Video lectures
 - vii. Interactive boards [Smart Boards]
 - viii. Visualizers
 - ix. OHP and LCD Projectors
- An allied paper on Computer Science is made mandatory for all Undergraduate programmes in order to make the students familiar with ICT skills.
 - To ensure computer literacy an interdisciplinary course in basic computing aspects is offered in all UG programmes.
 - Post graduates and research students present their seminars using ICT facilities.

All students have to attend a compulsory Orientation Programme on admission. The wide range of continuous assessment components that include, Daily Home Assignments, Class Assignments, Seminars and Group Discussions, Additional Assignments, Quizzes, Class Tests, Projects, Internships, Viva-voce examinations and attendance, enable effective assessment of learning levels of students. In addition, teacher-student interactions, reports of Class Committees and Proctorial meetings help in identification of different levels of learners. Faculty members and various Committees regularly review the academic progress and counsel students to improve their performance to ensure their academic growth.

The Institute offers a number of opportunities for advanced learners to augment their talent and meet their learning needs for which mentoring is offered on need basis:

1. Under-Graduate Research Awards (UGRA): to encourage select bright UG students to undertake research projects.
2. Students are encouraged to make research contributions in their major project at the PG level and publish their results in journals and also present it at National and International Conferences.

3. Students are encouraged to participate in summer research fellowship programmes at prestigious research institutes and laboratories.
4. The Institute, in collaboration with the Systems Society of India, organizes various competitions and an Annual Students' Systems Conference (Paritantra) and Technical Colloquia regularly and gives prizes and awards.
5. Vertical and Horizontal Progression: Provision has been made for bright students to undertake advance credit courses and lateral entry to higher degree programs.
6. MoUs and Collaboration: Students are encouraged to work in laboratories of National and International Institutes and Universities with MoU.
7. Financial support is provided to students for participation in National and International Conferences.
8. The Institute, in association with Association of Alumni and Friends of DEI (AAFDEI) registered in USA, provides financial support for boarding and lodging and travel assistance to students on their visit abroad for higher studies or for conferences.
9. Earn while you learn provision has been made for UG, PG and research students for part time jobs in the large number of projects running in the Institute. This helps them learn state of the art techniques and also get remuneration.
10. Students are encouraged to help slow learners in their class and in junior classes.

Special measures are taken to support relatively slow learners, are :

- Organizing Extra Classes
- Remedial and Tutorial Classes are held to prepare them for remedial exams
- Assistance from classmates and senior students is arranged
- Providing tutorial assignments
- Providing lectures uploaded on web and extra reading material to improve basic understanding of subject
- Encouraging them to study courses on developing soft skills to master understanding of language
- Encouraging them to participate in various activities to develop social skills

Participatory learning activities are adopted by the faculty to facilitate

student-centric learning, apart from class room instructions. Seminar, case study, group discussion and demonstration, conceptual quiz, role-play, mini project, dissertation work, internship, industrial visits, and hands on-/field training form an integral part of participatory learning methodologies. All models of the curriculum, meant for the UG and PG students, incorporate one or more of such participatory techniques in the teaching learning process as a compulsory component.

Students and scholars are involved and given responsibilities in organising events such as alumni association meetings, seminars, conferences, workshops during the period of study and hence are provided an opportunity to develop/enhance administrative and leadership traits under the mentoring of faculty.

The institution encourages e-learning by enabling access to online resources (e-books/journals/databases) and digitized resources made available in the central library. The wi-fi environment of the campus makes it as a 24x7 learning spot, especially for post graduate students and scholars.

Project work is integral part of all post graduate courses and faculty members provide guidance and evaluate the thesis too. As a whole, the Teaching –Learning process advocates principles of Life Long Dynamic Learning by the inclusion of

- Mentored learning
- Stimulated learning
- Experiential learning
- Self Paced learning
- Learning by research
- Self learning
- Interdisciplinary and Multidisciplinary learning
- Culturally inclusive learning

9.2. Feedback analysis and reward /corrective measures taken, if any (10)

A. Student Feedback on Course Delivery

- Yes, Feedback is collected at the end of every semester for all the courses from students on a ten point scale, by a neutral mentor who is not conducting their classes. Besides, the feedback taken

during Class Committee Meetings, online feedback, paper based feedback by neutral teachers, Feedback by Central Committee, Feedback from Examiners are also used as tools for providing feedback.

- More than 90% students do take part in the feedback.
- In yearly feedback system, teachers who do not teach to a particular class are deputed to take the feedback of the teachers of that class. The format of feedback sheet as follows:

Qualities and Values of Teaching STUDENT FEEDBACK FORMAT FIRST YEAR (CIVIL) July 2016 - May 2017 <i>[GRADING ON A SCALE FROM 0 TO 10, WHERE 0 INDICATES THE LOWEST AND 10 INDICATES THE HIGHEST]</i>								
PARAMETER	FIRST SEMESTER				SECOND SEMESTER			
	MEM 101 (DGR)	MEM 102 (DGR) / (RCG)	MEM 103 (KR)	MEM 104 (RSS)	MEM 201 (AY)	MEM 202 (VSD)	ME M 203 (SKS) / 	MEM 204 (PD)
1. Teacher's Knowledge of Subject								
2. Teacher's Ability of Explanation to Students								
3. Teacher's Ability to Create Interest in Subject using various Teaching-Learning Methods								
4. Teacher's Ability to Provide Structured Delivery of Course Contents								
5. Teacher's Timeliness and Fairness in Evaluation and Conduct of Examination								
6. Teacher's Ability as Orator (Voice clarity, Poise and Tone)								
7. Teacher's Language and Behaviour with students and Fellow Colleagues								
8. Teacher's Regularity, Punctuality and Self-Discipline								
9. Teacher's Willingness to Solve Subject related Problems of Students								
10. Teacher's Ability to Set Balanced Question Papers								
11. Teacher's Morality, Ethics and Professionalism towards Students								

Feedback Form for Societal Representatives		
I. Please fill in the following:		
Name:	Age	Ph.No.
Address		Email id:
Qualification:	Course/ s (with year) pursued from DEI:	
Are you a parent or a guardian of DEI student?	NO	YES
Please put a tick mark (✓) in the appropriate column:		Course completed / being pursued by your ward _____ Year of course admission: _____ Year of course completion: _____

II. Please assign a score from 5 to 1 (Highest: 5, Lowest: 1)* to the following statements with reference to DEI.* Interpretation of the scores 5, 4, 3, 2, 1				
5 = Completely Agree	4 = Agree to a large extent	3 = Moderately Agree	2 = Agree to a lesser extent	1 = Do Not Agree

S. No.	Statements with reference to DEI	Score (5-1)
1	Commendable reputation for quality education	
2	'A' grade brand image (nationally and internationally)	
3	Better possibilities for recruitment	
4	Philanthropic social collaborations and contributions	
5	Low fee structure	
6	Location of the Institute	
7	Disciplined environment in the campus	
8	Security provisions in the campus	
9	Transparency in admission process	
10	Admission result declaration well in time	
11	Infrastructure, water and sanitation facilities in DEI	
12	Administrative staff is cooperative and supportive	
13	Teaching staff is co-operative and supportive	
14	Course curriculum is well structured and up to date	

15	Quality of teaching-learning is up to the mark	
16	Desirable positive development in students' personality	
17	Socially desirable attributes in DEI alumni	
18	Examination system is appropriate and well defined	
19	Examination results are declared in a timely manner	
20	Evaluation is fair and unbiased	
21	Curriculum is well diversified to inculcate value dimension and social sensitivity in the students	
22	Provisions in the institute for co-curricular activities	
23	Contribution of the institute in social upliftment	
24	Contribution of the institute in women empowerment	
25	Contribution of the institute in improving the living standards of the people of the nearby slum and rural areas	
26	Participation of the institute in the nationally significant events	
27	Contribution of alumni of the institute in economic development of the society	
28	Adherence of the staff of the institute to moral values	
29	Adherence of the students of the institute to moral values	
30	Importance given by the alumni of the institute to the ethics and value oriented quality living	
31	Institution is a pride of City of Taj	
<p>What do you like about DEI?</p> <p>What would you like to be improved in DEI?</p> <p>Your expectations from DEI in the coming years:</p> <p style="text-align: center;">Thank you very much for sparing your precious time.</p>		

Parents Feedback Form

I. Please rank from 1 to 5 (**Highest: 1, Lowest: 5**) the following reasons for choosing DEI for your ward:

Rank (1-5)	Reasons for choosing DEI
	Reputed for Quality Education
	Better possibilities for recruitment
	Low fee structure
	Location (vicinity)
	Campus Discipline

II. Please tick (✓) mark in the column of the best option (as per your experience) for each of the statements given in the table below:

	Do Not Agree	Agree to lesser extent	Moderately Agree	Agree to greater extent	Completely Agree
Admission Process is quite transparent					
Prospectus is informative					
Admission result is declared well in time					
Campus discipline is appropriate					
Security of students is ensured in the campus					
Infrastructure, water and sanitation facilities are up to the mark					
Administrative staff is cooperative and supportive					
Teaching staff is co-operative and supportive					
Course curriculum is well structured and up to date					
Quality of teaching-learning is up to the mark					
I see positive behavioural change in my ward after taking admission in DEI					
Examination system is appropriate and well defined					
Semester examination result is declared in time					
Evaluation is fair and unbiased					
Curriculum is well diversified to inculcate					

value dimension and social sensitivity in my ward					
Focus on all round personality grooming of students					
Grooming students for job- interviews					
Provisions for placement assistance					
Library and Book Bank facility is quite appropriate					
Internet & Computer facility availability					
Availability of games-field					
I would recommend others' kids to study in DEI					

Student Feedback Form

Please provide the following information:

Faculty: Class:

1. Why you have chosen DEI for education? (Please rank in order of preference):

S No	Parameters	Rank
1	For Quality Education	
2	Low fee	
3	Location (vicinity)	
4	Discipline	
5	Qualified & Experienced Faculty	
6	Placements	
7	Goodwill of the Institute	
8	Others (Please Specify)	

2. Please tick the most appropriate box suited for given statements:

S No	Parameters	Do Not Agree	Agree to lesser extent	Moderately Agree	Agree to greater extent	Completely Agree
A	Admission & Registration					
1	Admission process is transparent					
2	Admission information is timely available					
3	All required information for admission is available in Prospectus					
4	Standard questions are asked in entrance exam and interview					
5	Admission result is declared well in time					
6	Staff behaviour is cooperative during admission process					
7	Online registration process is convenient and clear					
8	Enrolment numbers are					

	allotted timely					
9	Fee deposit procedure is convenient and clear					
10	Student ID card and Library card issued well in time					
B	Infrastructure					
1	Infrastructure, water and sanitation facilities are up to the mark					
2	Campus discipline and security is appropriate					
3	Proper first-aid and other emergency services are available in the campus					
4	Photocopy/Printing/stationery facilities are available to the students in the campus					
5	Canteen facility is available in the campus					
6	Regular power supply is available in the campus					
7	Proper Parking facility is available in the campus					
8	ATM/Telephone facility is available in the campus					
9	Proper internet facility is available for students in the campus					
10	Proper sports and extra-curricular facilities are available for students in the campus					
11	Appropriate provisions are made for campus recruitment and placement assistance					
12	The laboratories are well-equipped and maintained					
C	Teaching & Examination					
1	Administrative and teaching staff is cooperative and supportive					
2	Course curriculum is well structured and up to date					
3	Quality of teaching-learning					

	is up to the mark					
4	Faculty student ratio is satisfactory					
5	Teaching staff is well-qualified and experienced					
6	Appropriate teaching aids are used in classes					
7	Teacher-student interaction is encouraged in the campus					
8	Teachers are Regular and punctual for classes					
9	Examination system is appropriate and well defined					
10	Examination results are declared in time					
11	Evaluation of exams are unbiased					
12	Grading system is well defined					
13	Exam re-evaluation rules are well defined and followed					
14	RDC is held timely for Research Scholars <i>(to be filled only by Ph.D. scholars)</i>					
15	Ph.D. viva is timely conducted <i>(to be filled only by Ph.D. scholars)</i>					
16	Students are encouraged to participate in extracurricular activities					
17	I would recommend others to study in DEI					
D	Library Facilities					
1	All Required books are available in the library					
2	Library is well equipped with journals/e-journals/software's/database					
3	Library timings are suitable for students					
4	Sufficient reading space is available for the students					
5	Sufficient number of books					

	are issued at a time					
6	Library staff is supportive and courteous to students					

Any other comments/observations -

Staff Feedback Form

Please provide the following information (optional):

Department: Faculty:

1. Please mention the reason for joining DEI. (Please rank in order of strength of the reason):

S No	Parameters	Rank
1	Better career opportunity	
2	Good working environment	
3	Location (vicinity)	
4	Discipline	
5	Standard Norms	
6	NAAC Accreditation	
7	Goodwill of the Institute	
8	Good Package	
9	Others (Please Specify)	

2. Please tick the most appropriate box suited for given statements:

S No	Parameters	Do Not Agree	Agree to lesser extent	Moderately Agree	Agree to greater extent	Completely Agree
A	Administration					
1	Fair recruitment and selection process is followed					
2	Proper orientation for newly selected employees					
3	Administrative staff is cooperative and supportive					
4	Salary and other financial incentives are timely provided					
5	Staff benefit schemes information are timely available to the staff					
6	Tax related provisions are clarified to the staff					
7	University By-laws are accessible to all staff					
8	Internal promotion rules are well defined and properly followed					
9	Leave application rules are consistent					

	with UGC rules					
10	Adequate time is taken in leave application processing					
11	Post retirement support services are up to the mark					
12	ID card and Library card issued well in time					
13	Working hours are properly defined					
B	Infrastructure					
1	Infrastructure, water and sanitation facilities are up to the mark					
2	Campus discipline and security is appropriate					
3	Proper first-aid and other emergency services are available in the campus					
4	Photocopy/Printing/stationery facilities are available to the staff in the campus					
5	Canteen facility is available in the campus					
6	Regular power supply is available in the campus					
7	Proper Parking facility is available in the campus					
8	ATM/Telephone facility is available in the campus					
9	Proper internet facility is available for staff in the campus					
10	Required working equipment and facilities are properly available to the staff					
11	Proper sports and extra-curricular facilities are available for students in the campus					
12	Appropriate provisions are made for campus recruitment and placement assistance					
13	The laboratories are well-equipped and maintained					
C	Academic (For teaching staff only)					
1	Proper distribution of work load					
2	Course curriculum is well structured and up to date					

3	Quality of teaching-learning is up to the mark					
4	Appropriate teaching aids are available in classes					
5	Teacher-student interaction is encouraged in the campus					
6	Examination system is appropriate and well defined to teaching staff					
7	Evaluation of exams are unbiased					
8	Grading system is well defined to teaching staff					
9	Teaching staff is encouraged for research activities					
10	Teachers are encouraged to participate in conferences and seminars					
11	Sufficient number of workshop/seminar/conferences/FDP's are organized for staff					
12	Proper sports and extra-curricular facilities are available for students in the campus					
13	Appropriate provisions are made for campus recruitment and placement assistance					
14	The laboratories are well-equipped and maintained					
D	Library Facilities(For teaching staff only)					
1	All Required books are available in the library					
2	Library is well equipped with journals/e-journals/software's/database					
3	Library timings are suitable for staff					
4	Sufficient reading space is available for the staff					
5	Library staff is supportive and courteous with teaching staff					
6	Proper training provided to teaching staff for using e-resources					
<i>Any other comments/observations</i>						

DAYALBAGH EDUCATIONAL INSTITUTE (DEEMED UNIVERSITY)

EMPLOYERS FEEDBACK FORM

Dear Madam, Sir

We thank you for having chosen DEI for recruiting students. We would request you to spend a few minutes to answer the questions below related to our students and systems. Your response will greatly help us improve the quality of our systems and programmes. These responses will be kept completely confidential. Thanks.

(A) Please rate the following attributes / systems at DEI on a scale of 1 (lowest) to 5 (highest)

	Rating (on a scale of 1 to 5) 1-poor; 5-excellent	
1	Placement process (timing, organisation, response)	
2	Infrastructure at DEI campus	
3	Support from DEI	

(B) Please look at the attributes below as applied to students of DEI working in your organisation. Please rate the students on a scale of 1 (poor) to 5 (excellent)

		1 (lowest)	2	3	4	5 (highest)
1	Comfort level while working in teams					
2	Technical knowledge & skills					
3	Displaying creativity and innovation in assigned tasks					
4	Analytical skills (ability to visualize, articulate and conceptualize both complex and uncomplicated problems by making decisions that are sensible given the available information)					
5	Communication Skills (Verbal, Non-Verbal and Written)					
6	Use of Information Technology and computers					
7	Use of data and statistical tools to support decision making					
8	Leadership skills / ability to manage					
9	Planning and organisation skills					
10	Demonstrating initiative					
11	Displaying adaptability and flexibility as per situation					

		1 (lowest)	2	3	4	5 (highest)
12	Working under pressure					
13	Managing time efficiently					
14	Looking for ways to perform better					
15	Working beyond schedule if required					
16	Overall evaluation of the students					

(C) In D.E.I. certain values are reinforced in students. Please rate the students on a scale of 1 (lowest) to 5 (highest) based on the values displayed by the student in day to day tasks

Rating (on a scale of 1 to 5) 1-poor; 5-excellent	
1. Hard working	
2. Demonstrating Integrity	
3. Demonstrating Self-reliance	
4. Selfless service to others	
5. Cooperation within and outside team	
6. Honesty in everyday tasks	
7. Sincerity towards work	
8. Dignity of labour	
9. Humility	
10. Any other (please list) _____	

(D) What specific feedback would you want to give DEI regarding changes in courses / curricula that would help its students perform better in industry

(E) What feedback would you want to give DEI regarding the skills that need to be developed in the students during their stay in DEI

(F) Please mention any other comments which you would like to provide

DAYALBAGH EDUCATIONAL INSTITUTE (DEEMED UNIVERSITY)

ALUMNI FEEDBACK FORM

Dear Alumni,

We thank you for having chosen DEI to complete your course. We would request you to spend a few minutes to answer the questions below. Your response will greatly help us improve the quality of our systems and programmes and will be kept completely confidential. Thanks.

(A) Please rate the following attributes / systems at DEI on a scale of 1 (lowest) to 5 (highest)

		Rating (on a scale of 1 to 5 1-poor; 5-excellent)
1	DEI Admission Process	
2	Infrastructure and Other Facilities	
3	Teaching Staff	
4	Administrative Staff	
5	Examination System	
6	Training (Summer / Co-op)	
7	Placement Activities	
8	Library facilities	
9	Canteen facilities	
10	Hostel facilities (if applicable)	

(B) Please look at the statements below as applied to DEI, mark your choice accordingly.

		Do Not Agree	Agree to lesser extent	Moderately Agree	Agree to greater extent	Completely Agree
1	Teaching at DEI focuses on concepts so as to make learning better					
2	The learning I had in DEI has been useful in my career / further education					
3	The continuous evaluation pattern used in DEI is useful for					

		Do Not Agree	Agree to lesser extent	Moderat ely Agree	Agree to greater extent	Comple tely Agree
	student development					
4	The examination system at DEI is well planned					
5	DEI has a strong alumni association which is active and supportive					
6	Students passing out from DEI generally do well in their professions					
7	The courses that are taught at DEI help meet contemporary requirements					
8	DEI focuses on holistic development of the student rather than just academic					
9	DEI involves alumni in its activities					
10	Less weightage should be given to extracurricular activities in the overall system at DEI					
11	The course curriculum and contents at DEI are updated regularly					
12	The innovative features of D.E.I. (such as interdisciplinary courses, work-based training, social service,					

		Do Not Agree	Agree to lesser extent	Moderat ely Agree	Agree to greater extent	Comple tely Agree
	continuous evaluation etc.) has helped me in my outlook and job					
13	Values (e.g. hard work, self-reliance, selfless service, cooperation, honesty, sincerity, dignity of labour etc.) that are reinforced in DEI have made a significant impact on me					
14	I would recommend others to study in DEI					

(C) Please mention any other comments which you would like to provide.

Dayalbagh Educational Institute (Deemed University)

Alumni Survey 2018

(Students who graduated from DEI (beyond School level) between 1981 & 2018)

Demographic Data

1	Name (optional)				
2	Address (optional)				
3	Age		Gender	Male / Female	
4	Present Occupation				
5	Position/Designation				
6	Job Through		Placement Office/Own Efforts		
7	<i>Faculty & Department / Technical College / Women's Polytechnic / Distance Education & Location / ICT Centre & Location / Any other (For a complete list of faculty & departments, refer Annex I)</i>		Please specify (DEI):		
8	<i>Module/Certificate/Diploma/ Undergraduate/ PG Diploma/ Masters/M.Phil/Ph.D.</i>		Please specify (DEI):		
9	Specialization, if any				
10	Year of entry (DEI)				
11	Year of passing (DEI)				
12	Are you a member of any Alumni Association?		Yes/No; If Yes, Name of Association:		
13	Education				
	School/College	Year	Programme	% (optional)	Rank (optional)

Instructions

The objective of this survey is to get feedback from Alumni of the Dayalbagh Educational Institute (DEI) to help improve the quality of DEI. Space is provided after each section for your additional comments, if any.

Each statement given in the survey has to be rated on **one** of the following scales depending upon its application. The ratings have to be on 1 to 5 scale only. Please read the statements carefully and indicate the rating of each attribute by placing a tick mark (✓) against the statement. **Please avoid neutral ratings as far as possible.**

Rating Scales

1 (Disagree)	2 (Somewhat Disagree)	3 (Neutral)	4 (Somewhat Agree)	5 (Agree)
1 (None)	2 (25%)	3 (50%)	4 (75%)	5 (All)

Dimensions for Assessment

PART A (PLEASE ANSWER ALL QUESTIONS)

	1. TEACHING / TEACHERS	<i>NONE</i>	25%	50%	75%	ALL
	Rating Scale	1	2	3	4	5
1	Teachers' knowledge of the subject is excellent.					
2	Teachers continuously update themselves about the latest in their field.					
3	Teachers display genuine enthusiasm in teaching.					
4	Teachers explain/clarify doubts in the class.					
5	Teachers encourage students to ask questions in the class.					
6	Teachers substantiate lectures with practical examples.					
7	Teachers are regular and punctual in conducting the class.					
8	Teachers are available and helpful for clearing doubts outside the class.					
9	Teachers are more interested in private tuition than teaching in the class					
10	Teachers are impartial in the class.					
11	Teachers are well prepared for the class.					
12	Teachers are well respected by the students.					
13	Teachers distribute the relevant reading material in the class.					
14	Teachers regularly take feedback from students and are open to students' opinions.					
15	Teachers provide motivation for self-learning					
16	Teachers focus on concepts so as to make learning better.					
17	Overall quality of teachers/teaching in the program was excellent.					

	2. EVALUATION	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	Rating Scale	1	2	3	4	5
1	Criteria for evaluation are scientifically designed to ensure learning.					
2	Continuous evaluation pattern used in DEI is useful for student development.					
3	DHA (Daily Home Assignment) concept used in DEI is useful for student development					
4	Evaluation focuses on testing students' application of knowledge.					
5	All teachers uniformly implement the evaluation system.					
6	Testing is fair and transparent.					
7	Evaluation gives a good indication of a student's learning and achievement.					
8	Exams and tests are well planned and scheduled appropriately during the semester.					
9	Number of quizzes and tests are adequate.					
10	Assignments given are challenging.					
11	Students undertake assignments seriously.					
12	Students treat external exams casually because of their low weightage in the overall evaluation.					
13	DEI focuses on holistic development of the student					

	3. CURRICULUM	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	Rating Scale	1	2	3	4	5
1	Subjects covered in the curriculum are relevant to the area of specialization.					
2	Weightage given to courses in the overall system is appropriate.					
3	Contents of courses are updated at regular intervals.					
4	Fundamental concepts are well covered in the courses.					
5	Question banks are relevant and useful for courses.					
6	Curriculum encourages creativity/research.					
7	Adequate emphasis is given to developing communication skills					
8	Courses that are taught in DEI help meet contemporary requirements.					
Additional Comments						

	4. RESOURCES	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	Rating Scale	1	2	3	4	5
1	DEI has adequate resources for teaching/teaching aids.					
2	DEI has facilities for photocopying /printing etc.					
3	DEI has well equipped labs to meet course requirements.					
4	DEI has good computer facilities for students.					

	5. LIBRARY	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	Rating Scale	1	2	3	4	5
1	Library has adequate books of the subjects taught.					
2	Students get the desired books whenever needed.					
3	Library journals are available to students if needed.					
4	Timings of the library are suited to students.					
5	Photostat facility is adequate in the library.					
Additional Comments						

	6. INFRASTRUCTURE	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree
	Rating Scale	1	2	3	4	5
1	Classrooms are well designed.					
2	Reading room facility is available to students.					
3	Toilets are well maintained.					
4	Canteen facilities exist in the campus.					
5	Sports facilities are adequate in the campus.					
6	Campus has well laid out gardens /greenery.					
Additional Comments						

8. VALUES AND INNOVATIONS					
<p>In DEI certain values (e.g. hard work, self reliance, selfless service, cooperation, honesty, sincerity, dignity of labour etc. are reinforced in students. Please indicate the extent to which these values have made an impact on your personal and professional life.</p>					
	NONE	25%	50%	75%	100%
Rating Scale	1	2	3	4	5
1. Hard work					
2. Integrity					
3. Self reliance					
4. Selfless Service					
5. Cooperation					
6. Honesty					
7. Sincerity					
8. Dignity of labour					
9. Humility					
10. Any Other (Please list.)					
<p>Have the innovative features of DEI (such as interdisciplinary courses, work-based training & social service) helped you in your general outlook and career? Please also suggest other innovative features that can strengthen the education system of DEI</p>					
9. Suggest three areas of DEI that need improvement.				10. Suggest three areas of strength of DEI	

11. OVERALL RATING OF D.E.I. (Please encircle your choice)				
Below Average 1	Satisfactory 2	Good 3	Very Good 4	Excellent 5
Would you recommend others to study in DEI? Yes/No		<i>If yes, why? If no, why not?</i>		
Do you think education in DEI has helped you in shaping your career? Yes/No/To some extent		Please explain.		
Did you participate in the DEI Alumni Survey conducted in 2003		Yes / No		

Date_____

Place_____

PART B (OPTIONAL)

12. SKILLS & COMPETENCIES					
Please assess the preparedness of a DEI student in the following skills / competencies when he / she passes out. Please use a scale of 1 (lowest) to 5 (highest)					
	Very Low	Low	Medium	High	Very High
Rating Scale	1	2	3	4	5
1. Intellectual Skills e.g. ability to think independently & exercise critical judgement, demonstration of creativity & innovation, analytical skills, problem solving skills and ability to apply practical knowledge & project experience to new situations					
2. Communication Skills e.g. writing ability, ability to articulate & convey a message coherently, fluency in speaking & making presentations and listening skills					
3. Computers and Use of Information Technology e.g. basic familiarity with computers & computer software, ability to use IT for professional development and programming					
4. Quantitative and Design Skills e.g. ability to apply mathematical concepts, ability to use empirical data & statistical tools to support decision making and ability to design & conceptualize a system					
5. Interpersonal Skills e.g. ability for diverse & cross-functional teamwork, ability for team building and for taking ownership of team results					
6. Management Skills e.g. leadership, project planning & management, initiative & responsiveness, professional ethics, integrity, ability to work under pressure, adaptability & flexibility and time management					

7. Self-Development and Growth e.g. knowledge of latest developments, maintaining balance between theoretical knowledge & practical applications, ability to develop plans & methodologies for implementation, zeal to succeed and urge to perform better					
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Annexure I: List of Faculties & Departments at DEI

Faculty of Arts	Faculty of Commerce	Faculty of Education	Faculty of Engineering	Faculty of Science	Faculty of Social Sciences
<ul style="list-style-type: none"> • Department of Drawing & Painting • Department of English • Department of Hindi • Department of Home Science • Department of Music • Department of Sanskrit 	<ul style="list-style-type: none"> • Department of Accountancy & Law • Department of Applied Business Economics 	<ul style="list-style-type: none"> • Department of Foundations of Education • Department of Pedagogical Sciences 	<ul style="list-style-type: none"> • Department of Electrical Engineering • Department of Mechanical Engineering 	<ul style="list-style-type: none"> • Department of Botany • Department of Chemistry • Department of Mathematics • Department of Physics & Computer Sciences • Department of Zoology 	<ul style="list-style-type: none"> • Department of Economics • Department of Management • Department of Psychology • Department of Sociology & Political Science

<p style="text-align: center;">Alumni Survey EXECUTIVE SUMMARY Preliminary Report 14th December 2018</p>
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Background

A survey of DEI Alumni was conducted recently covering the Alumni of all Faculties, Technical College and Distance Education, and all those who graduated pre and post 1981. This report provides a preliminary summary and analysis of responses received till date.

Objective of Survey

The objective of the survey was to collect feedback from DEI Alumni in order to:

- Identify areas of possible improvement; and
- Gauge extent of progress made since the last such Alumni survey in 2003,

as part of the overall agenda to continue to enhance the quality of education at DEI.

Survey Methodology

1. Design the Alumni Feedback Form (AFF) along the same pattern as the last Survey.
2. Make the AFF available on “Google Forms” to be completed and submitted on-line.
3. Encourage participation by sharing of the “Google Link” through various communication channels:
 - DEI website and Alumni networks
 - Email and Social media (WhatsApp& Twitter)
 - Word of mouth.
4. Collect and gather responses received on “Google Forms”.
5. Create database of submissions, perform analysis and comparison with prior survey.

6. Compile findings and prepare report.

Survey Time-frame

The communication of survey to the Alumni community started early in April 2018, with a planned deadline of July 2018. Most responses were received during the months of June & July 2018, but due to poor response in some faculties, informal follow-up activity continued during August & September 2018. The portal was finally closed on 4th November. Preliminary results have been analysed and completed in November & December 2018.

Summary of Questions

- Feedback and inputs taken from Alumni, both in quantitative (numerical, scale of 1-5) and qualitative (written) terms.
- The 64 questions used last time were increased to 75 this time.
- Additional 11 questions were designed to capture certain key developments at DEI since 2003 (e.g., DHAs, Distance Education, Skill based training, etc.).

All questions were categorised in the same 8 Dimension as before, as follows:

S. No.	Dimension	Number of Questions	
		2018	2003
1	Teaching/Teachers	17	16
2	Evaluation	13	10
3	Curriculum	8	7
4	Resources	4	4
5	Library	5	5
6	Infrastructure	6	6
7	Other Areas	13	6

Other Areas
includes new seven
questions on Skills
& Competencies

8	Values & Innovation	9	10
Total Questions		75	64

Summary of Coverage

Alumni from six Faculties and Technical College from last time were covered again, and this time, Alumni from Distance Education was also included:

NOTE ON "OTHER"	
•	This includes REI (pre'81), WTC (Pre'81), Women's Polytechnic, etc.
•	Where the response did not mention any faculty or mentioned more than one faculty, it was captured in "Other Faculty"

S. No	COUNTS (NOS)
1	ARTS
2	COMMERCE
3	EDUCATION
4	ENGINEERING
5	SCIENCE
6	SOCIAL SCIENCES
7	TECHNICAL COLLEGE
8	DISTANCE EDUCATION
9	OTHER

DE Includes ICT Centres

Rating Scale

Each question was rated on a scale of 1 through 5, as follows:

Rating	Explanation	%
1	Disagree	None
2	Somewhat Disagree	25%
3	Neutral	50%
4	Somewhat Agree	75%
5	Agree	All

Scale for Overall Rating of DEI was as follows:

Rating	Explanation
1	Below Average
2	Satisfactory
3	Good
4	Very Good
5	Excellent

Overall Summary of Responses

PART 7 of Responses		2018	2018	2018	YEAR OF PASSING OUT			
		TOTAL Responses	MALES	FEMALES	2010-2018	2003-2009	1981-2002	Pre 1981-
S. No	COUNTS (NOS)							
1	ARTS	23	2	21	11	4	7	1
2	COMMERCE	51	31	20	30	8	12	1
3	EDUCATION	16	1	15	4	3	7	2
4	ENGINEERING	166	160	6	79	32	42	13
5	SCIENCE	85	28	57	40	13	30	2
6	SOCIAL SCIENCES	137	53	84	81	28	27	1
7	TECHNICAL COLLEGE	143	136	7	79	40	23	1
8	DISTANCE EDUCATION	68	29	39	52	11	4	1
9	OTHER	21	0	21	11	5	2	3
	TOTAL	710	440	270	387	144	154	25
		100%	62%	38%	55%	20%	22%	4%
	% of TOTAL							
1	ARTS	3%	0%	8%	3%	3%	5%	4%
2	COMMERCE	7%	7%	7%	8%	6%	8%	4%
3	EDUCATION	2%	0%	6%	1%	2%	5%	8%
4	ENGINEERING	23%	36%	2%	20%	22%	27%	52%
5	SCIENCE	12%	6%	21%	10%	9%	19%	8%
6	SOCIAL SCIENCES	19%	12%	31%	21%	19%	18%	4%
7	TECHNICAL COLLEGE	20%	31%	3%	20%	28%	15%	4%
8	DISTANCE EDUCATION	10%	7%	14%	13%	8%	3%	4%
9	OTHER	3%	0%	8%	3%	3%	1%	12%
	OVERALL	100%	100%	100%	100%	100%	100%	100%

- A total of 710 Alumni responses were received, majority (62%) from male participants.
- Majority (62%) of overall responses and (67%) of male responses, are from Alumni of:
 - Faculty of Engineering
 - Technical College.
- Majority (52%) of female responses are from Alumni of Faculties of:
 - Science
 - Social Sciences.
- More than 55% of the responses are from recent graduate Alumni (last 8-year pass-outs).
- Overall participation from Alumni of Faculties Arts and Education was not encouraging.

Comparison of Responses to Prior Survey

		2018	2003	2018	2003	2018	2003
		TOTAL	TOTAL	MALES	MALES	FEMALES	FEMALES
S. No	COUNTS (NOS)	Responses	Responses				
1	ARTS	23	63	2	0	21	63
2	COMMERCE	51	30	31	18	20	12
3	EDUCATION	16	31	1	2	15	29
4	ENGINEERING	166	102	160	102	6	0
5	SCIENCE	85	86	28	31	57	55
6	SOCIAL SCIENCES	137	56	53	24	84	32
7	TECHNICAL COLLEGE	143	31	136	31	7	0
8	DISTANCE EDUCATION	68	0	29	0	39	0
9	OTHER	21	53	0	9	21	44
	TOTAL	710	452	440	217	270	235
		100%	100%	62%	48%	38%	52%
	% of TOTAL						
1	ARTS	3%	14%	0%	0%	8%	27%
2	COMMERCE	7%	7%	7%	8%	7%	5%
3	EDUCATION	2%	7%	0%	1%	6%	12%
4	ENGINEERING	23%	23%	36%	47%	2%	0%
5	SCIENCE	12%	19%	6%	14%	21%	23%
6	SOCIAL SCIENCES	19%	12%	12%	11%	31%	14%
7	TECHNICAL COLLEGE	20%	7%	31%	14%	3%	0%
8	DISTANCE EDUCATION	10%	0%	7%	0%	14%	0%
9	OTHER	3%	12%	0%	4%	8%	19%
	OVERALL	100%	100%	100%	48%	100%	52%

- Overall participation is up 57% (from 452 to 710), and excluding Distance Education, is up 42%.
- Distance Education comprised 10% of total in 2018.
- Most of the increase in participation is from Alumni of:
 - Faculty of Engineering
 - Faculty of Social Sciences
 - Technical College.
- Majority of decline in participation (down to 5% from 21%) is from Alumni of:
 - Faculty of Arts
 - Faculty of Education.
- Male participation increase is from Technical College, while female participation increase, from Social Sciences.

Note: Of the 710 respondents in 2018, 113 (or 16%) had also participated in the 2003 Survey.

Frequency Distribution

Each of the 710 participants responded to 75 questions, as a result of which a database of approximately 53,000 (75 x 710) responses were collected for further analysis.

This chart shows the count of responses to each of the 1-5 scale ratings (number represents the response count).
Rating of 5 shows a steep increase in 2018.

This chart shows the % of responses to each of the 1-5 scale ratings (number represents % of total).
Rating of 2 & 4 shows a slight decline in 2018.

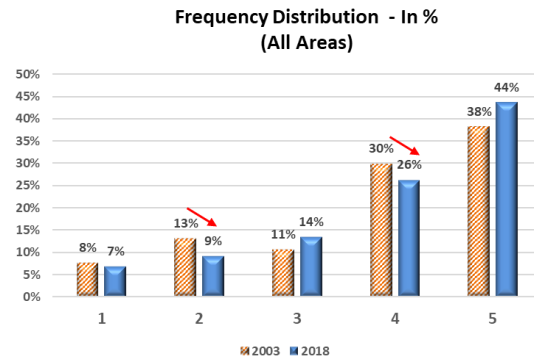
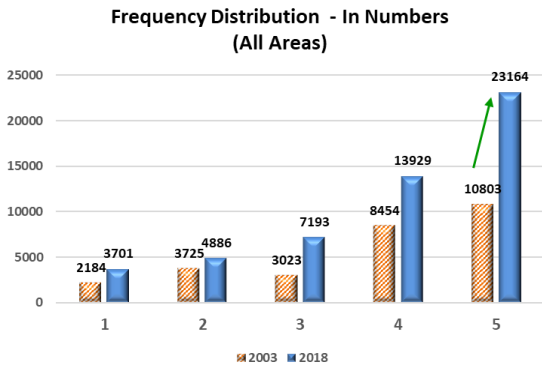
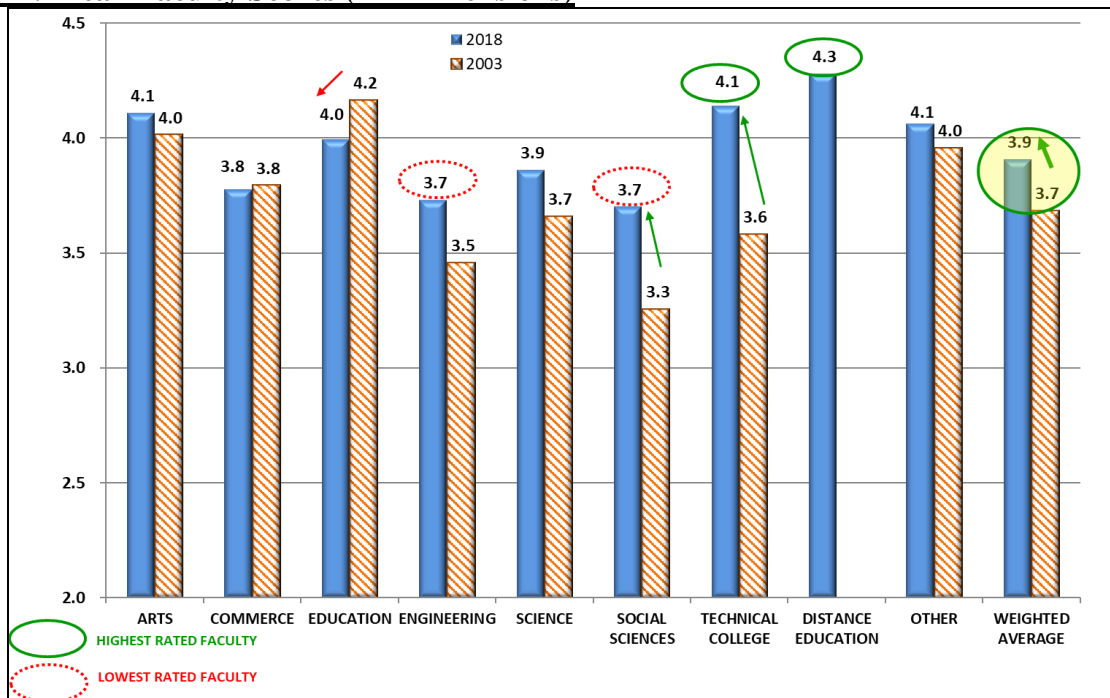


CHART 1: Mean Faculty Scores (All Dimensions)



- Overall Score for all Faculties combined has gone up to 3.9 in 2018 from 3.7 in 2003.
- Increase is mainly because of a significant improvement in Social Sciences and Technical College.
- There is a slight decline in the score of Education (although the sample size is too small to be representative)
- Distance Education and Technical College are rated the highest.
- Engineering and Social Sciences Faculties continue to trail in overall rating, compared to others.

CHART 2: Mean Dimension Scores (All Faculties)

- Overall Score for all Dimensions combined has gone up to 3.9 in 2018 from 3.7 in 2003.
- Increase is mainly because of a significant improvement in Library and Other Areas.
- Values & Innovations continues to be the highest rated area.
- Resources and Infrastructure continue to trail in overall rating.

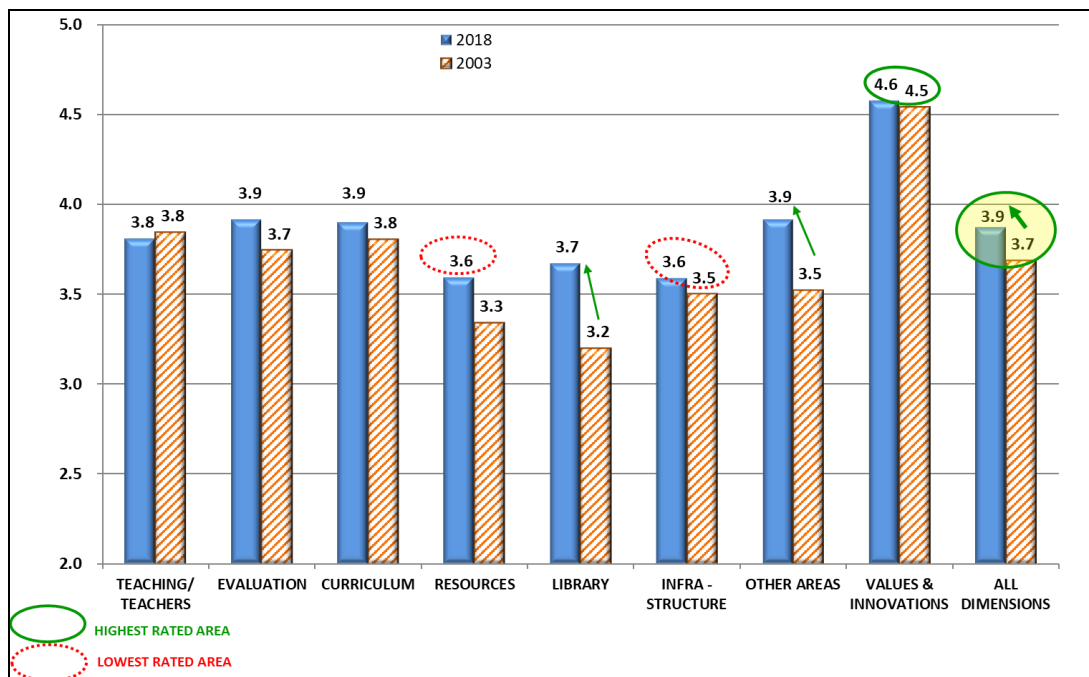
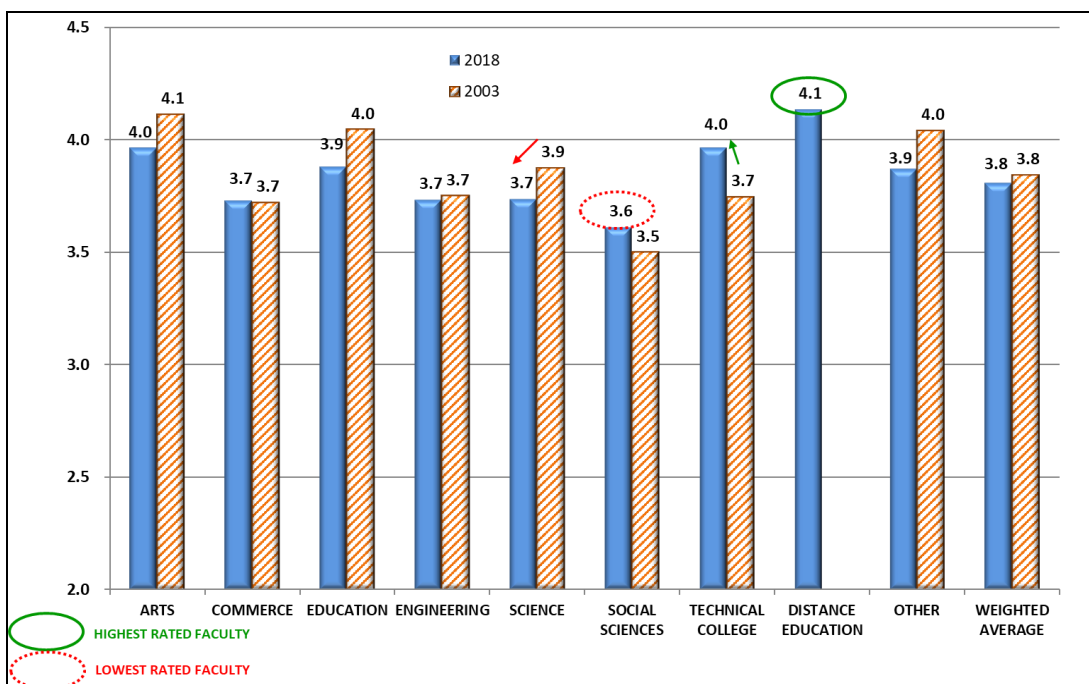
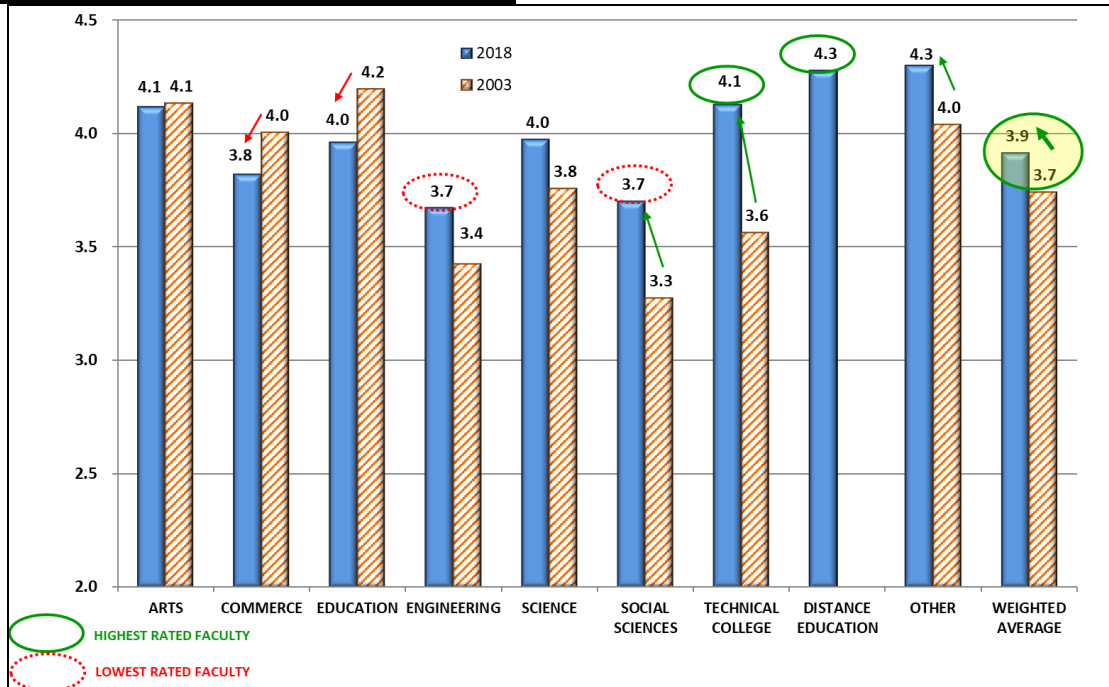


CHART 3: Mean Faculty Scores (Teachers/Teaching)



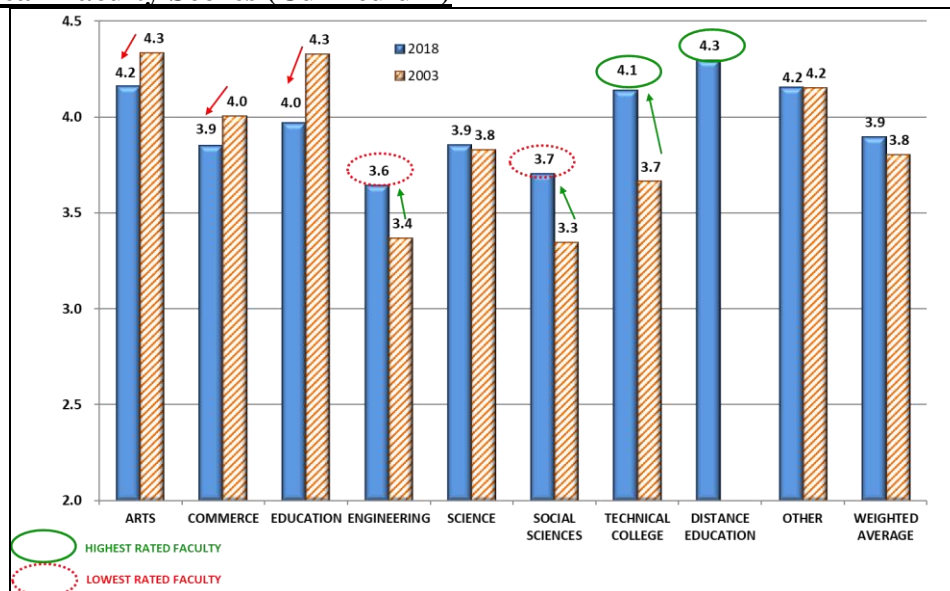
- While Overall Score is stable at 3.8, there are slight changes in some Faculties.
- Technical College shows a slight increase while Science Faculty a small decrease.
- Distance Education is rated highest, while Social Sciences the lowest.

CHART 4: Mean Faculty Scores (Evaluation)



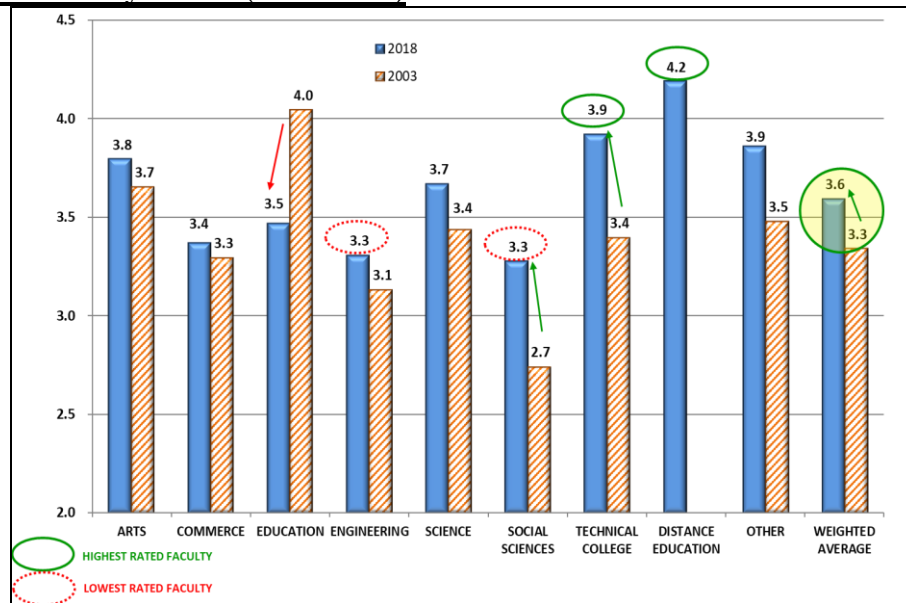
- Overall Score for all Faculties combined has gone up to 3.9 in 2018 from 3.7 in 2003.
- Increase is mainly because of significant improvements in Social Sciences Faculty and Technical College.
- There is a slight decline in the score in Education and Commerce Faculties.
- Distance Education and Technical College are rated the highest.
- Faculties of Engineering and Social Sciences continue to trail in overall rating.

CHART 5: Mean Faculty Scores (Curriculum)



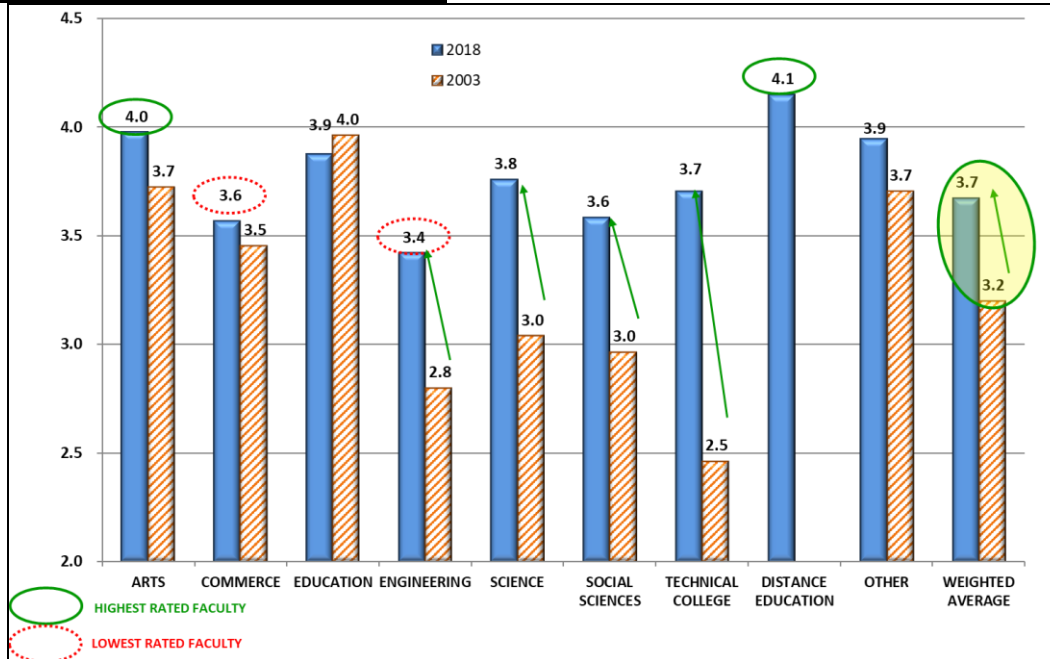
- Overall Score for all Faculties combined has gone up marginally to 3.9 in 2018 from 3.8 in 2003.
- Increase is mainly because of improvements in Faculties of Engineering, Social Sciences and Technical College.
- There is a decline in scores in the Faculties of Arts, Commerce and Education.
- Distance Education and Technical College are rated the highest.
- Faculties of Engineering and Social Sciences continue to trail in overall rating, despite their improvements.

CHART 6: Mean Faculty Scores (Resources)



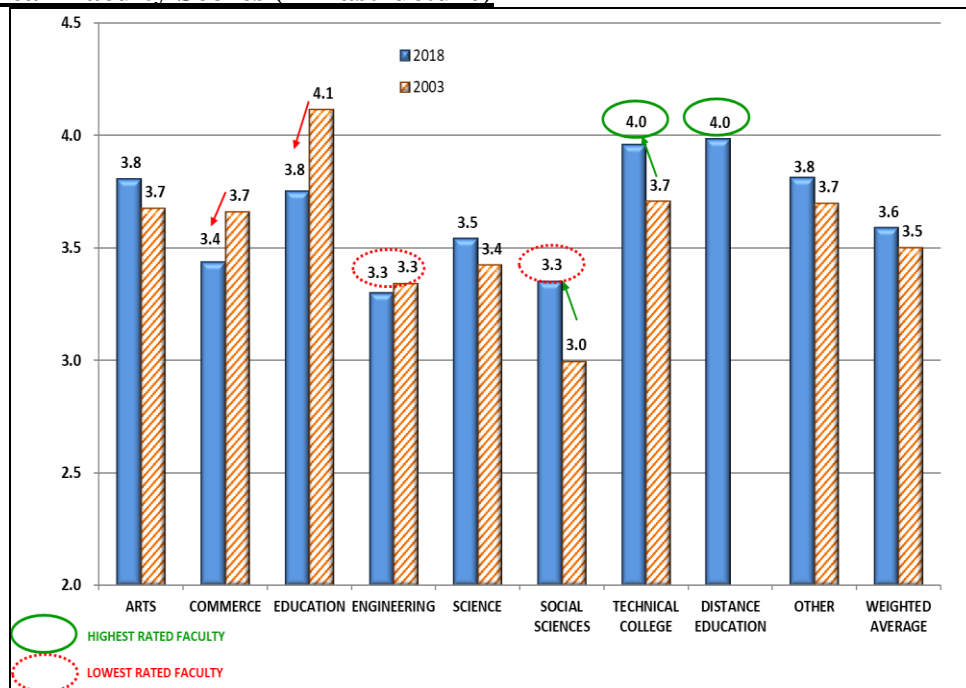
- Overall Score for all Faculties combined has gone up significantly to 3.6 in 2018 from 3.3 in 2003.
- Increase is mainly because of significant improvements in Faculty of Social Sciences and Technical College.
- There is a significant decline in score in the Faculty of Education.
- Distance Education and Technical College are rated the highest.
- Faculties of Engineering and Social Sciences continue to trail in overall rating, despite their improvements.

CHART 7: Mean Faculty Scores (Library)



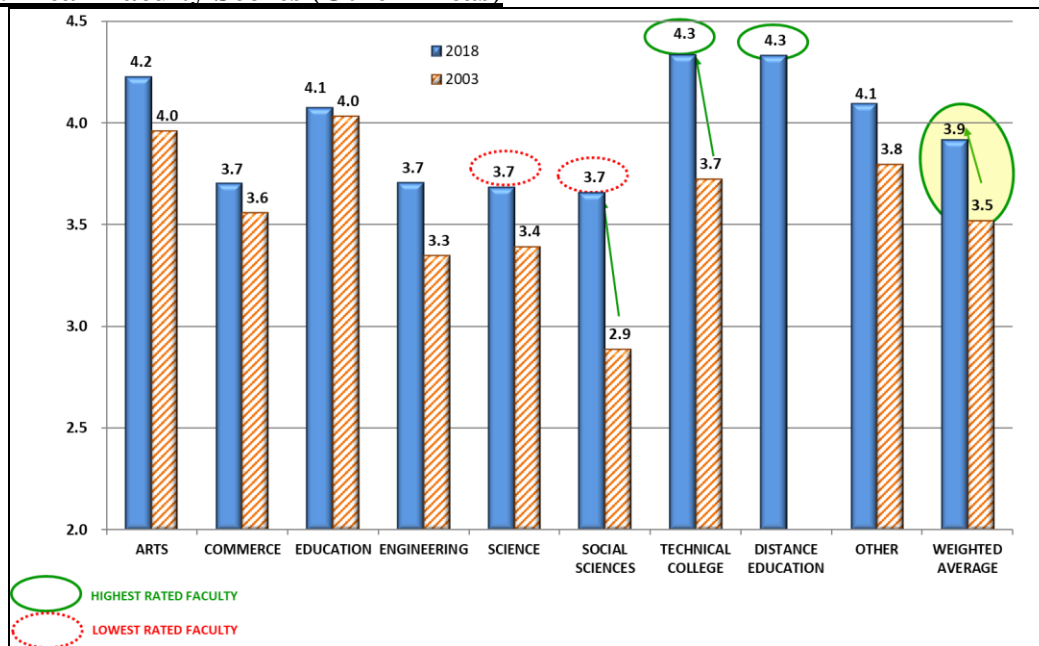
- Overall Score for all Faculties combined has gone up significantly to 3.7 in 2018 from 3.2 in 2003.
- Increase is mainly because of significant improvements in almost all the Faculties.
- There is a slight decline in scores in the Faculty of Education, but its sample size is very small.
- Distance Education and Faculty of Arts are rated the highest.
- Faculties of Commerce and Engineering continue to trail in overall rating.

CHART 8: Mean Faculty Scores (Infrastructure)



- Overall Score for all Faculties combined has gone up marginally to 3.6 in 2018 from 3.5 in 2003.
- Faculty of Social Sciences & Technical College show a slight increase.
- Faculties of Commerce and Education show a slight decline.
- Distance Education and Technical College are rated the highest.
- Faculties of Engineering and Social Sciences continue to trail in overall rating.

CHART 9: Mean Faculty Scores (Other Areas)



- Overall Score for all Faculties combined has gone up significantly to 3.9 in 2018 from 3.5 in 2003.
- Increase is mainly because of a significant improvement in Faculty of Social Sciences and Technical College, along with slight improvements in other Faculties as well.
- Distance Education and Technical College are rated the highest.
- Faculties of Science and Social Sciences continue to trail in overall rating, despite their improvements.

NOTE: There were seven new questions added in this area regarding skills and competencies (See [Chart 13](#)).

CHART 10: Mean Faculty Scores (Values & Innovation)

- Overall Score for all Faculties combined has gone up marginally to 4.6 in 2018 from 4.5 in 2003.
- Technical College shows a slight increase along with some other Faculties
- A significant decline is noticed in Others category, while the Faculty of Commerce also shows a slight decline.
- Distance Education and Technical College are rated the highest.
- Faculties of Commerce and Social Sciences are rated the lowest.

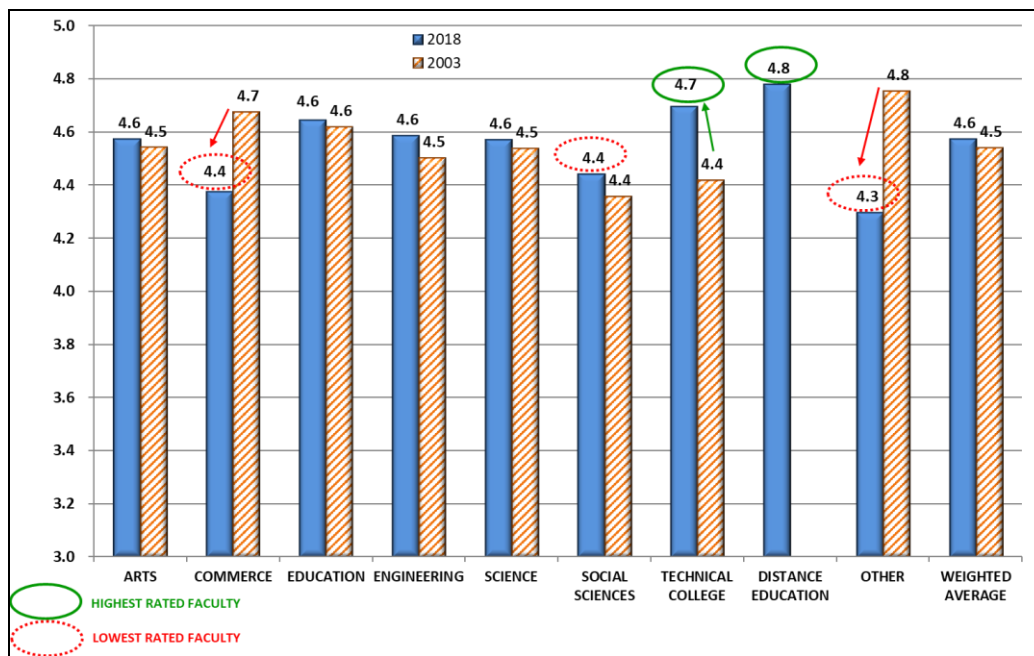
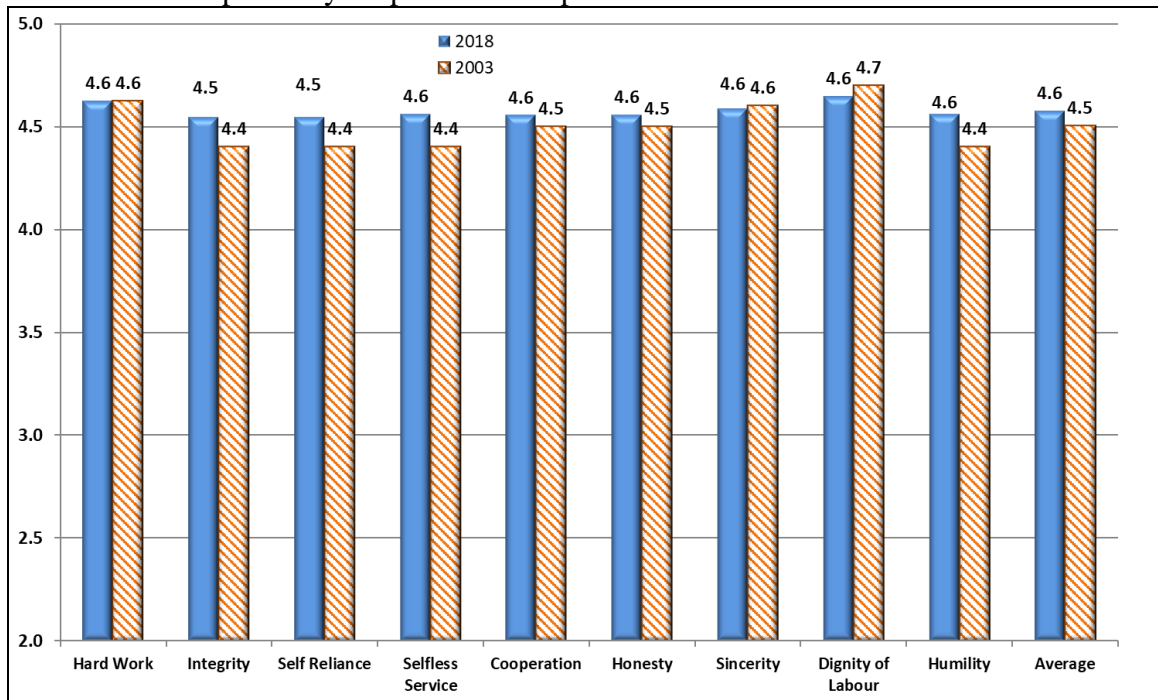


CHART 11: Mean VALUE Scores (Value Attributes)

QUESTION: In DEI certain values are reinforced in students. Please indicate the extent to which these values have made an impact on your personal and professional life.

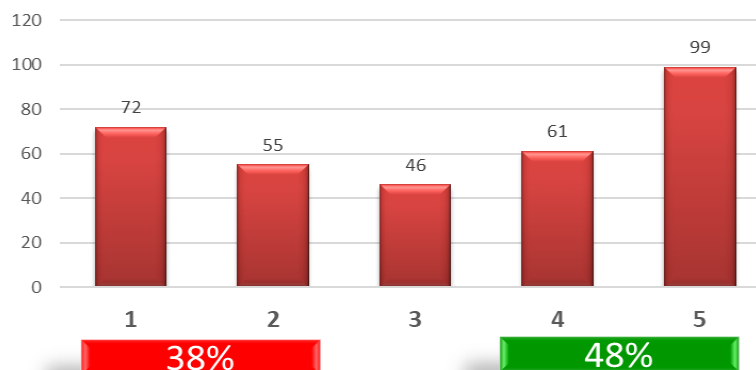


- Overall Score for all Faculties combined has gone up marginally to 4.6 in 2018 from 4.5 in 2003.
- Almost all the attributes of Values are showing a slight increase contributing to the overall increase.
- The Value Scores remain as the highest rated category, with all areas rated above 4.5 (out of 5.0).

CHART 12: Response to new question on DHAs

QUESTION: Daily Home Assignment (DHA) concept used in DEI is useful for student development.
Please only answer if graduated from DEI after 2014 - 333 or 46% responded.

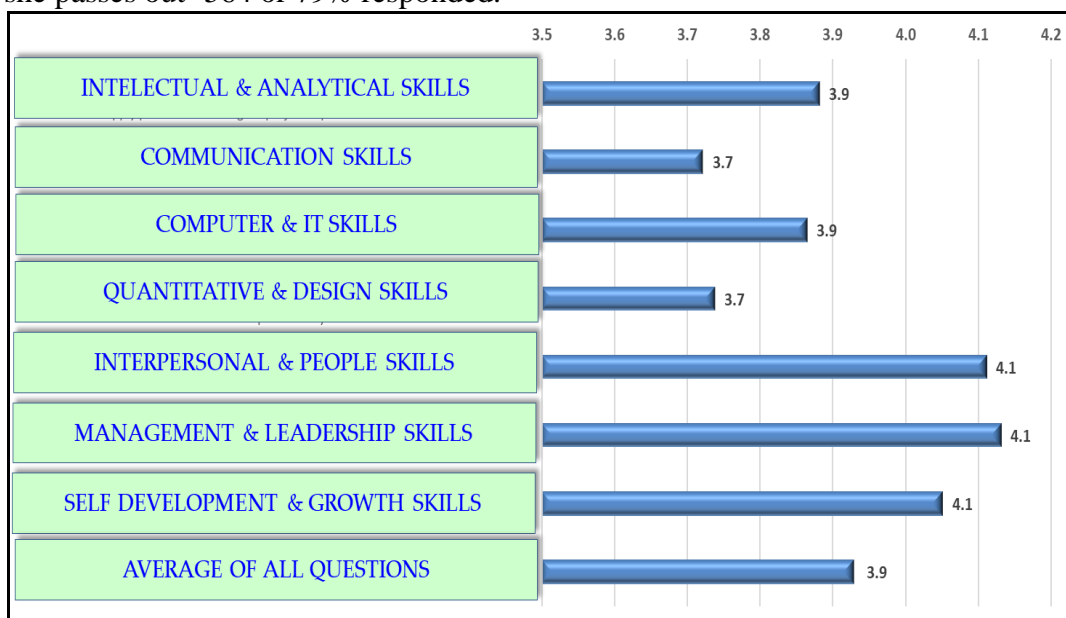
FREQUENCY DISTRIBUTION - RESPONSE TO DHA QUESTION



- Overall Response is VERY MIXED – 38% DISAGREE, while 48% AGREE.

CHART 13: Response to new questions on SKILLS (Other Areas)

QUESTION: Please assess the preparedness of a DEI student in the following skills / competencies when he / she passes out- 564 or 79% responded.



- Overall Average Rating at 3.9 is low due to subdued ratings in two areas (Communication Skills & Quantitative & Design Skills).
- Interpersonal and Management & Leadership Skills are rated high.

Details of the specific questions posed in the Survey Form for the above-mentioned skills are as follows:

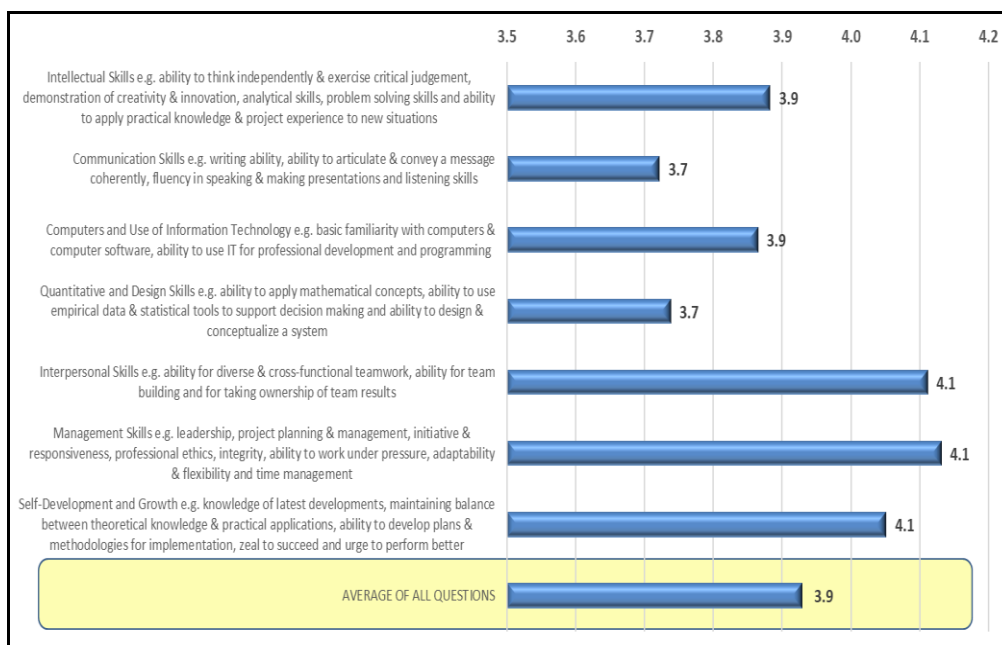
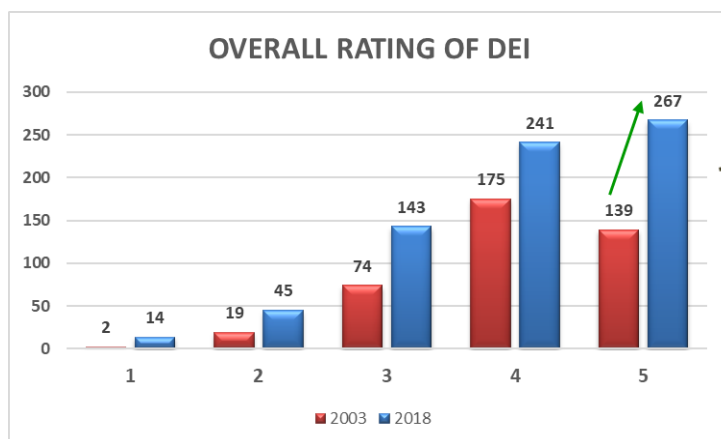


CHART 14: Overall Rating

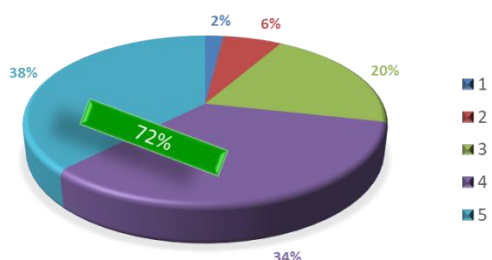
Summary of responses to the Question asking for an overall rating of DEI.



THE TOTAL NUMBER OF RESPONSES IN 2018 WAS 710 vs 409 IN 2003.

THERE IS A MARKED INCREASE IN THOSE RATING DEI AS A "5" IN THE OVERALL RATING.

OVERALL RATING OF DEI - 2018



OVERALL RATING OF DEI - 2003

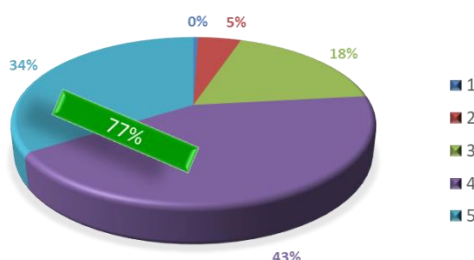


CHART 15: Would you recommend DEI

There is an increase of 1% (from 5% to 6%) in those who would NOT recommend DEI.

S. No.	FACULTY	2018				2003			
		TOTAL Responses	Yes	NO	NO %	TOTAL Responses	Yes	NO	NO %
1	ARTS	23	22	1	4%	63	60	3	5%
2	COMMERCE	51	44	7	14%	30	28	2	7%
3	EDUCATION	16	14	2	13%	31	31	0	0%
4	ENGINEERING	166	155	11	7%	102	97	5	5%
5	SCIENCE	85	78	7	8%	86	84	2	2%
6	SOCIAL SCIENCES	137	129	8	6%	56	47	9	16%
7	TECHNICAL COLLEGE	143	139	4	3%	31	30	1	3%
8	DISTANCE EDUCATION	68	67	1	1%				
9	OTHER	21	20	1	5%	53	53	0	0%
	TOTAL	710	668	42	6%	452	430	22	5%

- Vast majority (94%) continue to recommend DEI. Only small decline from prior.
- Largest increase is in the Faculties of Education and Commerce, while Social Science shows some improvement.

ANALYSIS OF EXPLANATION GIVEN BY THOSE WHO SAID “NO”

45%	Teachers/Teaching methodology/Education system
21%	Poor Career counseling/Placements support
11%	General/Miscellaneous/Vague reasons
8%	Poor Infrastructure
5%	Bias/Partiality in the staff etc.
5%	Unique Issue /problem which went unaddressed
5%	Other/irrelevant response

NOTE: Verbatim inputs received to qualitative questions are analyzed at Faculty level.

Overall Highlights

- Overall Score for all Faculties across all Dimensions has gone up to a respectable 3.9 in 2018 (from 3.7 in 2003).
- Similarly, the Overall Score for all Dimensions across all Faculties has gone up to a respectable 3.9 in 2018 (from 3.7 in 2003).
- The areas of Values continue to command a very respectable overall rating of 4.6 (up slightly from 4.5)
- Overall response is Mixed to a new question on DHA – whether it’s useful for students’ development – with close to 38% of respondents disagreeing and 48% agreeing.
- Overall rating for new questions on Skills & Competencies is highest in the following areas:
 - Interpersonal and People Skills
 - Management and Leadership skills
 - Self-Development and Growth skills.
- Responses to overall rating of DEI indicates that a vast majority (72%) regard it above average (4 or 5 rating), although slight decline from last survey (77%).
- An overwhelming number of respondents (94%) would recommend DEI to others, although slight decline from last survey (95%).

Based on the feedback of the students, the total marks obtained are calculated by adding marks for each point (10 for scale 10, 9 for 9, 5 for 5 etc.). Then the Dean communicates the same to the concerned teacher personally and warns him in case the total is less than 50%.

Teachers do take the personal feedback to understand the problems of the students and improve their own performance.

Different teachers do prepare their sheets differently. Two such sheets are as follows:

Sample 1:

DAYALBAGH EDUCATIONAL INSTITUTE

Date _____

Review of the Course

Please take a few moments to answer the questions below. Your responses will greatly assist me in improving my learning processes and provision.

Course: - xxx-xxx**Tutor:** - _____**Session:** - July-December 2008

TEACHERS SELF EVALUATION SURVEY	ALWAYS EXCELLENT	MOSTLY/ V. GOOD	FREQUENTLY/ GOOD	NEVER/BE LOW	NOT APPLICABLE
DESCRIPTION OF TEACHER	1	2	3	4	
1. Well prepared and organized					
2. Knowledgeable about the subject					
3. Presentations are clear and understandable					
4. Make the subject interesting					
5. Conveys enthusiasm					
6. Is open to student opinions					
7. Allows questions and answer clearly and understandably					
8. Show genuine interest in and concern for the students in the class					
9. Available and helpful outside the class					
10. Requires students to think					
11. High overall level of teaching					
12. Exercises good control over the class					
13. Regularity in conducting classes					
14. Teaches all the units					
15. Completes the course in time					
16. Substantiate the lecture with practical examples					
17. Legible writing					
18. Encourage discussions					
DESCRIPTION OF THE COURSE					
1. Objectives and procedure were made clear					
2. Testing is fair, gives a good indication of student achievement					
3. Tests were challenging and worthwhile					
4. I have learnt a great deal from this course					

FURTHER COMMENTS ON:

Mannerisms
Voice/Speech
Suggestions for improvement
Sample 2:

D.E.I. Faculty of Engineering
Student's Feed Back Form

In order to improve teaching-learning process you are required to give your objective observations concerning the course teacher on the items given below. This will be kept secret and will have no negative consequences upon you.

Semester: _____ Batch: _____ Date: _____

Course: _____ Course Teacher: _____

S.N.	Mark Tick (✓) in the column which is most appropriate in your opinion.				
1.	Well prepared and organised	Always	Mostly	Rarely	Never
2.	Knowledge of the subject matter	Excellent	V. Good	Good	Below Average
3.	Clarity in presentations	Excellent	V. Good	Good	Below Average
4.	Ability to explain the subject matter	Excellent	V. Good	Good	Below Average
5.	Ability to create interest in the subject	Excellent	V. Good	Good	Below Average
6.	Allows questions in the class and answers clearly and understandably	Always	Mostly	Rarely	Never
7.	Deviates from the subject matter	Never	Rarely	Mostly	Always
8.	The questions asked test the understanding of the student	Always	Mostly	Rarely	Never
9.	Shows genuine interest and concern for the students in the class	Always	Mostly	Rarely	Never
10.	Motivates the students to study	Always	Mostly	Rarely	Never
11.	Sense of humour	Excellent	V. Good	Good	Below Average
12.	Conducts classes regularly	Always	Mostly	Rarely	Never
13.	Maintenance of discipline in the class	Excellent	V. Good	Good	Below Average
14.	Completes the course in time	Always	Mostly	Rarely	Never
15.	Audibility of voice	Excellent	V. Good	Good	Below Average
16.	Legibility of handwriting	Excellent	V. Good	Good	Below Average
17.	Fair in evaluation	Always	Mostly	Rarely	Never
18.	Evaluation done in time	Always	Mostly	Rarely	Never
19.	Evaluation helps the students to improve	Always	Mostly	Rarely	Never
20.	Tests are challenging and worthwhile	Always	Mostly	Rarely	Never
21.	Available and helpful outside the class	Always	Mostly	Rarely	Never

22.	Would you like to be taught by him in future	Always	Normally	Not often	Not at all
23.	Overall level of teaching	Excellent	V. Good	Good	Below Average

Internal Quality Assurance Cell

The Internal Quality Assurance Cell of the Institute was constituted on 16 September, 1995. It performs the following tasks on regular basis:

1. Improvement in quality of teaching and research by regular inputs to all concerned based on feedback from students.
2. Providing inputs for best practices in administration for efficient resource utilization and better services to students and staff.
3. Providing inputs for Academic and Administrative Audit and analysis of results for improvement in areas found weak.

Academic and Administrative Audit Committee (AAAC)

An Academic and Administrative Audit Committee constituted as per the norms of UGC, regularly visits the department every semester, conducts meeting with students individually and takes feedback. Then the committee holds meeting with staff and conveys the shortcomings if any about the courses and the teachers. In case of critical cases, the chairman warns the concerned teacher to improve.

9.3. Feedback on facilities (5)

The Feedback on facilities is taken during the Class committee meetings held quarterly. Students submit their report through Class Committee members and Class Proctors to the HOD for immediate attention towards a problem. Following is the format of feedback report:

Students, faculty and staff are motivated to provide feedback and help the institute to identify and fill the gaps. Please find below the links for Institute Feedback Forms for all stakeholders: (Internal) <http://10.2.0.60/deifedback/index.htm>

REVIEW REPORT: STUDENTS FEEDBACK TO THEIR PROCTORS

TO BE SUBMITTED			
BY: CLASS COMMITTEE MEMBERS	Name:	TO: CLASS PROCTORS	
FACULTY:		DEPTT.:	
CLASS:			
DATE:			
1	Topic Taught		
2	Copy of DHA		
3	Quality of Teaching		
4	Improvements if any		
5	Conditions:		
	a	Toilet	
	b	Classrooms	
	c	General	

		<i>Facilities</i>	
	<i>d</i>	<i>Uniform</i>	
6	<i>Effectiveness of the Core Courses</i>		

In addition to the above, the AAAC also enquires the students thoroughly about the facilities and in case of any problem, warns the person concerned to rectify the problem urgently during the meeting with staff.

9.4. Self-Learning (5)

The curriculum include compulsory institute core courses for all UG students that are designed for overall development of student to evolve into a complete human being, and all of these components are not strictly restricted to prescribed syllabus but give freedom to student to pursue topics of interest. These include

- Compulsory Co-curricular courses
- Games
- Work-experience courses
- Comparative study of religions
- Cultural Education
- Rural Development
- Agricultural Operations
- Non-departmental Half Courses
- Social Service
- Scientific methodology, General Knowledge and Current Affairs

The students have to pursue following curricular components which require them to expand the boundaries of learning and exercise self-learning. These components include

- Major Project
- Minor Project
- Projects during internship programs during summer terms after I year (30 days), II year (40 days) and III year (180 days)
- Rural Engineering Project
- Design Engineering and Theme Development project
- Product manufacturing project
- Seminars and Group discussion
- Assignments that require knowledge of software tools
- Lab courses that uses software tools for simulation

Further, students are encouraged to participate in student competitions, hackathons, technical paper presentations etc. which provide scope for learning beyond the prescribed syllabus.

The institute provide following facilities for the students for supporting self-learning

VidyaPrasar

Institutes' on-line collaborative learning, live web cast and content management system VidyaPrasar, in its present state of development, provides course web publishing, file storage and

sharing facilities through a web based connection to the Internet thus providing with full portability.

VidyaPrasar hosts course websites and material and Wiki for courses in Computer Science and Engineering. Live streaming services, interactive seminars, e-Books, on-line self-examination facilities, and video-on-demand services etc are its main features. Sponsored by the National Mission on Education through Information and Communication Technology (NMEICT) this project is part of a tri-institute collaborative initiative coordinated by the Indian Institute of Technology, Bombay, and with the Amrita University as the third partner.

SWAYAM

SWAYAM is a programme initiated by Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. Students are taking advantage of Swayam portal regularly.

NPTEL

Students do take the advantage of NPTEL courses beyond class room lectures for enhancing knowledge and strengthening their understanding.

Teaching-Learning in DEI follows a student-centric process employing experiential, participative, problem solving and constructivist methodologies, through (a) Teaching Methodology, (b) Experience-Based Courses, (c) Different Modes of learner-centered teaching (d) a wide range of co-scholastic components and (e) Specialized Centres of Learning.

(a) **Experiential and Participatory Teaching-Learning** methods used include:

1. Seminar cum Group Discussions
2. Individual and Group Projects
3. Self-Study and Dissertations
4. Field work
5. Case Analysis
6. Presentations
7. Term Papers
8. Self-Study Courses
9. Active Learning: Flipped Classroom, Team work, Students as teachers
10. Video viewing cum discussions
11. Research Colloquia

(b) Experience-based/ Practice-oriented courses

Based on the principle of '*Learning by Doing*' a large proportion of courses in each programme have a high practical component to provide hands on learning experience to the students:

1. *Work-Based training*
2. *Co-operative Industrial Internship*
3. *Performing Arts Courses*
4. *Vocational and Skill courses*
5. *ICT courses*
6. *Rural Development Core course with focus on Agricultural Operations*

7. *Scouting and Guiding Programme*
8. *Student Centred Online Teaching-Learning System (SCOTLS) for B.Ed. and M.Ed. Internship at remote locations (incorporating Tablet-based teaching in collaboration with Microsoft, India.)*
9. *Teaching Internship in adopted tribal villages and neighbouring community schools.*
10. *Vocational and Skill courses*

(c) Learner-Centred Modes of Education

Learner-Centred modes of teaching-learning are used that make learning self-paced and self-regulated:

- (i) **Vidyaprasar**(www.vidyaprasar.dei.ac.in), an *on-line collaborative learning, live web cast and content management system* with state-of-the-art interactive learning resources. MOOCS developed by DEI and under e-PG-Pathshala and SWAYAM.
- (ii) **e-DEI-de** program of DEI for certification through on-line modular courses for open and distance learners.
- (iii) **Ten Virtual and Remote Triggered Laboratories**
- (iv) **MOOCS**, especially for online vocational courses. DEI has created the first skillpedia in regional languages named, Massive Online Courseware Skilling and Entrepreneurship Network for India (MOOCSKENE-Bharat). The network offers free on-line learning in multiple languages across the country.
- (v) Variety of Elective courses.

(d) Co-Scholastic Learning Components

A wide range of compulsory co-scholastic learning components cater to varied learner interests and potentialities that include co-curricular activities, games and sports, yoga, community outreach, field and industrial visits, creative and problem-solving contests and Field and Industry experience. A Business Advisory Clinic provides free consultancy to Business firms and Industries facing difficulties. Faculty members and students take up real life case studies and offer appropriate guidance. More than 6,000 cases have been taken up and resolved satisfactorily.

(e) Specialized Centres of Learning

The advanced centres of learning include:

1. Multi-disciplinary Quantum and Nano Systems and the Consciousness Studies Virtual Centers
2. The Virtual Advanced Lab for Interactive Design, Analyze, and Test in Electronics – eVALIDATE.
3. **The iNFORMATION-cOMMUNICATION-nEURO-cOGNITIVE- Technologies Assisted Language Lab(I-c-n-c-TALL)**
4. **2G to 5G, IOT, AI and Robotics Laboratories**
5. **Quantum Jugaad Centre and Entrepreneurship and Virtual Incubation Centre**

The above teaching learning modalities ensure experiential and participatory learning leading to a holistic development of students within and beyond the classroom.

9.5. Career Guidance, Training, Placement (10)

Training, counselling and placement is offered to every graduating student for her to be confident and competitive in her choice of career and for inculcating entrepreneurial skills.

Students of the institution are employed in Financial Institutions, educational institutions, IT companies, automobile industries, central and state government services, textiles industries and core engineering industries. During their course of study a five month Cooperative Education programme is made compulsory. Co-operative education is a structured method of combining classroom-based education with practical work experience in the industry. It entails cooperation between Institute and Industry to produce trained professionals. DEI is collaborating with University of Waterloo (a global leader in the Co-op education model) and has launched its own Co-op model in 2013, suitably adapted to Indian conditions. The model aims at development of 'employability skills' through the introduction of a 6 month industry stint as part of the course requirement.

Indian Industry has lately been very concerned with the lack of requisite technical and soft skills of students entering industry. The recent 'National Employability report' claims that 47% of graduates across India are unemployable for any job¹. The time and cost of training students after education is becoming a major challenge for industry. Three key reasons why DEI has launched the Co-op model are:

- Global practices
- Need expressed by industry in various interactions and forums in the past
- Need for reducing high rates of attrition amongst fresh graduates due to mismatch in culture and expectations

The Co-op model was launched by DEI in 2013 for its Engineering and MBA programmes. 100% of the students were placed within 5 months of the launch of the programme. The feedback from the first set of returning students has been excellent. 80% of companies paid stipend or provided some non-financial support.

While the cost of recruiting, training and developing a fresh graduate can be upwards of one year's salary, most fresh graduates leave the organisation within 2 years due to non-fitment with culture and working environment. The Co-op model allows organisations to observe the candidate closely for an extended period of time thus allowing a deeper understanding of the competencies and fit of the student. The students bring fresh ideas and perspectives to the organisation and they can be assigned routine duties or special projects. Students on the other hand gain immensely through an extended on-the-job understanding of how academic principles are applied in real situations and an opportunity to test the skills learnt in the classroom. The interaction and feedback from re-turning students and participating organisations allows the University to enhance and improve its curriculum. With a deeper understanding of the industry, which grows with each passing year, the faculty are able to relate practice to theory better.

Summer Training process is of a short duration and primarily aimed towards exposing students to industry practices. By the time students learn about the organisation and its processes, the training period is close to completion. Co-op model on the other hand is a partnership between the industry and the institute. Assignments (routine as well as special) are given with a view to

let the student face real situations with intensive supervision by the project guide and supported by the faculty of the institute. The longer period also allows the organisation to understand the personality and motivation of the student and use this information at the time of recruitment. The stipend or some other non-financial support provided by the organisation helps motivate the trainee to deliver his or her best performance and industry also gets involved in overseeing the trainee's work. A request letter in the following format is sent to the industries for training.



DAYALBAGH EDUCATIONAL INSTITUTE

(Deemed University)

DAYALBAGH, AGRA – 282005, U.P., INDIA

Phone: (0562)-2801545; Fax: (0562)-2801226

Web: <http://www.dei.ac.in/>

January 20, 2018

To,
Manager (HR)
Cadence Design Systems
NOIDA

Dear Sir/Madam,

Greetings from Dayalbagh Educational Institute!

DEI is a Deemed University located in Dayalbagh, Agra, well known for its academic ascendancy and extramural excellence. DEI has been accredited by the National Assessment and Accreditation Council (NAAC) and has been awarded an 'A' grade in October 2013. In 2009, a Committee set up by the Ministry of Human Resource Development (MHRD) under Professor P.N.Tandon placed DEI in 'A' category, third in rank and 8th among all 130 Deemed Universities under review. Recent overall NIRF ranking of the Institute is **63** and the **All India NIRF Ranking** of the DEI Faculty of Engineering is **69**.

From the year 2013, the DEI Faculty of Engineering introduced a compulsory 5-month Co-operative Education Internship Program for B.Tech. students after completion of their 6th semester of study. This unique internship program is one of very few such available in the country that offers a structured method of combining classroom-based education with practical work experience in the industry. It entails cooperation between Institute and Industry to produce trained professionals to meet current industry needs/skills. You will be happy to note that this initiative has been very well received by industry and over 60 companies / institutions have already participated in the program.

A brief introduction to the Co-operative Program (Co-op Program) is attached along with this email for your kind perusal. For B.Tech. students, the program is scheduled to run from **April 01, 2019 till August 31, 2019**.

Towards this end, we earnestly solicit your help and support by accommodating some of our B.Tech. (Electrical) students for the Co-op internship training in your esteemed organization as was being done in the past. I am enclosing the CVs of the following students who wish to undergo internship in your esteemed organization.

1.

I request you to kindly provide necessary facilities for the same at your works. The students may be allotted focused projects for the benefit of your organization under the joint supervision of an expert from your organization as well as faculty from our institute. We eagerly await your response to this email so that we can take the Co-op Program forward.

Thanking you and looking forward to hearing from you,
Sincerely,

Prof. Ajay Kumar Saxena
Head, Electrical Engineering

Measures initiated by the institution for student support and progression

- Introduction of need and skill based courses.
 - Offering Innovative, Add on and Certificate Courses.
 - Remedial coaching for slow learners.
 - Industrial and field visits
 - Internship / Cooperative Training for experiential learning.
 - Inclusion of students in various committees, departmental association and club meets
 - Making NSS /NCC mandatory for sensitizing the towards nation building activities.
 - Career Guidance and Placement Cell
 - Music and yoga classes
 - Participation in Corporate Social Responsibility
 - DEI has a programme of study which is designed to make a person “complete”. The core courses such as Agricultural Operations, Social Service, Comparative Study of Religion, Cultural Education, NSS, Games & Sports etc. help in developing the overall personality of the student. The classes for Career Guidance in particular start from third year onwards. During the four semesters (III – VIII), a compulsory slot is provided in the Time table for career Guidance activity.
-
- ICT Continuing Education Centre
 - In addition to the above, ICT Continuing Education Centre of D.E.I. regularly prepares students for a good career. For students with Hindi background, the cell conducts Spoken English Classes. Under the Career Guidance classes students are trained for Resume writing, Interview preparation, Co-op Training etc. Mock Interviews are conducted for practice.

The following table shows the activities conducted during last three years:

Data 2016-2018 (June)ICT Continuing Education Centre						
	Dates	2018 continuing	Dates	2017	Dates	2016
Soft Skills	Jan-March March-April	4+20+32= 56	Jan-April Aug-Nov Dec.	11+8+22 + 20+Winter Camp 48= 116	Feb-April July-Aug Sept.-Oct. Jan-May	14+7+20+43 +58 UPSDM 100= 242
Spoken English	Jan-April	20+ 42= 62	Aug'17-April'18	15+90= 105	Jan-April, Aug-Nov 2016	30 students, cont., 100+230= 330

Career Guidance	Jan-March 12th Jan-April 17 th	B. Tech Co- Op 260 students	Aug - December 17, Jan- April'17	260 Co- Op (B. Tech) students	Aug- March, Jan- April	190 Co- Op(B. Tech) students
Placement Preparation Interview /Workshop Resumes/ Mocks/ GD's	(Jan-April), Feb 11th, April 1st, March 18th, April 8th, April 11th	Resumes 100+ Workshop <i>Personal Effectiveness</i> <i>1</i> = 189 students, Mocks 30 students, GD's 30 students, Mocks 67 students, GD 25+50 students Total= 491	21/01/17, 19/02/17 17/09/17 24/09/17 29/10/17, 5/11/17 Aug-Nov, Oct 14th , December —	Mocks- 49 students GD's - 118 students attended 220 resumes checked, Co-Op guest lectures 190 students	Jan- April, March 11, Sept.- Nov 2016, July- Aug Aug- Nov'16, 13th Nov	<i>Seminar- Career In Public Relations, 100 attended, GD's 54 +100=154, Mocks 115+8=123,Co- Op Guest Lectures, GD Sahai70 MukulSahai, 19</i>
Basic IT	Jan-Feb	6 students for PPTmodule,	JAN- APRIL, Aug-Nov	12+3 = 15 for WORD	Feb- May, Aug- Nov	60+30+15= 105
Excel			March- April, Oct 19-26- 2nd(modula r)	30+51= 81	April, Nov 27th	22+53= 75
C-Prog			JAN-APRIL	11	AUG- NOV	11

AADEIs Training Programmes

Alumni Association of Dayalbagh Educational Institutions organizes Training programmes in collaboration with the Industry-Institute Partnership Cell and ensures the placement of the students of Engineering.

WRITE NAME IN BLOCK LETTERS FOR CERTIFICATES

1. Name: _____ M / F

2. SC _____ ST _____ OBC _____ GEN _____

3. STUDYING IN FACULTY _____

ROLL NO. _____

Subject /Class _____

SEMESTER _____

Contact Info. _____

For Jobseekers/Enhancers _____

Branch _____ Qualifications _____

Contact Info: _____

Please circle:

MODULES: WORD EXCEL POWERPOINT

Signature of Applicant: _____

Date _____

For Office Use:

Date: _____

Amount: _____ Due: _____



ICT Continuing
Education Centre,



We support
YOU

Office Located in rear verandah, Central Office,
Administrative Block, DEI,
Phone: 999-793-3440, 9808632807, 9634555217
Contact: Punam Prakash
Email: punam.prakash@gmail.com



Training Programs
In Collaboration With
Industry Institute Partnership Cell
for DEI Students
ITS 301 (2017-18)

DEI Courses for Enhancing
Job-Placement

Aim: Prepare and assist current and past DEI students for
placements, including the following:

- Train students in resume writing
- Develop interview and communication skills
- Practice group discussions
- Enhance IT skills and Vocational skills

Methodology: Distance Education Mode:

Teaching is conducted using pre-recorded audio or
video instructions, facilitated by mentors at the
locations where the course is run.

Calendar 2017-8, ITS301
ICT Continuing Education Centre
DEI, Dayalbagh

Aug	Sept	Oct	Nov	

Course Title: ITS 301

Course Description:

Developing skills in: understanding basic hardware, and software,
how to operate computers & Learning basics of Word, Excel, Power
point and Internet (Microsoft Office Tools) to prepare documents,
data tables and presentations, and use of internet

Dates/Class Timings:

When: July – Nov, Sundays/weekdays

Where: Commerce Faculty/Computer Centre

Time: 8:00, 9:30 AM Weekdays

2:00-3:30PM Sundays **Tuition:** Rs. 250/
with study materials per module
4classes per module

Registration From:

11:00 AM –4:30 PM NOW

Office (in the rear verandah at Central Office)



Location: Central Office (rear verandah)

Office Phone: 10:30-4:30 – 93645555217, 9997933440/
9808632807 Email: aadeisictcc.dei@gmail.com

Office Notes:



1. Name: _____ M / F

2. STUDYING IN FACULTY _____

ROLL NO. _____

Subject/Field _____

SEMESTER _____

Contact Info _____

3. NAME OF COURSE :

☐ PERL

Signature of Applicant: _____

Date _____

For Office Use:

Received from: _____ Date: _____

Amount: _____ Due: _____

AADEIs



Office Located in rear verandah, Central Office,
Administrative Block, DEI
Phone: 9808632807, 9634555217
Contact: Punam Prakash
Email: punam.prakash@gmail.com
aadeisctcec.dei@gmail.com

AADEIs Training Programs
In Collaboration With
Industry Institute Partnership Cell
for DEI Students
ITS 305 (2015-16)
An Introduction to Perl

**DEI -APAC Courses for Enhancing
Job-Placement**

Aim: Prepare and assist current and past DEI students for
placements, including the following:

- Train students in resume writing
- Develop interview and communication skills
- Practice group discussions
- Enhance IT skills and Vocational skills

Methodology: Distance Education Mode:

Teaching is conducted using pre-recorded audio or
video instructions, facilitated by mentors at the
locations where the course is run.



INDUSTRY INSTITUTE PARTNERSHIP CELL
DAYALBAGH EDUCATIONAL INSTITUTE
ICT Continuing Education Centre DEI Dayalbagh
ANNOUNCES

Placement Simulation (Free)

Last session this semester

- GD's 12 PM
- Aptitude Tests 12:45 PM
 - Mock Interview- 2 PM
- For Soft Skills Classes (Electrical & Civil 5th Sem)

& final semester students of B. Tech,
B. Tech 7thsem, Diploma 5thsem, all streams
Sunday, 19th November

*College Uniform, Bring 2 copies of your
checked resumes for the mock interview!*
Registration and Resume check : NOW
*Improve YOUR Communication Skills and
Technical knowledge for interviews, polish your
Personality to prepare for Placement....*

Where: Multimedia Hall/Commerce Faculty
at ICT CEC OFFICE in CAO

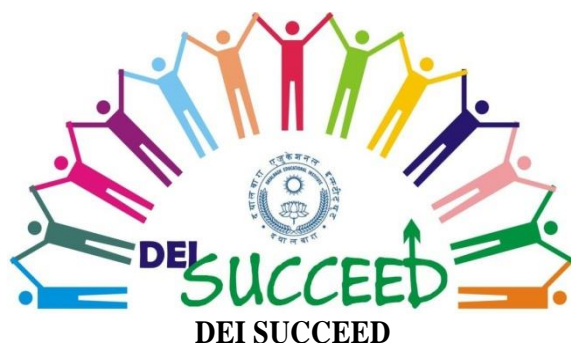
ICT Continuing Education Centre DEI Dayalbagh (Office)
Located in Central Administrative Office
Contact Information: **Punam Prakash**
(A) 9808632807, Office Phone: 963455217

9.6. Entrepreneurship Cell (5)

Since its inception in 1981, the Dayalbagh Educational Institute (Deemed University) has envisioned and successfully implemented an innovative, comprehensive, flexible and value based education system with the mission objective of evolving a complete man ("Total Quality Person"). In pursuance of this objective, the Entrepreneurship Virtual Incubation Cell (EVIC) seeks to engender within students an intense entrepreneurial drive by fostering innovation with a social relevance.

The EVIC aims to adopt an inter-disciplinary systemic approach, whereby initiatives taken are institute-wide, without regard to departmental barriers. These initiatives are incubated in-house with the objective of nurturing social entrepreneurs who will focus on providing low cost solutions in the following primary domains: Education (Culture, Values and Quality), Energy, Health, Water and Waste Management. The EVIC provides all possible assistance to promote creative thinking and an entrepreneurial mindset among the students so as to help convert socially relevant innovative ideas into market accepted products.

As part of TEQIP activities, the faculty has established DEI SUCCEED, startup cell to encourage startup activities in the faculty.



DEI Start Up Commencing Centre for Emerging Entrepreneurs of Dayalbagh

Introduction:

Skill development and entrepreneurship has been an integral part in the Education system of DEI, since its inception in 1917. In accordance with the lofty goal of Government of India for promoting vocational skill education, DEI has started several vocational courses to participate in Nation building through skill education and eventually imparting impetus to entrepreneurship. The modern age tools of tinkering labs, living labs and mobile labs imbibe general awareness and induce interest among students at school level. The values of rich Indian culture are sowed in young children through school of Art and Culture, Music School and School of Languages.

Besides the conventional education system, students have opportunity to learn and promote their hobbies as skill through Modular Courses starting from class VII onwards. Centre for Applied Rural Technology and Deen Dayal Upadhyay Kaushal Kendra serve as skill infusing organizations. Even students with prior learning and basic school level qualifications can be benefitted by lateral and diagonal transitions possible from Modular Course level to Graduation level to PhD.

DEI took a quantum leap in entrepreneurship development benefitting masses from tribal belts to international level through well established Labs and skill parks namely Automotive workshops, Apparel and toy manufacturing association and Agro& Dairy business avenues. Community entrepreneurship and societal contribution are imbibed in values and teachings of Dayalbagh. Entrepreneurial avenues like agriculture Dairy, Textile Manufacturing etc. has gained popularity in no time among students seeking skill development and entrepreneurial guidance. Unique schemes like earn while you learn are providing financial support while pursuing education to needy students and provides them better learning with concept of disposal of duties and shouldering responsibilities for self reliance. A super intelligent marketing network, connecting rural economic zones to state economic zones to international markets laid a sturdy foundation for deprived rural masses to sell their products, nationally and internationally. E-portals and business advisory clinics help in organized operation and establishment of entrepreneurial avenues for novices and young entrepreneurs. The Curriculum has Village Industries and Entrepreneurship, Agriculture Operations and Social Service as integral part and are compulsory core courses for students of all branches. The institute has already implemented schemes like Earn-while-you-learn, EVIC-Entrepreneurship Virtual Incubation Cell. All these facts make the Institute a fertile ground for advanced entrepreneurial activities.

To enhance the effectiveness of above mentioned endeavors and to provide need specific support to those with entrepreneurial aspirations, DEE SUCCEED has been established as a pre-incubating startup cell. Through the Cell, it is intended to build a strong eco-system for nurturing innovation and entrepreneurship and thus contribute to sustainable economic growth and generate large scale

employment opportunities.

Vision Objective:

Augment entrepreneurial culture among the faculties and students of the institute and promote new ideas, innovations and subsequently to convert these innovative ideas/problems to feasible business models and possible entrepreneurial venture.

Mission Specific Objectives:

1. To develop a critical mass of motivated students & faculties with entrepreneurial orientation & skill
2. To build infrastructure support for innovation & early stage enterprise development and enabling access to resource & facilities at institute
3. To enhance in-house competency development to serve potential and early stage entrepreneurs and student innovators at the institute.
4. To provide platform for the budding entrepreneurs to interact with industrialists, professionals and alumni for motivation and guidance
5. To strengthen the inter department and inter-institutional linkage, incubators and other ecosystem enablers at different levels,

Activities:

For realizing the objectives following activities are planned

- 1) To develop a critical mass of motivated students & faculties with entrepreneurial orientation & skill
 - a) Sensitization of target groups by organizing ice breaking sessions, motivational talks, interaction sessions with Alumni and successful entrepreneurs
 - b) Conduct General Entrepreneurial Tendency Test for students and staff for identification of dreamers and Dreamer Mentors
 - c) To organize Workshops on Design Innovation/ Problem Identification/ Rapid Prototyping / Idea generation hackathons and encourage students to participate
 - d) To encourage students and faculty to pursue and earn e-learning certificates on Entrepreneurship and Innovation
 - e) To arrange for interested students to undertake internship in Start-ups
- 2) To build infrastructure support for innovation & early stage enterprise development and enabling access to resource & facilities at institute
 - a) To prepare and display Service Chart for Students to avail services
 - b) Design and Print Promotion Material for Start-up Cell
 - c) To start Idea Club, Innovation Club and Start-up Club, establish organizational hierarchy in each of these and organize activities through these student clubs
 - d) Create provision for seed money support for major and minor projects of the students

- e) To provide seed money support to projects for student competitions
- 3) To enhance in-house competency development to serve potential and early stage entrepreneurs and student innovators at the institute.
 - a) Conduct Mentor Training/FDP/EDP /capacity development Programs
 - b) Provide trainings to in-house Experts
 - c) Reward outstanding mentors, student members for their contributions
 - d) Encourage faculty to carry out research on Entrepreneurship
- 4) To provide platform for the budding entrepreneurs to interact with industrialists, professionals and alumni for motivation and guidance
 - a) To arrange for alumni meet at campus
 - b) To arrange for interaction sessions with local entrepreneurs
 - c) Organize Tech-fest, competitions, hackathons
 - d) To organize visits, training to other institutions
- 5) To strengthen the inter department and inter-institutional linkage, incubators and other ecosystem enablers at different levels.
 - a) Conduct GETT for student and faculty of other departments of the Institute to extend the base of the Cell
 - b) Conduct Inter-Department Interaction Sessions to identify Current Industry & Societal problem & Entrepreneurship opportunity
 - c) Encourage Students to team up with Inter disciplinary representation to develop the Proof of Concepts (POC) for the proposed Solutions.
 - d) Encourage Students to participate and present their Ideas/Start-up models in various B-Plan Competitions/Events/ Workshops organized by other Lead institutes.

Events Planned

- 1. Conducting General Entrepreneurial Tendency Test for students, Staff for identification of dreamers and Dreamer Mentors
- 2. Organizing ice breaking sessions, motivational talks, interaction sessions with Alumni and successful entrepreneurs for students
- 3. To organize Workshops on Design Innovation, Problem Identification, Rapid Prototyping, Idea generation hackathons and encourage students to participate
- 4. Conducting activities through Idea Club, Innovation Club and Start-up Club
- 5. Conduct Mentor Training/FDP/EDP /capacity development Programs
- 6. Conduct GETT for student and faculty of other departments of the Institute to extend the base of the Cell
- Conduct Inter-Department Interaction Sessions to identify Current Industry & Societal problem & Entrepreneurship opportunity

9.6. Entrepreneurship Cell (5)

Since its inception in 1981, the Dayalbagh Educational Institute (Deemed University) has envisioned and successfully implemented an innovative, comprehensive, flexible and value based education system with the mission objective of evolving a complete man (“Total Quality Person”). In pursuance of this objective, the Entrepreneurship Virtual Incubation Cell (EVIC)

seeks to engender within students an intense entrepreneurial drive by fostering innovation with a social relevance.

The EVIC aims to adopt an inter-disciplinary systemic approach, whereby initiatives taken are institute-wide, without regard to departmental barriers. These initiatives are incubated in-house with the objective of nurturing social entrepreneurs who will focus on providing low cost solutions in the following primary domains: Education (Culture, Values and Quality), Energy, Health, Water and Waste Management. The EVIC provides all possible assistance to promote creative thinking and an entrepreneurial mindset among the students so as to help convert socially relevant innovative ideas into market accepted products.

Report of activities of DEISUCCEED

1. Startup Cell is formed and core team is constituted.

Team Members	Designation	Discipline	Role	Email	Contact
DR. G.S. SAILESH BABU	Associate Professor	Electrical Engineering	Coordinator	babu.sailesh@gmail.com	7060185804
DR. ASHOK YADAV	Assistant Professor	Mechanical Engineering	Member	ashokyadavaca@gmail.com	9412893447
ANURAG GUPTA	Assistant Professor	Mechanical Engineering	Member	deianuraggupta@gmail.com	8979555250
K. PRITAM SATSANGI	Assistant Professor	Electrical Engineering	Member	pritamsk@gmail.com	9412159166
PROF. PRAVEEN SAXENA	Professor	Accountancy & Law	Member	pravinsaxenadei@yahoo.co.in	9897136483

2. General Entrepreneurship Tendency Test (GETT) was conducted for about 400 B.Tech. students and about 50 dreamers were identified. Detailed List of dreamers is attached as Annexure 1.
3. Four Motivational Lectures and Technical Lectures were organized

Motivational Lectures Organized:

- 1) Lecture-cum-Interaction Session organized a on 28th November, 2017 on “Career Opportunities for Engineering Students: is Entrepreneurship a Viable Option?” by **Drs. Ajay Sharma, CEO at ASR Ventures & President Rotary International Hague, Netherlands**
- 2) Student Interaction Session organized a on 8th December, 2017 on “Internship, Choices, Career”, **Rajendra S Pawar, Chairman & Managing Director, NIIT**

Lecture-cum-interaction sessions Organized:

- 1) Lecture-cum-Interaction Session organized a on 7th December, 2017 on “Jugaad Innovation” by **Navi Rajdou, Author, Jugaad Innovation**
 - 2) Lecture-cum-Interaction Session organized a on 1st January, 2018 on “Self-powered and ultra-low-power circuits and system ” by **Prof. Aatmesh Shrivastava, Department of Electrical and Computer Engineering, Northeastern University in Boston, MA, USA.**
- Details are attached as Annexure 2.

4. A two day workshop on Matlab and Simulink in Engineering Education was organized for B.Tech. students on 27-28 March, 2018 and experts from Industry delivered lectures. Details are attached as Annexure 3.
5. A Campus Hackathon titled "**#buildwithDEI**" was organized from April 6 to April 8, 2018 to explore and address Societal problems. Details are provided as Annexure 4.

Annexure 1: Student Dreamers Identified

Number of students who scored above 40 in Gen. Entrepreneurial Tendencies Test : 54

S.No	Roll No.	Name	Sem	Branch	Score			Contact
1.	154061	Aashi Gupta	6	Electrical	49	GN	F	9410832218
2.	126188	Devashish Chauhan	8	Electrical	47	GN	M	7983436218
3.	144101	Rupal Mittal	8	Electrical	47	GN	F	9359288589
4.	154172	Shubhra Tyagi	6	Mechanical	47	GN	F	9410003676
5.	154175	Stuti Agarwal	6	Electrical	47	GN	F	8791411592
6.	154156	Pratyush Priyadarshi	6	Mechanical	46	GN	M	7417631661
7.	164016	Divya Gupta	4	Civil	46	GN	F	9412750283
8.	144079	Manasvi Pourush	8	Electrical	45	GN	M	9412850139
9.	144034	Prateek Jain	8	Electrical	44	GN	M	9897766136
10.	146459	Shivani Sharma	6	Mechanical	44	GN	F	9458283650
11.	154065	Amit Kumar	6	Electrical	44	SC	M	9927719025
12.	154173	Shuchita Mahajan	6	Mechanical	44	GN	F	9997184284
13.	1700845	Aman Agarwal	2	Mechanical	44	GN	M	8410755787
14.	144085	Mehar Verma	8	Electrical	43	GN	F	9319053512
15.	154081	Isha Saxena	6	Electrical	43	GN	F	9720041666
16.	154177	Sumiran Barnwal	6	Mechanical	43	BC	F	08235357527
17.	164045	Sanket Upman	4	Civil	43	GN	M	7500112282
18.	164113	Nitish Singh	4	Electrical	43	SC	M	9411964642
19.	144026	Mohit Rajput	8	Civil	42	BC	M	9758191055
20.	144072	Komalchitt Juneja	8	Electrical	42	GN	F	8954808447
21.	144114	Vasim Ali	8	Electrical	42	BC	M	9926335955
22.	144191	Ankit Yadav	8	Footwear	42	BC	M	
23.	154150	Netrapal Singh	6	Mechanical	42	GN	M	7037315375
24.	154167	Sarita Rawat	6	Mechanical	42	ST	F	9412256434
25.	164074	Aditi Chaturvedi	4	Electrical	42	GN	F	9451074561
26.	164080	Ambika Bhardwaj	4	Electrical	42	GN	F	8439588085
27.	164096	Ishita Saraswat	4	Electrical	42	GN	F	9410251040
28.	164111	Mohit Kumar	4	Electrical	42	SC	M	8650269007
29.	1700897	Shivesh Vikramaditya	2	Mechanical	42	GN	M	8279557250
30.	1700900	Shubhangi	2	Mechanical	42	GN	F	9412169979
31.	136021	Kirti Mishra	8	Civil	41	GN	F	9528828916
32.	144032	Prakher Gupta	8	Civil	41	BC	M	9927094591
33.	144103	Sankalp Rai Bhalla	8	Electrical	41	GN	M	9997980777
34.	154014	Dishani Singhal	6	Civil	41	GN	F	9358509899
35.	154092	Mamta Khimyani	6	Electrical	41	GN	F	8445923069

36.	154157	Punarvasu Sharma	6	Mechanical	41	GN	M	8889025385
37.	164078	Aman Singhal	4	Electrical	41	GN	M	9897248233
38.	1700644	Kapil Srivastava	2	Civil	41	GN	M	9540063650
39.	1700737	Rishabh Singhal	2	Electrical	41	GN	M	9719290305
40.	1700854	Bhanu Pratap Saini	2	Mechanical	41	BC	M	9456635351
41.	144031	Poornima Mathur	8	Civil	40	GN	F	9927058269
42.	144050	Suyash Goyal	8	Civil	40	GN	M	9045871198
43.	144074	Kunal Kumar	8	Electrical	40	SC	M	8439259209
44.	144095	Prateek Badhautia	8	Electrical	40	BC	M	9536075818
45.	146757	Rajiv Kumar	6	Mechanical	40	BC	M	8979738641
46.	154110	Shivam Khandelwal	6	Electrical	40	GN	M	8650701033
47.	154131	Arvind Singh	6	Mechanical	40	SC	M	9045659512
48.	154178	Tarun Agarwal	6	Electrical	40	GN	M	9897001167
49.	156421	Sachin Yadav	4	Mechanical	40	BC	M	9639954962
50.	164089	Bharat Dubey	4	Electrical	40	GN	M	9411963363
51.	164231	Kamal Kishor	4	Mechanical	40	BC	M	8744972287
52.	1700741	Sanmukh Sinha	2	Electrical	40	GN	M	919718997901
53.	1700817	Sumit Kumar	2	Footwear	40	ST	M	8630402977
54.	1700901	Siddharth Jain	2	Mechanical	40	GN	M	9837026708

Annexure 2: Lectures/talks Organized

Details of Motivational Lectures organized

Motivational Lecture-cum-Interaction Session organized a on 28th November, 2017 on

“Career Opportunities for Engineering Students: is Entrepreneurship a Viable Option?”

Drs. Ajay Sharma , CEO at ASR Ventures & President Rotary International Hague, Netherlands

Ajay is accomplished Board member, international speaker, social entrepreneur, Impact investor and executive for business development in European, Asian and Middle-East markets. Before becoming independent investor and consultant, he worked in corporations like TechMahinda, Huawei, Alcatel-Lucent and Escotel. He studied Diploma in Electrical Engineering in 1993 in DEI. Ajay now holds Engineering, MBA and LLM and studied at universities like Harvard Business School,

University-Liverpool, University-of-Bradford and DEI. Ajay speaks at multiple international forums and universities in technologies BLOCKCHAIN and Cyber security and entrepreneurship.

Ajay holds following positions and delivers values in world.

CEO and Founder ASR Ventures – Invest in impact innovations

Chief Regulatory and investments officer – TOBLOCKCHAIN (BLOCKCHAIN Powerhouse)

President – Rotary Club The Hague Metropolitan (First English international club of Netherlands with 20 plus nationalities)

Global Advisor and director– Sampoorna Global (Social enterprise- Augmenting menstrual hygiene for young girls)

European Director– E2Labs– Critical Infrastructure Cybersecurity Solutions. Partner– Exasun (Innovative Solar panels)

Partner– BSS Holland (Defense Security Solutions) Mentor in World Startup Factory



A Lecture-cum-Interaction Session was organized a on 28th November, 2017 on

“Career Opportunities for Engineering Students: is Entrepreneurship a Viable Option?”

During the interaction, Mr. Ajay explained the importance of balanced outlook towards career opportunities that includes conventional Jobs as well as entrepreneurial opportunities. He cited his own experience and growth as an example to lay emphasis on the view that- jobs provide level growth but more security. On the other hand, entrepreneurial activities provide more growth opportunities although involve more risk factors.

He explained that the best compromise of the two options has to be person specific and each individual must take his call on the basis of his comfort level. He also stressed on introducing guarded entrepreneurial opportunities in educational institutions to inculcate suitable mindset in the students without actually exposing them to the risk factors.

Students were motivated by speaker and hand fruitful interaction and an impromptu session on

innovations that they want to convert into a Start-up.

Motivational lecture and Interaction Session organized a on 8th December, 2017 on “**Internship, Choices, Career**”

Rajendra S Pawar

Chairman & Managing Director, NIIT Ltd.

Rajendra S Pawar is the Chairman and Co-Founder of NIIT Group that encompasses NIIT Limited, a leading Global Talent Development Corporation, and NIIT Technologies Limited, the software and services arm. As a co-founder of the NIIT Group, Pawar has not only revolutionized the IT training industry, but is also recognized as a global technology thought leader.

As the Chairman of India's IT industry body- National Association of Software and Service Companies (NASSCOM), Pawar has led several ICT industry initiatives, giving voice to the sector's aspirations and goals. Earlier during 1990-92, as President of MAIT (Manufacturers' Association for Information Technology), Pawar integrated MAIT's activities with other leading industry associations in India.

A Fellow member of the Computer Society of India (CSI) and the Institution of Electronic and Telecommunication Engineers (IETE), Pawar was awarded an Honorary Doctoral Degree by Rajiv Gandhi Technical University (MP) in 2005.

Awards and Accomplishments

- Acknowledging his contribution to the IT industry in India, Pawar has been awarded the country's prestigious civilian honour, **Padma Bhushan** by the President of India in 2011
- Pawar is a member of the Prime Minister's National Council on Skill Development and has served the Prime Minister's National Task Force (1998) commissioned to develop India into an IT Superpower
- An advisor to the Hunan Province of China, he has also been a member of PIAC (Presidential International Advisory Council) of the Government of South Africa for IT
- As a founding member of the International Business Council of the World Economic Forum, Pawar is deeply engaged in addressing issues of global significance
- Global Business Intelligence firm, Ernst & Young conferred Pawar with its prestigious “Master Entrepreneur of the Year” award, in 1999. He has also been named as the “IT Man of the Year” by IT industry journal, Dataquest
- Pawar has been awarded ‘The Global India Splendor Award’ on the occasion of the 60th year of Indian independence, for his work in developing human resource potential
- He has received ‘Distinguished Alumnus Award’ from IIT Delhi in 1995 and ‘Madhav Award’ from The Scindia School
- Pawar has also been honoured with the prestigious ‘Nayudamma Award’ in 2012, for his continued contribution to the IT industry in India

Mr. Pawar referred to historical developments in human society and how they resulted in agrarian, scientific, industrial and information revolutions. He said that the current century is the period of knowledge revolution. The industrial revolution was driven by innovations that reduce, and if possible remove, human intervention, where as the knowledge revolution is driven by products having human being as the centre of the theme. This resulted in decline of conventional job careers and germination of altogether new paradigms of jobs, entrepreneurial objectives and innovations.

He also explained that the current generation professionals has better opportunities to explore and take risks as their typical career is spanned over 70 – 80 years. He urged the students to take a plunge in whatever endeavour they deem suitable without worry as they have ample time to switch. The session ended with a prolonged interaction with students. The impromptu session was highly appreciated and enjoyed by the students

Lecture-cum-Interaction Session organized a on 7th December, 2017 on
“Jugaad Innovation”

Navi Rajdou

Author, Jugaad Innovation

Radjou was born in India with French-American dual citizenship. He earned a diploma in technical studies (DEST) from the National Conservatory of Arts and Crafts (CNAM) in Paris, France and an MS degree in information systems from Ecole Centrale Paris. He started his career with IBM at its Toronto Software Lab and eventually served as Vice President and Principal Analyst at Forrester Research, a US- based technology research and consulting firm. Till 2011, he served as the Executive Director of the Centre for India & Global Business at Judge Business School, University of Cambridge. Radjou is a Fellow at Judge Business School and a World Economic Forum (WEF) faculty member. He is a member of WEF's Global Future Council on Innovation & Entrepreneurship. For several consecutive years, he has served on the international panel of judges for The Economist's Innovation Awards. Navi also served as a judge for Fast Company's 2017 World Changing Ideas Awards.



Mr Rajdou presented the idea that with tighter budgets and dwindling natural resources, along with new technologies and environmentally conscious consumers, innovation with lesser inputs and greater impact the effective way is added as a new paradigm to business and social organizational models. With an estimated trillion-dollar global market for frugal products and potentially huge cost savings to be gained, frugal innovation is revolutionizing business and reshaping management thinking. He explained that amalgamation of disruptive technologies and

innovation will result in to phenomenal results. His talk was appreciated by the audience.

Lecture-cum-Interaction Session organized a on 1st January, 2018 on
“ Self-powered and ultra-low-power circuits and system ”

Prof. Aatmesh Shrivastava

Department of Electrical and Computer Engineering, Northeastern University in Boston, MA, USA.

Atmesh Shrivastava did is BS in Electronics and Communications Engineering, Birla Institute of Technology, India in 2006 and PhD in Electrical Engineering, University of Virginia, Charlottesville in 2014.

He is an expert on Self-powered and ultra-low-power circuits and system; energy-harvesting and power-first system/computer architecture; internet-of-things; ultra- low power bio-medical and neural circuits and systems; exascale computing; high-reliability system design.

Atmesh delivered a talk on Self-powered and ultra-low-power circuits and system in which he discussed about technologies employed to reduce power requirements of circuits. He explained about issues that will crop up at ultra low powers and possible remedies that can be employed. He advised students about opportunities for pursuing higher studies abroad. He also encouraged the students for trying for Research Assistance in the US universities. The talk was well appreciated by all.

Annexure 3: Two day Workshop on MATLAB & Simulink in Engineering Education

Speakers:

1. Dheeraj Pandey (B.tech , M.tech from IIT Bombay) Math Works MATLAB
2. Akhilesh kumar (M.tech from MMM Gaziabad ,B.tech from IMS Gaziabad) Design Tech Systems .

Total Number Of 2nd Year Students -45 & Final Year -30







Annexure 4: Hackathon- #buildwithDEI

Dates: April 6 - April 8, 2018 Total Students: 30 Teams: 7

Team Name	Team Members	Faculty
Hackers	Divya Gupta Ayushi Pandey Anami Prasad Agam Singhal Priyanka Chauhan	Faculty of Engineering
Masterminds	Apar Singhal Akash Baranwal Tamanna Srivastava	Faculty of Engineering
Spartans	Shashank Shekhar Upadhyay Vikas Gaur Rohit Upadhyay Rishabh Singhal	Faculty of Engineering
Prohackers	Mukul Kaushik Shivam Singh Rahul Sharma Avinash Govind Kushwah	Faculty of Science
Freelancers	Shweta Kumari Khushboo Singh Divya Singh Kritika Gupta Shruti Jain	Faculty of Engineering
Badlaav	Aaditya Sharma Akhil Goel Chhavi Nagpal Ambika Bhardwaj Akanksha Agarwal	Faculty of Engineering
IOTians	Antas Jain Mohit Gautam Arpit Yadav	Faculty of Engineering

Expert

Ms. Niti Prasad

- B.Sc. in Computer Science and minor in finance from **Michigan State University**.
- Assistant Vice President of IT Strategy at Synchray Financial.
- Teacher with Girls who Code.
- Member of Society of women Engineers.

Teacher Coordinator

Mr. Amol Gupta, Assistant Professor, Faculty of Engineering, DEI.

Judge Dr. G.S. Sailesh Babu, Associate Professor, Faculty of Engineering, DEI.

Student Coordinator

Ms. D. Arti, Final Year, B.Tech. in Electrical Engineering with specialization in Electronics

Problem Statements



To resolve Exam paper leaking we rely on the honesty and judgment of individual people to disseminate the question papers and that in itself bears the key to the problem

The Education Board wants a solution where using technology this problem can be resolved



- QR code based encoding
- Mobile monitoring and verification system
- Enhanced security solutions
- Crowd-sourced whistle-blower solutions
- The solution needs to be practical and easy to implement in a national scale.

91% of the girls aged 10-18 years have experienced sexual harassment. Studies show that due to social oppression and fear of retaliation the reported number is far less than the real number. We need a solution where victims of sexual harassment can safely report the crimes committed against them.

- Ensure personal safety
- Connects women to safety networks
- Crowd sourced complain system
- Awareness for violence against women

Non-communicable diseases include heart disease, stroke, most cancers, asthma, diabetes, chronic kidney disease and more. They are the leading cause of death in the world, representing over 60% of all deaths.

- Awareness Solutions
- Health Awareness Apps
- Fitness Apps and tools
- NCD Risk Tracking

Corruption is rampant in public procurement, in tax and customs collection and in regulatory authorities. Awards of public and private tenders are frequently marred by corruption allegations.

- Crowd-sourced solutions
- Beyond the scope of whistle blowing
- Can bring in the culprits under proper inspection
- Solutions that provide information related to corruption-prone transaction
- Make the public aware of the pitfalls

Overloaded or un-roadworthy vehicles, worsening road condition, blind contortions, lack of awareness of safe road use, poor traffic management and poor driver training are among many reasons for the high levels of road traffic accidents.

- Traffic safety awareness
- GPS enabled accident reporting app
- Black-spot mapping
- Crowd-sourced complain app against bad drivers
- personal accident safety apps
- Black-spot alarm
- Route declaration app



Students participating in Hackathon

9.7. Co-curricular and Extra-curricular Activities (10)

The following co-curricular and extra-curricular activities are conducted on regular basis apart from a compulsory credit based evaluation for all students. For each year of study there is a three credit course on CCA and is compulsory for all students. Students are evaluated on the basis of their participations in voluntary services, performance in games and sports, performance in literary activities, performance in cultural activities and their participation in District/Regional/State/National and International level events. In the past our students have excelled in Youth Parliament at National Level, Youth Festival in International Level and have also won several awards in various Technical Events. The following activities are regularly conducted in the Institute and/or participated by students outside the institute.

- NSS Camps and Cleanliness Drives throughout the year. (Annexure -)
- Special Annual Winter Camp.
- Sports, Cultural, Literary Activities,
- NCC,
- Annual Intra-Faculty and Inter-Faculty Cultural and Sports Competitions,
- Inter-University Youth Festivals,
- Model Parliament etc.
- Bi-monthly DEI News,
- Annual DEI Magazine,
- Student technical Newsletter.
- Wall magazines.
- Yoga and Karate Classes for girls.
- Inter-University English Drama Festival,
- Inter-University Hindi Drama Festival,
- Celebration of National Days,
- Open day (31st January),
- Founder's Day (20th December)
- Bhakti Sangeet,
- Yoga Day,
- Science Day
- Engineers Day
- Army Flag Day
- Communal Hormany Day
- Value Day (on Deepavali)
- Student Systems Conference
- Sci-Hi
- Teacher's Day
- Special events are organised on birth anniversary of renowned persons

The Institute organizes Cultural Activities regularly throughout the year for the all-round development of students. In addition to the compulsory component, competitions are organized at Faculty, Institute and Inter-Institute levels in different categories viz. Literary, Fine Arts, Dance,

Dramatics and Music. Students of the Institute have participated in several Zonal and National Youth Festivals and have won laurels for the Institute. The Institute organizes Youth Parliament competition under the aegis of the Ministry of Parliamentary Affairs (Govt. of India). DEI has the honour of being National Winner two times and Runners-up one time in the competition.

The details of co-curricular and extra-curricular activities in which the students participated during last three years are as follows:

S. No.	Item
A	Competitions at Faculty Level
B	Competitions at Institute Level
C	Competitions at Inter-Institute Level on the theme “Quality & Values in Education”
D	Hindi and English Drama Festivals (Inter-Institute)
E	Teachers’ day
F	Faculty Level and Institute Level Annual Prize Distribution Functions
G	Winter Training Camp
H	Youth Festivals (Competitions outside the Institute)

The calendar of Cultural, Literary, Dance, Theatre and Fine Arts Activities for the sessions 2018-19, 2017-2018 and 2016-17 are as follows:

A. Competitions At Faculty Level

S. No.	Event	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
1	Essay Writing (Hindi/English)	27.8.2018	09.8.2017	24.8.2016
2	Poster making & Cartooning	28.8.2018	12.8.2017	27.8.2016
3	Elocution (Hindi)	29.8.2018	16.8.2017	31.8.2016
4	Elocution (English)	30.8.2018	19.8.2017	3.9.2016
5	Mime & Mimicry	31.8.2018	23.8.2017	7.9.2016
6	Debate (Hindi)	6.9.2018	26.8.2017	10.9.2016
7	Debate (English)	7.9.2018	30.8.2017	14.9.2016
8	Skit	10.9.2018	6.9.2017	17.9.2016
9	On the Spot Painting & Collage	11.9.2018	9.9.2017	21.9.2016
10	Clay Modelling & Rangoli	12.9.2018	9.10.2017	24.9.2016
11	General Knowledge Quiz (Written)	17.9.2018	13.9.2017	28.9.2016
12	Spot Photography & One Act Play (Hindi/ English)	18.9.2018	4.10.2017	1.10.2016
13	Light & Classical Vocal Solo	19.9.2018	7.10.2017	19.10.2016
14	Bhakti Sangeet	24.9.2018	11.10.2017	22.10.2016
15	Light Vocal (Group), Classical Instrumental Solo (Percussion &	25.9.2018	14.10.2017	26.10.2016

	Non-Percussion), Folk Orchestra			
16	Theatrical Script Writing (H/E)	26.9.2018	18.10.2017	29.10.2016
17	Western Vocal (Solo & Group)	3.1.2019	21.10.2017	7.1.2017
18	Folk/Tribal Dance (Solo & Group), Classical Dance (Solo)	4.1.2019	6.1.2018	11.1.2017
19	Satirical Creative Writing (Hindi/English/ Sanskrit) & Translation (English-Sanskrit, Sanskrit-English)	5.1.2019	10.1.2018	14.1.2017
20	Poetry Recitation (Self Composed) – (Hindi/English/ Sanskrit)	10.1.2019	13.1.2018	18.1.2017
21	Antakshari (Hindi/English/ Sanskrit)	11.1.2019	17.1.2018	21.1.2017
22	Dumb Charades	12.1.2019	27.1.2018	25.1.2017
23	Crazy Ideas (Hindi/English)	14.1.2019	3.2.2018	28.1.2017
24	Street Play (Hindi/English)	16.1.2019	5.2.2018	8.2.2017
25	Youth Parliament	17.1.2019	7.2.2018	10.2.2017

B. Competitions At Institute Level

S. No.	Event	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
1	<u>Inter-Faculty Competitions Phase-I</u> Elocution, Essay, Debate, GK Quiz-Oral, Mime, Mimicry, Fine Arts, Theatrical Script Writing, One Act Play (Hindi)	29.10.2018	29.10.2017	6.11.2016
2	<u>National Education Day</u> Competitions on the occasion of Birthday of Maulana Abul Kalam Azad	11.11.2018	11.11.2017	11.11.2016
3	<u>Inter-Faculty Competitions Phase-II</u> Indian & Western Music Items, Dance, Dumb Charades, Satirical Creative Writing, Translation, Poetry, Crazy Ideas, Street Play and Antakshari	17.2.2019	11.2.2018	19.2.2017

C. Competitions At Inter-Institute Level On The Theme “Quality & Values In Education”

S. No.	Event	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
1	Poster Making & Cartooning	8.9.2018	21.8.2017	16.9.2016
2	Bhakti Sangeet (Devotional Music)	27.10.2018	16.10.2017	26.9.2016
3	Elocution (Hindi/English) (Quality & Values Day)	7.11.2018	19.10.2017	30.10.2016

D. Inter-Institute Hindi And English Drama Festivals

S. No.	Event	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
1	English Drama Festival	12.11.2018 to 14.11.2018	10.11.2017 to 12.11.2017	10.11.2016 to 12.11.2016
2	Hindi Drama Festival	29.10.2018 to 31.10.2018	27.10.2017 to 29.10.2017	14.11.2016 to 16.11.2016

E. Teachers' Day

Event	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
Felicitation of Retired Teachers of DEI	5.9.2018	5.9.2017	5.9.2016

F. Faculty Level And Institute Level Annual Prize Distribution Functions

Event	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
Faculty of Engineering	4.2.2019	13.3.2018	27.2.2016
Institute Annual Prize Distribution Function	2.3.2019	24.3.2018	9.3.2016

G. Winter Training Camp

A number of students of the faculty of Engineering participated enthusiastically in the Winter Training camp organized in the Institute from 19th December 2017 to 25th December 2017. Some of them also played a key role as a member of the organizing team.

Event	CAY 2018-2019	CAYm1 2017-2018	CAYm2 2016-2017
Winter Training camp	19.12.2018 to 24.12.2018	19.12.2018 to 24.12.2018	19.12.2018 to 24.12.2018

H. Youth Festivals

Students of the Faculty of Engineering represented the Institute in various events in the North Zone Youth Festival and National Youth Festival during the last three sessions and bagged awards.

Some of the awards won by the students of Faculty of Engineering

2018-19

Inter-University North Zone Youth Festival

Western Instrumental (Non-percussion) – I

2016-17

Inter-University North Zone Youth Festival

Instrumental Solo Non-percussion - III

Inter-University National Youth Festival

Instrumental Solo Non-percussion - III

2015-16

Inter-University Group Level Youth Parliament Competition

Divyanshi Malhotra - III

Harpreet Kaur - IV

Disha Saxena	- IV
<u>Inter-University National Youth Parliament Competition</u>	
Harpreet Kaur	- I
Disha Saxena	- II
Divyanshi Malhotra III	
<u>Inter-University North Zone Youth Festival</u>	
Spot Photography)	- I
<u>Inter-University National Youth Festival</u>	
Spot Photography	- II

NSS Activities

The NSS unit of the Institute organizes a variety of programs/ campaign for making campus and surroundings clean and green. These programs are organized in Regular NSS Classes, One Day NSS Camps and Special Programs e.g., Seven Day NSS Camps. The highlights of these Programs are as follows.

1. The NSS Volunteers of the Institute enthusiastically participate in regular scheduled NSS classes organized for making campus and surroundings clean.
2. A number of activities under the NSS and Cleanliness drives are organized throughout the year. One week NSS camp is organized every year in the Institute during the month of December for the purpose of serving the society. During the camp, students perform several activities such as cleaning the Institute and nearby villages, awareness creation among the villagers about social evils and their eradication etc. A number of cultural and literary competitions are also conducted during the camps.
3. The NSS Wing of the Institute organizes One Day NSS Camps (compulsory for all first and second year students, enrolled as NSS Volunteers) for special cleaning drive. In these camps students make sincere efforts to make campus clean.
4. Special Tree Plantation Drive is organized during July – August every year to make campus and surroundings green.
5. All First Year NSS Volunteers, during Mid Semester Break (December every year) participate in Seven Day Special Camp. In these Camps they organize Special Cleaning Campaign to ensure Campus and surroundings clean.
6. The NSS Volunteers also participate in Special Cleaning drive under “Swacchh Rail Swacchh Bharat” at Agra Cantt Railway Station every year.
7. DEI under its NSS program holds **free Medical** and Assistance Camps for nearby Villages and People of Neighborhood Community every fortnight with the help of Dayalbagh Medical Relief Society.

During the Medical Camp, a program “**Hole in the Wall**” is conducted for the village children. In this program, village children are allowed to play with a computer and learn in a natural way. A mentor remains available for guidance. This program has become very popular in the nearby villages. In these camps apart from free medical aid and other services, NSS Volunteers also organize Awareness Programs on various issues, e.g., Cleanliness (Swachhta), Health, Hygiene, Malnutrition, Sanitation, Pollution and Environmental issues, Social Issues, Family Planning, Literacy, Women Empowerment, Beti-Bachao-Beti-Padha, Voting Rights, Ill-effects of Parthenium, Evils of Tobacco, Smoking, Drug Addiction, Critical health issues, e.g. Tuberculosis, AIDS, STD etc. through

Discussion, Posters, Banners and Pamphlets.

Alumni Meet

Faculty of engineering and alumni of the Institute jointly organize a silver jubilee reunion meet every year in the month of December/January. The alumni, teachers and students share their experience, knowledge and ideas.

Games

The Institute organizes various sports and games at different levels. Students participate in various games such as Football, Hockey, Cricket, Volley ball, Basket Ball, Lawn Tennis, Table Tennis, Badminton, Cricket, Kho-Kho etc. Gymnastic facilities are available in Hostels. Games are the part of a compulsory core course of the Institute and therefore, slots are provided in the Time Table for Games and students compulsorily take part in these activities every week. Football practice starts in July and goes up to September. Cricket and Hockey practice is held from November to March. Volley Ball and Basket Ball are open throughout the year. Intra-Faculty and Inter-Faculty competitions are regularly organized in all games every year. Prizes and certificates are awarded to the winners on the Annual Day.

Sports

All sports like races (100 m race, 200 m race, 400 m race, 800 m etc.), jumps (long jump, high jump, hop step & jump etc.) and throws (javelin throw, discuss throw, shot put etc.) are conducted every year. Sports competitions are held in during the period of December to February. Best performers of Intra-Faculty competitions represent the Faculty at the Institute level. The winners are awarded prizes on the annual sports day.

Basant Sports competitions are very popular. Final Basant Sports are held on the Basant Day every year with pomp and show.

National Unity Day

National unity day is celebrated on 31st October. Various activities such as special lecture, debates, poster presentations, essay writing and others are performed on this occasion.

Sadbhavna Diwas

The birthday of former prime minister Late Mr. Rajiv Gandhi is celebrated on 20th August every year as Sadbhavna Diwas. On this occasion oath taking ceremony is performed by ever person of the Faculty mentioning that “I will keep the humanity always on the topmost by neglecting the cast, religion, area and language”.

National Education day

National Education Day is celebrated every year on 11th November in remembrance of first education minister Mr. Maulana Abul Kalam Azad. Various activities such as fine arts, debates, sketches etc. are performed on his life journey.

National Youth day

The birthday of Revered Swami Vivekananda, 12th January, is celebrated as National Youth Day in the Faculty of engineering. The ideas, thoughts, visions etc. are discussed with the students. The students are also encouraged with the messages of Swami Vivekananda.

Founder’s Day

On the occasion of the birth anniversary of the founder of DEI, Revered Dr. M.B. Lal Sahab, Founder’s Day is celebrated every year on 31st January. All the labs, workshops, departments are open for all including general public to witness the progress of the Institute in different areas. Also, on this occasion a photo cum poster exhibition is organized depicting the various general activities

and special activities carried out.

Independence Day Celebrations

15th August is celebrated as Independence Day. A variety of activities such cultural activities, social activities and others are performed. Students are also motivated by the telling them various stories of our freedom fighters.

Republic Day Celebrations

26th January is celebrated as Republic Day. Several cultural activities and social activities are performed. Students are also informed with the visions of the makers of our Constitution.

Hindi Diwas

Hindi Diwas is celebrated on 14th September every year in the Institute. Various activities such as poetry recitation, prose recitation, essay writing, plays etc. are performed on this occasion.

Earn while you learn

Economically weaker students of the institute are encouraged by awarding free ships/scholarships from the ‘**Earn while you learn scheme**’ of the institution implemented from the year 2014. The needy and interested students are given an opportunity to work in the institute at various places in library, automobile, canteen, hostels, accounts section, administrative sections, solar system maintenance etc. part time and paid basis. Students are engaged in conducting Lab. classes and paid conveyance charges depending upon the number of hours spent. Institution provides higher education to all with disabilities at all levels from U.G to Ph.D. Mildly differently-abled are admitted along with the regular students without any discrimination.

Work in Dayalbagh Agricultural Farms

Students are made to till the soil by working in the agricultural fields during the Agriculture Operations class (a compulsory core course). This certainly makes them understand the importance of “dignity of labor” and helps in imbibing in them the feeling of “service to humanity”.

DEI Magazine and News Letter

Bi-monthly DEI News Letter makes everyone aware of the activities and the progress going on in the Institute. Annual DEI Magazine gives opportunity to the students to bring out their literary talent and express their ideas on one or the other topic.

Green eco-friendly Campus

DEI has become an eco-University by full solar power and other eco-friendly acts which avoid pollution in all its forms.

Energy conservation

There is no culture of installing ACs in the Office rooms. The buildings are designed to be airy and cool to reduce the need for Air conditioning. Energy efficient lighting is used every where including Hostels. Cycling is preferred in the campus. Seven Solar power Generation plants of total capacity of 700 kWp have been installed meeting the entire needs of the campus, thus making DEI to be a Green Campus. Solar Cooking and Solar Hot water facilities have been provided in the Hostels.

Use of Renewable Energy

Institute has a policy to make the campus eco-friendly and accordingly installed Solar Power Plants and Solar cooking to avoid dependence on fossil fuels. Students have designed and built a Solar van which is used for commuting of staff. Institute Mechanical Engineering Dept is engaged in Research on Biodiesel. Chemistry Dept of DEI is chosen as a member of Solar Energy mission of Government of India.

Water Harvesting

Extensive water harvesting facilities have been installed in the campus. The Institute bore wells get water at 100 to 120 ft depth while general level in Agra lies between 200 ft. to 250 ft.

Innovative e-waste management

The Institute has come up with several ideas to utilize e-waste by converting it into some Art objects.

Efforts for Carbon Neutrality

Campus has drastically reduced Carbon emissions. The waste leaves are not burnt but are converted into organic fertilizer. The solar photo voltaic panels used in the Solar power plant of DEI, Solar Hot water and cooking in Hostels, Development of Bio-fertilizers, Bio-fuels, Solar driven vehicles, Research on Hydrogen fuels are some of the contributions of this academic Institution to teach the public methods to attain Carbon neutrality at the national level.

Plantation

Campus is made Green by extensive plantation by NSS volunteers. Institute works in collaboration with the NGO, “SPHEEHA” which is committed to preserve the Ecology and Heritage of Agra region. DEI is collaborating with ‘SPHEEHA’ on projects aimed at preserving the water table in Agra. SPHEEHA also helps in planting Trees in DEI Campus

Workshops

The Centre for Quantum and Nano-Systems, Centre for Core Courses and the Centre for Consciousness Studies regularly organize workshops and seminars for the benefit of faculty and students.

CRITERION 10	Governance, Institutional Support and Financial Resources	120
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10.1. Organization, Governance and Transparency (55)

10.1.1. State the Vision and Mission of the Institute (5)

Vision of the Institution:

To provide education, more education, education made perfect, which is the only “panacea for our country’s ills and evils”. DEI aims to serve as an exemplary model of education, covering the entire spectrum of knowledge and wisdom, to selflessly serve mankind by evolving a race of supermen, who possess the virtues to resolve the grave global challenges and establish a more humane and enlightened society.

Mission of the Institution:

The mission objective of DEI is to provide value-based, comprehensive and inter-disciplinary education to evolve a ‘*complete person*’, i.e., a well-rounded total quality person, whose hallmarks are intellectual strength, emotional maturity, truthfulness, simple living, high moral character, scientific temper, general awareness, interdisciplinary outlook and one who discharges duties and obligations and is capable of giving a fuller response to social and environmental challenges.

10.1.2. Availability of the Institutional Strategic Plan and its Effective Implementation and Monitoring (25)



DAYALBAGH EDUCATIONAL INSTITUTE: HIGHLIGHTS OF STRATEGIC PLAN 2012-2031

The Dayalbagh Educational Institute with its unique education philosophy is rated among top Institutions in India offering value based quality products. DEI has recently drafted its 'VISION 2031' and shared it with premier Institutions like IITs and IIMs to get a feedback on its innovative features with a view to become a top teaching-cum-research Institute leading others with an exemplary system of education that integrates kindergarten through class 12, through UG/PG to Ph.D. programmes. Almost every one appreciated the depth of work being done by DEI and its future plans .



Pillars of Transformation

UNDERGRADUATE EDUCATION
 GRADUATE EDUCATION
 RESEARCH
 INFRASTRUCTURE
 INFORMATION AND COMMUNICATION TECHNOLOGY
 CAMPUS DEVELOPMENT



ENHANCING THE QUALITY OF EDUCATION

Review every Programme for currency, quality

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
National Workshop on Curriculum Update																				
<ul style="list-style-type: none"> • Comparison with peer institutions • Assessment of alumni and employers • Level of faculty- student interaction 																				
Student Enrolment <ul style="list-style-type: none"> • Institutional resources available for the programmes • Student satisfaction level 																				

Introduction of flexible programmes (credit pacing etc.)

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Full automation of the Academic Office – ERP / Upgrade ERP																				
Introduce flexible curricula in phased manner																				
Full web support for all programmes																				

INFRASTRUCTURE INFORMATION AND COMMUNICATION TECHNOLOGY

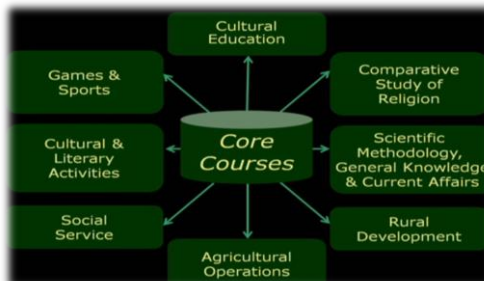
Enhancing the Quality of Education

CRITICAL Action Points Initiated ELOPMENT

1. National Workshop on Curriculum Update by all departments is getting Conducted
2. Full automation of the Academic Office – ERP / Upgrade ERP under progress
3. Introduce flexible curricula in phased manner
4. Full web support for all programmes
5. Re-vitalization of the Core Programmes
6. Strengthening our Innovations in Education
7. Key Performance Indicators of Teaching Staff
8. Course Notes, Question Papers and Question Bank review
9. E-Book Writing, Peer Reviewed Journal Publications etc.
10. Space and Resource Sharing and Optimal Time Management
11. Enrichment of Sports, Games and Other Facilities
12. Recruitment of Outstanding Faculty

ENHANCING THE QUALITY OF EDUCATION

- Our core programme – the hallmark of our education – distills the tenets of the DEI Education Policy into the education of students of ALL our Programmes
- This is an immutable programme – in the face of progress in all other sectors of this plan our core courses will retain a central position in our education



Re-vitalization of the Core Programme

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Full workshop on Curriculum Update																				
Introduce new pedagogical approach																				
Introduce full ICT																				
Web support with video repository/Update Web repository																				

ENHANCING THE QUALITY OF EDUCATION

Establish a Centre for Teaching Excellence

- Introduce new instructional methods
- Promote teaching excellence in faculty through regular Workshops
- Develop new ICT interactive instructional methods and facilitate their deployment
- Institute Teaching Excellence Fellowships for Outstanding Teachers

Action Points for Timeline	2012 - 2016				
	12	13	14	15	16
Apply for funding					
Building construction					
Recruitment and start of Centre					



Implement top level 5-year review of all academic programmes

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Check relevance, rigour, enrichment (Director, Senior Deans)																				

Adjust overall undergraduate enrolment to avoid overcrowding

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Monitor admissions annually (Deans with inputs from Heads)																				

ENHANCING THE QUALITY OF EDUCATION



Expand the Undergraduate Research Award (UGRA) Programme

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Identify immediate potential departments																				
Timeline future potential departments																				
Expansion Phase - 1 (maximum 1 Dept./Yr.)																				
Expansion Phase - 2 (maximum 1 Dept./Yr.)																				

UGRA presently offered in

- Soft computing and Robotics
- Solar Energy
- Microwave Techniques
- Neuromorphic VLSI Design
- Photonics

CREATIVITY, LEADERSHIP, INDEPENDENT THINKING

Sample Achievements Of Students

Where our UGRA students go...

- Achint Setia – M.S. Research Computer Science IISc, Bangalore
- Apurva Narayan – Ph.D. Systems Design Engineering, University of Waterloo
- Rohit Narula – M. Tech. VLSI Design and Technology sponsored by Texas Instruments
- 2011: IEEE xTreme 24 hour online worldwide programming contest, over 2000 teams.

DEI: 171 worldwide, All India: 4th / 600

- 2010: Best design project award Computer Graphics and Vision School, IIT Delhi
- Last five years: All India GATE Rank 99.9 by several students
- UG Exchange visitors to MoU Universities (University of Waterloo, University of Maryland) has also begun

ATTRACT ACADEMICALLY TALENTED STUDENTS

Aggressively Increase web presence
Introduce a Systematic Publicity Campaign through Alumni

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Create Web Development and Communications Cell																				
Rework DEI Web site																				
Introduce standardized web sites for all Departments																				
Web update																				
Rework of Prospectus by Faculty Committee																				
Update Prospectus																				
Hold country-wide Workshops using ICT on DEI Programmes																				

- Increase number of UG Scholarships for Talented students in all Departments
- Introduce an encouragement programme for talented students to get awards, scholarships, prizes, fellowships
- Provide more systematic on-campus work opportunities for students facing economic hardship

Recruitment of outstanding faculty

2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

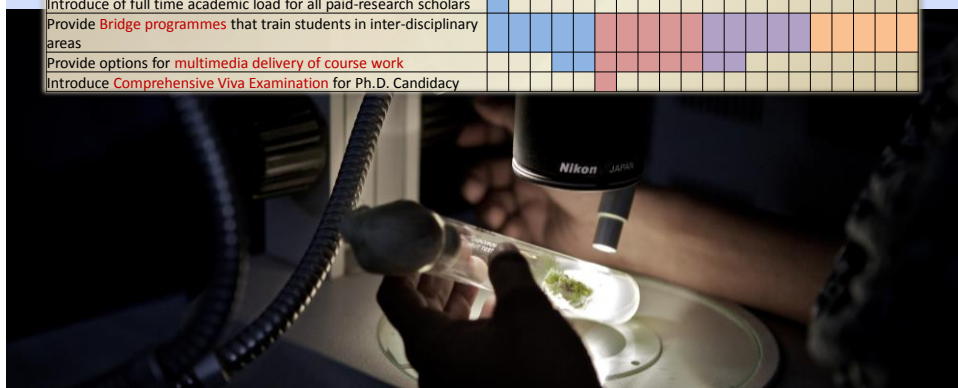


- Double/Triple Faculty strength in all Departments by 2021
- Retain retiring faculty as Emeritus Professors
- Use MoU and other contacts for appointment of Visiting Professors
- Increase close ties with industry through Alumni for appointment of Adjunct Professors
- Approach UGC for increase in Regular UGC Teaching Posts
- Introduce contractual Assistant Professor appointments to fulfill immediate requirements

GRADUATE EDUCATION AND RESEARCH

Overhaul the Ph.D. Programme for Quality Research

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Ensure only high quality candidates are admitted to the programme																				
Set up Graduate Assistance Stipends in all programmes																				
Encourage the requirement of one International Examiner in Ph.D.																				
Introduce mandatory Ph.D. Colloquia in all Departments																				
Introduce formal training on Oral and Presentation skills																				
Mandatory requirement of one international journal publication																				
Formal course work requirement guidelines to be reviewed																				
Introduce of full time academic load for all paid-research scholars																				
Provide Bridge programmes that train students in inter-disciplinary areas																				
Provide options for multimedia delivery of course work																				
Introduce Comprehensive Viva Examination for Ph.D. Candidacy																				



GRADUATE EDUCATION AND RESEARCH

Introduce a **5-year high level assessment** of individual research programmes

2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Ensure each faculty member to have at least one **major research project** by 2021

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Explore **Industry tie-ups** for research funding (in synchronism with hiring of Adjunct Faculty)

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Introduce **Post Doctoral Research Fellowships**

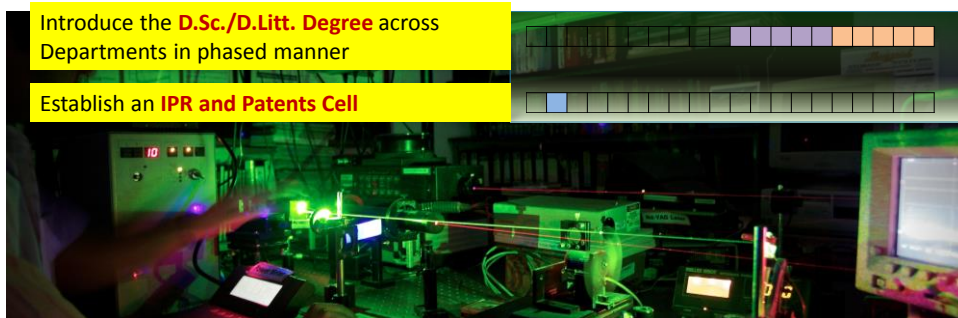
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Introduce the **D.Sc./D.Litt. Degree** across Departments in phased manner

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Establish an **IPR and Patents Cell**

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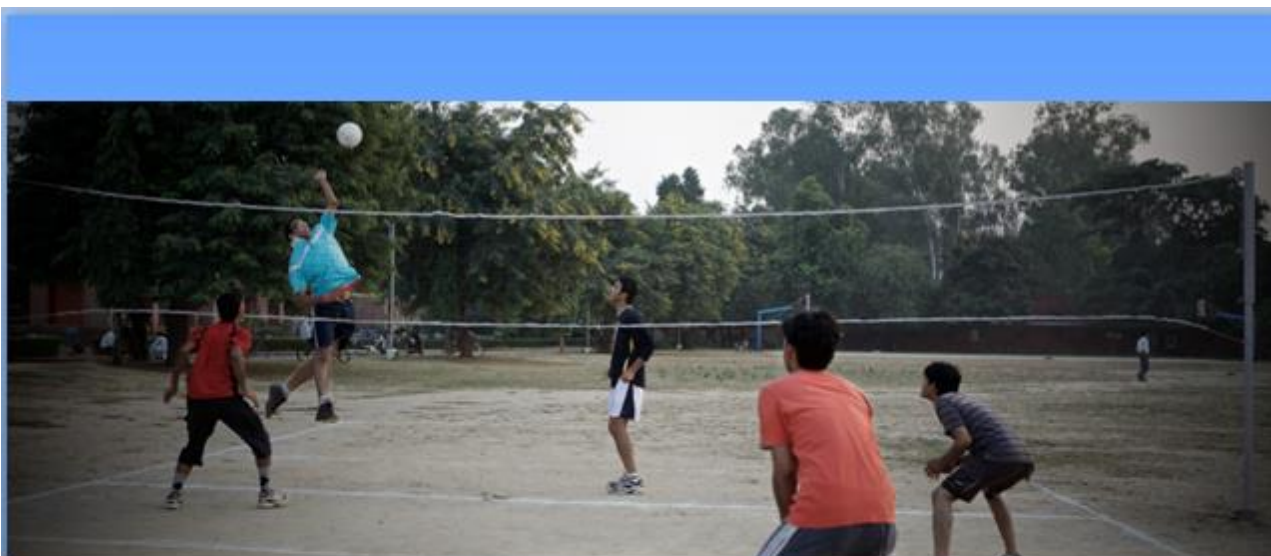


Training our students on Live Projects

UG/PG students are offered temporary appointments on a parttime basis in projects providing them opportunities for earning and training while studying

Some Major Projects In Progress

- Teachers empowerment, students empowerment and integration of tools for empowerment and synchronous delivery Rs. 7.5 cr
- Educational Resource Planning Software Development Project Rs. 3.5 cr
- Remote Triggered Virtual Labs Rs. 1.5 cr
- Quantum Computing and Teleportation Rs. 6.5 cr
- Green Energy Rs. 11.0 cr



UPGRADE ALL FACILITIES/ESTABLISH NEW FACILITIES

UPGRADE ALL FACILITIES

Retrofit | Upgrade all infrastructure for UG Education

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Construct State-of-Art Lecture Hall Complex																				
Classroom - renovation and modernization																				
Laboratory - renovation and modernization																				
Increase Upgrade computing facilities																				
Increase Upgrade ICT facilities																				
Create Resource Centres in Grade A Departments																				

NEW Students Activity Centre

Hobby Clubs / Indoor games / Open air amphitheatre / Resource Centre

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Committee to Study SAC Models and generate proposal																				
Acquisition of Funds for SAC																				
Design and Building																				
Roll out																				
Upgrade create new indoor games facilities																				

Retrofitting of all Cafeteria Facilities to make them meeting places for discussions

NRSC Women's Retrofit Renovate																				
NRSC Mens Retrofit Renovate																				
New Canteen for Womens Polytechnic																				
Set up independent Cafeteria for Institute Staff, Guests, Examiners																				
Other Cafeterias Retrofit Renovate																				

NEW STADIUM AND CULTURAL CENTRE

Complete Upgrade of all Sports and Games Facilities

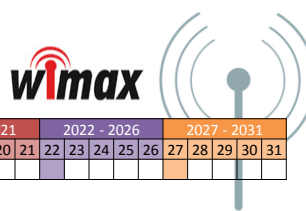
Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Design and Acquire Funds																				
Build state of the art stadium with all modern facilities																				
Upgrade facility																				



Setup a state of the Art Cultural Centre for Performing Arts

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Plan development for Centre																				
Application for Funding																				
Building construction and infrastructure fitting																				
Recruitment of manpower																				
Roll-out																				

UPGRADE ALL FACILITIES



NATIONAL MISSION PROJECT
Standalone Campus Wireless
Network with local GSM capability
(now operational)

2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Upgrade Computing Facilities

Upgrade computing terminals																			
Increase number of terminals in CC (50-100 to total of 300)																			
Strengthen computing facilities in all faculties every 5 years																			



UPGRADE ALL FACILITIES

Overhaul of the Library System

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Centralize all Libraries by constructing a New Library																				
Provide on-line access to all essential research-aligned journals																				
Increase number of titles by 20% every year																				
Create on-line Catalog																				
Link all Library Databases																				
Introduce Inter-Library Loan Systems																				

NATIONAL MISSION PROJECT

- The University offers state-of-the art Virtual Laboratory facilities over the Internet to all students
- Students can log in from their homes and conduct advanced experiments in electronics.

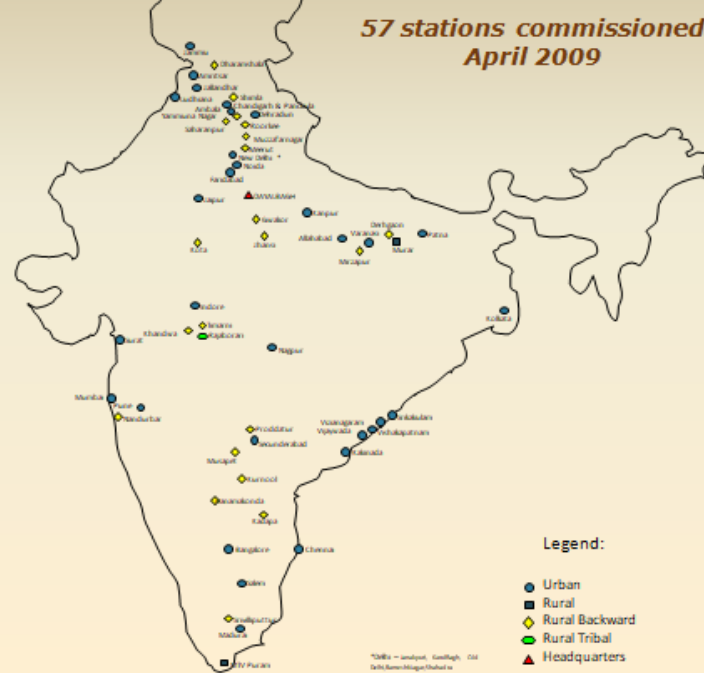


DEI GOES GREEN

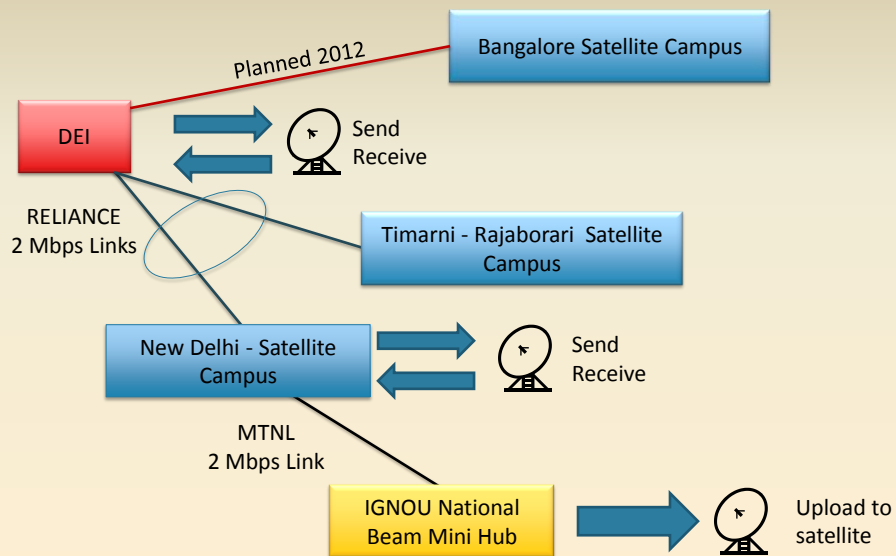


HARNESSING INFORMATION AND COMMUNICATION TECHNOLOGY

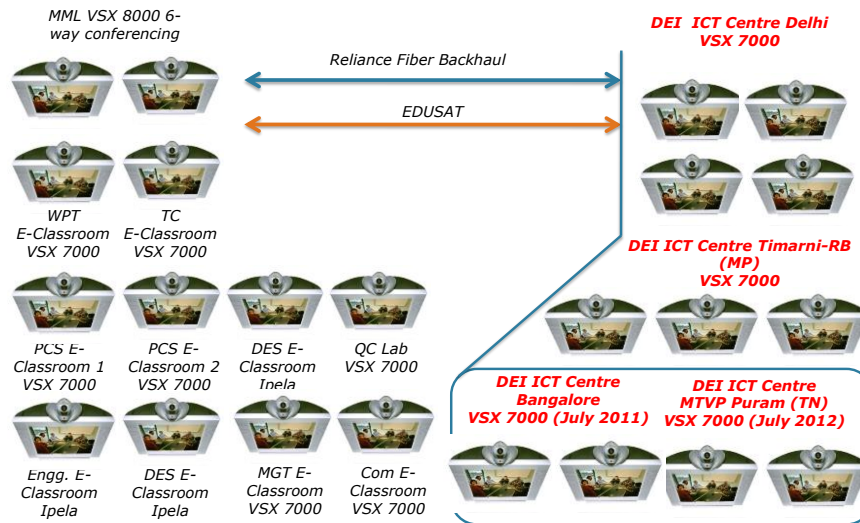
HARNESSING INFORMATION AND COMMUNICATION TECHNOLOGY: THE DEI EDUSAT NETWORK



HARNESSING INFORMATION AND COMMUNICATION TECHNOLOGY: BACKHAUL LINKS FOR EDUSAT AND VIDEO CONFERENCING CLASSES



HARNESSING INFORMATION AND COMMUNICATION TECHNOLOGY: SOME CAMPUS VIDEO CONFERENCING FACILITIES



vidyaprasar.dei.ac.in
National Mission Project designed entirely by
Student Team

DAYALBAGH
EDUCATIONAL INSTITUTE

vidyaprasar
MULTIMEDIA LABORATORY

[Home](#)
[Scope](#)
[Infrastructure](#)
[Process Flow](#)
[Course Portal](#)
[Video-on-Demand](#)
[Live Webcast](#)
[Course Wiki](#)
[e-Books](#)

Education through Technology

Course Portal

Access our course material including videos, question banks, assignments, seminar topics

Video-on-Demand

Search our video repository to quickly access content relevant to your interests

Live Webcast

Join one of our live class transmissions and take the course on the move

Read an e-Book

Read an e-Book of Course Notes on the subject of your interest

Welcome to Vidyaprasar, Dayalbagh Educational Institute's on-line collaborative learning, live web cast and content management system. In its present state of development, Vidyaprasar provides course web publishing, file storage and sharing facilities through a web based connection to the internet thus providing you with full portability. Vidyaprasar will presently host course websites and material, and Wiki for courses in Computer Science and Engineering. As part of future development of the system, live streaming services, interactive seminars, e-Books, on-line self-examination facilities, and video-on-demand services, will go on the web by the second quarter of 2011. Sponsored by the National Mission on Education through Information and Communication Technology (NMEICT) under the project "Teachers Empowerment, Students Empowerment, Integration of Tools for Empowerment (Synchronous Delivery)". This project is part of a tri-institute collaborative initiative coordinated by the Indian Institute of Technology, Bombay, and with the Amrita University as the third partner.

Widening the Circle

RESEARCH TECHNOLOGY PARK AND CENTRES FOR ADVANCED STUDIES
COLLABORATIONS AND CONNECTIONS
OUTREACH
ALUMNI
ACHIEVING UNIVERSITY LEVEL EXCELLENCE



**BUILDUP OF THE RESEARCH TECHNOLOGY PARK
ESTABLISHMENT OF NEW CENTRES AND SCHOOLS**

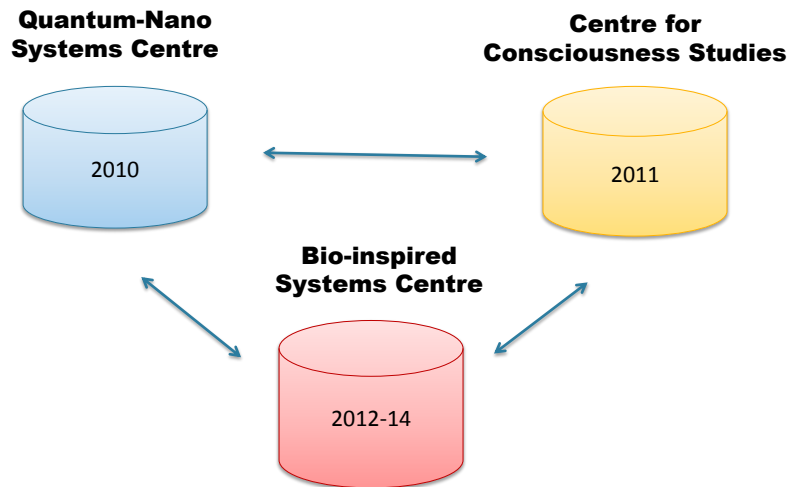
BUILDUP OF THE RESEARCH AND TECHNOLOGY PARK

- *Quantum Nano Systems Centre established in 2010*
- *Experiments are presently under way using a Superconducting Quantum Interference Device*
- *Part of the National Quantum Teleportation Network research programme*
 - *Collaboration with IIT Chennai, IIT Kanpur*
- *Centre for Consciousness Studies established in 2011*
- *Linkages established with QNSC in Intl. School on Quantum and Nano Systems, 2011*



UG Engineering students working on SQUID

TRANSDISCIPLINARY RESEARCH THROUGH NEW CENTRES



High Machine IQ Technology Incubator

PROMOTING OTHER NEW CUTTING EDGE THRUST AREAS

- *Hydrogen Research*
- *Agile Manufacturing*
- *Computing Science*
- *Nano materials*
- *Statistical Quality Control*
- *Lean Manufacturing*
- *Plant Biotechnology and Industrial Microbiology*
- *Vector Control*
- *Phytochemical*



COLLABORATIONS AND CONNECTIONS

COLLABORATIONS AND CONNECTIONS

UNIVERSITY OF MARYLAND

- In 2006/2011 DEI signed its MoU with the University of Maryland, College Park USA over the Internet through video conferencing
- Our activities have grown steadily over the past five years
- Regular resource persons at the DEI Annual International School on Quantum and Nano Computing Systems and Applications



no oral period to determine any modifications that might be necessary. The period of validity of this agreement may be extended by mutual consent.

Article II. Either party may terminate this agreement with written notification, signed by a designated official of the party initiating termination. Such notification must be given at least six months in advance of the effective date of termination.

University of Maryland, College Park Durgabai Educational Institute,
Durgabai, Agre

[Signature] *[Signature]*
V. G. Desai V. G. Desai
Director Director
FR. 1. 2006



COLLABORATIONS AND CONNECTIONS

UNIVERSITY OF MARYLAND

- 12 Computer Science graduate courses delivered since 2006 by Professor Ashok Agrawala
 - Operating Systems
 - Computer Networks
- Delivery of special lectures from DEI to Maryland on Soft Computing
 - Information Centric System Design



Prof. Ashok Agrawala, delivering lectures to students at DEI



COLLABORATIONS AND CONNECTIONS

UNIVERSITY OF MARYLAND

- Department of Chemistry at DEI and UMD have entered into path-breaking research on “Solar Hydrogen Production”
- **DST-NSF Material World Network Program**
 - UMD: Synthesis of nano-particulate metal oxides
 - DEI: Photochemical characterization
- Exchange
 - 3 faculty and 5 students (DEI ➡ UMD)
 - 2 faculty and 2 students (UMD ➡ DEI)



Video conferenced meeting between research groups at DEI and UMD in progress



collaborations and connections

University of WATERLOO, WATERLOO, ontario, canada

- MoU signed in 2008 through video conferencing
- Exchange of faculty between the Department of Systems Design Engineering (UW) and Faculty of Engineering (DEI)
- Our first student pursuing doctoral studies at UW earned the top grade Fall 2011
- Regular participants in QANSAS

COLLABORATIONS AND CONNECTIONS
MICHIGAN STATE UNIVERSITY, MICHIGAN, USA

- MoU signed, 2011
- Exchange of faculty between the College of Engineering and Faculty of Science
 - Research collaborations in the field of soft computing applications in biometrics
 - Collaborations in outreach activities through e-Education



COLLABORATIONS AND CONNECTIONS
UNIVERSITY OF MISSOURI, COLUMBIA, USA

- MoU proposed by UM in fields of
 - Green Nanotechnology
 - Phytochemicals
- Dr. Kattesh V. Katti, Director, University of Missouri Cancer Nanotechnology Platform visited DEI and signed the MoU, 2011



COLLABORATIONS AND CONNECTIONS

- In India
 - Indian Institute of Technology Delhi
 - Joint Courses
 - 16 jointly supervised Ph.D. scholars presently enrolled
 - Tata Institute of Fundamental Research
 - Regular faculty student exchange programme on Astrophysics
 - National Mission Projects
 - IIT Bombay
 - IIT Kanpur



COLLABORATIONS AND CONNECTIONS



Strengthen existing MoU's / Explore New MoU's

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Float Joint courses @ at least one per MoU University using ICT																				
Actively promote student exchange with Credit sharing																				
Actively promote joint supervision of Ph.D. Theses																				
Actively promote joint research projects																				
Promote offering joint Degrees and Certificates																				
Plan and start sending students for Master's and Doctoral work																				
Explore new MoU's (Stanford, MIT, MSU, UBC, industry)																				
Introduce International Colloquium Series using ICT																				

Set up formal exchange programmes for UG's under MoUs

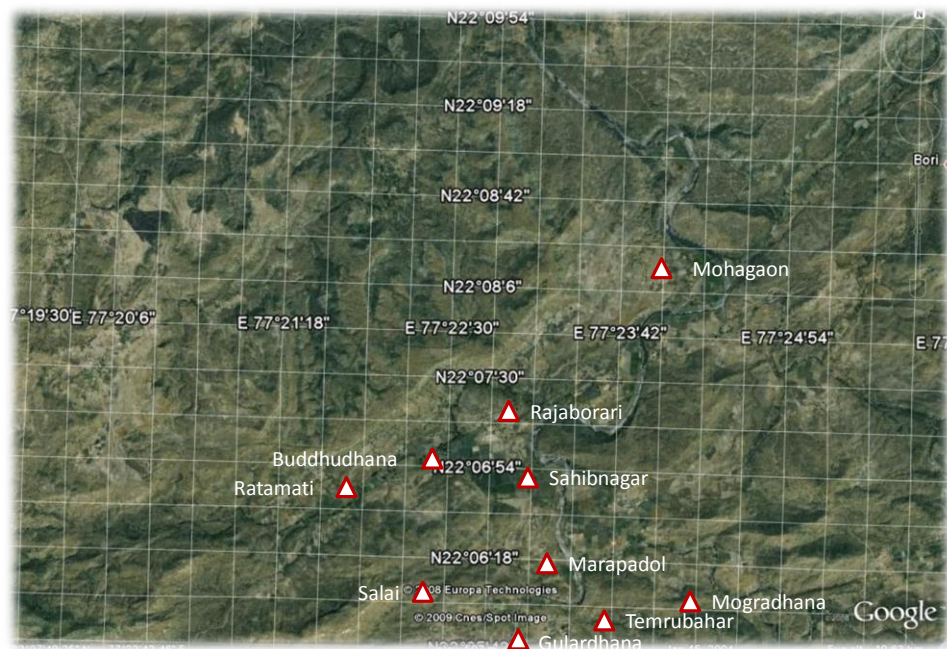
Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Identify Department-wise programmes - setup contact points																				
Identify formal procedures for student selection																				
Implement programme																				

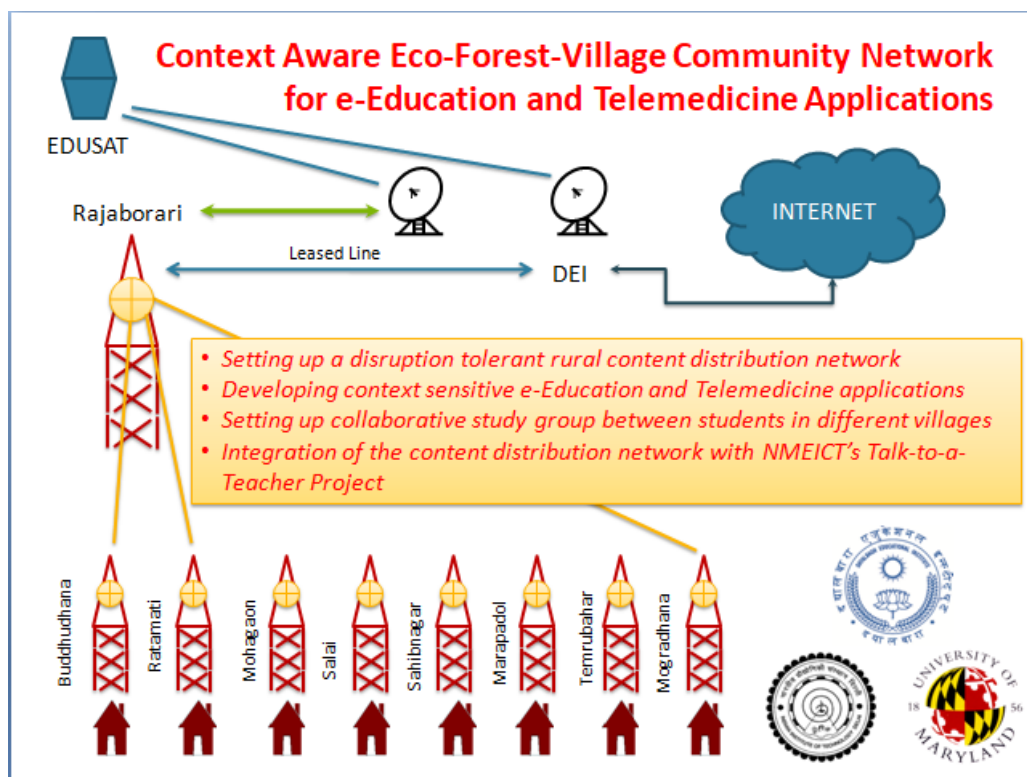
OUTREACH

- Major social service initiative launched in 2004
- Provides need based education
- Targets geographically remote areas and underprivileged and backward communities
- Vocational training programmes offered at 75 locations in India
- Professional Degrees – MBA and B Com are also being offered at selected ICT Centres

OUTREACH

Google Map of the Villages of Rajaborari

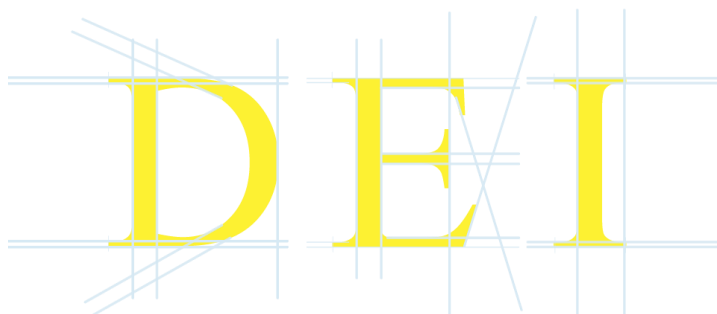




OUTREACH

Expansion and consolidation of our Distance Learning Programme

Action Points for Timeline	2012 - 2016					2017 - 2021					2022 - 2026					2027 - 2031				
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Deploy Context-Aware e-Content Distribution Networks on Rajaborari Campus																				
Expansion of Rajaborari Campus																				
Expansion of Delhi Campus																				
Expansion of MTV Puram Campus																				
Expansion of Bangalore ICT Centre																				
Expansion of EDUSAT Centres to 100 by 2016																				
Expansion of Murar Catchment Area Educational Programmes																				
Mentoring of Schools to improve quality																				



E-DEI-DE: E-DEI DISTANCE EDUCATION

- Each course-module will be 2-4 weeks long
- Courses will be taught on a **on-line mentored format**
- 24 x 7 On-line delivery of course material
- On-line assessment
- **Self-paced course modules**
- **Talk-to-an-expert** on-line
- Video- and audio conferencing for classroom discussions
- **Personal Contact Modules** (at DEI Campus) for professional diploma/degree courses in Management Electrical Engineering and Computer Science

First Course Offerings

- Soft Skills
 - Proficiency in English
 - Programming in Java
 - Deploying and Managing Computer Networks
 - MATLAB for Scientists and Engineers
 - Proficiency in Tally
 - Basic and Advanced Modules in Excel
 - Software Project Management
 - Mathematics for Finance
 - Applications of Finance
 - Arbitrage Pricing Theory and Options
 - Basics of Accountancy
 - Sales Management
 - Foundations of Management
 - Leadership Skills for Professionals
 - LaTeX for Researchers

First Course Offerings

- Basics of Accountancy
- Sales Management
- Foundations of Management
- Leadership Skills for Professionals
- LaTeX for Researchers
- Introductory Quantum Computing
- Intelligent Information Processing Systems
- Nanotechnology
- Green Nanotechnology
- Consciousness Studies
- Consciousness Practice

Co-Op Programme With Industry

- Students spend one term on-campus; one term employed in the industry
- *Co-operative Education & Career Services Centre* (CECSC) will administer the co-operative education system and career-related services
- CECSC will act as a liaison between
 - Students
 - Employers
 - Alumni
 - Faculties and departments within the University to help determine and facilitate employment opportunities

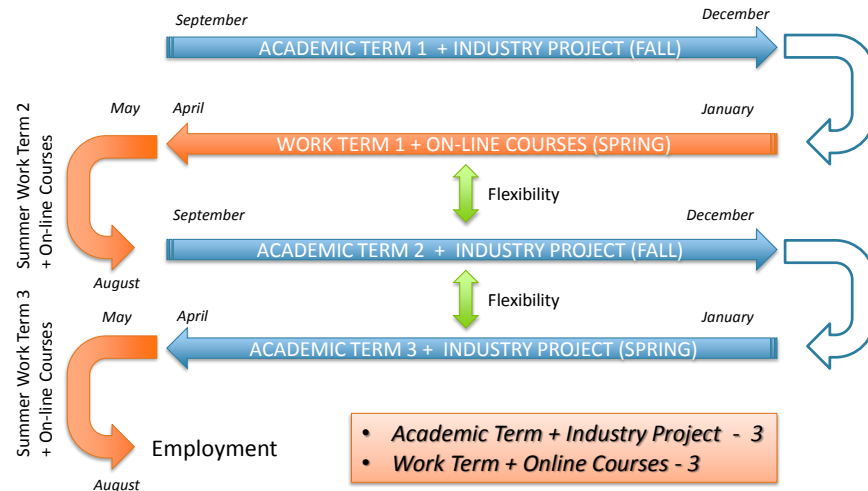
Unique Aspects Of The Dei Co-Op Programme

- A sandwich of
 - Work Term + On-line courses
 - Academic Term + Industry projects
- Only selected students will enter the Co-op stream

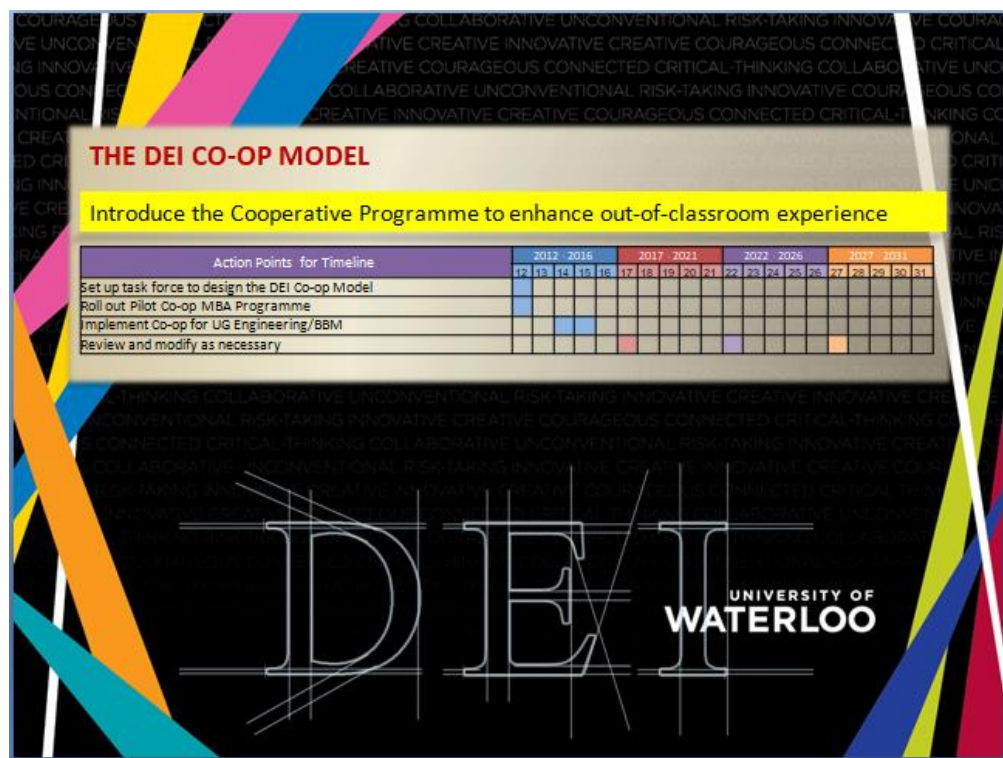
Co-op Programme will selected international slots for talented and enterprising students
(Collaboration with University of Waterloo)

UNIQUE ASPECTS OF THE DEI CO-OP PROGRAMME

• Pilot Roll-out 2012 – MBA Programme



DEI Co-op



Critical Enablers

ALUMNI SUPPORT
ADMINISTRATIVE EFFICIENCY
IMPLEMENTATION APPROACH



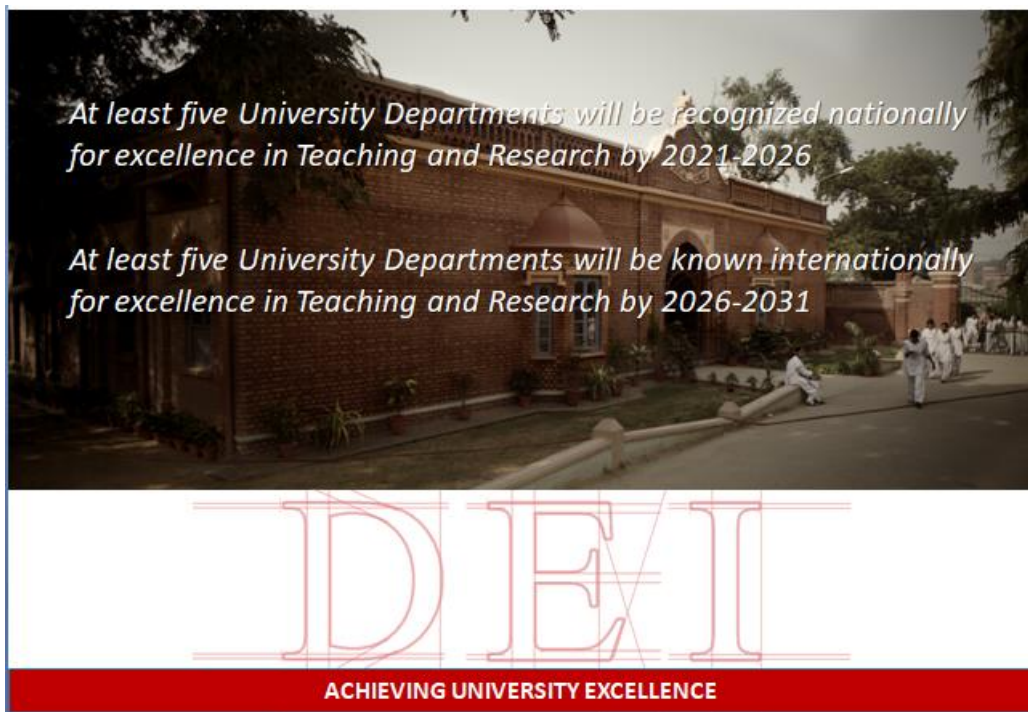
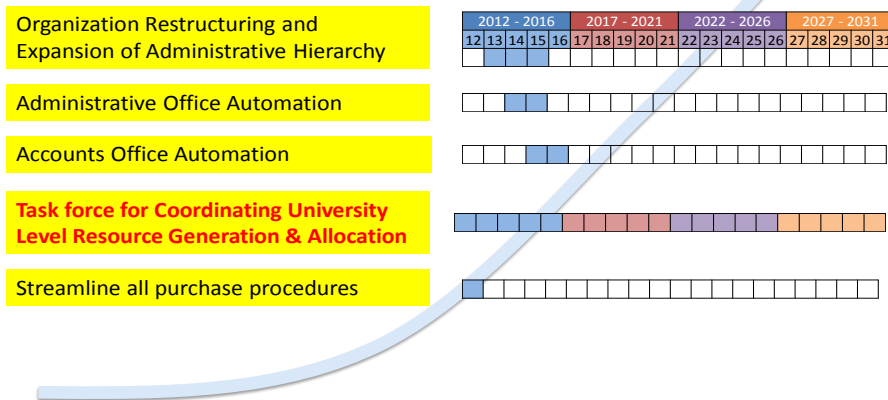
STRENGTHENING ALUMNI CONNECTIONS

The Association of Alumni of Dayalbagh Educational Institutions - AADEIs
The Association of Alumni and Friends of Dayalbagh Educational Institutions (USA) - AAFDEIs

Action Points for Timeline	2012 - 2016				
	12	13	14	15	16
Set up Alumni Chapters in different cities for mobilization (Training/Placement/Mentoring)					
Create a forum for regular re-unions of Alumni					
Start an Electronic Alumni Newsletter					



ENSURE ADMINISTRATIVE EFFICIENCY: SOME STEPS



Implementation Approach

- The Dayalbagh Educational Institute Strategic Plan sets forth an ambitious agenda for the next two decades
- Our vision is bold but we have a deep conviction that it is achievable, since history tells us so...
- Looking back, since 1981 the University has progressed strides ahead...
 - Solar Powered Green Campus

- Quantum Nano Systems Centre
- Multimedia Facility
- EDUSAT and Distance Education Programme
- Extensive ICT Facilities
- Mature Research Programmes
- Extensive Extra-Mural Research Funding (currently of the order of Rs. 45 crore)
- Others...
- Implementation will require the intense involvement of the entire University Community
- A process to clearly partition the proposed tasks and assign them to competent teams responsible for executing them
- Estimation of resources required and identification of means to secure them
- Feedback Mechanism – already in place through regular six-monthly/annual reviews by Academic and Administrative Audit Committee (AAAC)
- Develop of performance indicators
- Systematic plan to update the community on our progress
- The Spirit of “Why not?”
- Irish Dramatist and socialist George Bernard Shaw wrote
 - “You see things; and you say, ‘Why?’ But I dream things that never were; and I say, ‘Why not?’ ”
- At the Launch of the Day Boarding School Distance Learning Centre, DEI, on July 1, 2007, Revered Professor P. S. Satsangi, Chairman of the Advisory Committee on Education, Dayalbagh while recalling this quotation mentioned that the spirit of innovation guided by intuitive consciousness pervades all our plans...

10.1.3. Governing body, administrative setup, functions of various bodies, service rules, procedures, recruitment and promotional policies (10)

DEI has a well-defined organizational structure to ensure efficient governance and management through effective decision making. The main bodies that have been constituted under its Memorandum of Association to formulate and execute policies and strategic plans based on its Vision and Mission and manage all activities of the Institute

Bodies

1. The Primary Body
2. The General Body
3. The Governing Body
4. The Holding Trustees
5. Planning & Monitoring Board
6. The Academic Council
7. The Faculty Boards
8. The Finance Committee
9. The Managing Council for Technical Educational Institutions
10. The Managing Council for General Educational Institutions

The Institute MoA and Bye-Laws provide policy framework and direction for the functioning of the Institute. The roles and responsibilities of various bodies are also clearly defined to ensure transparency and accountability to achieve its objectives. Details are presented in *Annexure II*

Administrative Structure, Bodies And Committees Details

1. Planning & Review

- Institute IQAC
- Planning & Monitoring Board
- Finance Committee
- Building Committee
- AAAC

2. Admission

- Prospectus Committee
- Central Admissions Committee
- Arbitration Committee

3. Course Curriculum Development

- Department Board of Studies (BoS)
- Faculty Board of Studies
- Academic Council
- Standing Committee of Academic Council

4. Examinations

- Panel of Examiners
- Institute and Faculty Examination Committees
- Results Committee
- Grade Moderation Committee

5. Research

- Department Research Advisory Committee (RAC)
- Ethics and Plagiarism Monitoring Committee
- Research Development Committee (RDC)
- Institute R & D Committee

6. Awards and Scholarship

- Distinguished Alumni Award Committee
- Founder's Medal Committee

7. Placement

- Training and Placement Cell
- Faculty Placement Cell
- Alumni Placement Assistance Cell

8. Finance

- University IQAC

- Finance Committee
- Executive Committee

9. Discipline

- Anti-Ragging Committee
- Faculty Discipline Committee
- Faculty Proctorial Committee
- Proctorial Board
- Institute Discipline Committee

10. Grievance

- Grievance Redressal Committee
- Harassment of Women at Workplace Committee

11. Cultural Activities

- Faculty and Institute Cultural Committees

12. Sports

- Faculty and Institute Sports Committees

13. Core Course Advisory Committee

14. NSS

- Faculty and Institute NSS Committees
- Scouting and Guiding Committee

15. Library Committee

- Institute and Faculty Library Committees

In addition, each Faculty has a number of sub-committees and groups including students and staff members for carrying out various activities to ensure efficient functioning through decentralized management. External expert members are part of all-important bodies to provide an unbiased broader perspective, transparency and experience. DEI follows all rules and regulations concerning service, career advancement, research promotion, staff welfare and grievance redressal as laid down by various statutory regulatory authorities, such as, MHRD, UGC, AICTE, CoA and NCTE. The Institute accords due recognition to the achievements of staff and students with suitable incentives.

DEI is an inclusive organization that accepts diversity and inclusion as a way of life. Students and staff represent varied cultures, traditions, beliefs, languages, and lifestyles and work in harmony. The healthy work culture, extensive involvement of its members in various activities and organizational setup ensures timely redressal of grievances if any, at an early stage itself.

It is a matter of great pride that in its 37 years of existence, the Institute has been successful in this endeavour, has a very high retention of staff members and has had no disruptions in its academic

calendar. The General Body and Planning and Monitoring Board meet at least once a year, but more often as and when required, Finance Committee twice a year, Governing Body Meetings are held more than six times a year and the Academic Council, and Board of Studies at least three times a year for taking important academic decisions. A sample minutes of meetings are attached in *Annexure - Minutes of Meetings*

The dates of various Governing Body Meetings of the Institute held is given below:

2014	2015	2016	2017	2018	2019
8.3.2014	30.3.2015	5.3.2016	11.1.2017	27.1.2018	10.1.2019
3.5.2014	25.5.2015	20.5.2016	4.3.2017	19.3.2018	
23.8.2014	22.8.2015	30.7.2016	29.3.2017	20.4.2018	
1.11.2014	26.9.2015	19.9.2016	15.5.2017	31.7.2018	
27.12.2014	27.11.2015	25.10.2016	29.6.2017	10.11.2018	
			20.7.2017 (by Circ.)		
			16.9.2017		
			2.11.2017		

10.1.4. Decentralization in working and grievance redressal mechanism (5)

List the names of the faculty members who have been delegated powers for taking administrative decisions. Mention details in respect of decentralization in working. Specify the mechanism and composition of grievance redressal cell including Anti Ragging Committee & Sexual Harassment Committee.

Grievance Committee

The Grievance Committee of the Institute shall comprise the following Members with immediate effect:-

1. Dean, Faculty of Arts
2. Dean, Faculty of Commerce
3. Dean, Faculty of Education
4. Dean, Faculty of Engineering
5. Dean, Faculty of Science
6. Dean, Faculty of Social Sciences
7. Principal, DEI Technical College
8. Principal, DEI PV Girls' Intermediate College
9. Principal, REI Intermediate College
10. Prof. K. Shanti Swarup, Dean of Student Affairs--- Convener

Students and staff members of the Institute who feel aggrieved on any account may address their grievances either through the concerned Head of the Department/Dean/Principal or directly to the Convener of the Grievance Committee. The Committee will send its recommendations to the Institute (Registrar) for appropriate action.

The institution has a Grievance committee for timely redressal of the student grievances relating to infrastructural facilities, academics and all other needs. The Dean of Student Affairs is the Nodal Officer for the Grievance Committee. At the Department level the student grievances are sorted out in an informal way by the involvement of the faculty and the student representatives. The Students committee elected every year takes part in Redressal of student issues. The Dean, Student affairs works closely with the Student Council members on such situations to guide them. The Appeals Committee in the Examination Section looks into the appeals made by the students about aspects related to examination and evaluation. Issues related to hostel accommodation and related aspects are addressed by the student elect of the hostel in coordination with the warden. Transparency and smooth functioning of the system nullifies situations of complaints. If ever they occur, they are addressed immediately. Periodical Tutor – ward meeting ensures problem solving at immediate student level.

‘SC/ST complaints’ portal in the Institution website specially caters to the grievance of reserved community. Online students’ grievance cell has been created so that students can directly send their grievances online to the Nodal Officer. There are no grievance cases registered during this assessment period.

The Grievance Committee of the Faculty is given below:-

1. Prof. Rahul Swarup Sharma; Chief Proctor
2. Prof. C. Patvardhan
3. Prof. D. K. Chaturvedi
4. Prof. V Soami Das
5. Prof. D. Bhagwan Das
6. Prof. D. G. Rao
7. Sh. Manoj Kumar
8. Ms. Karishma Yadav
9. Prof. Vibha Rani Satsangi
10. Prof. Gur Pyari

Students and staff members of the Institute who feel aggrieved on any account may address their grievances either through the concerned Head of the Department/Dean or directly to the Convener of the Grievance Committee. The Committee will send its recommendations to the Institute (Registrar) for appropriate action. The institution has an Grievance committee for timely redressal of the student grievances relating to infrastructural facilities, academics and all other needs. The Dean of Student Affairs is the Nodal Officer for the Grievance Committee.

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10.1.5. Delegation of financial powers (5)

Institution should explicitly mention financial powers delegated to the Principal, Heads of Departments and relevant in-charges. Demonstrate the utilization of financial powers for each of the assessment years.

The institute has well established Financial Rules in accordance with GFR-2017 and are given below:

(i) General

- a. These rules cover all matters relating to the finances of the Institute including Non-University Educational Institutions, other than financial matters already covered by existing bye-laws, viz. bye-law No. 12 (Procedure for writing off of the unserviceable/obsolete articles) and No. 18 (Provident Fund).
- b. These rules should be read subject to the provisions of the Memorandum of Association and the Rules of the Institute, the directions of the Governing Body, and the administrative instructions issued by the authorities of the Institute from time to time.
- c. Unless otherwise provided, the powers delegated to the various authorities and functionaries in Appendix-I shall not be delegated further without the express authority of the Governing Body.
- d. The exercise of financial powers by the various functionaries of Faculties and Non-university educational institutions shall be subject to the budgetary allocations made under the relevant heads of expenditure and no expenditure in excess of such allocations shall be incurred without prior sanction of the Director within the limits laid down in Clause (viii)(b).
- e. All expenditure under the various grants is subject to the guidelines and other directions received from the grant-giving agencies.

- f. The powers delegated to a lower authority/functionary shall be automatically exercisable by the higher authority/ functionary.
- g. No powers of expenditure delegated to any functionary shall be exercised by it in its own favour.

(ii) Funds

The funds of the Institute shall consist of:

- a. grants received from the University Grants Commission and Central and State Governments,
- b. fees from students,
- c. subscriptions and donations from individuals, trusts, societies and other bodies,
- d. income from investments,
- e. miscellaneous income and receipts, and
- f. borrowings and loans.

(iii) Receipts

- a. All amounts due to the Institute shall be received by the staff of the Accounts Department as authorised by the Treasurer.
- b. Cheques, Demand Drafts and Postal Orders etc., received shall be examined by the Assistant Registrar (Accounts)/ Internal Auditor, before being lodged with the bank, to see that they are in order in all respects.
- c. All amounts received shall be deposited in the bank without delay the same day or latest by the next working day.
- d. Pay-in-slips for monies, cheques, etc., to be deposited in the bank shall be prepared by the Accounts Department staff and entered on the receipt side of the Cash Book. The entry shall be attested by the Assistant Registrar (Accounts) by reference to the counterfoil returned by the bank duly stamped, and the credit in the bank account watched through the bank statement. Delay in collection of over 3 days in respect of local cheques, demand drafts etc., and over a fortnight in respect of outstation cheques, demand drafts, etc., shall be immediately enquired into.
- e. Official receipts for amounts above Rs. 1,000/- shall be signed by the Treasurer/Registrar. Receipts for amounts not exceeding Rs. 1,000/- may be signed by the Assistant Registrar (Accounts) and those for amount not exceeding Rs.100/= may be signed by the Accounts Department staff as authorised by the Treasurer.

(iv) Payments

- a. No payment shall be made unless-
 - (1) there is a budget provision or a grant has been received for meeting the expenditure,

and

(2) the expenditure has been authorised by the proper authority as per statement of Delegation of Financial Powers (Appendix I).

- b. Bills and other vouchers presented for payment shall be examined by the Assistant Registrar (Accounts)/Internal Auditor to see that these have pay order mentioning the amount in words and figures, and are otherwise in order in all respects.
- c. All payments other than those made out of imprest money shall normally be made by crossed 'account payee' cheques/bank drafts after the relative bills, vouchers have been pre-checked by the Assistant Registrar (Accounts)/ Internal Auditor. Normally all salaries shall be paid by bank transfer to the accounts of the payees.
- d. Each cheque issued shall be entered in the Cash Book on payment side and signed as per details given under clause (vi) Banking Operations.
- e. Each voucher shall be stamped "paid by cheque no. _____ dated _____ for Rs. _____" and shall be passed by one of the officers signing the cheques.
- f. Each voucher shall be given a serial number with an identifying code. All vouchers shall be filed along with their receipts in chronological order.
- g. All entries on the payment side of the Cash Book shall be attested by the Assistant Registrar (Accounts) on the day of issue of the cheques and all cheques issued shall be accounted for in the Cash Book at the end of the day.
- h. The Assistant Registrar (Accounts) shall on each day of transaction verify the entries in the Cash Books and check their totals.
- i. The Treasurer shall verify the Cash Book balances as at the end of each month by reference to the Bank reconciliation statement.

(v) Accounts Books

- a. Proper books of accounts shall be kept with respect to:
 - (1) all sums of money received and expenditure incurred, and
 - (2) the assets and liabilities of the Institute.
- b. The books/registers to be maintained are listed in Appendix- II.
- c. All Cash Book entries and/or totals shall be posted in the Ledger under the appropriate heads at the end of each month.
- d. All credit and adjustment transactions shall be posted in the Cash Book on the day of the transactions.
- e. At the end of each month, the following statements shall be prepared by the Accounts Department staff, checked by the Assistant Registrar (Accounts) and submitted to the Treasurer:

- (1) Statements of staff salaries and Provident Fund deductions to be sent to the bank.
- (2) Statement of staff premiums to be sent to Life Insurance Corporation.
- (3) Statement of staff 'Cumulative Time Deposits' to be sent to the Post Office.
- (4) Monthly return of tax deducted at source from staff salaries to be submitted to Income Tax Officer.
- (5) Bank reconciliation statement.
- (6) Trial Balance and a progressive statement of income and expenditure.

f. The books of accounts shall be closed at the end of each financial year, that is 31st March.

(vi) Banking operations

- a. Bank accounts shall be opened under the authority of the Governing Body, which will also prescribe the procedure for the operations thereon.
- b. All bank accounts of the Institute shall be operated by the Treasurer, (or the Assistant Registrar (Accounts) for amounts not exceeding Rs. 1,000/-) jointly with the Registrar (or the Assistant Registrar (Administration) for amounts not exceeding Rs. 1,000/-) or the Director. (GBR-14 dated 1.11.2014).
- c. Signature of any one of the authorised persons shall be sufficient for the purpose of endorsement of negotiable instruments paid into the bank account of the Institute, including non-university educational institutions, for collection or discount or negotiation by the bank.

(vii) Annual Accounts and Budget Estimates

- a. The Treasurer will be responsible for the preparation of the Institute's annual accounts and budget estimates and for their presentation to the Governing Body after these have been considered by the Finance Committee. In the case of non-university educational institutions, the annual accounts and the budget estimates will first be considered by the respective Managing Council before submission to the Finance Committee.
- b. The following budget calendar shall be followed:
 - (1) Deans/Principals shall prepare and submit to the Treasurer by the end of August each year the revised estimates for the year and budget estimates for the following year for their respective Faculties/ Institutions in the form prescribed by the Treasurer.
 - (2) Estimates to be placed before Finance Committee by 30th September.
 - (3) Estimates to be placed before Governing body by 15th October.
 - (4) Estimates to be submitted to Government/U.G.C. by 31st October.
- c. No expenditure, other than that provided in the budget, shall be incurred by the Institute without the prior approval of the Finance Committee.
- d. The budget is not to be taken as any sanction or authority in the matter of seniority, pay and

allowances or in any matter requiring separate administrative and/or financial sanction.

- e. If during a financial year any scheme not included in the budget is sanctioned by the Government or University Grants Commission, it shall be reported to the Finance Committee and Governing Body at their next meeting.
- f. The Finance Committee shall fix the limits of the total recurring and the total non-recurring expenditure for the year, based on the income and resources of the Institute including those of non-university educational institutions. No expenditure shall be incurred by the Institute in excess of the limits so fixed, without the prior approval of the Finance Committee and the Governing Body.

(viii) Appropriation and Re-appropriation

- a. Based on the experience of last five years, amounts should be so appropriated to the various heads in the budget that there may not normally be any need for re-appropriation (i.e. transfer of funds from one head of expenditure to another) beyond 10 percent.
- b. Re-appropriation of funds from one head to another to the extent of 10% or Rs. 10,000/- (GBR-8 dated 6.4.90) whichever is more, may be sanctioned by the Director on the recommendation of the Treasurer. Re-appropriation of funds beyond this limit shall require the approval of the Governing Body.
- c. Re-appropriation of funds for expenditure on any new item shall require the prior sanction of the Governing Body.
- d. A statement showing the original allotments under the various heads of expenditure in the budget, as modified subsequently by re-appropriations sanctioned by the competent authority, actual expenditure up to January 31 and estimates for the remaining months of the financial year, shall be submitted to the Governing Body in February/March each year.

(ix) Audit of Accounts

Arrangements shall be made by the Institute for the yearly audit of the accounts of the Institute including non-university educational institutions by a Chartered Accountant.

(x) Investments

- a. All investments shall be held in the name of the Institute and relative receipts, documents, etc. kept in the custody of the Treasurer/Assistant Registrar (Accounts).
- b. Funds not required for immediate disbursement shall be deposited in short-term deposits/saving bank accounts. Interest earned thereon shall be credited to revenue of the Institute.

(xi) Borrowings

- a. The Institute shall not borrow any money without the prior sanction of the Governing Body.
- b. Temporary overdrafts from the bank or transfers of funds from one account to the other for payment of salaries or making urgent payments may be authorised by the Director on the recommendation of the Treasurer. Such overdrafts and transfers shall be reported to the

Governing Body at its next meeting and adjusted as early as possible .

(xii) Custody and Accounts of Stocks/Stores

- a. Stocks/Stores shall be kept in the custody of officials duly authorised by the Dean/Principal/Registrar in the case of C.A.O. In addition, a permanent register will be maintained at the Central Administrative Office for non-consumable items costing Rs. 1,000/- or more.
- b. Proper accounts of Stocks/Stores shall be maintained to prevent losses through theft, fraud or otherwise and to make it possible at any time to check the actual balance with the book balance.
- c. Separate accounts shall be kept for:
 - (1) consumable stores
 - (2) other assets like buildings, plant, machinery, equipment, furniture, fixtures, etc.
- d. Receipts and issues of stores shall be entered in the Stock Register without delay, both quantities and values shall be shown in the accounts, and a balance struck immediately.
- e. Stores shall not be held in excess of the requirements of a reasonable period.
- f. Stores shall be inspected atleast once a month by an official authorised by the Registrar, the Dean or the Principal, as the case may be.
- g. Physical verification of Stocks/Stores shall be made at least once in a year latest by 31 August. The verification shall be conducted by a responsible official conversant with the classification, nomenclature etc. of the particular class of stocks/stores to be verified, to be nominated by the Director, the Dean or the Principal, as the case may be. The verifying officer shall submit his report to the Director within fifteen days after completion of the verification.
- h. Losses due to theft and fraud, and damage due to neglect or any other causes shall be immediately reported by the concerned official and/or the verifying official to the Director, the Dean, or the Principal, as the case may be.
- i. The previous sanction of the competent authority shall be obtained before writing of the losses stated in (h) above.

(xiii) Miscellaneous

- a. Payment of salaries to staff shall not be made earlier than the last working day of the month, except on special occasions with the written permission of the Director.
- b. Members of staff handling cash/stores/other valuables shall be covered by a fidelity guarantee policy taken out by the Institute in their names.

STATEMENT OF DELEGATION OF FINANCIAL POWERS

Item No.	Nature of powers	Authority empowered	Extent of Delegation
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<u>I. CIVIL WORKS</u>			
A. <u>Civil Works- Major</u> (above Rs.1,00,000/-)			
1.	Administrative approval of all new civil works or major additions to existing ones; setting of financial limits for all such works.	Governing Body	Full powers
2.	Sanction of excess expenditure over estimates beyond 25% (GBR-7/7.8.2010) of approved civil works or major additions to the existing ones.	-do-	-do-
3.	Technical sanction of the detailed plans and estimates of new building; unless decided otherwise by the Building Committee, the schedule of rates as prescribed by the CPWD for the time in force shall be followed in preparing the estimates for the Institute's work, and where the schedule does not make any mention of rates, the Building Committee shall fix them.	Building Committee	-do-
4.	Approval of the construction of new buildings and alterations to existing buildings and inviting and approval of tenders for the purpose.	-do-	-do-
5.	Recommending to the Governing Body for sanction of expenditure incidental to the execution of each work, subject to the allotment made for it by the Governing Body.	-do-	-do-
6.	Sanction of day to day expenditure incidental to the execution of each work.	Director	-do-
B. <u>CIVIL WORKS – MINOR</u> (Upto Rs.1,00,000/-)			
7.	Administrative, technical and financial approval of all minor works and repairs to buildings, roads, paths etc. and sanction of day-to-day expenditure.	Director	Upto Rs.1,00,000 /-
C. <u>CIVIL WORKS – MINOR</u>			
8.	Repairs and maintenance of buildings, roads, paths etc. including sanitary and electrical works.	Dean/ Principal/ Registrar Head of Dept./ Incharge of Centre	Upto Rs.5000/- Upto Rs.2,500/-
D. <u>CIVIL WORKS – GENERAL</u>			
9.	Repayment of security deposits and earnest money of contractors.	Director	Full Powers

II. PURCHASES

Every authority delegated powers for purchasing/procurement of goods shall have the responsibility and accountability to bring efficiency, economy, transparency in matters of purchase and for fair and equitable treatment of suppliers. The person authorised to purchase goods should satisfy himself that the price is reasonable and consistent with the quality required.

Procedure for Purchase of Goods

(i) Purchase of goods without quotation:

Purchase of goods upto the value of Rs.15,000/- only on each occasion may be made without inviting quotations or bids on the basis of a certificate to be recorded by the Competent Authority in the following format:-

“I..... am personally satisfied that these goods purchased are of the requisite quality and specification and have been purchased from a reliable supplier at a reasonable price.”

(ii) Purchase of goods by a Purchase Committee:-

Purchase of goods costing above **Rs.15,000/-** and upto **Rs.1.00 lac** only on each occasion may be made on the recommendations of the Purchase Committee/Equipment Committee which will ascertain the reasonableness of rate, quality and specifications and identify the appropriate supplier. Quotations should be obtained from firms which are registered with Trade Tax Department and under no circumstances from general order supplier. Before recommending placement of the purchase order, the members of the committee will jointly record a certificate as under:-

“Certified that we, the members of Purchase Committee/Equipment Committee are jointly and individually satisfied that the goods recommended for purchase are of requisite specification and quality, priced at the prevailing market rate and the supplier recommended is reliable and competent to supply the goods in question.”

(iii) For purchase of goods costing more than **Rs.1.00 lac and upto **Rs.25.00 lacs** Limited Tender (direct invitation to a limited number of firms) method is to be followed.**

Limited Tender Enquiry should be issued to past successful suppliers plus all other known manufacturers, sole selling agent, authorised dealers whose details should be ascertained from Trade Directories, Internet, etc. Copies of enquiry should be sent directly by speed post/registered post/courier/e-mail to firms. Tenders shall be opened in the presence of equipment/purchase committee.

(iv) For Purchase of goods costing **Rs.25.00 lacs and above:-**

Advertised Tender Enquiry should be used for procurement of goods. It may also be notified on the web site. Ordinarily, the minimum time to be allowed for submission of bids should be three weeks from the date of publication of the tender notice. Where bids are also obtained from abroad, the minimum period should be kept as four weeks for both domestic & foreign bidders. Advertisement should be given in atleast one national daily having wide circulation.

Provided that purchase through Limited Tender Enquiry may be adopted even where the estimated value of the goods to be purchased is more than Rs.25.00 lacs in the following circumstances:-

- (a) The Director certifies that the demand is urgent and the purchase not through Advertised Tender Enquiry is justified in view of urgency. The nature of urgency and reasons as to why the procurement could not be anticipated should be recorded.
- (b) There are sufficient reasons, to be recorded in writing by the Director indicating that it will not be in the interest of the Institute to procure the goods through Advertised Tender Enquiry.
- (c) The sources of supply are definitely known and possibility of fresh source(s) beyond those being tapped, is remote.

10.	Purchase/hire of Equipment, Furniture and Fixtures:-
Equipment/ Purchase Committee	Full powers provided that in the case of a single item costing above Rs.30,000/- the prior approval of the Governing Body would be necessary.
Director	A single item costing up to Rs.20,000/- and single order not exceeding Rs.1,00,000/-
Dean/ Treasurer/ Registrar	A single item costing up to Rs.12,000/- and single order not exceeding Rs.25,000/-
Head of the Department/	A single item costing up to Rs.8,000/- and single order not exceeding Rs.15,000/-

11. Purchase of office stationery and consumable items including purchase of building materials for works they are competent to sanction under Item-I Civil Works of Appendix-I above Purchase/hire of Equipment, Furniture and Fixtures:-

	Purchase Committee	Full powers
	Director	One time order upto Rs.1,00,000/-
	Dean/ Principal/ Treasurer/ Registrar	One time order upto Rs.25,000/-
	Head of Department / Asstt. Registrar/ Incharge of Centres	One time order upto Rs.8,000/-,
<u>Composition of Purchase Committee</u>		
For Faculties, Central Library, Centres and Non-Univ. Edu. Institutions:		For Central Administrative Office:
1. Director or his nominee 2. Treasurer or his nominee 3. Dean of the concerned faculty/ Principal concerned/ Registrar in all other cases		1. Director or his nominee 2. Treasurer or his nominee 3. Registrar

4. Head of the Department/Chairman, Lib.Committee / I/c Centres		
Note:-		
1.	In case the Director's nominee chairs the meeting on behalf of the Director, the minutes of the meeting shall be submitted to the Director for his approval before implementation.	
2.	The various offices listed above shall exercise the above powers of purchases within the allocated budget and subject to availability of grant.	
12.	Purchase of books, journals & periodicals including newspapers in the faculties/non-university educational institutions	
Departmental Library Committee consisting of concerned Dean/ Principal, concerned Head / Seniormost teacher of the Department, and Assistant University Librarian/ Faculty Librarian		Upto Rs.20,000/- per order (GBR-7/7.8.2010)
Library Committee or its Working Committee as mentioned in Bye-law No.30 (GBR-7/7.8.2010)		Full Powers
13.	Purchase of books and periodicals including news-papers at the Central Administrative Office and other Centres/Sections	
Registrar/ Treasurer/ Head of the Centre/ Section and Assistant Registrar (Academic)/ Assistant Registrar (Accounts)/ next senior most officer in the Centre/ Section		Full powers, subject to the approval of the Director.

III.	<u>SIGNING OF CONTRACTS, AGREEMENTS AND DOCUMENTS</u>		
14.	Execution of documents relating to contracts	Director	Full powers
15.	Execution of service agreements of staff	Registrar	Full powers
16.	Signing of documents relating to sale/transfer of securities, provided the sale/transfer has been approved by the Governing Body.	Director/ Treasurer	Full powers
	All actions taken under item 17 shall be reported to the Governing Body.		
IV.	<u>SANCTION OF IMPREST CASH & TEMPORARY ADVANCES</u>		
18.	Sanction of limits for	Director on the	Full powers

	imprest money (within the limits prescribed by the Governing Body)	recommendation of the Treasurer	
		Treasurer, on the recommendation of the Dean/ Principal/ Registrar in the case of Central Admn. Office.	Upto Rs.1000/-
19.	Sanction of temporary advances for the Institute's work.	Director, on the recommendations of the Treasurer	Full powers.
V.	<u>MISCELLANEOUS</u>		
20.	Expenditure on publications and Printing	Director	Full powers
21.	Expenditure on Advertisements	Director	Full powers
22.	Expenditure on Law suits and other legal matters	Director	Full powers
		Registrar	Upto Rs.500/- per law suit.
23.	Awarding of Fellowships (Visiting & Research Fellows)	Director on the recommendations of the Standing Committee of the Academic Council	Full powers.
24.	Sanction to staff from the un-assigned grant	-do-	Full powers within the UGC guidelines.
25.	Awarding of medals, prizes and other awards etc, for academic achievements.	Governing Body on the recommendations of the Academic Council	Full powers
26.	Payment of honorarium	Director	Full powers
27.	Granting of free ships, stipends and scholarships and aid	Director on the recommendation of the Dean/	Full powers

	from poor aid fund to students	Principal	
28.	Refund of Caution Money	Treasurer	Full powers
29.	Sumptuary expenses: Abolished vide Director's order dt. 14.11.1991.		
30.	Sanction of expenditure on Institutional Hospitality	Director	Full powers
		Treasurer/ Registrar	Upto Rs.25/- per head subject to a maximum of Rs.250/- per meeting and Rs.3000/- per year.(GBR:7/7.8.2010)
		Deans/ Principals	Upto Rs.15/- per head subject to a maximum of Rs.150/- per meeting and Rs.1500/- per year.
		Asstt. Registrar/ Heads of Depts.	Upto Rs.10/- per head subject to a maximum of Rs.100/- per meeting and Rs.600/- per year.
31.	Expenditure on maintenance of Guest House	Director	Full powers
32.	Hiring of motor vehicles, furniture, fixtures and miscellaneous items (GBR-7/7.8.2010)	Director	Full powers

33.	T.A. & D.A. Bills :-		
(i)	Bills conforming to T.A./D.A. rules -		
	(a) At CAO	Treasurer/ Registrar	Full powers
	(b) At faculties/Non. Univ. educational institutions	Dean/ Principal	Full powers
(ii)	Bills not conforming to TA/ DA rules, like travel by a class higher than the admissible class etc.	Director, subject to report to the Governing Body	Full powers.
34.	Sports (GBR-15 dated 21.10.92) :-		
(i)	Power to sanction expenditure on sports activities for all types of items	Sports Officer	Upto Rs.200/-

	e.g. refreshments, contingencies etc.		
(ii)	Power to sanction purchase of sports material where required for emergent use	Sports Officer	Upto Rs.500/-
(iii)	Power to sanction expenditure on sports activities for which prior administrative sanction of the Director has been obtained	Sports Officer	Upto Rs.1000/-
35.	Repair of equipment, furniture, vehicles and appliances based on approval of necessary estimates (GBR-48 dated 22.3.95)		
	Administrative and Financial Powers	Head of the Department/ Chairman, Library Committee/ Incharges, Centres (GBR-7/7.8.2010)	Upto Rs.5000/-
	-do-	Dean/ Principal/ Treasurer/ Registrar	Upto Rs.10,000/- (GBR-7/7.8.2010)
	-do-	Director	Upto Rs.20,000/- (GBR-7/7.8.2010)
	-do-	Repair Committee (constitution same as of Equipment Committee: Bye-law No.11)	Upto Rs.50,000/- (GBR-7/7.8.2010)
	-do-	Governing Body	Full powers

10.1.6. Transparency and availability of correct/unambiguous information in public domain (5)

(Information on policies, rules, processes and dissemination of this information to stakeholders is to be made available on the web site)

The institute is having a web-committee which will be scrutinizing the program/ institute specific information before uploading on to the web. Because of this mechanism, the ambiguity will be avoided. However, if somebody is in need of further clarification, the same will be addressed by the concerned department/ section. The Institute has a well-established Right to Information cell headed by the information officer Sh. H.K.Khanna. All the relevant information are available on the institute website apart from are included in the institute prospectus. However, the documents are also available at the relevant offices for the stake holders.

YES. All the information are available on Institutes website. DEI maintains complete transparency in its financial, academic, administrative and auxiliary functions by clearly defining its vision, mission, objectives and procedures and disseminating them at all levels.

Proper procedures are strictly followed according to Govt. norms. The annual academic plan, is prepared in advance, communicated and displayed by the respective bodies. The details of various activities are regularly reported to concerned bodies and committees and records and minutes of the meetings maintained meticulously.

Transparency in Academic Functioning

DEI strictly adheres to the academic calendar that details the various activities in advance. Admission notifications are made through newspapers and on its website. Admission forms are processed online, with all the relevant details explained in the prospectus and also on the website.

The entire academic plan is clearly explained to all students in a compulsory orientation programme on admission, addressed by the Director, Deans and senior faculty.

The elaborate system of various committees and bodies coupled with a strong multiple-level feedback mechanism from all stakeholders, also ensures the dynamism required to keep pace with the changing educational environment.

The credits of each programme and outcomes are clearly specified.

The internal assessment, comprising various components, ensures that students receive their evaluated answer sheets and monitor their progress, performance and fairness in the evaluation. There is provision for re-evaluation, remedial examinations and grievance redressal system.

The fee is minimal, online and withdrawal and refund as per UGC norms.

DEI allows all applicants to appear for the admission process and selects candidates strictly on merit. It deals directly with students and even helps with filling up forms through help-desks.

Transparency in Administrative Functioning

Recruitments and Staff Promotions are also undertaken with utmost transparency. All posts are advertised online and list of candidates screened and called for interview are displayed on the DEI website. Employees can readily discuss and access their records in the various sections of the central administrative office. RTI applications are received and processed promptly. Notices are promptly shared on emails, salary statements sent electronically. Govt. regulations and amendments are promptly placed before the concerned bodies, circulated, displayed on DEI website. Major issues are decided through consensus, for instance, the Institution of Eminence, Vision-2031 strategic Plan and white papers were finalized through involvement and feedback of all stakeholders.

Transparency in Financial Functioning

DEI strictly follows all the rules and regulations of the Government of India. It has adopted General Financial rules, 2017. All expenditure proposals undergo strict financial scrutiny at various levels

including Finance Committee and Governing Body. All its purchases are made in a transparent manner strictly as per GFR. Its fee collections and staff and vendor payments are through online mode. Its Annual Budget and Annual Accounts are prepared as per MHRD norms and are placed before the Finance Committee and Governing Body. Propriety is ensured at all levels with regular audits by internal auditor, Chartered Accountant, State Government (Through Local Fund Audit) and Central Govt. (through CAG via AG, U.P.). No draft para has ever been issued against the Institute.

10.2. Budget Allocation, Utilization, and Public Accounting at Institute level (15)

Summary of current financial year's budget and actual expenditure incurred (for the institution exclusively) in the three previous financial years.

Total Income at Institute level: For CFY, CFYm1, CFYm2 & CFYm3

For 2018-19(Rs. In Lakhs)

Total Income in 2018-19				Actual expenditure in 2018-19 till 31.12.2018			Total No. of students in 2018-19 7665
Fee	Govt.	Grant(s)	Other Sources (specify)	Recurring including Salaries	Non-recurring	Special Projects/Any other, specify	Expenditure per student
240	461.70	6864.51	428.37	6063.95	157.04	238.59	0.79 (till now)

For 2017-18(Rs. In Lakhs)

Total Income in 2017-18				Actual expenditure in 2017-18			Total No. of students in 2017-18 6641
Fee	Govt.	Grant(s)	Other Sources (specify)	Recurring including Salaries	Non-recurring	Special Projects/Any other, specify	Expenditure per student
495.80	226.50	6689.42	1201.01	6895.27	462.73	429.71	0.95

For 2016-17 (Rs. In Lakhs)

Total Income in 2016-17				Actual expenditure in 2016-17			Total No. of students in 2016-17 5822
Fee	Govt.	Grant(s)	Other Sources (specify)	Recurring including Salaries	Non-recurring	Special Projects/Any other, specify	Expenditure per student
374.92	354.01	5215.09	918.35	5595.49	692.90	254.37	0.91

For 2015-16 (Rs. In Lakhs)

Total Income in 2015-16				Actual expenditure in 2015-16			Total No. of students In2015-16: 4699
Fee	Govt.	Grant(s)	Other Sources (specify)	Recurring including Salaries	Non-recurring	Special Projects/Any other, specify	Expenditure per student
350.72	19.77	4716.17	699.64	4987.64	562.20	354.29	0.97

Table B.10.a

Items	Budgeted in 2018-19	Actual expenses 2018-19(till 31.12.18)	Budgeted in 2017-18	Actual Expenses in2017-18	Budgeted in 2016-17	Actual Expenses in2016-17	Budgeted in 2015-16	Actual Expenses in 2015-16
Infrastructure Built-Up	65.00	60.86	-	-	-	-	250.00	242.66
Library	45.00	42.55	5.00	3.87	50.00	46.65	15.00	15.05
Laboratory	65.00	61.03	120.00	113.30	120.00	118.84	135.00	134.30

equipment								
Laboratory consumables	5.00	2.55	150.00	147.13	160.00	151.24	75.00	74.09
Teaching and non-teaching staff salary	5500.00	5359.24	5800.00	5785.10	4665.00	4660.95	4400.00	4301.40
Maintenance and spares	150.00	134.44	190.00	181.14	250.00	244.53	190.00	187.00
R&D	R & D Grants are received for various Govt. Funding is reported separately							
Training and Travel	19.00	16.49	75.00	70.05	70.00	67.17	30.00	26.84
Miscellaneous expenses *	-	-	-	-	-	-	-	-
Others, specify	575.00	574.15	1100.00	1057.41	1000.00	999.01	575.00	568.41
Total	6424.00	6251.31	7440.00	7358.00	6315.00	6288.39	5670.00	5549.81

Table B.10.2b

*** Items to be mentioned.**

10.2.1. Adequacy of budget allocation (5)

(The institution needs to justify that the budget allocated over the years was adequate)

The budget allocated over the years for various programs by the institute are adequate and in case there is any deficiency, it is made from Institute's own resources. Apart from regular Budget, the departments are receiving various project grants to meet their expenditure. The budget allocation and utilisation for the last three years is adequate. Formal budget estimates are prepared by each department and are reviewed in HODs meeting with the Dean.

10.2.2. Utilization of allocated funds (5)

(The institution needs to state how the budget was utilized during the last three years)

The allocated funds are utilized properly and are adequate as per the Academic requirements. The budget funds are utilized on priority basis as per the requirements of each department based on availability of funds. However, all recurring and non-recurring expenditure of departments is met in full (including salaries, lab consumables etc.).

10.2.3. Availability of the audited statements on the institute's website (5)

Yes

10.3. Program Specific Budget Allocation, Utilization (30)**Total Budget at program level: For CFY, CFYm1, CFYm2& CFYm3****From Faculty Grants Only (expenditure per Students: Institute basis)****For 2018-19**

Total Budget in 2018-19		Actual expenditure in 2018-19 (till 31.12.2018):		Total No. of students in 2018-19
Non recurring	Recurring	Non Recurring	Recurring	Expenditure per student
3.20	29.89	2.24	26.42	0.79

For 2017-18

Total Budget in 2017-18:		Actual expenditure in 2017-18:		Total No. of students in 2017-18:
Non recurring	Recurring	Non Recurring	Recurring	Expenditure per student
72.23	45.00	69.75	40.23	0.95

For 2016-17

Total Budget in 2016-17:		Actual expenditure in 2016-17:		Total No. of students in 2016-17:
Non recurring	Recurring	Non Recurring	Recurring	Expenditure per student
10.22	45.00	9.089	33.25	0.91

For 2015-16

Total Budget in 2015-16:		Actual expenditure in 2015-16:		Total No. of students in 2015-16:

Non recurring	Recurring	Non Recurring	Recurring	Expenditure per student
120.22	93.50	110.882	88.64	0.97

Table B.10.3a

Items	Budgeted in 2018-19	Actual expenses 2018-19(till 31.12.2018)	Budgeted in 2017-18	Actual Expenses in 2017-18	Budgeted in 2016-17	Actual Expenses in 2016-17	Budgeted in 2015-16	Actual Expenses in 2015-16
Laboratory equipment	110.00	102.64	10.00	8.3	150.00	141.49	15.00	11.29
Software	System software and Application Software cost is included with Equipment cost							
Laboratory consumable	10.00	6.11	20.00	17.53	30.00	26.55	20.00	17.60
Maintenance and spares	Included in Laboratory Consumables							
R & D	Separate R & D Project Grants received and indicated							
Training & Travel	-	-	-	-	-	-	-	-
Miscellaneous expenses *	10.60	8.50	5.55	5.35	8.66	8.62	3.33	3.28
Total	120.60	117.25	35.55	31.18	188.66	176.66	38.33	32.17

Table B.10.3b

*** Items to be mentioned.**

10.3.1. Adequacy of budget allocation (10)

The Head of the department instructs the concerned lab in charges to provide the budget required for the coming academic year. The Lab in charge provides, both, recurring and non recurring expenditure budget required for the lab. based on the budget provided by various lab in charges the a final budget proposal will be prepared with the following items

- Laboratory equipment

- Laboratory consumables
- Maintenance and spares
- Miscellaneous expenses

The budget provided by the institute to the department is adequate to maintain and procure new items for the departments, to meet the academic requirements. The yearly budget is prepared according to the needs & requirements of the departments taking into consideration of annual intake of students, laboratory & infrastructure developments. The budget allocation and utilization for the last four years is adequate.

10.3.2. Utilization of allocated funds (20)

The allocated funds are utilized properly and are adequate as per the Academic requirements. In the year 2015-16, the budget proposals involved for procuring major equipment for genetic engineering Lab. It can also be utilized for conducting experiments for other labs. This equipment was purchased in the next year budget after several negotiations with the suppliers. Due to this the budget utilization was not utilized properly for 2015-16. However, in the year 2016-17, the equipment was finally purchased.

10.4. Library and Internet (20)

(Indicate whether zero deficiency report was received by the Institution for all the assessment years. Effective availability/purchase records and utilization of facilities/equipment etc. to be documented and demonstrated)

10.4.1. Quality of learning resources (hard/soft) (10)

- Accessibility to students
- Support to students for self-learning activities

Relevance of available learning resources including e-resources:

Institute Library and Faculty Library is made available the following resources for the benefit of the staff and students. All these resources are very much relevant to the course curriculum and are also mandated by AICTE too.

E-Journal Package:

1. Science Direct
2. IEEE All Society Periodicals Package
3. ASME Digital Library

4. ASCE Digital Library
5. McGraw Hill Access Engineering
6. JGate – Engineering & Technology
7. ProQuest
8. EBSCO Business Source Elite
9. J Gate – Social Science and Management Science

In additions to the above mentioned resources, Institute is also providing links to various Open Access resources along with subscribed e-resources through its website. URL : www.dei.ac.in.

For the easy access, all the online resources are subscribed as IP Based access subscription. This will help the users to access any resource from any computer connected in the CBIT Campus LAN. and also through WiFi enabled devices. In addition to this, Institute is providing Federated Search mechanism through which a user can access all the databases through single search box. This will help the users for searching multiple database at a stretch. Remote off campus access facility is created and this can be used by the users as and when they require with a special request. Support to students for self-learning activities Institute Library & Information Centre is supporting the students for self-learning activities. In this process it is subscribing multiple online resources, through which student will get an access to variety of resources to study and learn on their own.

Following resources are also accessible to the students:

- 9000 + NPTEL Videos
- 100+ Subjects NPTEL Text Content
- 298 Subjects MIT Open CourseWare
- 1000+ E-Books
- 500+ Projects
- 1500+ Software Tutorial Videos
- 2000+ Universities Information
- 2500+ Companies Information

For the effective use of these self-learning resources Institute Library & Information Centre established an exclusive E-Learning Resource Centre. This centre is having latest HP i7 computer systems with 21 inch monitors and headphones, which helps the users in their self-learning activity by accessing the online lectures of removed experts of their field.

Student Mentoring and Support

Academic Support : Remedial Teaching, Peer coaching for weak students, Integrated programs for bright students, flexible choice based credits,

Undergraduate Students Research Awards (UGRA) to encourage bright students to pursue research. Short courses on Soft Skills, Resume writing and Computer Skills by AADEIs throughout the year for unemployed graduates also.

Vidyaprasar: Availability of videos of lectures in courses.

Placement Support: Alumni Placement Assistance Cell (DEI-APAC) with DEI-TPO. Cell for guiding and mentoring for National Tests- IAS, NET/GATE etc.

Class Committees and Proctorial System: Each class has a Proctor and each course has a class committee comprising students and teachers other than the course teacher. Regular Teachers appointed as Wardens in hostels.

Financial Support:

Cost-effective education, Scholarships, Support through part-time jobs in Projects.

Alumni Support: For participation in conferences and training abroad, summer training and co-op internship.

Business Advisory Clinic: Students alongwith faculty offer free services to advise entrepreneurs and ailing businesses.

Counselling Cell: The Psychology Dept. offers free counselling services to students.

Entrepreneurship and Incubation Cell: To encourage Entrepreneurship and start-ups Entrepreneurship Development Cell functioning in the Institution. We train students to improve their entrepreneurial skills; so that they become job providers rather than job seekers.

Students Chapters: IEEE, IET and SSI Student Chapters to encourage professional activities.

Paritantra: Annual Student Conference and Annual Summer School for High School Students in Science.

Health Centre : SA Hospital offers medical treatment at nominal cost.

Earn while you learn: Students manage daily Canteen services at various locations by preparing food items, serving and selling them. Also students are engaged in conducting lab classes and are trained and paid stipend for these activities.

Facility under MOUs for students to study courses at IIT Delhi, Univ. of Maryland, USA.

Research Technology Park-Multi-disciplinary Research Centres: The Centre for Quantum and NanoSystems , and the Centre for Consciousness Studies organize Workshops for the faculty and students

Any other Support:

- The welfare of the students is taken care by the Dean of Student Affairs, who is a senior faculty member. Various activities of the students are planned along with the students and staff

- Every class of students has a Captain, Vice Captain, Prefect & Asstt Prefect and teachers as Proctor. Regular class committee meetings are held.
- In order to improve the communication skills, soft skills and leadership skills, training and exposure are provided to the students.
- The Anti-Ragging committee constituted as required with inclusion of faculty from various departments for prevention of ragging and related incidences in the campus

The Lifelong Learning centre conducts short-term courses and vocational training to promote self-employment

- Insurance coverage is provided for students against the contingency of an accident

Support services to SC/ST students: A special SC/ST Cell looks into their admission requirements, take care to avoid any discrimination and provide assistance to enhance their communication and soft skills. Several bridge courses for languages and other basic subjects are organised. Additional Remedial coaching, Coaching for entry into civil services, NET/SLET and for competitive examinations and encouragement to apply and avail state, national scholarships for the deserving students.

10.4.2. Internet (10)

- Name of the Internet provider:
- Available bandwidth:
- Wi Fi availability:
- Internet access in labs, classrooms, library and offices of all Departments:
- Security arrangements: Entire Campus is under 24x7 CCTV surveillance which is also continuously monitored apart from Gents and Ladies Security Guards Deployed at various places within the campus.

DEI continuously strives to provide state-of-the-art technologies and update its ICT facilities to ensure efficient functioning. Extensive infrastructure has been setup during the last five years:

1. IP based Surveillance System
2. IP based Telephony
3. Remote Laboratories
4. Cadence Design Software The infrastructure includes:
 - Desktops (Xeon, Intel i5, Dual Core , AMD processor based with 4 to 32 GB RAM and 500 GB to 8TB HDD)
 - Laptops (i7, i5- 6th generation, Core2Duo based 2.4 GHz with 4 to 8 GB RAM

- Total number of systems =15
- 2 rack servers (Xeon 4.2 GHz, 32 GB RAM)

The IP Surveillance system and phone system was established in 2016 with the following configuration:

- IP camera (1.2 to 12 MP, sony, vivitek, Axis , canon, cp-plus) =300
- IP phone =200
- 8 NVR with 156 TB of storage
- 50 Cisco Switches

• 20 Km of Fiber Optic Cable. The additional Fiber Optic Cable laid in 2016 also connects various units of DEI such as the International Guest House and Seminar Hall Complex, Outer Boys Hostel, Tannery Campus, Girls Hostel II, Electrical Engineering Laboratory at Faculty of Engineering and Technical College, Library building in Faculty of Engineering, Shatabdi Bhawan, Faculty of Architecture and Psychology Department to the Institute LAN and for Internet access. Associated equipment such as ethernet and fiber switches were also installed at different locations.

In 2017, WIFI facility was installed with latest Cisco wireless controller 5520 and 30 Cisco Aironet 2802 series Wireless Access Points. All buildings, hostels, Seminar halls, conference rooms and common areas in the campus are now wi-fi enabled. Additional 16Mbps MPLS VPN Connectivity has been taken from BSNL for DEI Dayalbagh. More than 250 desktops have been added to create new laboratories and to replace legacy systems. These systems range from Intel i5 to i7 based systems.

Significant investment has been made to upgrade classrooms to e-classrooms/smart classrooms with the purchase of the following equipment:

- Sony VPL EW 536 With IQ Board
- Sony VPL-SW-536C Interactive Projector with White board
- Sony VPL EW 246 LCD Projector
- Digital Lectern with face plate KPS KPC 900 with Audio System
- Sony SRG-120DH Camera
- Network Controller KP-600U2
- Desktop Computers and Laptops for eClassrooms
- Polycom Real Presence Group 500 Solution

- LED TV 49"/50"
- Video Switcher/ Converters and Distributors

Microsoft MS Dreamspark license has been purchased for licenses to Microsoft products. Site License for Microsoft Office 365 has also been obtained for students and staff of DEI. The base SPSS package has also been purchased.

Tenders for purchase of Cisco ASA Firepower 2140 Firewall and Cisco Core Switch N9K-C9508 to upgrade the networking infrastructure in the Central Computer Center, GPON Network with accessories, BIOVIA Discovery Studio Teaching Suite, Mathematica, Robotmaster Education Bundle, Virtual Classroom solution, Multitouch Interactive Displays and Video Walls have been uploaded.

Declaration

The head of the institution needs to make a declaration as per the format given below:

I undertake that, the institution is well aware about the provisions in the NBA's accreditation manual concerned for this application, rules, regulations, notifications and NBA expert visit guidelines in force as on date and the institute shall fully abide by them.

It is submitted that information provided in this Self-Assessment Report is factually correct. I understand and agree that an appropriate disciplinary action against the Institute will be initiated by the NBA in case any false statement/information is observed during pre-visit, visit, post visit and subsequent to grant of accreditation.

Date:

Signature & Name

Place:

Head of the Institution with seal

ANNEXURE I (A) PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

B. Program Specific Outcomes

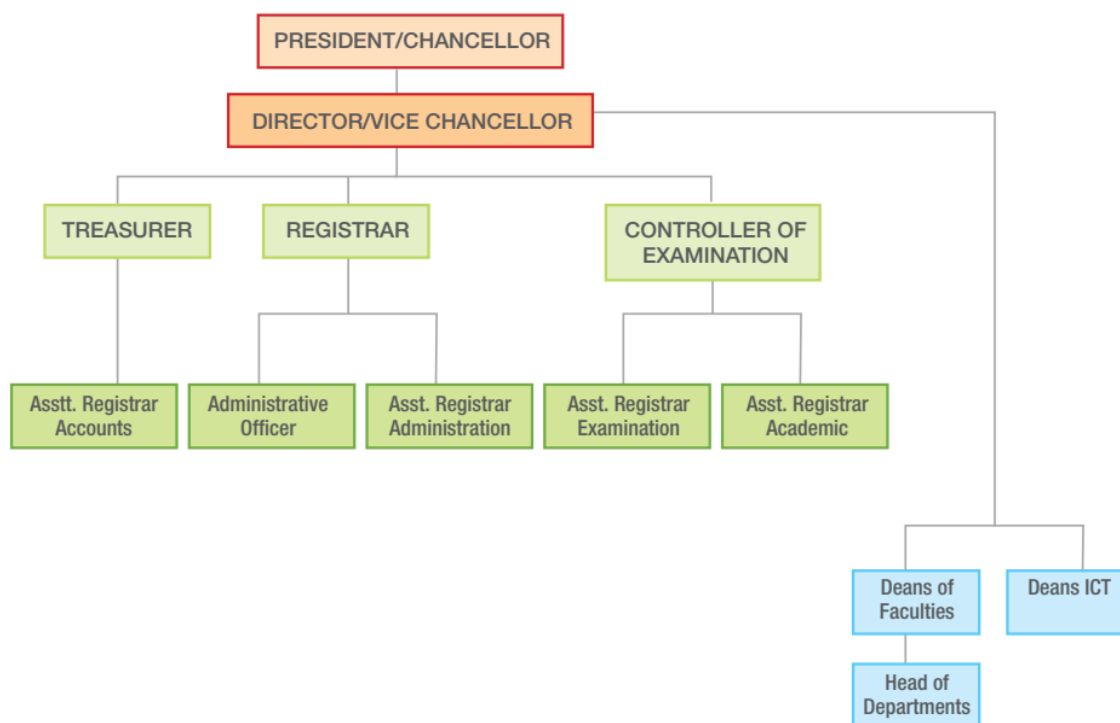
PSO1	Graduates of Mechanical Engineering will achieve excellence in product analysis, product design, innovation and entrepreneurship.
PSO2	Graduates will be able to analyze, interpret and provide solutions to the real life mechanical engineering problems.
PSO3	Graduates will be able to develop approaches to solve multidisciplinary problems of manufacturing using state of art technologies.

ANNEXURE II

ADMINISTRATIVE STRUCTURE, BODIES AND COMMITTEES DETAILS

Organization Structure

The organisational structure of the university fulfills the two aims of good governance and implementation of the Academic Plan. Supplementary committees and other bodies provide guidance, feedback, review, allowing evolution and adaptation to the changing educational needs of our society.



Organizational Structure and Independent Bodies

Independent Bodies and Major Committees



Independent Bodies and Major Committees

1. **Advisory Committee on Education (ACE)**

The Advisory Committee on Education was founded in 1991 and reconstituted in 2002. Its main objective is to enhance quality of teaching and research in the Institute and its colleges and schools so as to reach to the highest level of educational standards. This committee is a think tank that suggests, interalia, measures for enhancing the quality of the Dayalbagh Educational Institutions in accordance with the Dayalbagh Educational Policy. Meetings are held every alternate month; the Committee also meets more frequently when deemed necessary.

2. **General Body**

The General Body consists of a maximum of thirty members. This committee has the widest membership allowing interaction and feedback on a broad range of issues.

3. **Primary Body**

The role of the Primary Body is to constitute the first Governing Body of the Institute; to consider the Annual Report of the Institute and Accounts as submitted by the Governing Body; to review and monitor the act(s) of the Governing Body. The Primary Body shall not contravene any of the laws, rules regulations or directions, having the force of law prescribed or given by the government, state or central or any legally constituted body authorized to do so. The primary body of the institute consists of the following members:

S.No	Title
1	President/ Chancellor

2	Director/Vice Chancellor of the Institute
3	Treasurer /Finance Officer of the Institute
4	Two nominees of the President of the Institute
5	Six members nominated by General Body
6	One nominee from DEI Women's Training College Society
7	One nominee from DEI Engineering College Society
8	One nominee from Managing Committee of REI
9	One nominee from Ministry of Education, Govt of India
10	Secretary Education, Uttar Pradesh
11	One nominee from AICTE
12	Deans of Faculties

The Registrar is the ex-officio Secretary of the Primary Body. Generally, the Primary Body meets once every year. The term of the nominated members is for three years; however, the retiring members can be re-nominated. The President of the Institute shall preside at the meetings of the primary body and in his absence, the Director of the Institute shall preside over the same.

4. Academic and Administrative Audit Committee (AAAC)

The Academic and Administrative and Audit Committee is a special committee constituted to of provide feedback about the functioning of the university on administrative and academic matters. The AAAC consists of a few senior teachers of the university and senior teachers from other universities. Members are nominated by the Director. The AAAC team meets its objectives by visiting each faculty and department once every year, and meeting each section of the university community, including students and research scholars, faculty members, and office staff, to hear their grievances, if any, and any suggestions for the improvement of academic and/ or administrative matters. The AAAC's report is based on consolidated feedback from different sections of the university and sent to the Director, for further action. This is a unique system and allows each member of the university a way to loop back their inputs.

5. Planning and Monitoring Board

The Planning and Monitoring Board regulates the implementation of the development programmes approved by the UGC and advises the Governing Body and the Academic Council on any matter which it considers necessary for the fulfillment of the objectives of the institution. The Board meets at least once in every academic session

S.No	Title
1	Director (Chairman)
2	Registrar
3	Deans, by rotation every 2 years
4	Principal, by rotation every 2 years
5	Four members may be co-opted
6	Two external members
7	One UGC Nominee

6. Internal Quality Assurance Cell

The Internal Quality Assurance Cell (IQAC), was constituted in September 1995 based on the guidelines of the National Assessment and Accreditation Council set up by the UGC. The activities of the IQAC envelop every component of the university system including: Admission Criteria; Curriculum Design; Programme Selection; Curriculum Implementation; Evaluation; Employability.

The Cell aims to improve the quality of teaching and research by regular feedback from students; provide inputs for best practices in administration for efficient resource utilization and better services to students and staff; inputs for academic and administrative audits and analysis of results for improvement in areas found weak.

Students and staff can give their feedback and suggestion on teaching and administrative performance by dropping their views in the Suggestion Box located in DEI Computer Centre, or to the Coordinator, IQAC.

S.No	Title
1	Director - Chairman
2	All Deans of Faculties
3	Principal of TC
4	In-charge Computer Center - Secretary
5	Two members from each faculty and college

7. Board of Management (Governing Body)

The Governing Body's role in the governance system of the Institute is to frame policies for achieving excellence in teaching and research in the Institute. Its main areas of concern are academic, financial, and

judicial.

A. Academic Responsibility

In terms of academics, the Governing Body directs the affairs of the institute and exercises general superintendence and control over it with the aim of:

- formulating the educational policies and programme for the growth and development of the institute and implementing them;
- making bye-laws, amendments or repeals as per the rules;
- create faculties as it may deem fit from time to time, on the recommendation of the Academic Council;
- introducing new courses of study and training in faculties of the institute including non-university educational institutions to raise standards of education;
- conferring or granting degrees, diplomas and other academic distinctions or titles;
- determining the cadre and grades of the staff of the institute;
- creating, suspending or abolishing posts and fixing the emoluments and conditions of services of its employees;
- appointing teaching staff and such other staff, not provided for elsewhere, as may be found necessary;
- constituting selection committees, or terminating the services of any employee in accordance with rules;
- submit annual report of the Institute to the Primary Body.

B. Financial Responsibility

Opening bank accounts, prescribing the procedure for their operation, considering annual accounts and the institute's budget estimate as submitted by the finance committee; taking such actions within the limits prescribed by the finance committee, appointing auditors for the institute; receiving grants from the University Grants Commission, the Central and the State Governments.

C. Judicial Responsibility

The Judicial Responsibility is to select the command seal for the institute and to provide for the custody and use of the same; to give suitable directions, to holding trustees of the institute regarding

utilization of the properties of the trust; to sanction to file, withdraw, defend or compromise any suit, appeal petition, application or any legal proceeding, civil, criminal, revenue or any other proceeding of any nature whatsoever in any court of law office or department or before any tribunal or to authorize any reference to the arbitrator or arbitrators or reference by or on behalf of the institute and/or authorize person(s) to discharge the above functions, including the authority to sign verify pleading and to engage counsel; to constitute the Managing Councils for non-university educational institutions and assign to them such powers and the functions as a deems fit to constitute a Distance Education Cell and assign to it such powers and functions as deemed fit; to exercise such other powers and perform such other duties, as may be necessary for the proper functioning of the Institute.

The Governing Body of the Institute consists of the following members:

S.No	Title
1	The Director / Vice Chancellor (Chairman)
2	Treasurer
3	Two Deans from the faculty of the Institute, by rotation in the alphabetical order of the names of the faculties. (The term shall be one year
4	One nominee of the Ministry of Education, Government of India
5	One nominee of the Chairman, UGC; Director
6	Director, Higher Education, U.P.
7	One nominee of the Academic Council of the institute
8	One nominee of the Radhasoami Satsang Sabha, Dayalbagh, Agra
9	One nominee of the Managing Committee of the Radhasoami Educational Institute of Agra
10	One representative each, from the industry and agriculture of Dayalbagh, to be nominated by the President of the Institute
11	Three members, not amongst the members or employees of the institute, to be nominated by the president of the institute from amongst eminent educationalists and technologists
12	The Registrar is the ex-officio Secretary of the Governing Body

8. Finance Committee

The purpose of the Finance Committee is to examine accounts and scrutinize proposal of expenditure of the institute including those of non-university educational institutions

The Finance Committee of the institute consists of the following members:

S.No	Title
1	Director (Chairman)
2	Treasurer
3	One nominee of the Department of Finance, Government of U.P.
4	One nominee of the Governing Body, the Dean
5	One nominees of the Governing Body, the UGC
6	Registrar is the ex-office Secretary of the Finance Committee

9. Academic Council

The Academic Council's function is to control and regulate the standards of education, research and examinations in the institute including non-university educational institutions, and to advise the governing body on all academic matters

S.No	Title
1	Director (Chairman)
2	Deans of Faculties
3	Heads/ In-charges of all teaching departments in the university faculties, who are not Deans
4	Members of the teaching staff of each faculty, not below the rank of a lecturer who is not the Dean, Head or In-charge from any faculty; in order of seniority. Selection would take place by rotation, for a term of one year
5	Coordinator of the distance education cell
6	Principals of all the non-university educational institutions
7	Director of Technical Education, U.P.
8	A nominee of the chairman, UGC
9	Two specialists in industry nominated by the Governing Body
10	Five eminent members from the fields of Arts and Culture, Commerce, Education, Engineering and Science; nominated by the Governing Body. The Registrar is the ex-office secretary of the Academic Council.

10. Standing Committee of the Academic Council

The role of the Standing Committee of the Academic Council is to invite such other internal members of

the Academic Council as it may deem fit, for its meeting which are convened under instructions from the Director. To advise on equivalence of examinations and such matters as may be referred to it by the Academic Council or the Director. In every case where the Standing Committee disposes of any matter, it is reported to the Academic Council at its next meeting.

Standing Committee of the Academic Council membership comprises:

S.No	Title
1	Director – Chairman
2	All the Deans and Principals
3	Registrar – Secretary

11. Managing Councils (Technical Education & General Education)

The managing councils have such functions and perform such administrative and academic duties for non-university educational institutions in Dayalbagh, as may be assigned to them by the bye-laws and from to time, appoint such committees/ boards of studies, as may be prescribed by the bye laws

The Managing Council for the Non-University Technical Educational Institutions consists of following members:

S.No	Title
1	Director (Chairman)
2	Treasurer
3	Principals of the non-university technical educational institutions
4	One teacher from the non-university technical educational intuition not below the rank of lecturer by rotation in order of seniority
5	Two nominees of the Governing Body from amongst its members
6	Directors, Technical Education, U.P
7	One nominee of the Northern Regional Office, A.I.C.T.E.
8	One nominee of the Managing Committee of the Radhasoami by the President
9	Two persons who are not the members or employees of the Institute, including non-university and educational institutions. To be nominated by the President of the Institute from amongst eminent educationalist and technologists
10	The Registrar is the ex-officio Secretary of the Council

12. Building Committee

The Building Committee's role is to select and recommend sites for construction of buildings, and to accord technical sanctions to the detailed plans and estimates. It approves the construction of new buildings and alterations to existing buildings and invites and approves tenders for the purpose. The Building Committee comprises of the following members:

S.No	Title
1	Director or his nominee not below the rank of Professor - Chairman
2	Superintending Engineer of Agra division of the Central Public Works Department
3	A representative of the Planning Board of the Institute
4	Treasurer
5	Principal Co-Ordinator of the DEI Engineering Committee
6	Superintendent of Works of the Institute
7	Registrar - Member Secretary

13. Equipment Committee

The Equipment Committee's role is to scrutinize quotations and approve purchases of equipment. The Equipment Committee comprises of the following members:

S.No	Title
1	Director or his nominee not below the rank of Professor - Chairman
2	Treasurer or his nominee
3	Dean of the concerned faculty/Principal concerned/ Registrar in all other cases
4	Head of the concerned department/Chairman, Library Committee/In-charge of the concerned center
5	Teacher/equivalent position from whom the proposal for the purchase of equipment has originated.
6	Registrar for purchases in Central Administrative office.
7	Expert from outside the faculty/non-university educational institution concerned, nominated by the Director

14. Library Committee

The Library Committee supervises the work of the libraries of the Institute. The Library Committee comprises of the following members:

S.No	Title
1	Chairman

2	All the Deans and Principals
3	One teacher from each of the faculty/non-university educational institutions to be nominated by the Director in consultation with the Dean/Principal concerned (Term of two years)
4	Treasurer
5	The In-charge, Central Library

15. **Board of Studies**

The functions of the Board of Studies are

- To make recommendations about courses of studies and examinations in the subject(s) with which it deals.
- To initiate proposals regarding new courses of study and propose changes thereto.
- Subject to the control of the Academic Council and the Faculty, to prepare proposals for research work in the subjects assigned to the Board of Studies.
- To advise on any question referred to it by the Governing Body, the Academic Council, the Faculty or the Director.

A. Faculty Board of Studies

The Faculty Board for each Faculty consists of all the Professors and Heads of Departments of the Faculty and two external experts, with the Faculty Dean as the Chairman. The recommendations of the Board of Studies regarding revision of syllabus and/or new courses approved by the Faculty Board are placed before the Academic Council of the Institute before implementation. The Faculty Boards meet at least once every year

B. Department Board of Studies

The Board of Studies within each Department of the Institute, for each subject or relevant group of subjects, consists of the Head of the Department as Chairperson; all Professors of the Department; two teachers other than Head of Department and Professors by rotation in order of seniority; and up to three persons not connected with the Institute who are nominated by the Director, possessing expert knowledge of the subject(s).

16. Results Committee

The function of the Results Committee is to prepare the results of the examinations after satisfying itself that the results conform to expected standards. In any case where the result is unbalanced, the committee will take action.

Cases where the use of unfair means in examinations is reported by the Dean/Principal concerned along with the report of the invigilator(s)/member(s) of the flying squad and the Centre Superintendent and the report of the Examiner are also examined by Results Committee of the Institute. The Results Committee consists of

S.No	Title
1	Director – Chairman
2	All the Deans and Principals
3	Registrar – Secretary

17. Grade Moderation Committee

Each Faculty constitutes a Grade Moderation Committee which normalizes the grades assigned by the course instructor. The Committee scrutinizes the marks assigned by each of the course instructors and identifies natural gaps and clusters so as to assign the appropriate grades to all the students. The Grade Moderation Committee comprises members nominated by the Head of Department concerned.

18. Central Proctorial Board (Discipline Committee)

The members of the proctorial board are the chief proctors of the faculties and look after the general welfare of the students; they are also authorized to check any student on disciplinary grounds.

There is a Students' Welfare and Discipline sub-committee at the Faculty/ college level. The faculty representatives in the Students' Welfare and Discipline Committee are the ex-officio Conveners of the faculty committee, and the Dean is its Chairman, who will also nominate other members in the sub-committee. It comprises of a Chief Proctor separately for male and female students at the Institute level as well as at the Faculty level along with the sub-committees formed by the members at the faculty level.

19. Class Committees

Every class in each of the departments of the Institute shall set up a Class Committee, usually consisting of 6 members. These members are selected by students from amongst themselves, with the support of

their class teachers. The number of members in the Class Committee may vary depending on class size. The functions of the Class Committee are to provide a means of self-governance to the students. The students will be able to go to Class Committee members with any problem they may have, especially concerning academics. Thus, Class Committee members provide a conduit through which problems related to academic issues may be sorted out. These issues are then brought to the attention of concerned teachers and, if needed, the Head of Department.

The Chief Proctors and the Proctors at faculty level are in charge of these committees. Their task is to understand and resolve students' problems, referring them to higher authorities if solutions do not emerge. The committees are made up of Chief Proctors at faculty level, Proctors (forming sub-committees) and students.

20. Central Sports and Games Committee

There is a central Sports and Game Committee for supervising and training students of DEI. The Committee consists of the following members: The Director: Chairman; Convener: Nominated by Director; Secretary: Sports Officer; Coach and Organizing Secretary: Sports Officer; two or more faculty members from each faculty nominated through the Dean /Principal; Faculty in charges for sports nominated through the Deans/ Sports Officer.

The committee is responsible for organising sports events, a march past on special occasions, athletic meets, marathons on days of national importance and also to help students prepare and participate in games at the zonal/state/national level.

21. Cultural Programmes Committee

The Cultural Programmes Committee consists of a cultural advisor nominated by the Director, a cultural coordinator nominated by Director, one cultural coordinator and co-coordinator from each faculty nominated by the cultural advisor and cultural coordinator with the consent of the Deans/ Principals.

22. Alumni Committee

This committee comprises two to four members from different faculties headed by the Co-ordinator Dean, Alumni Relations.

The major functions of the committee include making direct connections with DEI's alumni, maintaining the yearbook of batches graduating, providing the single point of contact for alumni, publishing and circulating the alumni newsletter and organizing alumni reunions.

23. Departmental Research Advisory Committee

A Departmental Research Degree Committee is constituted in each Department. After admission to the Ph.D. Programme, candidates study the prescribed courses, including one on research methodology, for a minimum period of one semester. The Departmental Research Committee with the Head as its Chairman and the senior staff members as members recommend courses to be covered by the candidate. The Departmental Research Committee will also be responsible for organizing the colloquia and presentations by students.

24. Research Development Committee

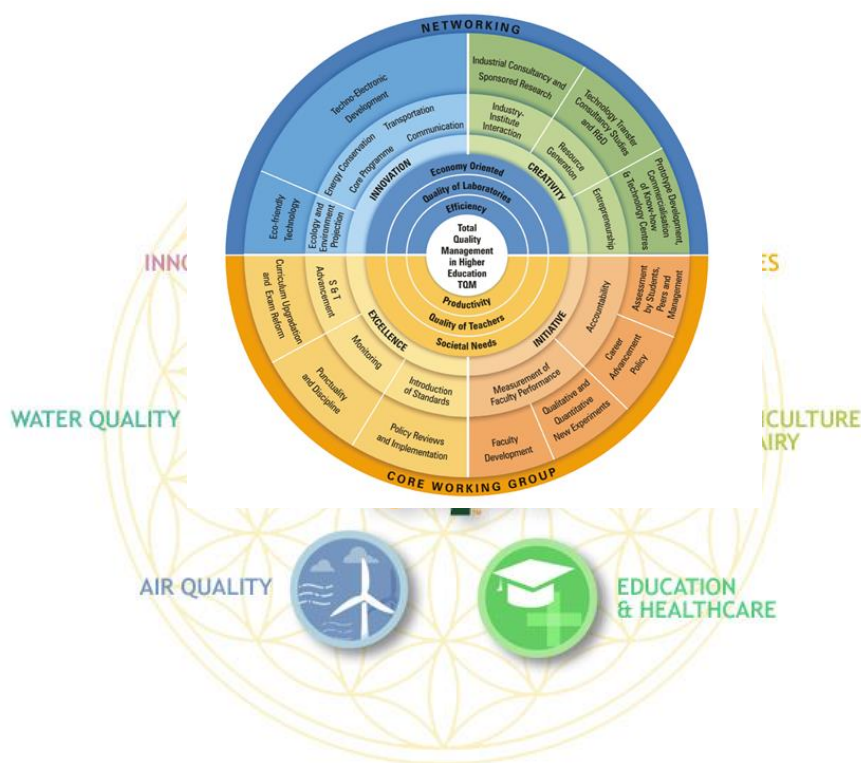
This Committee closely monitors issues related to research work leading to the award of the Ph.D. degree. The RDC consists of the Director of the Institute, the concerned Dean, the Head of the Department, and two external experts in the subject, appointed by the Director in consultation with the Head of the Department and Dean concerned. The Supervisor is a co-opted member of the RDC for his candidate.

Dayalbagh Educational Institute

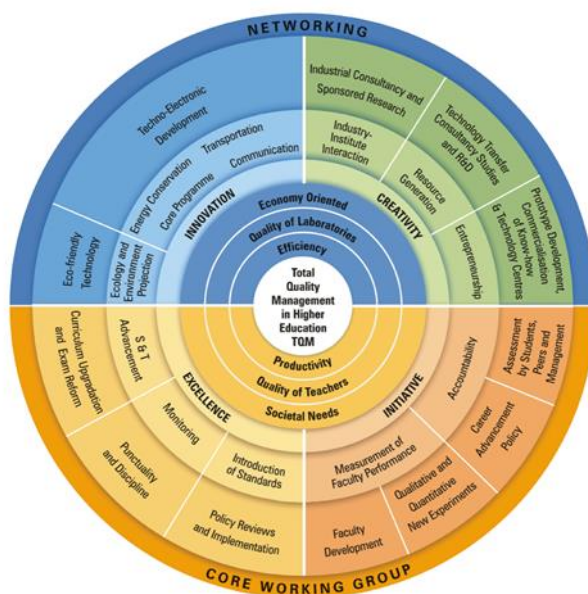
(Deemed to be University)

Swachh Campus - Report

Making Sustainability A Way of Life



Conceptual Framework of Education at (DEI)



Dayalbagh, Agra – 282005, Uttar Pradesh.

Section I

1. **Location** **Name and Address of the Institute with State and District of**

Dayalbagh Educational Institute (Deemed to be University) Dayalbagh, Agra – 282005, Uttar Pradesh
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2. **Student Strength and Faculty Strength**

Student Strength	6659	Faculty Strength	265
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3. **Number of Hostels and Modernity of Toilets and Water Supply Systems**

Number of Hostels - Four (4)

All the hostels are provided with proper water storage, pipeline systems for ensuring clean and uninterrupted supply of water as well as washrooms and toilets. Hostels are equipped with RO systems to ensure pure and safe drinking water supply to boarders. Each hostels have well ventilated, illuminated and clean rooms, common room and dining halls. The hostel premises is maintained clean and green by the boarders themselves.

4. **System or Technology in place for Solid and Liquid Waste Management**

Waste Management Systems

The campus is provided with a complete set of garbage cans for different type of bio and non-bio degradable waste. The collection of garbage from these cans is done on frequent basis i.e. once every day with the help of staff and students. The students of B. Voc. in Water, Sanitation and Waste management are helping in maintaining and operation this system efficiently.



Special Interventions in the area of solid waste management includes installation of **150 Cum Bio-Gas Plant** for production of Bio Gas using Cow Dung and development of **Wormy-**

Compost Pits and Composting using Bio Waste by our B Voc students. The Bio Gas is then used to generate electricity for lighting and heating applications at Dairy Plant and Gowshala.



5. Hostel Kitchen Facilities

Hostels kitchen are well equipped with state-of-the-art solar thermal plant/ LPG system and PNG system for cleaner and hygienic cooking facilities under green initiatives.



6. Campus Greenery

Around 75 per cent of the campus is covered with lush green gardens and lawns providing maximum greenery. DEI campus



is eco-friendly and pollution free zone. Only electric vehicles and bicycles are allowed inside.



Special Mention – Bio-diversity Parks

Two Bio-diversity parks have been developed as a unique initiative to protect and promote sustainable green eco-system in the campus and to conserve and re-introduce the native species of Agra region. These parks are regularly maintained with the help of sufficient number of sprinklers and drip-

farming by staff and students of the Institute. Wide variety of plants including herbal, fruit-bearing, medicinal and ornamental inhabits the parks.

DEI Seminar Complex Biodiversity Park is spread on an area of 10 acres of land. The soil is sandy, completely carbon dead and does not retain water for long. The park is designed in a way to prevent hot winds blowing during summers, when the temperature soar to 47 degree C and relative humidity goes down to 20-25%, from reaching the centre of the park to protect various other plants. On the periphery bushes of bougainvillea have been planted.



Inside this tall trees, such as khejedi, roheda, ronjh, pilu, khabbar, that can withstand hot dry air were specially brought from Rajasthan and planted. A curtain of bamboos and karounda have also been provided all around as wind curtain. The biodiversity park at REI Intermediate College comprises of *Bougainvillea* garden, Succulent and Gymnosperm Garden , Birds and Butterfly garden, Multigrafted and Rare plants, Palm plantation, Arboretum 1 and 2 (types of tree species, Tropical fruit garden and Temperate fruit garden. The water diversity park is also provided with a weather monitoring system and water harvesting system to recharge the ground water. Treated water from STP is being collected and used for these plants, thus saving clean water for drinking purpose. Solar pumping system is also proposed at this site.

A River Bank Filtration (RBF) plant is under construction to provide clean and pure drinking water to the nearby villagers. The project is funded by DST and Solar power will be used for any electricity use.

A chain of green houses are proposed to enhance the income of farmers by growing non-seasonal produce. Two such green houses are in operation at present. It is also proposed to demonstrate Solar Agri Farm to double the income of farmers by utilising their land for agriculture and solar power generation. Solar power thus generated can be used in Agriculture and Dairy farm for various applications.

Rain Water Harvesting: In all the new buildings, extensive water harvesting facilities have been installed in the campus. The Institute's bore wells get water at 100 to 120 ft depth while general levels in Agra lie between 200 to 250 ft.

Innovative e-waste management: The Institute has come up with several ideas to utilize e-waste by converting it into some Art objects.

Efforts for Carbon neutrality: Campus has drastically reduced Carbon emissions. The waste leaves are not burnt but are converted into organic fertilizer. The solar photo voltaic panels used in the Solar power plant of DEI, Solar Hot water and cooking in Hostels, Development of Bio-fertilizers, Bio-fuels, Solar driven vehicles, Research on Hydrogen fuels are some of the contributions of this academic Institution to teach the public methods to attain Carbon neutrality at the national level.

Tree Plantation: Campus is made Green by extensive plantation by NSS volunteers. Institute works in collaboration with the NGO, "SPHEEHA" which is committed to preserve the Ecology and Heritage of Agra region. DEI is collaborating with 'SPHEEHA' on projects aimed at preserving the water table in Agra. SPHEEHA also helps in planting Trees in and around DEI Campus.

DEI in association with the Nagar Panchayat Dayalbagh is also doing various social activities. A mobile toilet is also provided at various places of community service for students and staff to prevent open defecation.

7. **Highlights of any Solar Power or other Innovative usage**

Renewable Energy

In order to attain the lofty vision through sustainable developmental activities in agreement with the concept of Eco-Village, Dayalbagh Educational Institute has taken initiatives in harnessing the non-conventional and renewable energy through Solar Thermal Plants for cooking, Solar Photovoltaic power plants for electricity generation, Bio Gas (Gobar Gas) for cooking and electricity generation, Bio Mass Gassifier at community kitchen for cooking and solar distillation for water purification.

Hygiene and Safety: Use of KMnO_4 (Potassium Per Manganate) in water and in production plants run by students and general awareness on hygiene and safety, makes people and the surrounding community and villages more healthy.

Special (Green Energy) Initiatives

- The whole university campus is powered by 11 Distributed Roof-Top Solar PV Power Plants aggregating to a total of 658.2kWp to ensure uninterrupted supply.
- The institute has Solar Thermal Cooking Systems in all the hostels to provide low cost and clean cooking solution.
- Solar Electric Vehicles (e-rickshaw etc.)
- Bio Gas (Gobar Gas) Plant
- Bio-Mass Gassifier
- Solar Distillation system



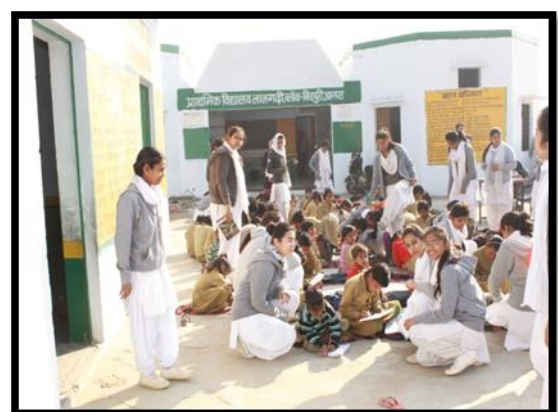
Section II

1. Name of village or neighbourhood adopted by the Institution with district name.

Dayalbagh, Agra

2. Number of People or Families covered by effort: 5000

3. Interventions undertaken in the area



Before Intervention

After Intervention

Cleanliness and concern for hygiene has always been core to campus life at the Institute. National Service Scheme program of Government of India has been inducted as a compulsory component of the curriculum in all under-graduate programmes. Regular classes with

interventions in nearby adopted village and slums are the unique innovative aspect of teaching-learning environment at DEI.

The NSS unit has adopted Dayalbagh-semi urban locality and also provides services to four nearby villages in Mauja-Khaspur, Eight Slums and Agra Cantt Railway Station. In these locations students of the Institute regularly participate in diverse activities such as cleanliness, social awareness programs, free medical and assistance camps, blood donations camps, literacy programs, women empowerment, skill development programs, computer literacy, career counselling, rural assistance through Chaupal to promote micro-enterprises.



NSS CAMPS : 1. Village Site

2. Agra Cantonment Railway Station

The silent, solid and sustained social work through innovative and government directed programs have brought about drastic changes in the living and health conditions of neighborhood community, adopted villages and slums. Remarkable and exemplary efforts of students got appreciation from government officials including Railway Department, medical practitioners, social activists, scientists, dignitaries of NGOs, ministers of government of India and also the visitors from abroad.

Free Medical & Assistance Camps

Activities in Free Medical & Assistance Camps



Organization of Free Medical and Assistance Camps (FMACs), initiated on 27th June 2010 is an innovative program of the institute. These camps are organized on fortnightly rests in nearby rural areas. The aim of these camps is to provide comprehensive package of health, awareness and assistance to people including children, youth, and women of nearby villages and neighborhood community. The services offered in these Camps include Multi-specialty Free Medical Services, Hole-in-the-Wall Program, Children Recreation, Spoken English facilities for rural children, Education and Career Counselling, Vocational Training and Skill Development Programs for rural youth, Rural Assistance and Chaupal (Bhagvad Geeta Ke Updesh) for developing culture and ethics among people of nearby villages and neighbourhood community

- Winter Training Camps: Winter Training Camp during end of December is being organized for all students from Class-I to PG Level. Training is imparted to give practical exposure to various dimensions of life and personality development. This also helps in boosting confidence level of the students and help in bridging the gap between theoretical and practical world without restricting to any discipline. A students can also select their future career in academics or otherwise.
- SCI-High: A new initiative taken by Dayalbagh Educational Institute since 2012 is to organize a summer school (SCI-HIGH) for exposure to advanced topics in science for High School students after their board exams. The school intends to present a bouquet of ideas in science to young students, who pass out of high school to interest them for a career in science. This will encourage them to contribute to the scientific development of the society and our country. The school runs around mid-semester break in March and has 1-hour expert lectures to provide a window on state of the art topics such as quantum computing, nano computing, bio-inspired systems, internet technologies, multimedia technologies, computer vision, solar power, biotechnology among others. These serve as an eye-opener for the students and provide them a glimpse of the wonderful opportunities that lie ahead in science. There are lab visits also to provide a first-hand view of science in action.

Unique Initiatives at DEI

Swachh Bharat Abhiyaan – Agra Cantt. Railway Station



Social Service (Shramdaan)

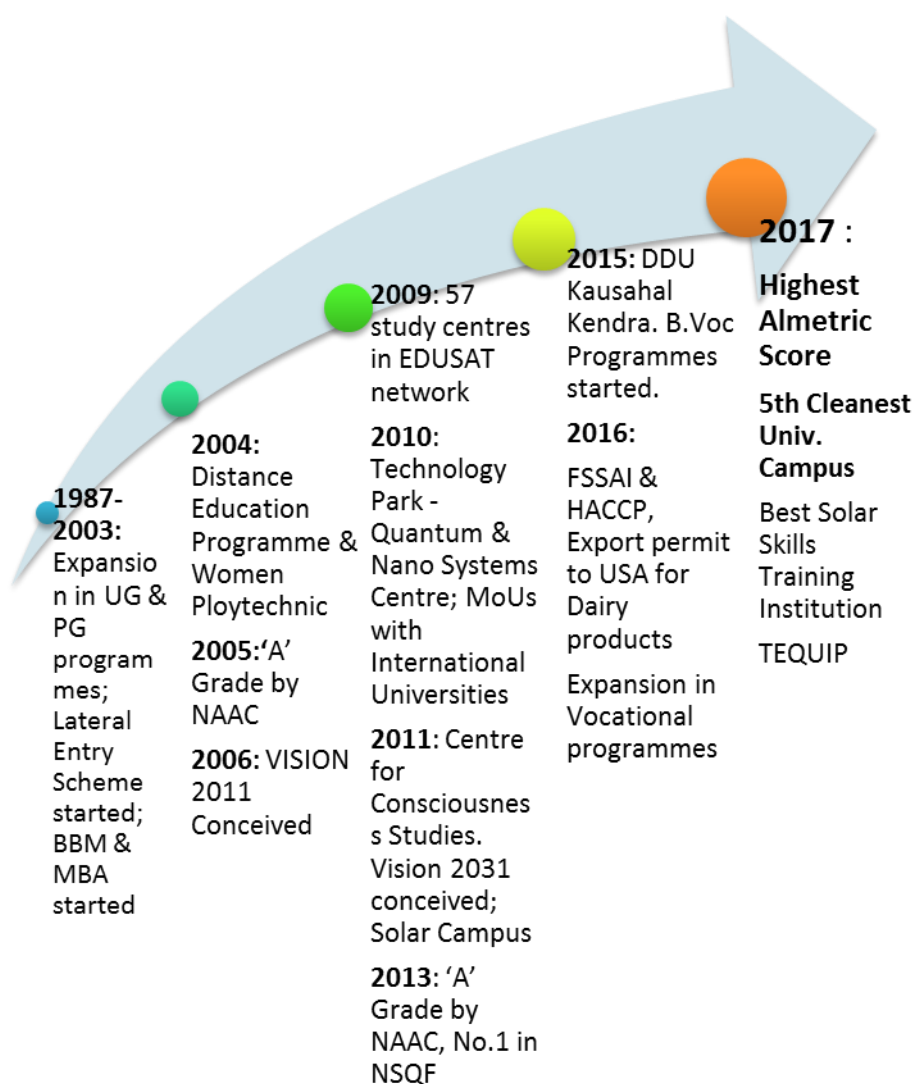


D. E. I. Education Policy

"The D.E.I. Education Policy is an innovative, comprehensive and flexible higher and technical education policy with the mission objective of evolving a complete man (total quality person) which conforms to the concept of total quality management and is geared for transformation of India to a knowledge society" (Revered Professor P.S. Satsangi, Chairman, Advisory Committee on Education, Dayalbagh). Formulated in 1975, the cornerstone of the DEI Education Policy is the emphasis on excellence but not at the cost of relevance. The stress is on developing the student into a Complete Person, inculcating in him or her (i) a value system - academic values, moral and spiritual values and social sensibilities, (ii) entrepreneurial skills for self-support and awakening (iii) a higher order thought process that would enable a search for the Ultimate Reality. In an Alumni survey carried out in 2006 the Alumni of DEI rated the values they had acquired while studying at DEI as being the most important benefit they perceived of having studied at DEI.

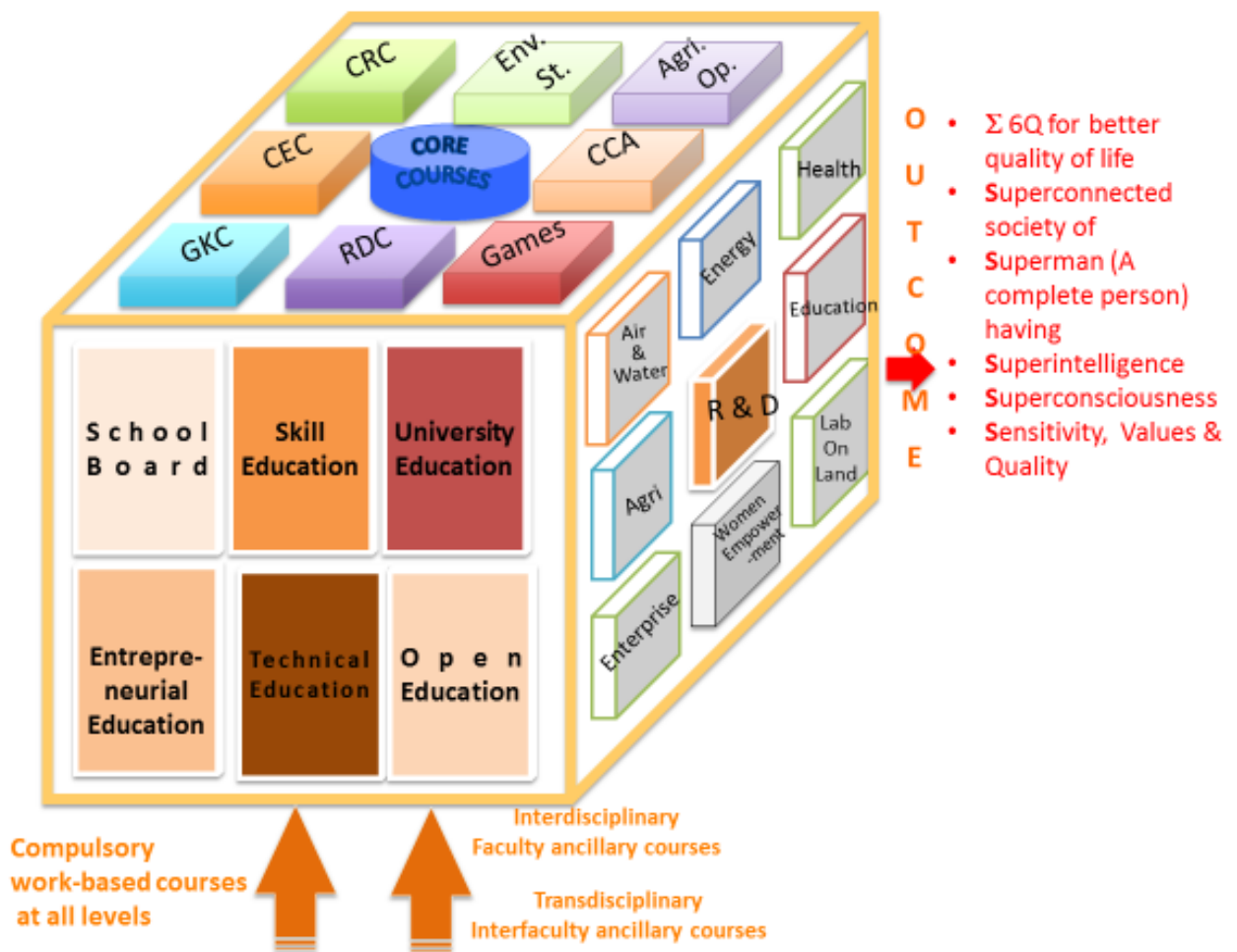
In achieving its mission objective of evolving a well-rounded complete person, quality stands by itself. A conceptual model for the Total Quality Management (TQM) framework through which DEI endeavours to achieve quality in higher education has been defined and is illustrated below. It defines an institutionalized quality control mechanism that permeates all its processes.

Some of the milestones achieved at DEI since 1981 are shown below



DEI Vision 2031

In 2011, the Dayalbagh Educational Institute embarked upon a bold initiative, VISION 2031, and has recently formulated a comprehensive and progressive Strategic Plan for 2018-2032, with the goal to become a top teaching-cum-research Institute through an exemplary system of perfect education. Education that serves as a model to all those working for the upliftment of humanity; that provides an environment to produce super-conscious human beings. Such an education system then combines the best that is there in modern science and ancient philosophy, western materialism and eastern spirituality.



Conceptual Framework of Education at DEI: An Integrated Perspective

Declaration

I undertake that, the institution is well aware about the provisions in the NBA's accreditation manual concerned for this application, rules, regulations, notifications and NBA expert visit guidelines in force as on date and the institute shall fully abide by them.

It is submitted that information provided in this Self-Assessment Report is factually correct. I understand and agree that an appropriate disciplinary action against the Institute will be initiated by the NBA in case any false statement/information is observed during pre-visit, visit, post visit and subsequent to grant of accreditation.

Date: 12-02-2019

Place: AGRA



Signature & Name

REGISTRAR

DAYALBAGH EDUCATIONAL INSTITUTE

DAYALBAGH, AGRA-282005

Head of the Institution with seal

