SELF ASSESSMENT REPORT (S.A.R.)

FOR ACCREDITATION OF UG ENGINEERING PROGRAMME (**Mechanical Engineering**) Tier I



NATIONAL BOARD OF ACCREDITATION N.B.A.

New Delhi



Bundelkhand Institute of Engineering and Technology (B.I.E.T.) Kanpur Road, Jhansi 284128

SAR Contents

Serial Code & Link to the Item	Item	Page No.
PART A	Institutional Information	3-8
PART B	Criteria Summary	9
	Program Level Criteria	
1	Vision, Mission and Program Educational Objectives	9-18
2	Program Curriculum and Teaching – Learning Processes	19-33
3	Course Outcomes and Program Outcomes	34-59
4	Students' Performance	60-65
5	Faculty Information and Contributions	66-78
6	Facilities and Technical Support	79-83
7	Continuous Improvement	84 - 89
	Institute Level Criteria	
8	First Year Academics	90 - 95
9	Student Support Systems	96- 107
10	Governance, Institutional Support and Financial Resources	108 - 142
PART C	Declaration by the Institution	143
Annexure I	Program Outcomes(POs) & Program Specific Outcomes (PSOs)	144

PART A: Institutional Information

Bundelkhand Institute of Engineering and Technology, Jhansi (Formerly Bundelkhand Engineering College, Jhansi) was established in the year 1986 with an objective to develop Bundelkhand region, basically a backward region of state of Uttar Pradesh, through growth of technical education and industrial research. Subsequently, basic infrastructural facilities, on an area encompassing about 240 acres of land, were developed. The institute was started initially with two branches, viz., Computer Science & Engineering and Electronics and Instrumentation Engineering, with an intake of 30 students in each.

The campus was gradually developed into a neat, clean and green campus adding two additional branches, Mechanical Engineering and Civil Engineering with an intake of 20 students each in 1990. Moving ahead on the path of progress, in 1997, Chemical Engineering with an intake of 30 students was started and in 2000 Information Technology with an intake of 40 students was added (under self-finance scheme). In the same year, the intake of Mechanical Engineering and Computer Science & Engineering were raised to 45 and 60 students respectively, and Electronics & Instrumentation Engineering was renamed as Electronics & Communication Engineering and intake was raised to 60. In 2006, the intake of Civil Engineering was increased to 45. From session 2007-08, a four-year B. Tech programme in Electrical Engineering (under SFS) with an intake of 60 students has been added to the existing six B. Tech programmes.



BIET Jhansi Entrance and Academic Building

In addition to these undergraduate programmes from session 2005-06, two post graduate programmes in (i) Environmental Engineering and (ii) Construction Technology & Management in Civil Engineering Department and one in 2006 Manufacturing Science & Technology in Mechanical Engineering Department with intake of 18 students each, had been started. From the session 2006-07 a M. Tech. Programme in Digital Communication System in Electronics & Communication Engineering Department with intake of 20 students had also been added to the list of P.G. programmes being run by the institute. From session 2007-08, a two-year management programme leading to M.B.A. degree with an intake of 60 students has also been started. In this way the total intake of students in the institute including M. Tech. programmes is 528. It may be mentioned that all PG programmes are running under Self Finance Scheme (SFS).

1. Name and Address of the Institution: Bundelkhand Institute of Engineering and Technology Jhansi NH-25, Kanpur Road Jhansi (UP) PIN 284128

- 2. Name and Address of the Affiliating University: Dr. APJ Abdul Kalam Technical University Lucknow Sector 11, Jankipuram Extension, Lucknow (UP) PIN 226031
- 3. Year of establishment of the Institution: 1988

4. Type of the Institution:

Institute of National Importance	e
University	
Deemed University	
Autonomous	Y
(Year of Grant of Autonomy	2012)
Any other (Please specify)	

Note:

- 1. In case of Autonomous and Deemed University, mention the year of grant of status by the authority.
- In case of University Constituent Institution, please indicate the academic autonomy status of the Institution as defined in 12th Plan guidelines of UGC. Institute should apply for Tier 1 only when fully academically autonomous.

5. Ownership Status:

Central Government

State Government

Government Aided	Υ
Self - financing	
Trust	
Society	
Section 25 Company	
Any Other (Please specify)	



6. Other Academic Institutions of the Trust/Society/Company etc., if any: NA

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

Table A.6

Note: Add rows as needed.

Boys-Hostels



Vrindawan Bhawan Panchavati Bhawan

Saket Bhawan

Jai Bharat Bhawan

Girls-Hostels

PG-Boys Hostels



Yashodhara Bhawan

Kalpana Chawla Bhawan Major Dhyanchand Bhawan

APJ Abdul Kalam Bhawan

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 anv	Year of increase/ decrease	AICTE Approval	Accreditation Status*
1.	B Tech Chemical Engineering (UG)	Chemical Engineering	1997	30			1997	Not accredited 11, 12 & 13 March 2016
2.	M Tech Energy Sc. & Technology (PG)		2014	18			2014	Eligible but not applied
3.	B Tech Civil Engineering (UG)	Civil Engineering	;1990	20	45	2006	1990	Not accredited 11, 12 & 13 March 2016
4.	M Tech Construction Technology and Management (PG)	-	2005	18			2005	Eligible but not applied
5.	M Tech Environmental Engineering (PG)		2004	18			2004	Withdrawn
6.	B Tech Computer Science and Engineering (UG)	Computer Science	1989	30	60	2000	1989	Not accredited 11, 12 & 13 March 2016
7.	B Tech Electronica and Communication Engineering (UG)	Electronics Engineering	1989	30	60	2000	1989	Not accredited 11, 12 & 13 March 2016
8.	M Tech Digital Communication (PG)		2006	20			2006	Withdrawn
9.	M Tech Bio-medical Engineering (PG)		2014	18			2014	Eligible but not applied
10	B Tech Electrical Engineering (UG)	Electrical Engineering	2007	60			2007	Eligible but not applied
11.	B Tech Information Technology (UG)	Information Technology	2000	40			2000	Not accredited 11, 12 & 13 March 2016
12	B Tech Mechanical Engineering (UG)	Mechanical Engineering	1990	20	45	2000	1990	Not accredited 11, 12 & 13 March 2016
13	M Tech Manufacturing Engineering and Technology (PG)		2005	18			2006	Withdrawn
14	M Tech Thermal Engineering (UG)		2012	18			2012	Eligible but not applied

Table A.7

Write applicable one: Applying first time No

Granted provisional accreditation for two/three years for the period specify period) No Granted accreditation for 5/6 years for the period (specify period)

Not accredited (specify visit dates, year) 11, 12 & 13 March 2016

Withdrawn (specify visit dates, year) NA

Not eligible for accreditation NA

Eligible but not applied NA

6

No

Note: Add rows as needed

8. Programs to be considered for Accreditation vide this application

	Program Name
S. No.	
1	B Tech Mechanical Engineering (UG)

Table A.8

9. Total number of employees:

A. Regular Employees (Faculty and Staff):

Items		C	AY	CAY	(m1	CA	Ym2
		Min	Мах	Min	Max	Min	Max
Faculty in Engineering	м	29	34	29	29	29	29
	F	01	01	01	01	01	01
Faculty in Maths, Science &Humanities teaching in engineering Programs	М	04	04	04	04	04	04
	F	01	01	01	02	02	02
Non-teaching staff	м	84	84	84	84	84	84
	F	01	01	01	01	01	01

Table A.9a

Note: Minimum 75% should be Regular/Full Time faculty and the remaining shall be Contractual Faculty as per AICTE norms and standards.

The contractual faculty (doing away with the terminology of visiting/adjunct faculty, whatsoever) who have taught for 2 consecutive semesters in the corresponding academic year on full time basis shall be considered for the purpose of calculation in the Student Faculty Ratio.

CAY – Current Academic Year

CAYm1- Current Academic Year minus1= Current Assessment Year

CAYm2 - Current Academic Year minus2=Current Assessment Year minus

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

Items		САҮ		CAYm1		CAYm2	
		Min	Max	Min	Max	Min	Мах
	м	43	43	44	44	44	44
Faculty in Engineering	F	16	16	13	13	13	13
Faculty in Maths, Science	М	04	04	04	04	04	04
&Humanities teaching in							
engineering Programs	F	02	02	02	02	02	02
	м	57	57	57	57	57	57

Non-teaching staff	F	02	02	02	02	02	02

Table A.9b

10. Total number of Engineering Students:

Under Graduate (UG)

			CAYm2
Item	CAY	CAYm1	
Total no. of boys	1157	1151	1053
Total no. of girls	236	206	243
Total no. of students	1393	1357	1296

Post Graduate (PG)

			CAYm2
Item	CAY	CAYm1	
Total no. of boys	125	120	121
Total no. of girls	17	19	25
Total no. of students	142	139	146

Table A.10

(Instruction: The data may be categorized in tabular form separately for undergraduate, postgraduate engineering, other program, if applicable)

11. Vision of the Institution:

"To transform the institute as a premier centre for imparting technical education to produce quality professionals to meet the global challenges and societal needs"

12. Mission of the Institution:

- I. To create an academic ambience leading to quality professionals.
- II. To design and implement the curriculum to meet the needs of the industry and society.
- III. To collaborate with premier academic institutions, research organizations and industry to enhance skills and employability

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

i.	Name		Dr. Vinod Kumar Tyagi
	Designation		Director
	Mobile No.		9450723106
	E mail id		director@bietjhs.ac.in
ii	NBA coordinator, if de	esignated Name	Dr. Abhai Kumar Verma
	Designation		Professor
	Mobile No.		9415136394
	E mail id	abhaikumar.vern	na@hotmail.com

PART B: Criteria Summary

Name of the program : B.Tech Me

B.Tech Mechanical Engineering

PART B: Program Level Criteria

1.1. State the Vision and Mission of the Department and Institute (5)

The vision & mission of the institute were arrived at in the Visioning exercise carried out in the institute. The Institute articulated the vision statement through vision exercise conducted at BIET with support of Senior Faculty Members of PDA College of Engineering, Gulbarga. On the basis of the vision statement, the mission statements of the institute were also evolved

Institute Vision

To transform the institute as a premier centre for imparting technical education to produce quality professionals to meet the global challenges and societal needs.

Institute Mission

1. To create an academic ambience leading to quality professionals.

2. To design and implement the curriculum to meet the needs of the industry and society.

3. To collaborate with premier academic institutions, research organizations and industry to enhance skills and employability.

Stakeholders of the program

- Students and their Parents/guardians
- The faculty and the staffs of the Institute
- Uttar Pradesh Government
- Regulatory Authorities i.e. AICTE, UGC, NBA, NPIU and AKTU, Lucknow.
- Alumni

Mechanical Engineering Department

The Department of Mechanical Engineering is one of the pioneer and leading department in terms of well-educated faculty members, research activities as well as facilities. Established in 1990, the Mechanical Engineering Department offers courses in B.Tech (Mechanical) and M.Tech. (Manufacturing Science & Technology and Thermal Engineering) and Ph.D Programme (through AKTU) affiliated with AKTU, Lucknow suiting to the requirements of modern industry and research. M.Tech in Manufacturing Science and Technology was started in 2006 and M.Tech in Thermal Engineering was started in 2012 with sanctioned intake of 18.

The Department has well equipped labs with modern facilities such as equipment, measuring tools, advanced machines and latest software. Department has been supported by the World Bank through TEQIP-I (Ist phase), continuing with TEQIP-II and TEQIP-III for development of labs and infrastructure. The labs include CAM Lab with CNC machines, CAD Lab with latest softwares like Solidworks, Ansys, etc, Heat and Mass transfer lab, Refrigeration and Air conditioning lab, DOM lab, Materials and Testing lab, Mechanics lab, Fluid Machinery lab, Automobile lab, power plant lab, Manufacturing science lab, Applied thermodynamics lab and workshop with welding, machine, forging, sheet metal, carpentry and fitting shop. Wire EDM, ZNC EDM, ECM, Lab view for virtual instrumentation along with temperature and pressure sensors with DAQ card, Computerized Hardness tester, Pin on disc Wear test apparatus, Metallurgical Microscope have been purchased with support of TEQIP.

The Department presents a nice blend of courses focusing on recent development in engineering and technology with special emphasis on design, thermal technologies, production processes, automobiles and CAD/CAM. The department is fully centred on the all-round development of students. All the faculties are keen to provide all round support to the students for their full-fledged development.

The Mechanical Engineering Department was accredited w.e.f. 19 March 2004 for 3 Years and again w.e.f .22 Jan 2008 for 3 years. Most of the faculty are well qualified and have completed their PhD from premier institutions like IITs, NITs, etc. The faculty of Mechanical Engineering Department have published research papers in International conferences and reputed refereed international and national journals. The faculties have good experience in guiding PhD and M.Tech students.



Department of Mechanical Engineering, B.I.E.T. Jhansi

Vision

To impart quality education in mechanical engineering to serve the changing needs of industry and society

The Department of Mechanical Engineering will strive to ensure that its programmes remain pertinent in the global context and the engineers coming through the Institute will exhibit their professional competence while adhering to social values. The Department of Mechanical Engineering aims at continuously upgrading the infrastructure to attract the best talent among its faculty and students.

<u>Mission</u>

The Department of Mechanical Engineering is committed to:

- 1. To strengthen academic infrastructure leading to quality professionals in the field of mechanical engineering
- 2. To impart the domain knowledge to the students through well designed curriculum based on the inputs from stakeholders to serve the needs of industry and society.
- 3. To enhance the technical skill through collaborations with premier academic institutions, research organizations and industries to promote the employability and inculcate entrepreneurship

The Department of Mechanical Engineering will ensure that the contemporary curriculum will be continuously empowering our graduates to be globally competent. Comprehensive efforts are being made to ensure that the students learn best industrial practices to develop a flair for solving real world problems.

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

Programme Educational Objectives

The Department of Mechanical Engineering, B.I.E.T. Jhansi, has formulated the following programme educational objectives for the under-graduate program in Mechanical Engineering:

- To empower the students with the knowledge of contemporary science, mechanical engineering related subjects and develop domain skills
- Promote higher education, research and development and other innovative efforts in Mechanical Engineering related areas.
- Prepare graduates to pursue career in industry or higher education by improving technical, professional and communication skills.

The knowledge of contemporary science, mechanical engineering related subjects and domain skills imparted in the programme will enable our graduates to be successful in their professional career. Promotion of higher education, research and development and other innovative efforts in Mechanical Engineering related subjects will broaden their horizon to enable them to lead in their area of specialization. The education will enable graduates to pursue career in industry or higher education by improving technical, professional and communication skills

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

Stakeholders of the program

- **Students:** The entire scope of outcome based education revolves around the students and hence they are the principal stake holders.
- **Faculty & Staff:** The faculty is the driving force through which the concept of outcome based education can be accomplished.
- Industries/Research Organizations/Employers: The industries & employers provide broader perspectives towards the definition & realization of the stated objectives.
- Alumni: The alumni being the recipients of the knowledge imparted at the institute are better judges of the system and hence their opinions play an important role in accomplishing the PEOs of the UG Programme.
- **Parents:** It is essential to consider the opinions of parents because welfare of their wards has a direct bearing on accomplishing the PEOs of the UG Programme.
- Uttar Pradesh Government
- Regulatory Authorities i.e. AICTE, UGC, NBA, NPIU and AKTU Lucknow.

To create awareness among internal and external stakeholders with effective process implementation is followed. Internal stakeholders including Administration, Board of Study Members, Faculty, supporting staff, students etc. and external stakeholders including employers, industry, alumni, parents, etc are made aware of the process. The Vision & Mission statements are published and disseminated through the following means:

- 1. Institute website
- 2. It is displayed at Departmental offices and prominent locations in the Department Workshops so that it can be viewed by students, parents, faculty members and others.
- 3. It is briefed to newly admitted students and their parents during the induction programme conducted by the department at the start of the academic year

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

The earlier Vision & Mission statements of the Department were reviewed & revised as per the following process:

- The Vision & Mission of the Institute were the basis for the formulating the Vision and Mission of the Department
- > Considering opinion of stakeholders including Administration, Faculty and Alumni.
- The exercise for finalizing Vision and Mission was carried out in consultation with faculty and director.
- > The finalized Vision & Mission Statements were disseminated to stakeholders.



Figure 1.1: Process for Defining Vision & Mission

Process of defining PEOs of the program

Opinions of the stakeholders have been obtained through deliberations to evolve

the PEOs. The vision and mission statements of the department are the foundation for

defining the programme educational objectives.

- The Department of Mechanical Engineering has developed and maintained a welldefined set of educational objectives and desired program outcomes.
- The educational objectives of the Mechanical Engineering program relate to all of our stake holders such as students, faculty, employers and alumni.
- The department tries to ensure that these objectives and desired outcomes are met which are generally observed through different assessment tools.

- The educational objectives are met thoroughly through strong bonding with the teachers and the students even beyond the class room boundaries
- These statements have been discussed in the department meetings of faculty members with feedback invited from staff, alumni and industry.
- The statements were presented to Board of Studies (BOS) members for comments and feedback.



Process for Defining PEOs

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

In order to bring our dream Mission into reality:

- (i) The Department of Mechanical Engineering is dedicated to produce Mechanical Engineers with basic knowledge in mathematics, science and engineering, to develop problem solving skills necessary for the career advancement in Mechanical & allied disciplines, and to implement these abilities into real practice.
- (ii) Produce engineers with a strong practical and theoretical exposure in the relevant disciplines, who are able to contribute to society through innovation, enterprise and leadership.
- (iii) Nurture engineer with a global outlook and to provide technological leadership through necessary technical tools.
- (iv) Produce engineers with teamwork, communication and interpersonal skills.

A "Mission of the Department – PEOs matrix" is generated with justification and rationale of the mapping)

PEO Statements	M1	M2	М3
PE01: To empower the students with the knowledge	3	3	-
of contemporary science, mechanical engineering			
related subjects and develop domain Skills.			
PEO2: Promote higher education, research and	-	3	2
development and other innovative efforts in			
Mechanical Engineering related areas.			
PEO 3: Prepare graduates to pursue career in	-	2	3
industry or higher education by improving			
technical, professional and communication skills.			

Relevance Rating: 1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "-"

Table B.1.5

Note: M1, M2. . .Mn are distinct elements of Mission statement. Enter correlation levels 1, 2 or 3 as defined below:

Note: Wherever the word "process" is used in this document its meaning is process formulation, notification to all the concerned, and implementation

The Mission of the Department aims at providing a strong foundation in Mechanical Engineering, fostering creativity and the innovation to provide solutions to engineering problems. The Mission also aims at building relationships with globally acknowledged academic institutions & industrial organizations in India & abroad. The proficient engineers will be in-tune with the needs of the community and society by way of providing solutions to various problems in their field of expertise.

The PEOs have been formulated with the Mission of the Department as basis and their relationship has been shown in the Table 1.1.

Mission Statements	PEO to which it correlates
To strengthen academic infrastructure	To empower the students with the knowledge of contemporary science, mechanical engineering related subjects and develop domain Skills
leading to quality professionals in the field of mechanical engineering	Pursue higher education, research and development and other innovative efforts in Mechanical Engineering
> To impart the domain knowledge	> Pursue higher education, research and
to the students through	development and other innovative efforts in
curriculum based on the inputs	Mechanical Engineering.
From statemolders \sim To serve the needs of industry	Frepare graduates to pursue career in industry or higher education by improving technical
and society.	professional and communication skills
 To enhance the technical skill through collaborations with premier academic institutions, research organizations and industries to promote the employability and inculcate entrepreneurship 	 Pursue higher education, research and development and other innovative efforts in Mechanical Engineering. Prepare graduates to pursue career in industry or higher education by improving technical, professional and communication skills

Table 1.1: Correlation of each Mission Statement to the PEOs of the Programme

Mission Statement 1 (M1):

The first Mission statement relates to the two PEOs.

- It is only through the accomplishment of the first PEO which establish that graduates have strong foundation knowledge in Mechanical Engineering and domain skills.
- To develop quality professionals with higher education, research and development and other innovative efforts as required.

Mission Statement 2 (M2):

The realization of second Mission statement relates to the two PEOs of the department

• This will enable them to take up higher education and professional roles of increasing responsibility and make tangible contributions to their growth as engineers.

• Higher education, research and development and other innovative efforts in students of Mechanical Engineering would be developed to serve the needs of industry and society

Mission Statement 3 (M3):

The third Mission statement relates to the two PEOs of the department.

- The enhancing of technical skills leads to improved proficiency to make them confident to face and overcome challenges posed by industry and society
- The ability to strengthen their employability skills and research proficiency.
- The ability of the graduates to demonstrate professionalism and social awareness to strengthen the relationships between academia and industry and to promote entrepreneurship.

Role of Administrative system for PEO achievement

The administrative system helps in ensuring the achievement of program educational objectives (PEOs). The admistrative committees and their functions, working processes and related regulations are described as follows.

Academic Council

- (i) Establish, coordinate, and oversee particular programs to evaluate student academic achievement.
- (ii) Set educational standards and goals, and help establish policies and procedures to carry them out.
- (iii) Plan and lead professional development activities for teachers, administrators, and supporting staff.

Board of Studies

(i) Evaluate curricula, teaching methods, and programs to determine their effectiveness, efficiency, and utilization, and to ensure that academic activities comply with national, state, and local regulations, best suited to the latest industrial market demand.

Dean Academics

- (i) Enforce discipline and attendance rules.
- (ii) Counsel and provide guidance to students regarding personal, academic, vocational, or behavioral issues.
- (iii) Collaborate with teachers to develop and maintain curriculum standards; develop mission statements, and set performance goals and objectives.
- (iv) Recruit, hire, train, and evaluate primary and supplemental staff.

Head of Department

- (i) Confer with parents and staff to discuss educational activities, policies, and student behavioral or learning problems.
- (ii) Observe teaching methods and examine learning materials to evaluate and standardize curricula and teaching techniques, and to determine areas where improvement is needed.
- (iii) Motivate teachers for improvement and strengthen them academically.
- (iv) Monitor teachers continuously through well documented "Student Feed Back Report" and Annual Confidential Report.

POs and PSOs

DO1	Engineering knowledge: Apply knowledge of mathematics, science and engineering to analyse, design and evaluate mechanical
P01	components & systems using state -of-the-art II tools.
	Problem analysis: Analyse problems of mechanical engineering including thermal, manufacturing and industrial systems to
PO2	formulate design requirements.
	Design/development of solutions: Design, implement, and evaluate mechanical systems and processes considering public
PO3	health, safety, cultural, societal and environmental issues.
	Conduct investigations of complex problems: Design and conduct experiments using domain knowledge and analyze data to
PO4	arrive at valid conclusions.
	Modern tool usage: Apply current techniques, skills, knowledge and computer based methods and tools to develop mechanical
PO5	systems, understanding of the limitations.
	The engineer and society: Analyse the local and global impact of modern technologies on individual organizations, society and
PO6	culture and professional engineering practice.
	Environment and sustainability: Apply knowledge of contemporary issues to investigate and solve problems with a concern for
PO7	sustainability and eco-friendly environment.
	Ethics: Apply ethical principles and commit to professional ethics and legal responsibilities and social norms of the engineering
PO8	practice.
	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in
PO9	multidisciplinary settings.
	Communication: Communicate effectively in diverse groups and exhibit leadership gualities, to comprehend and write effective
PO10	reports.
PO11	Project management and finance : Apply management principles to manage projects in multidisciplinary environment
	respect management and management principles to manage projects in matablepiniary environment.
PO12	Life-long learning: Pursue life-long learning as a means to enhance knowledge and skills.
PSO1	To empower the students to apply knowledge and practical skills, in major mechanical engineering streams
	To enable the student to take up career in industries or to pursue higher studies in mechanical and allied programs with regard
PSO2	for environment and society.

CRITERION 2: Program Curriculum and Teaching – Learning Processes (100)

2.1. Program Curriculum (30)

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

(Describe the process that periodically documents and demonstrates how the program curriculum is evolved considering the POs and PSOs)

Industry Coordination Committee (ICC) discussed the relevance of the curriculum in context of requirements and trends of industry. Feedback was collected for improvement of curriculum and suggestions were invited for new subjects, suitable as per industrial needs. The feedback of the ICC was presented in the Board of studies (BOS) and discussions were held. The minutes of the ICC and BOS were presented in the Academic Council. The academic council (held on 31 July 2018) suggested the Choice Based Credit System (CBCS) as per AKTU Lucknow (based on AICTE model curriculum) to be implemented as per the requirements of the department and institute. It has been implemented in the session (2018-19) for the first year students.

Contribution of Course curricula to POs

POs	Course Curricula
 At graduation, our students will have: ➤ The ability to apply knowledge of mathematics, science, and engineering 	 Engineering Mathematics, Engineering Physics, Engineering Chemistry; Basic and Advance Civil Engineering Courses. Interdisciplinary Engineering Curricula
The ability to design and conduct experiments, as well as to analyze and interpret data	 Experimental Courses and Laboratory Works in all major Sciences and Engineering Applications
The ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, and sustainability.	 Co-curricular Activities like Modeling and Simulation of Engineering Fundamentals and Principles
 The ability to function on multi-disciplinary teams 	 Open Electives, Extra/co-curricular Students Interdisciplinary Activities
The ability to identify, formulate, and solve engineering problems	Project works
An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	 Skill to develop cutting edge tools in the area of Manufacturing, design, thermal, materials, industrial and their applications
A recognition of the need for, and an ability to engage in life-long learning	 Designing major infrastructure
The broad education necessary to understand the impact of engineering solutions in a global, economic,	 Students Participation into seminars, Conferences, workshops through paper presentation, modeling and live projects,

environmental, and societal context	Course work on Engineering and Managerial Economics
> A knowledge of contemporary issues	
	 Providing General Awareness and counseling to the students through Students Counselors knowledge contemporary issues
> The understanding of professional and	Human Values and Professional Ethics
ethical responsibility	Professional Communication
The ability to communicate effectively	

2.1.2. Structure of the Curriculum (5) B. Tech 1st Year (Mechanical Engg.) Structure in accordance with Dr APJ AKTU. Lucknow Effective w.e.f. Academic Session 2018-19

SEMESTER - I

5I. No	Code	Subject	Pe	eriods			Evaluatio	n Schem	e	End Semester		Total	Credit
			L	Т	Р	СТ	ТА	Tot al	PS	TE	PE		
		3 \	VEEKS	COMP	ULSOR	Y INDUC	TION PRO	DGRAM					
1	KAS101/ KAS102	Physics/ Chemistry	3	1	3	30	20	5 0	25	100	25	200	5.5
2	KAS 103	Mathematics I	3	1	0	30	20	5 0	-	100	-	150	4
3	KEE101/ KCS 101	Basic Electrical Engineering/Progr amming for Problem Solving	3	1	2	30	20	5 0	25	100	25	200	5
4	KCE101/ KWS101	Engineering Graphics & Design/Workshop Practices	1	0	4	-	-	-	25	-	25	50	3
													0
													17.
		TOTAL										600	5

SEMESTER – II

51 No	Code	Code Subject Periods Evaluation Scheme						End Ser	End Semester		Credi		
		545jeet		T	Р	СТ		Total	PS	TF	PF	local	0.00
	1	3	WEEK	S COM	PULSO	RY INDU		ROGRAM				1	1
1	KAS201/ KAS202	Physics/Chemistr y	3	1	3	30	20	50	25	100	25	200	5.5
2	KAS203	Mathematics II	3	1	0	30	20	50	-	100	-	150	4
3	KEE201/ KCS201	Basic Electrical Engineering/Prog ramming for Problem Solving	3	1	2	30	20	50	25	100	25	200	5
4	KCE201/ KWS201	Engineering Graphics & Design/Workshop Practices	1	0	4	-	-	-	25	-	25	50	3
	KAS204	Professional English	2	0	2	30	20	50	-	100		150	3
													0
		TOTAL										750	20.5

Curriculum for II year, III year and IV year (Before 2018-19 Batches)

			Total Nur	nber of cont	act hours	1	
	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical# (P)	Total Hours	Credits
	I	YEAR	I, SEMESTI	ER-I	1		1
1.	EAS-103	Mathematics-I	3	1	0	40+10	4
2.	EAS-101	Engg. Physics-I	2	1	0	30+10	3
3.	EME-102	Engg. Mechanics	3	1	0	41+10	4
4.	ECS-101	Computer Concepts & Programming in C	3	1	0	40+10	4
5.	EAS-104	Professional Communication	3	1	0	40+10	4
6.	EAS-105	Environment & Ecology	2	0	0	30	2
7.	EAS-109	Remedial English Language*	2	0	0	30	0
		PRACTI	CAL/TRAI	NING			
8.	EAS-152/ EME-152	Engg. Chemistry Lab/ Engg. Mechanics Lab	0	0	2	20/20	1
9.	EEE-151/ ECS-151	Electrical Engg Lab / Computer Programming Lab	0	0	2	20/20	1
10.	EWS-151/ ECE-151	Workshop Practice/ Computer Aided Engg. Graphics	0	1	3	40/40	2
11.	EAS-151/ EAS-154	Physics Lab / Professional Communication Lab	0	0	2	20/20	1
12.	GP-101	General Proficiency	0	0	0		1
	Total		18	6	9		27

	YEAR I, SEMESTER-II										
1.	EAS-203	Mathematics-II	3	1	0	40+10	4				
2.	EAS-202	Engg. Physics-II	2	1	0	30+10	3				
3.	EAS-202	Engg. Chemistry	3	1	0	40+10	4				
4.	EEE-201	Electrical Engg.	3	1	0	40+10	4				
5.	EAS-204/	Professional Communication/	3	1	0	40+10	4				
6.	EME-201	Manufacturing Processes	2	0	0	26	2				
	PRACTICAL/TRAINING										
7.	EME-252/ EAS-252	Engg. Mechanics Lab/ Engg. Chemistry Lab	0	0	2	20/20	1				
8.	ECS-251/ EEE-251	Computer Programming Lab/ Electrical Engg. Lab	0	0	2	20/20	1				
9.	ECE-251/ EWS-251	Computer Aided Engg. Graphics/ Workshop Practice	0	1	3	40/40	2				
10.	EAS-254/ EAS-251	Professional Communication Lab/ Physics Lab	0	0	2	20/20	1				
11.	GP-201	General Proficiency	0	0	0		1				
		Total	16	6	9		27				

		YEAI	R II, SEME	STER-III			
1.	EHU- 301/EHU-	Industrial Psychology/ Industrial Sociology	2	0	0	30/ 30	2
2.	EAS-301 / EOE-031-	Mathematics-III / Science Based/ Open Elective***	3	1	0	40+10/ 40+10	4
3.	ECE-301	Fluid Mechanics** Engineering Core (interdisciplinary)	3	1	0	40+10	4
4.	EME301	Materials Science in Engineering	3	1	0	41+10	4
5.	EME-302	Strength of Materials	3	1	0	34+10	4
6.	EME-303	Thermodynamics	2	1	0	26+10	3
7.	EHU-111	*Human Values & Professional Ethics	2	0	0	30	0
		PRA	CTICAL/T	RAINING	-		
8.	EME-351	Material Science & Testing Lab	0	0	2	20	1
9.	EME-352	Machine Drawing-I	0	0	3	30	1
10.	EME-353	Thermodynamics Lab	0	0	2	20	1
11.	ECE-351	Fluid Mechanics Lab *	0	0	2	20	1
12.	GP-301	General Proficiency	0	0	0		0
	Total		16	5	9		26
		YEAR	R II. SEME	STER-IV			
1.	EHU-402/	Industrial Sociology/	2	0	0		2
2.	EOE-41- EOE-48/	Science Based Open Elective***	3	1	0		4
	EAS-401						
3.	EEE-409	Electrical Machines & Automatic Control Engineering Core (interdisciplinary)	3	1	0	40+10	4
4.	EME-401	Applied Thermodynamics	3	1	0	36+10	4
5.	EME-402	Manufacturing Science-I	3	1	0	38+10	4
6.	EME-403	Measurement & Metrology	2	1	0	31+10	3
7.	EHU-111	*Human values & Professional Ethics	2	0	0		0
		PRAC	CTICAL/TE	RAINING			
8.	EME-451	Machine Drawing-II	0	0	3	39	1
9.	EME-452	Manufacturing Science-I Lab	0	0	3	24	1
10.	EME-453	Measurement & Metrology Lab	0	0	2	16	1
11.	EEE-459	Electrical Machines & Automatic control lab	0	0	2	20	1
12.	GP-401	General Proficiency	0	0	0		1
	Total		16	5	10		26
		YEAR	R III, SEM	ESTER-V	•		
1.	EHU-501	Engineering and Managerial Economics	3	1	0	40+10	3
2.	EME-501	Machine Design-I	2	1	0	30+10	3
3.	EME-502	Theory of Machines-I	3	1	0	40+10	4
4.	EME-503	Manufacturing Science-II	3	1	0	40+10	4
5.	EME-504	Heat & Mass Transfer	3	1	0	38+10	4
6.	EME-505	IC Engine and Compressors	2	1	0	30+10	3
7.	EHU-111	Human values &	2	0	0		0

		Professional Ethics					
		PRACTICAL	TRAININ/	G/PROJEC	Т		
8.	EME-551	Machine Design-I lab	0	0	2	16	1
9.	EME-552	Seminar	0	0	3	30	1
10.	EME-553	Manufacturing Science-II lab	0	1	2	16	1
11.	EME-554	Heat & Mass Transfer lab	0	0	3	24	1
12.	GP-501	General Proficiency	-	-	-		1
	Total		16	7	10		26

		YEAR III, SEMESTER-VI						
1.	EHU-601	Industrial Management	3	0	0	40	3	
2.	EME-011	Departmental Elective Fluid machinery	3	1	0	34+10	4	
3.	EME-201 Departmental Elective-II Nonconventional energy resource & utilization		2	1	0	27+10	3	
4.	EME-602	Machine Design-II	3	1	0	28+10	4	
5.	EME-603	Theory of Machine-II	2	1	0	38+10	3	
6.	EME-604	Refrigeration and air conditioning	3	1	0	39+10	4	
7.	EHU-111 Human values & Professional Ethics		2	0	0			
		PRACTIO	CAL/TRAI	NING				
8.	EME-651	Fluid Machinery lab	0	1	2	16	1	
9.	EME-652	Machine Design-II lab	0	0	2	16	1	
10.	EME-653	Theory of Machine lab	0	1	3	24	1	
11.	EME-654	Refrigeration and air conditioning lab	0	0	2	16	1	
12.	GP-501	General Proficiency	-	-	-		1	
	Total		16	6	9		26	

	YEAR IV, SEMESTER-VII						
1.	EOE-701	Open Elective Operation research	3	1	0	41+10	4
2.	EME-031	Departmental Elective Computer Aided Manufacturing	3	1	0	40+10	4
3.	EME-041	Departmental Elective-IV Mechanical System Design	3	1	0	40+10	4
4.	EME-701	Computer Aided Design	3	1	0	40+10	4
5.	EME-702	Automobile Engineering	3	1	0	38+10	4
6.	EHU-111	Human values & Professional Ethics	values & 2 0 onal Ethics		0		0
	•	PRACTICA	L/TRAINI	NG		•	·
7.	EME-751	CAD/CAM Lab	0	1	2	30	2
8.	EME-752	I.C.Engine& Automobile Lab	0	0	2	20	1
9.	EME-753	Project	0	0	3	30	2

10.	EME-754	Industrial Training I & II Evaluation and viva	0	0	2	20	1	
11.	GP-501	General Proficiency	-	-	-		1	
	Total	Total		6	9		26	
	YEAR IV, SEMESTER-VIII							
1.	EOE-083	Open Elective -II**) Product Development	3	1	0	37+10	4	
2.	EME-055	Departmental Elective - V (Six Sigma Methods & application	3	1	0	35+10	4	
3.	EME-064	Departmental Elective –VI (Production & operation management) **	3	1	0	40+10	4	
4.	EME-801	Power Plant Engineering	3	1	0	40+10	4	
5.	EHU-111	Human values & Professional Ethics	2	0	0		0	
	PRACTICAL/TRAINING							
6.	EME-851	Project	0	0	12	120	8	
7.	GP-501	General Proficiency	-	-	-		1	
	Total		12	3	12		24	

Table B.2.1.2

Seminars, project works may be considered as practical

2.1.3. State the components of the curriculum (5) *Program curriculum grouping based on course components*

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total number of credits	No.of subject and lab
Basic Sciences	14.55	380	31	9 subjects and 3 lab
Engineering Sciences	12.20	360	26	5 subjects and 5lab
Humanities and Social Sciences	4.70	180	10	5 subjects
Program Core	40.84	1243	87	19 subject and 18lab
Program Electives	10.79	276	23	6 subjects
Open Electives	5.633	148	12	3 subject
Project(s)	4.69	150	10	2 project
Internships/Seminars	0.938	50	2	2 seminars
Any other (Please specify)	5.63	60	12	GP+ Remedial English+ Human value and professional ethics
Total number of Cred	its	2847	213	

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)

This institute is affiliated to Abul Kalam Technical University (A.K.T.U.) Lucknow, U.P. formerly UP Technical University (U.P.T.U.). The course curriculum of Mechanical Engineering departmental has been taken from the university. The following are the means and methods used to identify extent of compliance of the University curriculum for attaining the Program Outcomes :

- Class room instructions
- Tutorials
- Course materials and PPT presentation
- NPTEL videos
- GAP Analysis



PROCESS OF GAP ANALYSIS

Following is the process used to identify extent of compliance of University curriculum for attaining the POs and PSOs.

- ➢ Identify the Course Outcomes (CO) for each subject
- Map each Course Outcome with POs and PSOs
- > The GAP is analysed on the basis of the CO attainment of individual courses
- Feedback from faculty
- Identification of curricular gaps
- > Departmental meetings to find the topics to bridge the GAP and Content beyond the syllabus.
- > These contents are delivered to the students through Tutorial and/or Remedial classes.
- Analysis of subject attainment
- Feedback from Alumni and students

To identify the curricular gap the following activities are undertaken: conduct the Exit-Survey, Alumni Survey and Recruiter Survey. The extra and remedial classes are arranged by hiring the experts from other reputed institutions.



The measures and processes used to identify the curricular gaps for the attainment of COs/POs are as follows:

- Weak students are identified after class test I, II & III conducted in every semester.
- Extra classes are taken to overcome the gap of weakness in weak students.
- Regular assignment work is given to the students.
- Tutorial classes are held to clear the doubts of weak students.
- Regular counselling is carried out to sort out their problems

The following modes of delivery of courses help in the attainment of the POs

S. No.	Delivery	Concerned	Attainment of POs
	Methods/Modes	Course	
1.	Lectures (Using Black Board/PPT)	All major theory courses	The ability to apply knowledge of mathematics, science, and engineering both in theory and practice
2.	Interspersed with Discussion	All Experimental Courses	The ability to design the experiments, as well as to analyze and interpret data
3.	Mode of mutual Interaction	Research Papers/Conferenc es /seminars etc.	➢ The ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, construction ability, and sustainability
4.	Group Discussion	Projects etc.	 The ability to function on multi- disciplinary teams The ability to identify, formulate, and solve engineering problems An ability to use the techniques, skills,

			 and modern engineering tools necessary for engineering practice. ➤ The ability to communicate effectively
5.	Students Workshop/Counseling	Misc.	 The understanding of professional and ethical responsibility The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context A recognition of the need for, and an ability to engage in life-long learning A knowledge of contemporary issues

2.2. Teaching-Learning Processes (70)

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

- > Department follows the academic calendar in principle with affiliated University. It consists of the activities planned for the semester which includes internal test dates, laboratory and end examination schedules etc.
- Subject allotment is done well in advance to allow members to prepare lesson plans, course plan, soft / hard copies of the lecture notes.
- Experiments in the laboratories are conducted as per the guidelines. Some discussions are made beyond syllabus relevant to the course. Laboratory manuals explaining the details of the experiment are available with the instructor/course teacher during the semester.
 - The faculty adopts various innovative practices to create and improve instruction methods using pedagogical initiatives such as real examples, collaborative learning for students.

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- These methodologies include traditional chalk & talk methods, presentations, lecture Collaborative learning methods are used where every concept is explained with real world problems and illustrations.
- Assignments are given to students for their better performance.
- Tutorial classes are conducted to bridge the curriculum gap as well as to support the slow learners based on their performance in external exams and after the first internals.
- Invited talks and mentoring sessions on the current professional practices are done from the academia and /or industry persons.
- Industrial visits are conducted to reduce the gap between industry and institute.
- Workshops are organized to help the students to understand concepts beyond curriculum.
- E-learning (using NPTEL Lecture, MOOCS) is promoted for skill development of the students.

Scope for self-learning:

- To expose the students to latest trends within and beyond their curriculum using ICT.
- Mechanical Engineering Forum (M.E.F) encourages students to explore their talents, test their knowledge by discussions, brainstorming and problem solving with focus on outputs of learning and academic careers.
- Engaged to work in Industries during vacation and have Industrial training
- Industrial visits arranged by the Departments.
- Technical talks.
- Seminars for senior students.
- Language lab facilities to enable students to prepare to take up the GATE/TOEFL examinations.

Learning /Promotion of beyond Syllabus Contents

The following activities promote the delivery of the course content beyond the syllabus imparted for the attainment of COs and POs to bridge curricular gaps.

- Intranet facility provides learning of subjects not necessarily in the curriculum
- Many e-learning materials, journals and magazines are subscribed and made available to the students at the Institute Library to help the students inculcating the habit of self-learning.
- Moreover, provision of Internet in the hostels also helps the students to learn beyond what is taught in the classroom.
- Online NPTEL lecture series are available for students reference
- Students may regularly sharpen and broaden their knowledge by numerous books by eminent national and international authors on a variety of topics besides their syllabus. The library also possesses a number of magazines and periodicals related to different branches of science and technology which the students may readily access
- The library also subscribes to a host of online journals which are also made readily available to the students.
- Training on Soft skills and value added programs
- Workshops / Conferences / Technical Seminars
- Industrial Visits and Internship

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

- Internal semester question papers are set by considering the Syllabus content, GATE examination.
- Assignments are given to the students so that they may solve the problem themselves using text books, internet and by self-learning methods.

Evaluation methods are predefined which are as follows

		Theory	Practical	Project
	Assessments	Courses (%)	Courses (%)	Courses
	Internal test I & II	20		
Written	Attendance	6.66		
Examination	Teachers' assessment/quiz	6.66		
	End semester	66.66		
Practical				
examination				
(Experiment,	Viva-voce /Internal Evaluation		40	
submission				
& content				
Viva-voce	Lab External Examination		60	
Project	Internal Examination(Power point presentation)			29
Examination	External Viva-Voce(Power point presentation)			71

Evaluation System

> Question Papers:

- Previous university/ exam papers are taken into consideration while setting the question papers.
- The questions are set according to toughness (viz., problem analysis, modern tools application, formulation of problems etc.).

The questions are based on the Course Outcomes.

Assignments:

Assignment problems and submission dates are provided by the respective faculty members. Assignment questions are set using Bloom's Taxonomy process in relation with COs.

Blooms Taxonomy

- (i) Knowledge: Recall of Information, Discovery, Observation, etc
- (ii) Comprehension: Understanding, summarizing, demonstrating, discussing, etc
- (iii) Application: Using and applying knowledge, problem solving, design and experiment, etc
- (iv) Analysis: Evaluate, Identify and analyse patterns, recognise trends, etc
- (v) Synthesis: Create new ideas, design, invention, inferring, predicting, etc
- (vi) Judge: Evaluate, outcome, recommend, rating, etc

2.2.3. Quality of student projects (20)

S. No.	Delivery	Concerned	Attainment of POs		
	Methods/Modes	Course			
1.	Interspersed with	All Experimental	> The ability to conduct experiments, as		
	Discussion and	Courses	well as to analyze and interpret data and		
	Demonstration		finalizing the test results		
2.	Mutual interaction	Projects etc.	> The ability to function on multi-		
	with project		disciplinary teams		
	groups members		> The ability to identify, formulate, and		
	with their		solve engineering problems		

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	Supervisors	An ability to use the techniques, skills,
		and modern engineering tools necessary for
		engineering practice.
		The ability to communicate effectively

To start with choice of students groups (formed by means of ranking) is taken into consideration for desired faculty members. Based on the ranking of students group and their area of interest, the faculty is allocated. The students are asked to meet the faculty members at the end of even semester to discuss about the topic of project based on idea of their own or depending on suggestion from guide. The topic as discussed with the respective guides is presented to the Project Review Committee. Students are briefed about the objectives, outcomes and specific outcomes of the projects and steps to be followed.

Approach of Project Preparation is as follows;

- 1. Selection of area of interest of students.
- 2. Literature survey
- 3. Identification of Project
- 4. Allotment of Project
- 5. Manufacturing / Prototype making/Analysis
- 6. Collection of Data
- 7. Analysis of Data
- 8. Conclusion of the Project
- 9. Future scope of work

Quality of the project is measured in terms of consideration of factors including, but not limited to cost, type (application, analysis, product, research, review etc.) and standards. Project works are evaluated as per the schedule by the Project Review Committee. Students appear before the committee with Power point presentation followed by Viva-Voce.

Implementation details with details of POs and PSOs addressed through the projects is attached as follows:

B. Tech Final Year Project 2015-16

Project Relevance with POs and PSOs (Year 2015-16)

S. No.	Project Name	Project Guide	Mapping with POs	Mapping with PSOs
1	Study of wheel loading phenomenon in surface grinding	Dr S. Agarwal	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1
2	Premixes combustion behaviour of a dump combustor	Dr. N. P. Yadav	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1

3	Multi-objective optimization of cutting and geometric parameters in turning operation by grey relational analysis and Taguchi method	Dr. Tarun Soota	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1
4	Optimization of compact spur gear set	Dr. A. K. Padap	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1
5	Effect of heat treatment and deformation of microstructure and Mechanical properties of Nitronia- 50 steel	Dr. S. K. Rajput	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1
6	Experimental study on electroplating of Al workpiece	Er. A.Suryavansi	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1
7	Abrasive wear behavior of different coating on alloy AA6061	Er. Vijay Verma	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1

Project Relevance with POs and PSOs (Year 2016-17)

S. No.	Project Name	Project Guide	Mapping with POs	Mapping with PSOs
1	Modeling and analysis of grinding process	Dr S. Agarwal	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1
2	Predicting the performance of counter flow heat exchanger having rectangular flow process	Dr. N. P. Yadav	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1
3	Optimization of process parameter Aluminium 6061 material in CNC milling Taguchi method	Dr. Tarun Soota	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1
4	Dry sliding wear of AA 6061 Aluminium alloy processed during multi axal compression	Dr. A. K. Padap	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1
5	Modeling and optimization of machining parameter in drilling of Al 6083 using RSM	Dr. N. Kumar	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1
6	Experimental study on Die sinking EDM Machine to optimize the parameter	Dr. A.Suryavansi	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1
7	Effect of welding process on mechanical properties and micro structural characteristics of low alloy steel	Dr. S. K. Rajput	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1
8	Fabrication and analysis of fiber reinforced polymer composite of frame of bicycle	Er. Vijay Verma	PO1, PO2, PO3, PO4, PO3, PO5, PO6, PO9, PO10, PO11	PSO1

Project Relevance with POs and PSOs (Year 2017-18)

S. No.	Project Name	Project Guide	Mapping with POs	Mapping with PSOs			
1	Micro EDM drilling of high aspect ratio	Dr S. Agarwal	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1			
2	Optimization of fluid flow parameters of separate duct by experimental and CFD analysis	Dr. N. P. Yadav	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1			
3	Parametric optimization of wire EDM by using Fuzzy logic	Dr. Tarun Soota	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1			
4	Effect of two stage age hardening on the micro-structural and hardness value of AA 6063 alloy	Dr. A. K. Padap	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1			
5	Optimization of process parameter in CNC end milling of AISI 4340	Dr. N. Kumar	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1			
6	Optimization of performance parameter of stainless steel 316 in turning operation using extended Taguchi Approach	Dr. A.Suryavanshi	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1			
7	Micro structural evaluation and mechanical properties of dissimilar welds of austenitic and ferrite steel using CMAW process	Dr. S. K. Rajput	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1			
8	Investigation of heat transfer rate in automobile radiator using nano fluid as coolant	Er. Vijay Verma	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1			
9	Optimization of EDM parameter for ZrO ₂ ceramic using Taguchi method	Dr S. Agarwal	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1			
10	Experimental study of heat transfer coefficient at various volume fraction of nano fluids	Dr. N. P. Yadav	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1			
11	Multi-objective optimization of wire EDM by using grey relational analysis	Dr. Tarun Soota	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1			
12	Effect of precipitation hardening on properties of Al alloy	Dr. A. K. Padap	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1			
13	Flexural testing and tensile testing on the composite material formed by glen fiber and epoxy resin in the solar wring and over wring	Dr. N. Kumar	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1			
14	Optimization of machining parameter in abrasive water jet machining for Aluminium	Dr. A.Suryavansi	PO1, PO2, PO4, PO5, PO6, PO9, PO10, PO11	PSO1			
15	Effect of short peening on mechanical properties of alloy steel	Dr. S. K. Rajput	PO1, PO2, PO4, PO6, PO9, PO10, PO11	PSO1			

16	Optimization of turning parameter for material removal rate and surface	Er. Vijay Verma	PO1, PO2, PO4, PO5, PO6, PO9,	PSO1
	roughness using RSM		r010, r011	

2.2.4. Initiatives related to industry interaction (10)

To strengthen interaction with industries and to keep our students updated with the latest trends in Mechanical Engineering, the Department has implemented following initiatives. Mechanical engineering department keeps in touch with the Training & Placement Office of institute regularly through Departmental Coordinator. Expert lectures on recent trends by experts from industries are conducted for exposing the industrial needs to the students.

Students are permitted to take training at various industries. All students undertake summer/winter vacation training in industries *which is mandatory*.

Industrial visits along with the faculty members are arranged to bridge the gap between theoretical concepts and practical implications of the same.

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

Training & Placement Cell identifies the organizations, suitable for Mechanical Engineering students and approach them to allow our students for internship/ summer training.

- Industrial training is the part of program curriculum.
- Students attempt to simulate industrial projects in the lab.
- Students interact with industry to understand the practical implementation of theoretical aspects.
- Students also visit academic institution of repute.

Some of the organizations where students are going for the internships/ summer training are appended below:

S. No.	INDUSTRIES	PARTICULARS
1.	DLW (Diesel Locomotive Workshop)	Heavy Welding Shop, Loco Frame Study, Sub
		Assembly Shop Study.
2.	Parichha Thermal Power Plant.	Turbine Maintenance, boiler maintenance, CHP.
3.	Indian Railways Workshop	Air brake system, welding shop, Material Testing
4.	NTPC	Automation of power plant, Turbine Maintenance and
		Boiler Maintenance
5.	BHEL	Concept of CNC Machine, Axel design, locomotive
		manufacturing
6.	UPSRTC	Engine Repairing, Gear box, Repair of tyre
7	HAL	Fabrication and assembly of aircraft, jet engines, and
		helicopters, as well as their component and spares
8	GAIL	Maintenance of European gas turbine and transfer of gas
9	Ghatampur Thermal power plant	Boiler maintenance
10	BPCL Allahabad	Manufacture and Maintenance of pumps

CRITERION 3	Course Outcomes and Programme Outcomes	120
		-

3. Course Outcomes and Programme Outcomes (120)

3.1 Establish the correlation between Course Outcomes (COs) and Programme Outcomes (POs) and Programme Specific Outcomes (PSOs): (20)

(Program Outcomes as mentioned below and Program Specific Outcomes as defined by the Program). The following are the program outcomes and program specific outcomes:

PO1 Engineering knowledge:

Apply knowledge of mathematics, science and engineering to analyze, design and evaluate mechanical components & systems using state -of-the-art IT tools.

PO2 Problem analysis:

Analyze problems of mechanical engineering including thermal, manufacturing and industrial systems to formulate design requirements.

PO3Design/development of solutions:

Design, implement, and evaluate mechanical systems and processes considering public health, safety, cultural, societal and environmental issues.

PO4 Conduct investigations of complex problems:

Design and conduct experiments using domain knowledge and analyze data to arrive at valid conclusions.

PO5 Modern tool usage:

Apply current techniques, skills, knowledge and computer based methods & tools to develop mechanical systems, understanding of the limitations.

PO6 The engineer and society:

Analyze the local and global impact of modern technologies on individual organizations, society and culture and professional engineering practice.

PO7 Environment and sustainability:

Apply knowledge of contemporary issues to investigate and solve problems with a concern for sustainability and eco friendly environment.

PO8 Ethics:

Apply ethical principles and commit to professional ethics and legal responsibilities and social norms of the engineering practice.

PO9 Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 Communication:

Communicate effectively in diverse groups and exhibit leadership qualities, to comprehend and write effective reports. **PO11 Project management and finance**:

Apply management principles to manage projects in multidisciplinary environment.

PO12 Life-long learning:

Pursue life-long learning as a means to enhance knowledge and skill.

PSO1: To empower the students to apply practical skills, knowledge in major streams such as design, thermal, manufacturing and industrial engineering

PSO2: To enable the student to take up career in industries or to pursue higher studies in mechanical and interdisciplinary programs with regard to ethics, environment and society.

3.1.1 Course Outcomes (COs) (SAR should include course outcomes of one course from each semester of study, however, should be prepared for all courses and made available as evidence, if asked):(05)

Program Articulation Matrix

S.No	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	EME 102: Engineering														
	Mechanics	3	3	2.75	2								1	1.8	1
2	EME 201: Manufacturing														
	Process	1.5	2.5	1.5	1.5	1								1.5	1.67
3	EME 301: Material Science		2	2.2	26									2	2
4	EME 302: Strength of	2	2	2.2	2.0									3	2
4	materials	3	2.2	2.6	1.8									2.8	2.6
5	EME 401: Applied	-													
	Thermodynamics	3	3	2	1.8	1.6				1.8			1.5	2.8	1.4
6	EME 402: Manufacturing														
-	Science I	3	2.5	2	1									2.6	2.8
7	EME 403: Measurement and	3	1	2									2	2	
	Metrology		-	-	-								-	-	
8	EME 502: Theory of														
<u> </u>	Machines I	3	3	1.4	2.6	1.25							2	2	1.4
9	EME 503: Manufacturing	2.0	20	2.2	20	24	2.2						2.2	20	2.2
10	EME 504: Heat and mass	2.8	2.8	2.2	2.0	2.4	2.2						2.2	2.0	2.2
10	transfer	3	2.8	24	28	2	1.8	14	1	1		1	1.6	3	2.6
11			2.0	2.4	2.0	-	1.0	1.4	-	-		-	1.0	5	2.0
	EME 011: Fluid Machinery	2.6	1.67	1.8			1.8		1.8		1.5			1.8	1.67
12															
	EME 021: NCERU	3	2.3	2.5				3					2	1.75	2.8
13	EME 602: Machine Design II	2.8	2.8	2.6	2	1.75	2			1		1	1.33	1.8	2
14	EME 603: Theory of				-		-			-		-	1.00	1.0	
17	Machines II	3	3	1.75	2								2	2	1.25
15	EME 604: Refrigeration and														
	air-conditioning	2.4	2.8	2.8	3	2								2.2	2.8
16	EME 073: Operations														
	Research	2.4	2.4	2.4	2.4	2.6	2.4	1	1	1	1	1	2	2	2
17	EME 031: Computer aided														
	Manufacturing	2	2.5	1.4	2	1	2.2		1.4					1.6	1.67
18	EME 043: Mechanical	<u>,</u>	26	1	2	2	1.6	1				25	1	1.6	1.4
10	EME 702: Automobile	2	2.0	1	2	2	1.0	1				2.5	1	1.0	1.4
19	Engineering	3	1.3	3										2.6	1
20	EOE 083: Product														
20	Development	2.8	2.4	2	2	1.8	2	2		1.4		1.67	2	2.4	2
21	EME 055: Six sigma	1			1		1							1	
	Methods and applications	3	2.3	2	3	3								2.8	2
22	EME 064: Production and														
ļ	operation Management	1.8	1.8	1.6	2	2.5	3	1		1.5		2	ļ	1	1
23	EME 801: Power Plant														
	Engineering	2.6	3	1	1.6	2.4	2	2		1.6		2	1.8	2.6	2
		1	1	I	1	1	1	1	1	1			1	1	

Table 3.1.1.1: PO Articulation

Course Articulation Matrix

For the mapping of the course outcomes with the program outcomes, 3 means – high, 2 means – moderate, 1 means – weakly mapped with the respective course outcomes of that particular course. The following tables Give the mapping for the aforementioned Program Outcomes and Program Specific Outcomes with the corresponding Course Outcomes:

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 102.1	Determine resultants and apply conditions of static equilibrium to plane force systems. Analyze problems related to friction	3	3	2	1								1	2	
EME 102.2	Generate and sketch shear force and bending moment diagrams for statically determinate beams. Analyze systems to determine the forces in members of trusses	3	3	2	2								1	2	1
EME 102.3	Determine the centroid and moment of inertia	3	3	2	2								1	2	
EME 102.4	Solve problems in kinematic and dynamic systems	3	3	2	1								1	1	
EME 102.5	Derive and apply stress and strain relationships in single and compound members subject to axial force, bending moment and torsion	3	3	3	1								1	2	
EME 1	02 : Engineering Mechanics	3	3	2.75	2								1	1.8	1

Table 3.1.1.2: Course Outcomes and mapping of EME 102: Engineering Mechanics

Table 3.1.1.3: Course Outcomes and mapping of EME 201: Manufacturing Process

СО	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 201.1	Understand different ferrous and non-ferrous metals and alloys and their properties.	1		2										1	
EME 201.2	Basic knowledge of forming and casting processes and their applications.	2	2		1									1	2
EME 201.3	Introduction to basic fabrication processes such as welding and machining	1	3	1										2	1
EME 201.4	Elementary knowledge of nano- metallic material and other process used in engineering	2			2	1								2	2
EME 2	01 : Manufacturing Process	1.5	2.5	1.5	1.5	1								1.5	1.67

Table 3.1.1.4: Course Outcomes and mapping of EME 301: Material Science in Engineering

СО	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 201.1	Ability of understanding the Atomic														
501.1	Xray technique and defects in solid.		2	1	2										
EME 301.2	Ability to correlate the microstructure and mechanical properties and ability to design the specific material by understanding the phase diagram.	2	2	3	3									3	
EME 301.3	To be able for heat treating the material, knowledge of iron and steel ,non ferrous metals and alloy		2	3	3										
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EME 301.4	Imparting the knowledge of magnetic, electrical properties and superconductivity		2	1	2						2				
EME 301.5	Ability of processing the ceramic and plastic. Ability of designing the material for service conditions lie corrosion, fracture etc		2	3	3						2				
EME 3	01 : Material Science in Engineering	2	2	2.2	2.6					3	2				

Table 3.1.1.5: Course Outcomes and mapping of EME 302: Strength of Materials

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 302.1	Recognize the concept of one and two dimensional simple and compound stress and strain.	3	2	2	2									3	2
EME 302.2	Study and analysis of simple and composite beams, and also determine the deflection of beams using different methods.	3	2	3	2									3	3
EME 302.3	To understand the concept of helical, leaf springs and columns and struts.	3	3	3	2									3	3
EME 302.4	Study and analysis of thin and thick cylinders.	3	2	3	2									3	3
EME 302.5	To understand the concept of curved beams and unsymmetrical bending.	3	2	2	1									2	2
EME 3	02 : Strength of materials	3	2.2	2.6	1.8									2.8	2.6

Table 3.1.1.6: Course Outcomes and mapping of EME 401: Applied Thermodynamics

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	POS	PO9	PO10	PO11	PO	PSO 1	PSO2
	Derive and explain the application	101	102	105	104	105	100	10/	100	105	1010	1011	12	-	1302
	of Different Thermodynamic														
EME	relations and evaluate the														
401.1	combustion of fuels	3	3	2	2	1				2			1	3	2
	Demonstrate the working of Steam														
	Generators and Condensers and														
EME	evaluate the performance of Boiler														
401.2	and Condensers	3	3	2	1	2				2				3	1
	Analyse and evaluate the														
EME	performance of Rankine Cycle,														
401.3	Steam Engine and Nozzles	3	3	3	2	1				2			2	3	2
	Demonstrate the working of Steam														
EME	Turbines and Vapour power cycles	3													
401.4	and solve the numerical on these		3	1	2	2				2			2	3	1
	Explain the working of Gas turbines														
	and Jet propulsion engines and	2													
EME	evaluate the performance of Gas	5													
401.5	turbines and jet engines		3	2	2	2				1			1	2	1
EM	E 401 : Applied Thermodynamics	3	3	2	1.8	1.6				1.8			1.5	2.8	1.4

CO	Statement	PO1	PO2	PO3	P04	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO	PSO 1	PSO2
EME 402.1	Recognize the different types forming process and analysis of forging.	3	2	2	1	103	100	107	100	105	1010		12	2	2
EME 402.2	To study and analysis of rolling and drawing process.			2	1									3	3
EME 402.3	Explain the concept of sheet metal working process.			2	1									3	3
EME 402.4	Study of unconventional metal forming process and powder metallurgy.	3	3	2	1									2	3
EME 402.5	To study casting process.													3	3
EN	ME 402: Manufacturing Science I	3	2.5	2	1									2.6	2.8

Table 3.1.1.7: Course Outcomes and mapping of EME 402: Manufacturing Science I

Table 3.1.1.8: Course Outcomes and mapping of EME 403: Measurement and Metrology

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
	Understanding the generalized					. 00				. 05				-	1002
	measuring system their static and														
	dynamic characteristics for selecting														
E) (E	best instrument for various														
EME 403.1	measurements	3	1	2									2	2	
405.1	Developing the basic skill in														
	measurement related to pressure,														
	force, temperature, vibration, time														
EME	related measurement etc	3	1	2									2	2	
403.2	Understanding of Measuring														
	Methods and working principle of														
	Pressure, Force, Temperature,														
EME	Acceleration etc	3	1	2									2	2	
403.3															
	Metrology imparts the knowledge														
	related to linear and angular														
	measurement. limit fits and														
EME	tolerance,	3	1	2									2	2	
403.4	-														
	metrology of gears, surface finish														
EME	etc. It further helps in selecting the		1	2									<u>_</u>	2	
403.5	inspection tool in industries	5	1	2										2	
EME	E 403: Measurement and Metrology	3	1	2									2	2	

Table 3.1.1.9: Course Outcomes and mapping of EME 502: Theory of Machines I

CO	Statement												PO	PSO	
	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	12	1	PSO2
	Ability of understanding the various														
	mechanisms, inversions, and their														
EME	mobility analysis and also analyze														
502.1	their velocity using graphical and														
	analytical approach.	3	3	1	3	1							2	2	1

EME 502.2	Ability to analyze the acceleration of various links/points in different mechanisms graphically and analytically and Also develops the design concepts of different types of mechanism with lower pairs.	3	3	1	3	1				2	2	1
EME 502.3	Understand the concept of friction on inclined plane, belts, and journal bearing and also understand braking and development of device to measure the power with help of dynamometers	3	3	2	3	1				2	2	2
EME 502.4	Knowledge of various Cams, followers and their classifications. Design the Cam profile based on the prescribed follower motion.	3	3	1	2					2	2	1
EME 502.5	Ability to understand the gears, terminology, gears trains, and analyze gear tooth profile and interference phenomena.	3	3	2	2	2				2	2	2
Е	ME 502: Theory of Machines I	3	3	1.4	2.6	1.2 5				2	2	1.4

Table 3.1.1.10: Course Outcomes and mapping of EME 503: Manufacturing Science II

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME 503.1	Discuss the mechanism of metal cutting and different forces acting on the tools and tool wear and tool life	3	3	2	3	1	1						3	2	2
EME 503.2	Explain the different gear manufacturing processes and gear finishing operations, to discuss cutting tool material and fluids	3	3	1	2	2	2						2	2	2
EME 503.3	Understand the different manufacturing process like grinding and super finishing, discuss jig fixtures	3	3	2	2	3	3						2	3	2
EME 503.4	Explore advanced welding process	3	3	3	3	3	3						2	3	2
EME 503.5	Understand the different advanced manufacturing process and applications	2	2	3	3	3	2						2	3	3
EM	IE 503: Manufacturing Science II	2.8	2.8	2.2	2.6	2.4	2.2						2. 2	2.6	2.2

Table 3.1.1.11: Course Outcomes and mapping of EME 504: Heat and Mass Transfer

CO	Statement	PO1	PO2	PO3	PO4	POS	POG	PO7	POS	POQ	PO10	PO11	PO	PSO 1	DSO2
EME 504.1	Understand the fundamentals and various modes of heat transfer. Compute the heat transfer rate and temperature distribution in various geometry under steady- state heat conduction with and without heat	3	3	2	2	2	2	1		1			1	3	3

	generation.													
EME 504.2	Understand and analyse the heat transfer through extended surface. Distinguish and evaluate the heat transfer under unsteady-state.	3	3	3	3	2	2	2		1	1	1	3	3
EME 504.3	Deduce and analyse the forced and free convection heat transfer	3	3	2	3	2	2	1		1		2	3	2
EME 504.4	Understand the principles of radiation and analyse the thermal radiation exchange among the bodies.	3	2	2	2	2	1	1		1		2	3	2
EME 504.5	Basic of heat exchangers and heat transfer due to phase change. The design of heat exchanger using LMTD and NTU method. Fundamentals and various modes of mass transfer. Interpret and compute the mass transfer rate.	3	3	3	2	2	2	2	1	1	1	2	3	3
Е	ME 504: Heat and mass transfer	3	2.8	2.4	2.8	2	1.8	1.4	1	1	1	1.6	3	2.6

Table 3.1.1.12: Course Outcomes and mapping of EME 011: Fluid Machinery

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME 011.1	Understand the basics of the hydro machinery and the components, function and use of different types of turbines and pumps	3	2	3			3		2					2	2
EME 011.2	Classify fluid and rotodynamic machines	2		1			1		2		2			2	
EME 011.3	Identify and describe hydraulic turbines and their classifications	3	2	1			2		1					3	2
EME 011.4	Describe centrifugal and mixed flow pumps and fans and the related effects on systems	3		2			2		1		1			1	
EME 011.5	Estimate the hydraulic parameters and select the required hydraulic machine(pump)	2	1	2			1		3					1	1
	EME 011 : Fluid Machinery	2.6	1.67	1.8			1.8		1.8		1.5			1.8	1.67

Table 3.1.1.13: Course Outcomes and mapping of EME 021: NCERU

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME 021.1	Understand the energy resources, their classification, solar radiation and various sun earth angles.	3													3
EME 021.2	Understand the ways of utilizing solar thermal energy (namely plate collectors and PV cells) and to analyze the performance of the same.	3	3	2		1		3						2	3
EME 021.3	Perceive various mechanisms to convert biomass in to cleaner fuels	3	2	3				3						1	3

	and to acquire knowledge about designing and harnessing the wind energy.										
EME 021.4	understand the electrochemical devices like fuel cells which can provide the sustainable energy solutions in future and also to understand tidal power and production, transportation and storage of hydrogen as a fuel.	3				3			2	3	3
EME 021.5	Perceive various principles regarding thermoelectric materials to generate electric power. Also to acquire knowledge about geothermal energy ,OTEC and to understand international protocols regarding renewable energy generation.	3	2			3				1	2
	EME 021: NCERU	3	2.3	2.5		3			2	1.7 5	2.8

Table 3.1.1.14: Course Outcomes and mapping of EME 602: Machine Design II

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME 602.1	Understand the customers' need, formulate the problem and draw the design specifications	3	3	3	2	1	2					1	2	3	3
EME 602.2	Understand the methods of design of spur gears, helical gears, worm gears.	3	3	3	2	3	2					1		2	3
EME 602.3	Perform the design of various types of sliding contact, rolling contact bearings	3	3	3	3	1						1	1	2	3
EME 602.4	Design the crane hook, connecting rod, machine frame and other similar components of IC Engine.	3	3	2	1	1							1	1	1
EME 602.5	Design a machine component using theories of failure.	2	2	2	2					1		1		1	
EME 6	02: Machine Design II	2.8	2.8	2.6	2	1.7 5	2			1		1	1. 33	1.8	2

Table 3.1.1.15: Course Outcomes and mapping of EME 603: Theory of Machines II

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME	Analyze static and dynamic force of														
603.1	various linkages. Understanding the														
	concepts & analyze problems on Turning moment and Elysyheel														
	running moment and rrywneer.	3	3	1	2								2	2	1
EME	Understand and analyze the														
603.2	balancing of rotating and														
	reciprocating parts in a														
	Machine/mechanism.	3	3	2	2								2	2	1
EME	Ability to understand the concept														
603.3	and working principle of various														
	governors.	3	3	1	2								2	2	1

EME Und 603.4 Gyn ship lear vibr	derstand and analyze the roscopic effect on aero-planes, ps and automobile and also to rn the concepts of mechanical ration and critical speed of shaft.	3	3	3	2				2	2	2
EME 6	603: Theory of Machines II	3	3	1.7 5	2				2	2	1.25

Table 3.1.1.16: Course Outcomes and mapping of EME 604: Refrigeration and airconditioning

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME 604.1	Understand the principles and applications of refrigeration system	2	3	3	3	1								2	2
EME 604.2	Analyse performance of vapour compression refrigeration system	2	3	3	3	2								3	3
EME 604.3	Analyse air conditioning process using principles of psychometry	3	3	2	3	2								2	3
EME 604.4	Study the working principles of vapour absorption, thermoelectric, steam jet refrigeration	3	2	3	3	3								2	3
EME 604.5	Evaluate the cooling and heating loads in air-conditioning system	2	3	3	3	2								2	3
EME 6	04: Refrigeration and airconditioning	2.4	2.8	2.8	3	2								2.2	2.8

Table 3.1.1.17: Course Outcomes and mapping of EME 073: Operations Research

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME 073.1	Discuss the role of operations research in decision-making, and its applications in industry and should be able to formulate and design real-world problems through models & experiments.	3	3	3	3	3	3	1	1	1	1	1	2	2	2
EME 073.2	Apply and analyze various types of deterministic models like linear programming, transportation model etc.	2	2	3	2	3	2	1	1	1	1		2	2	2
EME 073.3	Apply and analyze various types of stochastic models like waiting line model, project line model, simulation etc.	2	2	2	2	3	3	1	1	1	1		2	2	2
EME 073.4	Deduce the relationship between a linear program and its dual and perform sensitivity analysis.	2	2	2	2	2	2	1	1	1	1		2	2	2
EME 073.5	Describe different decision making environments and apply decision making process in the real world situations.	3	3	2	3	2	2	1	1	1	1	1	2	2	2
]	EME 073: Operations Research	2.4	2.4	2.4	2.4	2.6	2.4	1	1	1	1	1	2	2	2

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME	Understand the basics														
031.1	principles of automation and														
	features of NC machines	2		2			3		1					2	2
EME	Understand the idea of part														
031.2	programming viz manual														
	(word address format) and														
	computer aided (APT														
	format)	2	2	1	2		1		1					2	
EME	Identify and describe														
031.3	different devices and system														
	of NC machine	1	3	1			2		2					1	2
EME	Understand the concept and														
031.4	benefits of application and														
	integration of computer in														
	manufacturing system	3		1		1	2		1					2	
EME	Introduction to robotics and														
031.5	intelligent manufacturing	2		2			3		2					1	1
EME	031: Computer aided Manufacturing	2	2.5	1.4	2	1	2.2		1.4	<u> </u>		<u> </u>		1.6	1.67

Table 3.1.1.18: Course Outcomes and mapping of EME 031: Computer aided Manufacturing

Table 3.1.1.19: Course	Outcomes and	mapping	of EME 043:	Mechanical	System 1	Design

СО	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 043.1	Understand the systems approach and problem formulation	2	2	1			1	1					1	1	1
EME 043.2	Understand and apply system theory and modelling	2	2	1			1	1					1	1	1
EME 043.3	Apply network technique and optimization concepts	2	3	1	2	2	2						1	2	1
EME 043.4	Understand and apply system evaluation and optimization	2	3	1	2	2	2					3	1	2	2
EME 043.5	Apply decision analysis and simulation to real problems	2	3	1	2	2	2					2	1	2	2
EME 0	43 :Mechanical System Design	2	2.6	1	2	2	1.6	1				2.5	1	1.6	1.4

Table 3.1.1.20: Course Outcomes and mapping of EME 702: Automobile Engineering

СО	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 702.1	Understand the need of a gear box in an automobile and to design the same.	3	1	3										3	1
EME 702.2	Perceive the requirement and working principle of transmission systems (clutches, universal joints, torque convertors and steering systems) and to analyze the same.	3	2											3	1
EME 702.3	Understand the general requirements and thermal aspects of braking systems. Also to perceive various types of suspension systems.	3	1											3	1
EME 702.4	Perceive the need and working of Electrical systems(Starting systems ,Lighting systems and Ignition systems) and the fuel supply systems in an automobile.	3												1	1
EME 702.5	Understand the requirement and working of 'Automobile air- conditioning', 'cooling and lubrication systems' and 'maintenance systems' in an automobile.	3												3	1

EME 702: Automobile Engineering	3	1. 33	3					2.6	1

СО	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EOE 083.1	Learn the concept and stage in product design methodology.	3	3	2	2	2	2			2			2	2	1
EOE 083.2	Analyze various factors affecting design problems.	3	2	3	3	1	2			1			3	2	2
EOE 083.3	Study various manufacturing cost components and learn cost analysis of product design.	3	2	3	1	1	1			1		2	2	3	2
EOE 083.4	Understand developments methods management techniques.	2	2	2	1	3	2	2		2		2	1	2	2
EOE 083.5	Learn value analysis of product.	3	3	3	3	2	3	2		1		1	2	3	3
EOE 08	33: Product Development	2.8	2.4	2	2	1.8	2	2		1.4		1.67	2	2.4	2

Table 3.1.1.21: Course Outcomes and mapping of EOE 083: Product Development

Table 3.1.1.22: Course Outcomes and mapping of EME 055: Six Sigma Methods and Applications

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 055.1	Understand the concept of quality, six sigma concept of quality, descriptive statistics and probability distribution.	3	1	1										2	2
EME 055.2	Understand basics of six sigma, application of six sigma in various sectors, six sigma organizations, its leadership council and champions	3												3	2
EME 055.3	Understand the methodology of six sigma, models of implementation of six sigma (DMAIC, DFSS) and selection of six sigma projects.	3		3										3	2
EME 055.4	Acquire various six sigma tools, failure mode effect analysis and design of experiments.	3	3		3									3	2
EME 055.5	Understand sustenance of six sigma, software for six sigma, Minitab and graphical analysis of Minitab plots.	3	3			3								3	2
EME 0	55: Six sigma Methods and applications	3	2.33	2	3	3								2.8	2

Table 3.1.1.23: Course Outcomes and mapping of EME 064: Production and Operation Management

СО	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 064.1	Understand scope, concepts and functions of POM	1													
EME 064.2	Study the system design, feasibility study, Apply the location and layout techniques	1	1	1				1				1			
EME 064.3	Apply the production and operations standards, Work measurement, project management	2	2	2								2			

EME 064.4	Study forcasting and Aggregate Planning and Operation scheduling	3	3	3	2	3			1		1	
EME 064.5	Study and Apply the concept of MRP and overviw of world lass manufacturing practices	2	2	2		2	3	1	2	3	1	1
EME 06	64: Production and operation Management	1.8	1.8	1.6	2	2.5	3	1	1.5	2	1	1

 Table 3.1.1.24: Course Outcomes and mapping of EME 801: Power Plant Engineering

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO2
EME 801.1	Understand and evaluate the various types of fuels and power cycles and its application in power plant. Evaluate the various loads and economical feasibility of power generation units.	2	3	1	1	3	1	1		1		2	1	2	2
EME 801.2	Evaluate the design layout and working of various components of steam power plant.	3	3	1	2	2	2	2		2			2	3	2
EME 801.3	Understand and analyze the working of Diesel engine and gas turbine power plants.	3	3	1	2	2	2	2		2			2	3	2
EME 801.4	Evaluate the design layout and working of nuclear and hydro electric power plants.	3	3	1	2	3	2	2		2			2	3	2
EME 801.5	Understand and analyze the various non-conventional power plants and electrical & pollution control systems use in power plant.	2	3		1	2	3	3		1			2	2	2
EN	IE 801 : Power Plant Engineering	2.6	3	1	1.6	2.4	2	2		1.6		2	1.8	2.6	2

Laboratory Courses

Table 3.1.1.25:	Program	Articulation	Matrix
1 abic 5.1.1.25.	1 I VSI am	1 M ticulation	TAGUITA

S.No	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	EWS 251: Workshop Practice	1.5	2.5	1.5	1	2								1.5	1.67
2	EME152 : Engineering Mechanics	2											1	3	
3	EME351 : Material Science and testing Lab	2											1	3	
4	EME-452: Manufacturing Science -1 lab	3	2.75		2									3	3
5	EME453 : Measurement and Metrology Lab	2											1	3	
6	EME-553: Manufacturing Science -II lab	3	2		2									3	3
7	EME554 :Heat and mass transfer lab	2.6	2.6	1.6	1.8	2	1	1		2			1.6	3	2
8	EME653: Theory of Machines lab	2											1	3	
9	EME-654: Refrigeration and Air conditioning lab	3	2		2									3	3
10	EME751: CAD/CAM lab	2	1.75	1	2	2	2	1		1		2		2.3	1.75

Course Articulation Matrix

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	P011	PO12	PSO1	PSO2
EWS 251.1	Study and practice the operation of different machine tools and hand tools used in manufacturing.	1		2										2	
EWS 251.2	Practice on manufacturing of components using workshop trades including fitting, carpentry, welding and sheet metal.	2	2	1	1									2	1
EWS 251.3	Identify and apply suitable tools for machining process including turning, facing, thread cutting and trapping.	1	3	2										1	2
EWS 251.4	Practice the different welding techniques and soldering.	2		1	1	2								1	2
	EWS 251 Workshop Practice	1.5	2.5	1.5	1	2								1.5	1.67

Table 3.1.1.26: Course Outcomes and mapping of EWS 251 Workshop Practice

Table 3.1.1.27: Course Outcomes and mapping of EME152: Engineering Mechanics Lab

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 152.1	To verify the law of parallelogram of forces. Also study the equilibrium of a body under three forces.	2											1	3	
EME 152.2	Friction experiment on screw-jack to determine its mechanical efficiency & determine the coefficient of friction of a flat surface.	2											1	3	
EME 152.3	To conduct the tensile test and impact test for a given mild steel specimen. Also determine its tensile strength and impact strength.	2											1	3	
EME 152.4	To conduct the hardness test and for a given specimen Also perform the experiment on compound gear train model to determine the velocity ratio.	2											1	3	
EME 152.5	To determine the mass moment of inertia of flywheel. Also perform the experiment on worm & worm wheel to find its mechanical efficiency.	2											1	3	
E	ME152 : Engineering Mechanics	2											1	3	

Table 3.1.1.28: Course Outcomes and mapping of EME351: Material Science and Testing Lab

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 351.1	Ability of understanding the metals Structure through metallographic optical/microscopy, phase identification and grain size determination.	2											1	3	
EME 351.2	Understanding the concept of heat treatment and correlation of micro structural transformation with mechanical properties.	2											1	3	
EME 351.3	Ability to measure the mechanical properties experimentally like Tensile test, Impact Test etc.	2											1	3	
EME 351.4	Ability to understand the Non Destructive Test.	2											1	3	
EME 351.5	Ability to understand the concept of degradation phenomenon of Metals	2											1	3	

like Corros	ion.									
EME351 : Material	Science and testing Lab	2						1	3	

Table 3.1.1.29: Course Outcomes and Mapping of EME-452: Manufacturing Science -1 Lab

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME- 452.1	Design the pattern and to prepare mould for casting process.	3	2	1	2									3	3
EME- 452.2	Analyse the forging process and to perform hand forging operations.	3	3											3	3
EME- 452.3	Demonstrate the sheet- metal operations like blanking/piercing, washer, making etc.	3	3											3	3
EME- 452.4	Acquire the knowledge to demonstrate metal forming processes like rolling, drawing and extrusion.	3	3											3	3
EME- 452.5	Demonstrate the experiments to understand powder metallurgy, jigs and fixtures.	3												3	3
EME-4	52: Manufacturing Science -1 lab	3	2.75		2									3	3

Table 3.1.1.30: Course Outcomes and mapping of EME453 : Measurement and Metrology Lab

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 453.1	Ability to understand the linear measurement line standard using the micrometer Vernier calliper etc.	2											1	3	
EME 453.2	Ability to understand the concept of measurement like Pressure/Temperature//Strain/Linear displacement etc	2											1	3	
EME 453.3	Able to understand the End Standard and angle measurement using slip gauges sin bar and bevel protractor	2											1	3	
EME 453.4	Ability to check the shape like circularity etc using dial gauge	2											1	3	
EME 453.5	Importance of the inspection in Industry and metrology of limit, fits and tolerance using Inspection gauges like feeler gauge, Ring Gauge etc.	2											1	3	
EME45	53 : Measurement and Metrology Lab	2											1	3	

Table 3.1.1.31: Course Outcomes and mapping of EME-553: Manufacturing Science -II Lab

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME- 553.1	Demonstrate thread cutting and tube														
	cutting on lathe machine.	3												3	3
EME- 553.2	Understand twist-drill and to demonstrate drilling of holes on														
	drilling machines.	3	2											3	3

EME- 553.3	Demonstrate tool grinding, gear cutting and machining experimentally.	3							3	3
EME- 553.4	Acquire the knowledge of different types of tools and its angles. Also to demonstrate the tool life, tool wear	2		2					2	2
	experimentally.	3		2					3	3
EME- 553.5	Demonstrate various low strength and high strength, conventional and non-conventional welding processes.	3							3	3
EME-5	53: Manufacturing Science -II lab	3	2	2					3	3

Table 3.1.1.32: Course Outcomes and mapping of EME554: Heat and Mass Transfer Lab

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 554.1	Measure important properties of metals, liquids and insulating materials	2	2	1	1	1	1	1		2			1	3	2
EME 554.2	Evaluate the variation in fin efficiency and heat transfer during free and forced Convection heat transfer.	3	3	2	2	2	1	1		2			1	3	2
EME 554.3	Measure and estimate the heat transfer coefficient in free and forced convection and correlated with theoretical values.	3	3	2	2	2	1	1		2			2	3	2
EME 554.4	Estimate the overall heat transfer coefficient, LMTD and effectiveness of shell and tube type heat exchange.	3	3	2	2	3	1	1		2			2	3	2
EME 554.5	Measure the emissivity of a surface and estimate the Stefan Boltzmann constant in radiation heat transfer.	2	2	1	2	2	1	1		2			2	3	2
EME55	4 :Heat and mass transfer lab	2.6	2.6	1.6	1.8	2	1	1		2			1.6	3	2

Table 3.1.1.33: Course Outcomes and mapping of EME653: Theory of Machines Lab

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 653.1	Ability of understanding the various mechanisms and inversion of four bar, single/double slider crank mechanism	2											1	3	
EME 653.2	To understand the concept of Gyroscopic couple by performing the experiment on motorised gyroscope	2											1	3	
EME 653.3	Ability to understand the characteristics of dead weight type governor & spring controlled governor though Experimentation	2											1	3	
EME 653.4	Experiment on longitudinal vibration & critical speed of shaft	2											1	3	
EME 653.5	To understand the working of Gear trains, brake and clutch	2											1	3	
EME65	3: Theory of Machines lab	2											1	3	

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME- 654.1	Evaluate various performance parameters on refrigeration test rig.	3	2		2									3	3
EME- 654.2	Understand various expansion devices and evaporators used in refrigeration systems.	3												3	3
EME- 654.3	Acquire the knowledge of various components of air-conditioning system.	3												3	3
EME- 654.4	Evaluate various performance parameters on air-conditioning test rig.	3	2		2									3	3
EME- 654.5	Understand window air conditioner.	3												3	3
EME-6 conditio	54: Refrigeration and Air oning lab	3	2		2									3	3

Table 3.1.1.34: Course Outcomes and mapping of EME-654: Refrigeration and Air conditioning Lab

Table 3.1.1.35: Course Outcomes and mapping of EME751: CAD/CAM Lab

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 751.1	To analyse the geometric transformation matrices; application of Numerical methods in FEM	3	2											2	1
EME 751.2	To able to sketch various entities using a 3D modelling software like Pro-E/Solid Works/Ansys	1	2			3				1		2		3	3
EME 751.3	Elementary Knowledge of CNC machine and automation	2	1				2								1
EME 751.4	Understand the manual and computer aided part programming	2	2	1	2	1		1						2	2
EME75	51: CAD/CAM lab	2	1.75	1	2	2	2	1		1		2		2.3	1.75

3.2. 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)

- In the Outcome Based Education (OBE), assessment is done through one or more than one processes, carried out by the institution, that identify, collect, and prepare data to evaluate the achievement of Course Outcomes (CO's).
- CO Assessment Processes Assessment tools are categorized into two methods to assess the Course outcomes as: Direct methods and Indirect methods.
- Direct Methods display the student's knowledge and skills from their performance in the continuous internal assessment tests, semester examinations, seminars, and class room and laboratory assignments etc. These methods provide a sampling of what students know and/or can do and provide strong evidence of student learning.
- Indirect methods such as surveys ask the stake holders to reflect on students learning. They assess opinions or thoughts about the graduate's knowledge or skills and they are valued by different stakeholders.

Frequency	Assessment process	Responsibility
	Internal exam papers are evaluated by the concerned faculty and	
3 per semester	internal marks are uploaded to the Institute Examination cell	Institute
	Final Examination is conducted and evaluated by the internal and	
1 per semester	external examiner both	Department
^	Examination is conducted and evaluated by the institute faculty	
1 per semester	members	Institute
1 per		
semester(Fifth)	Seminar is conducted at Department level.	Department
Pre final		
Semester	• Internal Project Evaluation is conducted at Department level.	
	5 1	
 Final 	• Final Project Evaluation is conducted and evaluated by	
Semester	internal and external examiner allotted by the institute	Institute
	Frequency 3 per semester 1 per semester 1 per semester 1 per semester 1 per semester 9 per semester 1 per semester 9 per final Semester 9 Final Semester	FrequencyAssessment process3 per semesterInternal exam papers are evaluated by the concerned faculty and internal marks are uploaded to the Institute Examination cell9 per semesterFinal Examination is conducted and evaluated by the internal and external examiner both1 per semesterExamination is conducted and evaluated by the institute faculty members1 per semester(Fifth)Seminar is conducted at Department level.• Pre final Semester• Internal Project Evaluation is conducted and evaluated by the institute faculty members• Final Semester• Final Project Evaluation is conducted and evaluated by the institute• Final Semester• Final Project Evaluation is conducted and evaluated by the institute

Table 3.2.1.1 Direct Assessment Tools

		Tuble 0.2.1.2 Inull cet Assessment 10015
S.No	Assessment tools	Description
1	Alumni:Survey	Collect variety of information about program Satisfaction and college from
1	Questionnaire	the Alumni students
2	Exit Feedback: Survey	Collect variety of information about program Satisfaction and college from
2	Questionnaire	the final year students.
2	Parent:Survey	Collect variety of information about program satisfaction and college from
3	Questionnaire	parents.
4	Employer's Feedback	Collect variety of information about the graduates' skills, capabilities and
4	Form	opportunities.
5	Student Feedback (About	Collect variety of information about outcome based education in teaching
5	Obe)	and learning process.
6	Feedback Form On	Collect variety of information about facilities from the students
0	Facilities	Conect variety of information about facilities from the students.

Table 3.2.1.2 Indirect Assessment Tools

3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels (40)

Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course. These relate to the skills, knowledge, and behaviour that students acquire in their matriculation through the course. The CO attainment levels can be measured based on the results of the internal assessment and external examination conducted by the institute. This is a form of direct measurement of attainment, in the institute three internal assessment tests are conducted for each course in a semester of which in each test the average of these percentage of students who achieve a set target for the CO's that are covered is computed. After the three tests, the average of these percentages is computed to decide the attainment level. The percentage of students attaining this target level of each CO is computed and the average of these percentages is considered for deciding the attainment level of course outcome

The following attainment levels are used

Attainment Level 1: 50% of students scoring more than university average marks or set attainment level. Attainment Level 2: 60% of students scoring more than university average marks or set attainment level. Attainment Level 3: 70% of students scoring more than university average marks or set attainment level

	C	01	C	02	CO3	CO4	CO5
S.No	CT1(15)	ESE(20)	CT2(15)	ESE(20)	ESE(20)	ESE(20)	ESE(20)
Student 1	14	18	14	18	19	17	11
Student 2	14	18	14	18	19	16	18
Student 3	14	18	14	17	19	16	18
Student 4	14	18	14	17	19	16	17
Student 5	13	18	14	17	19	16	17
Student 6	13	18	14	16	18	15	17
Student 7	13	18	14	16	18	15	16
Student 8	13	18	13	16	18	15	16
Student 9	13	17	13	16	18	15	16
Student 10	13	17	13	15	18	15	16
Student 11	13	17	13	15	18	15	16
Student 12	13	17	13	15	18	14	15
Student 13	13	16	13	15	18	14	15
Student 14	12	16	13	15	18	14	15
Student 15	12	16	13	15	18	14	14
Student 16	11	16	13	14	18	14	14
Student 17	11	16	13	14	17	14	14
Student 18	11	16	13	14	17	13	14
Student 19	11	16	13	14	17	13	14
Student 20	11	16	13	14	17	13	13
Student 21	11	16	13	14	16	13	13
Student 22	11	16	13	14	16	13	13
Student 23	11	16	13	14	16	12	13
Student 24	11	16	13	14	16	12	12
Student 25	10	15	12	13	16	12	12
Student 26	10	15	12	13	16	12	12
Student 27	10	15	12	12	15	12	12
Student 28	10	15	12	12	15	11	11
Student 29	10	15	12	12	15	11	11
Student 30	10	15	12	12	15	11	11
Student 31	10	14	12	12	15	11	11
Student 32	10	14	12	12	15	11	10
Student 33	9	14	11	12	14	10	10
Student 34	9	14	11	12	13	10	10
Student 35	9	14	11	12	12	10	10
Student 36	9	14	11	12	12	9	10
Student 37	9	14	11	12	12	9	9
Student 38	9	14	11	12	12	9	9
Student 39	9	14	10	11	11	9	9
Student 40	8	13	10	11	11	8	9

Table 3.2.2.1; Example 1: EME – 301 Material Science in Engineering

Student 41	8	13	10	11	11	8	8
Student 42	8	13	9	11	11	8	8
Student 43	8	13	9	11	11	8	7
Student 44	8	13	9	9	9	7	7
Student 45	8	12	8	9	9	6	7
Student 46	7	12	6	8	8	5	6
Student 47	7	11	5	8	8	4	6
Student 48	6	11	5	5	7	3	5
Student 49	6	11	0	4	6	3	4
Student 50	4	4	0	4	3	2	2

From the table, it is found that the percentages of students attaining CO1, CO2, CO3, CO4 and CO5 are 0.98, 0.86, 0.86, 0.7 and 0.72 respectively, hence the average percentage of students who attained all the COs is 82.4, This corresponds to course **attainment level of 3**.

		CO1			CO2		CO3	CO4	CO5
S.No	CT1	ESE	Total	CT2	ESE	Total	ESE	ESE	ESE
	(15)	(20)	(35)	(15)	(20)	(35)	(20)	(20)	(20)
1	12	15	27	3	8	11	10	9	12
2	14	16	30	9	10	19	8	10	10
3	8	12	20	8	11	19	9	11	8
4	9	13	22	8	12	20	7	8	7
5	13	14	27	5	5	10	5	7	9
6	14	15	29	8	6	14	6	6	11
7	12	10	22	6	10	16	8	5	12
8	12	10	22	9	7	16	12	9	14
9	9	12	21	7	6	13	11	10	15
10	1	8	9	6	8	14	10	12	13
11	11	12	23	6	10	16	11	13	6
12	11	14	25	6	11	17	8	8	5
13	2	9	11	4	9	13	6	9	7
14	11	8	19	7	8	15	5	4	12
15	14	9	23	9	10	19	4	12	10
16	8	12	20	8	12	20	9	10	11
17	14	15	29	2	5	7	7	11	12
18	11	12	23	7	7	18	3	6	9
19	8	13	21	5	6	11	2	5	8
20	5	10	15	7	10	17	4	3	12
21	13	12	25	10	11	21	10	4	14
22	11	9	20	8	12	20	11	2	8
23	6	8	14	13	14	27	8	8	9
24	13	12	25	6	3	9	12	10	10
25	14	14	28	8	5	13	9	11	11
26	10	12	22	6	6	12	11	9	12

Table 3.2.2.2 Example 2: EME – 401 Applied Thermodynamics

27	8	7	15	9	7	16	6	12	11
28	12	9	21	11	14	25	10	10	10
29	14	8	22	2	10	12	12	8	9
30	8	7	15	5	12	17	8	7	13
31	10	11	21	7	10	17	9	5	12
32	10	9	19	5	8	13	7	10	10
33	9	11	20	7	5	12	6	12	11
34	7	9	16	2	6	8	4	11	15
35	9	10	19	12	10	22	3	8	10
36	14	15	29	12	14	26	10	12	12
37	10	10	20	15	10	25	11	7	13
38	12	11	23	7	9	16	8	6	11
39	11	12	23	8	8	16	5	5	12
40	10	13	23	7	12	19	6	9	11
41	13	12	25	10	10	20	10	10	10
42	13	12	25	12	8	20	11	11	10
43	12	12	24	7	9	16	12	12	10
44	13	13	26	4	6	10	9	14	9
45	4	8	12	10	11	21	10	13	7
46	13	14	27	5	9	14	12	8	5
47	7	8	15	8	12	20	10	5	4
48	10	12	22	3	7	10	11	6	10
49	5	9	14	3	6	9	6	4	12
50	5	8	13	9	9	18	8	9	9

From the table, it is found that the percentages of students attaining CO1, CO2, CO3, CO4 and CO5 are 0.68, 0.46, 0.4, 0.42 and 0.68 respectively, Hence, the average percentage of students who attained all the COs is 52.8, this corresponds to course **attainment level of 1**.

S.No	Course	Average CO Assessment	Overall CO Attainment level
1	EME 102: Engineering Mechanics	0.50	1
2	EME 201: Manufacturing Process	0.45	0
3	EME 301: Material Science in Engineering	0.82	3
4	EME 302: Strength of materials	0.57	1
5	EME 401: Applied Thermodynamics	0.52	1
6	EME 402: Manufacturing Science I	0.61	2
7	EME 403: Measurement and Metrology	0.82	3
8	EME 502: Theory of Machines I	0.68	2
9	EME 503: Manufacturing Science II	0.79	3
10	EME 504: Heat and mass transfer	0.68	2
11	EME 011: Fluid Machinery	0.63	2
12	EME 021: NCERU	0.85	3
13	EME 602: Machine Design II	0.79	3

 Table 3.2.2.3 Course Outcome Assessment and Attainment levels

14	EME 603: Theory of Machines II	0.82	3
15	EME 604: Refrigeration and air- conditioning	0.75	3
16	EME 073: Operations Research	0.95	3
17	EME 031: Computer aided Manufacturing	0.79	3
18	EME 043: Mechanical System Design	0.85	3
19	EME 702: Automobile Engineering	0.73	3
20	EOE 083: Product Development	0.98	3
21	EME 055: Six sigma Methods and applications	0.93	3
22	EME 064: Production and operation Management	0.87	3
23	EME 801: Power Plant Engineering	0.87	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)

Assessment tools are categorized into direct and indirect methods to assess the programme educational Objectives, program outcomes and course outcomes.

- Direct methods display the student's knowledge and skills from their performance in the continuous assessment tests, end-semester examinations, presentations, and classroom assignments etc.
- These methods provide a sampling of what students know and/or can do and provide strong evidence of student learning.
- Indirect methods such as surveys and interviews ask the stakeholders to reflect on student's learning. They assess opinions or thoughts about the graduate's knowledge or skills and they are valued by different stakeholders

A listing and description of the assessment processes used to gather the data upon which the evaluation of each the Program outcome and Program Specific Outcomes are based. Examples of data collection processes may include, but are not limited to, specific exam questions, student portfolios, internally developed assessment exams, senior project presentations, nationally-normed exams, oral exams, industrial advisory committee;

Following are some possible program-level (P) and course-level (C) assessment tools:

- Exit surveys, exit interviews (P)
- Alumni surveys and interviews (P)
- Employer surveys and interviews (P)
- Performance in group and internship assignments and in problem-based learning situations (P, C)
- Assignments, reports, and tests in the design course (P, C)
- Standardized tests—e.g., the Examination i.e.; the GRE, (P, C)
- Student surveys, individual and focus group interviews (P, C)

- Self-analyses, learning logs, journals (P, C)
- Peer evaluations, self-evaluations (P, C)
- Behavioral observation, ethnographic and verbal protocol analysis (analyzing transcripts of student interviews or working sessions to extract patterns of problem-solving, thinking, or communication) (P, C)

The frequencies with which these assessment processes are carried out are random and some of them are performed at least once in a semester.

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

- Using Tables 3.2.2.3 for all the courses, the Program Outcome attainment values are computed as shown in Table 3.3.2
- For Example: EME 301: PO1 attainment value = $[(Corresponding cell value from Table 3.1.1 x Overall CO attainment value for course EME 301)/3] = <math>(2 \times 3)/3 = 2$.

S. No	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	Average CO	Overall CO Att. level
																Assessmen t	
	EME 102:																1
1	Engineering Mechanics	1.0	1.0	0.9	0.7								0.3	0.6	0.3	0.50	
	EME 201:																0
2	Manufacturing Process	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.45	
	EME 301:																3
	Material															0.82	
3	Science in	2.0	2.0	2.2	2.6									3.0	2.0	0.02	
	Engineering																
1	EME 302: Strength of															0.57	L T
4	materials	1.0	0.7	0.9	0.6									0.9	0.9	0.57	
	EME 401:																1
	Applied															0.52	
5	Thermodynamic	1.0	1.0	0.7	0.6	0.5				0.6			0.5	0.9	0.5	0.52	
	S																
	EME 402:															0.61	2
6	Science I	2.0	1.7	1.3	0.7									1.7	1.9	0.61	
	EME 403:																3
7	Measurement	3.0	1.0	2.0									2.0	2.0		0.82	
	and Metrology			-										_			
	EME 502:																2
8	Theory of	2.0	2.0	0.9	1.7	0.8							1.3	1.3	0.9	0.68	
	Machines I																2
0	EME 503: Manufacturing	2.0	2.0		20	24	2.2							2.6	2.2	0.70	3
9	Science II	2.8	2.8	2.2	2.6	2.4	2.2						2.2	2.6	2.2	0.75	
	EME 504: Heat																2
10	and mass	2.0	1.9	1.6	1.9	1.3	1.2	0.9	0.7	0.7		0.7	1.1	2.0	1.7	0.68	
	transfer																
11	EME 011: Fluid	1.7	1.1	1.2			1.2		1.2		1.0			1.2	1.1	0.63	2
	Machinery																
12	EME 021: NCERU	3.0	2.3	2.5				3.0					2.0	1.8	2.8	0.85	3
	EME 602:																
13	Machine Design	2.8	2.8	2.6	2.0	1.8	2.0			1.0		1.0	1.3	1.8	2.0	0.79	3
	11		1	1	1	1	1		1	1		1		1	1		

Table 3.3.2: PO & PSO Attainment Values

14	EME 603: Theory of Machines II	3.0	3.0	1.8	2.0								2.0	2.0	1.3	0.82	3
15	EME 604: Refrigeration and air- conditioning	2.4	2.8	2.8	3.0	2.0								2.2	2.8	0.75	3
16	EME 073: Operations Research	2.4	2.4	2.4	2.4	2.6	2.4	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	0.95	3
17	EME 031: Computer aided Manufacturing	2.0	2.5	1.4	2.0	1.0	2.2		1.4					1.6	1.7	0.79	3
18	EME 043: Mechanical System Design	2.0	2.6	1.0	2.0	2.0	1.6	1.0				2.5	1.0	1.6	1.4	0.85	3
19	EME 702: Automobile Engineering	3.0	1.3	3.0										2.6	1.0	0.73	3
20	EOE 083: Product Development	2.8	2.4	2.0	2.0	1.8	2.0	2.0		1.4		1.7	2.0	2.4	2.0	0.98	3
21	EME 055: Six sigma Methods and applications	3.0	2.3	2.0	3.0	3.0								2.8	2.0	0.93	3
22	EME 064: Production and operation Management	1.8	1.8	1.6	2.0	2.5	3.0	1.0		1.5		2.0		1.0	1.0	0.87	3
23	EME 801: Power Plant Engineering	2.6	3.0	1.0	1.6	2.4	2.0	2.0		1.6		2.0	1.8	2.6	2.0	0.87	3
	PO attainment Value	2.1 4	1.9 3	1.6 5	1.7 6	1.7 2	1.8 0	1.3 6	0.8 6	0.9 8	0.67	1.36	1.39	1.77	1.52		
	Target Value	2.5	2	2	2	2	2	1.5	1	1	1	2	2	2	2		

The following histogram's shows the variation of the Course outcomes with Program outcomes (refer to Section 3.1) in lieu of the course mappings, course assessment and the program outcome attainment level for the academic year.

The following figures are used to illustrate the information in the graphical format

- Figure 3.1: Mapping of CO-PO for the academic year 2017-18
- ▶ Figure 3.2: CO Assessments for Core Subjects w.r.t. POs for the year 2017-18
- ▶ Figure 3.3: Final CO Assessment of Core Subjects for year 2017-18
- ▶ Figure 3.4: PO's Attainment level for the academic year 2017-18
- ▶ Figure 3.5: Laboratory Mapping for academic year 2017-18



CO's Mapped	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Strong	84	68	20	20	13	8	7				2	1	42	25
Moderate	19	20	45	35	22	21	8	2	9		3	36	47	42
Weak	3	8	23	14	11	7	13	9	17	9	5	17	9	21



% CO Assessment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Strong	72	70	72	78	86	84	86				79	89	67	70
Moderate	86	76	74	72	70	86		74	57		95	78	78	83
Weak	83	83	76	54	73	83	93	92	90	100	93	57	77	68



Program Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
% CO														
Assessment	78.51	74.44	73.45	71.47	78.79	84.57	61.66	40.5	35.16	20	86.53	79.39	72.27	73.42



Attainment value	2.14	1.93	1.65	1.76	1.72	1.80	1.36	0.86	0.98	0.67	1.36	1.39	1.77	1.52
Target Value	2.5	2	2	2	2	2	1.5	1	1	1	2	2	2	2



CO's Mapped	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Strong	7	4			1								25	
Moderate	24	6	5	4	4				9	4		3	2	7
Weak	2	1	4	3	1	5	5					22	2	1

CRITERION 4	Students' Performance	100	

Item (Information to be provided cumulatively for all the shifts with explicit	CAY	CAY	CAYm1	CAYm2
headings, wherever applicable)	2018-19	2017-18	2016-17	2015-16
Sanctioned intake of the program (N)	45	45	45	45
Total number of students admitted in first year minus number of	45	45	45	39
students migrated to other programs/institutions, plus no. of students				
migrated to this program (N1)				
Number of students admitted in 2nd year in the same batch via lateral	*	0	7	9
entry (N2				
Separate division students, if applicable (N3)	*	1	0	0
Total number of students admitted in the Program $(N1 + N2 + N3)$	*	46	52	48

• Session 2018-19 is still in progress

CAY – Current Academic Year CAYm1- Current Academic Year minus1= Current Assessment Year CAYm2 - Current Academic Year minus2=Current Assessment Year minus 1 LYG – Last Year Graduate LYGm1 – Last Year Graduate minus 1 LYGm2 – Last Year Graduate minus 2

Year of entry	N1 + N2 + N3 (As defined above)	Number o graduate (Without or failure	of students ed WithO semester/y Backlog m <u>s in any se</u>	who have s ut backlo /ear of stud eans no cor mester/yea	uccessfully gS in any y npartment r of study)
		I Year	II Year	III Year	IV Year
CAY (2018-19)	45+9^				
CAYm1 (2017-18)	46+9+0	30			
CAYm2(2016-17)	45+7+0	36	34+4		
CAYm3(2015-16)	39+9+0	16	15+7	15+7	
CAYm4 (LYG)(2014-15)	43+9+0	35	33+6	33+4	33+4
CAYm5 (LYGm1)2013-2014	42+9+0	33	31+7	29+5	29+5
CAYm6 (LYGm2)2012-2013	36+8+0	27	27+6	23+4	23+4

^Sanctioned strength for lateral entry

Year of entry	N1 + N2 + N3 (As defined above)	Number of students who have successfully graduated (Students with backlog in stipulated period of study)						
		I Year	II Year	III Year	IV Year			
CAY (2018-19)	45+9^							
CAYm1 (2017-18)	46+9+0	41						
CAYm2(2016-17)								
CAYm3(2015-16)	45+7+0	44	43+7					
CAYm4 (LYG)(2014-15)	39+9+0	39	39+9	38+9				
CAYm5 (LYGm1)2013-2014	43+9+0	43	41+9	41+9	41+9			
CAYm6 (LYGm2)2012-2013	42+9+0	41	40+9	41+9	42+9			
САҮ	36+8+0	33	33+8	32+8	32+8			

^ sanctioned strength for lateral entry

Table B.4c

4.1. Enrolment Ratio (20)

Enrolment Ratio = N1/N

Item (Students enrolled at the First Year Level on average basis during the last three 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

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)

SI= (*Number of students who have graduated from the program without backlog*)/(*Number of students admitted in the first year of that batch and admitted in 2nd year via lateral entry and separate division, if applicable*)

Average SI = Mean of Success Index (SI) for past three batches

Item	Last Year Graduate, LYG (CAYm4)	Last Year Graduate minus 1, LYGm1 (CAYm5)	Last Year 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	52	51	44
Number of students who have graduated without backlogs in the stipulated period	37	34	27
Success Index (SI)	0.712	0.67	0.61

Success rate without backlogs in any semester/year of study = 15 × Average SI

Table B.4.2.1

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

SI= (Number of students who graduated from the program in the stipulated period of course duration)/ (Number of students admitted in the first year of that batch and admitted in 2nd year via lateral entry and separate division, if applicable)

Average SI = mean of Success Index (SI) for past=0.963

three batches Success rate = 5 × Average SI= 4.815

Item	Last Year Graduate, LYG (CAYm4)	Last Year Graduate minus 1, LYGm1 (CAYm5)	Last Year 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	52	51	44
Number of students who have graduated with backlogs in the stipulated period	50	51	40
Success Index (SI)	0.98	1.00	0.91
Average Success Index	0.963		

Table B.4.2.2

Note: If 100% students clear without any backlog then also total marks scored will be 20 as both 4.2.1 & 4.2.2 will be applicable simultaneously.

4.3. Academic Performance in Second Year (10)

Academic Performance = Average API (Academic Performance Index), where

API = ((Mean of 2nd Year Grade Point Average of all successful Students on a 10 point scale) or (Mean of the percentage of marks of all successful students in Second Year/10)) \times (number of successful students/number of students appeared in the examination)

Successful students are those who are permitted to proceed to the Third year.

Academic Performance	CAYm1	CAYm2	CAY <i>m3</i>
, Mean of CGPA or Mean Percentage of all successful students (X)	58.56	68.31	69.96
Total no. of successful students (Y)	50	48	51
Total no. of students appeared in the examination (Z)	50	48	52
$API = X^* (Y/Z)$	58.56	68.31	68.614
Average API = (AP1 + AP2 + AP3)/3		65.16	

Table B.4.3

4.4. Placement, Higher Studies and Entrepreneurship (30)

Assessment Points = $30 \times average placement$

Item	CAYm1 2017	CAY <i>m2</i> 2016	CAY <i>m3</i> 2015
Total No. of Final Year Students (N)	50	51	40
No. of students placed in companies or Government Sector (x)	09	19	08
No. of students admitted to higher studies with valid qualifying scores (GATE or equivalent State or National Level Tests, GRE, GMAT etc.) (y)	5	07	4
No. of students turned entrepreneur in engineering/technology (z)	NIL	NIL	NIL
x + y + z =	14	26	12
Placement Index : $(x + y + z)/N$	0.28	0.51	0.3
Average placement= (P1 + P2 + P3)/3	0.363		
Assessment Points = $30 \times average placement$	10.9		

4.5. Professional Activities (20)

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

- 1. Expert Lectures were organized as given in table below
- 2. Short term course (STC), FDP, Workshop organized as given below
- 3. Pradhan Mantri Kaushal Vishash Yojna (PMKVY) organized 01 Dec 2016 to 30 Apr 2017
- SAE India has recognized the formation of SAE India collegiate Club in department of mechanical engineering in the session 2018-19.

S.No.	Topic of Expert Lecture/Workshop	Date	Resource person with Designation
1	3D Modelling and Analysis	26-27 Oct	Mr Fijo Raphal, Mr A.Katiyar, CAD Centre
		2018	Delhi
2	Solidworks and 3D Printer	21/08/2018	Mr Shailendra, CAD Desk Jhansi
3	Scope of Research work on Alternative	09/08/2018	Prof(Dr) C.H. Biradar, TEQIP Coordinator
			Fr. Oshit Walia Managar Turba Baging
4		07-08Apr	(Ex-executive Honda R & D) and
	Advanced Vehicle Dynamics and CFD	2018	M S Guglani, Manager Turbo Racing, Racing
			(Ex-executive Maruti Suzuki R & D)
5		24 2 18	Er. Amit Tripathi
5		24-3-10	Manager, ERP NTPC Noida
			1.Dr. C. Singh (IIT Kanpur)
6.	Virtual instrumentation in Mechanical	29-30	2.Prof. P.Singh (Ex-Principal MMMEC
	Engineering	March,2017	Gorakhpur)
			3. Prof. S. Jharkharia (IIM Rohtak)
	Manufacturing Industry-An overview &		
7.	relevance of knowledge obtained during	28-1-2017	Er. Raman Kumar BHEL Jhansi
	technical course		
8.	Concept of thermal power plant station	25-4-2016	Er. K.K. Samele, PTPP Jhansi
9.	Concept of virtual instrumentation in Mechanical Engineering	18-2-2016	Er. Rahul Kumar, Application Engineer, National Instruments, New Delhi

FDP/STC/Workshop Organized

- S.T.C for one week on 'Role of Nano-Composites in Science and Engineering' (RNSE 2018) held at B.I.E.T. Jhansi under TEQIP III from Dec 18-22, 2018.
- Workshop for two days on '3D Modelling and Analysis' under TEQIP III held at B.I.E.T. Jhansi from Oct 26-27, 2018.
- Workshop for one day on 'Solid-Works and 3D Printer' held at B.I.E.T. Jhansi on 21 Aug 2018.
- Workshop for two days on 'Advanced Vehicle Dynamics and CFD' held at B.I.E.T. Jhansi from Apr 07-08, 2018.
- F.D.P. for one week on 'Emerging Trends in Mechanical Engineering' (ETME 2018)' held at B.I.E.T. Jhansi under TEQIP II from Mar 13-17, 2018.

- S.T.C for one week on 'Climate Change and Disaster Management' (CCDM 2017) through ICT by N.I.T.T.T.R.
 Chandigarh at remote center, BIET Jhansi from Nov 06-11, 2017.
- Workshop on Choice based credit system (CBCS) in UG and PG programs on 31 Mar 2017.
- Workshop on 'Virtual Instrumentation in Mechanical Engineering (VIME 2017)' held at B.I.E.T. Jhansi under TEQIP II from Mar 29-30, 2017
- F.D.P. for one week on 'Recent Trends in Mechanical Engineering (RTME 2017)' held at B.I.E.T. Jhansi under TEQIP II from Mar 21-25, 2017.
- S.T.C for one week on 'Skill India' through ICT by N.I.T.T.T.R. Chandigarh at remote center B.I.E.T. Jhansi from 27 Feb to 03 Mar, 2017.
- F.D.P. for one week on 'Advances in Thermal Sciences and Engineering (ATSE 2016)' held at B.I.E.T. Jhansi under TEQIP II from Oct 17-21, 2016.
- S.T.C for one week on 'Climate Change and Disaster Management' (CCDM 2016) through ICT by N.I.T.T.T.R.
 Chandigarh at remote center, BIET Jhansi from Oct 03-07, 2016

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

NIL

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

- 1. Best design award in Go-Kart (PROTOKO 1.0) at Bhopal during 9-11 March 2017 in Ultimate Karting Championship with an award of Rs. 12,000/-.
- Dynamic Award and All India Second Rank in Indian Kart Racing (PROTOKO 2.0) organised by ISIE, India held at Budhha International Circuit, Greater Noida during 17-19 January 2018, and also won the cash prize of Rs. 55,000/-.
- 3. Won 3rd position at BHEL, Jhansi Engineers Association Cultural Meet Sept 2018.

CRITERION 5 Faculty Information and Contributions (200)														
	Qualificati	ation Academic Research												
						s	-			S		S) sessment	
Name of the Faculty Member	Degree (highest degree)	University	Year of attaining higher Qualification	Association with the Institution	Designation	Date on which Designated a Professor/ Associate Profess	Date of Joining the Institution	Department	Specialization	Research Paper Publication	Ph.D. Guidance	Faculty Receiving Ph.D. during the Assessment Yea	Currently Associated (Y/N) Date of Leaving (In case Currently Associated is ("No" Faculty Receiving Ph.D. during the As Years	Nature of Association (Regular/Contract)
Prof S. Agarwal	Ph.D.	llT Delhi	2007	Yes	Professor	01-08- 2012	01-08- 1996	Mech. Engg.	Manufacturing, Machining advance engineering materials	40	l completed, 3 progress		Yes	Regular
Prof.N.P.Yadav	Ph.D.	IIT Kanpur	2011	Yes	Professor	01-11- 2012	06-10- 1999	Mech. Engg.	Thermal/CFD	25	5 progress		Yes	Regular
Dr. T. Soota	Ph.D.	U.P.T.U. Lucknow	2008	Yes	Associate Professor	15-12- 2012	15-12- 2009	Mech. Engg.	Industrial MCDM/Quality Management	25	2 progress		Yes	Regular
Dr. A.K.Pandey	Ph.D.	MNNIT Allahabad	2013	Yes	Associate Professor	11-12- 2017	11-12- 2017	Mech. Engg	Manufacturing (Advance Machining)	47	4 in progress		Yes	Regular
Dr.A.K. Padap	Ph.D.	IIT Roorkee	2010	Yes	Reader (from 29.01.201 0)		29-01- 2000	Mech. Engg	Machine Design/Tribology /Nano Material	27	2 in progress		Yes	Regular
Dr. Narendra Kumar	Ph.D.	IIT BHU Varanasi	2016	Yes	Asst. Professor		07-11- 2006	Mech. Engg.	Manufacturing, optimization, MMCs synthesis , Tribology	36	1 in progress	Yes	Yes	Regular
Dr. Ajay Suryavanshi	Ph.D.	MNNIT Allahabad	2016	Yes	Asst. Professor		04-12- 2006	Mech. Engg.	Manufacturing (Advance Machining)	12		Yes	Yes	Regular
Dr.S.K.Rajput	Ph.D.	IIT Roorkee	2015	Yes	Asst. Professor		17-12- 2007	Mech. Engg.	Thermo- mechanical processing, SPD, Grain refinement	15		Yes	Yes	Regular
Dr.Vijay Verma	Ph.D	MNNIT Allahabad	2018	Yes	Asst. Professor		06-06- 2009	Mech. Engg.	Production Engineering/Fati	3		Yes	Yes	Regular

								gue/fractur				
Er I.Naveen Kumar	M.Tech	IIT Karagpur	2010	Yes	Asst. Professor	04/09/ 2018	Mech. Engg	Thermal Energy and Environment	03		Yes	Contract ual
Er Anurag Tripathi	M.Tech	IIT Delhi	2015	Yes	Asst. Professor	04/09/ 2018	Mech. Engg	Energy studies	0		Yes	Contract ual
Er Kuldeep Kumar Singh	M.Tech	IIT Gauhati	2014	Yes	Asst. Professor	29/09/ 2018	Mech. Engg	Thermal Energy and Environment	0		Yes	Contract ual

PhD Scholar/Teaching Assistant

Er Jitendra Kumar	M.Tech	BIET Jhansi	2015	Yes	Teaching Assistant	01/11/ 2017	Mech. Engg	Manufacturing Science and technology	02		Yes	PhD Scholar
Er Madhuri	M.Tech	BIET Jhansi	2017	Yes	Teaching Assistant	01/11/ 2017	Mech. Engg	Energy science and technology	01		Yes	PhD Scholar

Table B.5

Note: Please provide details for the faculty of the department, cumulative information for all the shifts for all academic years starting from current year in above format in Annexure - II.

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

5.1 Student Faculty Ratio(SFR)(20)

(T_{α})	ha	aalaul	atad	t Da	nantman	t I and	1)
10	ve	cuicuit	πεα ι	u De	parimen	a Leve	<i>i</i>)

No. of UG Programs in the Department (n):	01
No. of PG Programs in the Department (m):	02
No. of Students in UG 2_{nd} Year = u1	51
No. of Students in UG 3_{rd} Year = u2	49
No. of Students in UG 4 th Year = u3	49
No. of Students in PG 1_{st} Year = p1	16 (TE) + 14 MST) = 30
No. of Students in PG 2_{nd} Year = p2	13(TE) + 10 (MST) = 23

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

(The above data to be provided considering all the UG and PG programs of the department)

S=Number of Students in the Department = UG1 + UG2 + ... + UGn + PG1 + ...PGm

F = Total Number of Faculty Members in the Department (excluding first year faculty)

Year	CAY	CAY CAYm1 (2015 17)		CAYm2	
	(2018-19)	(2017-18)	(2016-17)	(2015-16)	
u1.1	50	51	48	54	
u1.2	49	49	50	50	
u1.3	48	49	50	40	
UG1	u1.1+u1.2+u1.3= 147	u1.1+u1.2+u1.3= 149	u1.1+u1.2+u1.3=148	u1.1+u1.2+u1.3=144	
p1.1yr Thermal	10	16	13	16	
p1.2 yr	14	13	12	14	
PG1	p1.1+p1.2=24	p1.1+p1.2=29	p1.1+p1.2=25	p1.1+p1.2=30	
P2.1yr MST	01	14	10	10	
P2.2yr	14	10	10	12	
PG2	15	24	20	22	
Total No. of Students in the Department (S)	UG1 + UG2 + +UGn + PG1 + PGm=147+24+2 5=186	UG1 + UG2 + +UGn + PG1 + PGm=149+29+24 =202	UG1 + UG2 + +UGn + PG1 + PGm=148+25+20=193	UG1 + UG2 ++UGn + PG1+ + PGm=140+30+22=192	
No. of Faculty in the Department (F)	10	9	08	08	
Student Faculty Ratio (SFR)	18.6=186/10 (SFR0=S0/FO)	22.44 =202/9 (SFR1=S1/F1)	24.12=193/8 (SFR2= S2/F2)	24=192/8 SFR3= S3/F3	
Average SFR		22.29 = (18.6+22.44+24.12+24.00)/4 SFR=(SFR0+SFR1+SFR2+SFR3)/3			

Student Teacher Ratio (STR) = S / F

Table B.5.1

Marks to be given proportionally from a maximum of 20 to a minimum of 10 for average SFR between 15:1 to 25:1, and zero for average SFR higher than 25:1. Marks distribution is given as below:

< = 15 - 20 Marks < = 17 - 18 Marks < = 19 - 16 Marks < = 21 - 14 Marks < = 23 - 12 Marks < = 25 - 10 Marks > 25.0 - 0 Marks *Note:*

Minimum 75% should be Regular/ full time faculty and the remaining shall be Contractual Faculty as per AICTE norms and standards. The contractual faculty (doing away with the terminology of visiting/adjunct faculty, whatsoever) who have taught for 2 consecutive semesters in the corresponding academic year on full time basis shall be considered for the purpose of calculation in the Student Faculty Ratio.

5.1.1 Please provide the information about regular and contractual faculty as per format mentioned below:

Year	Total number of regular faculty in the department	Total number of contractual faculty in the department
CAY(2018-19)	9+3*	-
CAY (2017-18)	9	2
CAYm1(2016-17)	8	4
CAYm2(2015-16)	8	3

*NPIU Faculty

*Table 5.1.1

5.2. Faculty Cadre Proportion (20)

The reference Faculty cadre proportion is 1(F1):2(F2):6(F3)

F1: Number of Professors required = 1/9 x Number of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (N) as per 5.1

F2: Number of Associate Professors required = 2/9 x Number of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (N) as per 5.1

F3: Number of Assistant Professors required = 6/9 x Number of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (N) as per 5.1

Year	Professors		Associate Professors		Assistant Professors	
	Required F1	Available	Required F2	Available	Required F3	Available
CAY(2018-19)	1	2	2	3	7	4+3*
CAY(2017-18)	1	2	2	3	7	4
CAYm1(2016-17)	1	2	2	2	7	4



Example: Intake = 60 (i.e. total no. of students= 180); Required number of Faculty: 9; RF1= 1, RF2=2 and RF3=6 **Case 1**: AF1/RF1= 1; AF2/RF2 = 1; AF3/RF3 = 1; Cadre proportion marks = $(1+0.6+0.4) \times 10 = 20$ **Case 2**: AF1/RF1= 1; AF2/RF2 = 3/2; AF3/RF3 = 5/6; Cadre proportion marks = $(1+0.9+0.3) \times 10 = 1$ limited to 20 **Case 3**: AF1/RF1=0; AF2/RF2=1/2; AF3/RF3=8/6; Cadre proportion marks = $(0+0.3+0.53) \times 10 = 8.3$

5.3. Faculty Qualification (20)

 $FQ = 2.0 \times [(10X + 4Y)/F)]$ where x is no. of regular faculty with Ph.D., Y is no. of regular faculty with M. Tech., F is no. of regular faculty required to comply 20:1 Faculty Student ratio (no. of faculty and no. of students required are to be calculated as per 5.1)

Year	X	Y	F	FQ = 2.0 x [(10X + 4Y)/F)]
CAY(2017-18)	9	3	10	20.4
CAY(2017-18)	8	1	10	16.8
CAYm1(2016-17)	7	1	10	14.8
CAYm2(2015-16)	5	3	10	12.4
Average assessment				16.1

Table B.5.3

5.4. Faculty Retention (10)

No. of regular faculty members in

CAY(2018-19) = 9+3 CAY(2017-18) = 9 CAYm1(2016-17) = 8 CAYm2(2015-16) = 8

Item		
(% of faculty retained during the period of assessment keeping CAYm3 as base year)	Marks(allotted)	Marks (obtained)

period of assessment keeping CAYm3 as base year	
< 50% of required Faculty members retained during the 0	
>= 50% of required Faculty members retained during the 04 period of assessment keeping CAYm3 as base year	
>= 60% of required Faculty members retained during the 06 period of assessment keeping CAYm3 as base year	
>=75% of required Faculty members retained during the 08 period of assessment keeping CAYm3 as base year	
>= 90% of required Faculty members retained during the 10 period of assessment keeping CAYm3 as base year	10

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

(List the program specific criteria and the competencies (specialization, research publications, course developments etc.,) of faculty to correlate the program specific criteria and competencies)

- Department has the faculty members specialized in diversified areas of Mechanical Engineering Advance Machining of engineering materials, Thermal/CFD, Machine Design/Tribology/Nano Materials, Industrial MCDM/Quality Management, MMCs synthesis and characterization, Thermo-mechanical processing, SPD etc.
- Faculty members have good research exposure and have published research papers in journals of repute (Springer, Elsevier, Taylor and Francis, ASME, etc.) and presented several papers in national and international conferences in India as well as Abroad.
- Faculty has got the provision for going for higher studies like, PhD sponsored by the AICTE under QIP scheme.
- The faculty also organized FDPs/workshops sponsored by TEQIP to upgrade the knowledge base of students with latest technology and research
- Expert lectures from reputed industries like Parichha Thermal Power Plant (PTPP), BHEL, NTPC etc are also organized by the faculty members to get familiar with the latest technology used as per needs of the industry.
- The faculty also participates in FDPs/workshop/training in various reputed institutions like IITs, NITs etc, to upgrade their knowledge in latest field of research.
- Faculty also takes keen interest in developing central library facility by recommending latest books for the benefit of students and faculty.
- Recruitment of faculty is made as per the prescribed norms for the university and is recruited from all fields of specialization, very well suited to the UG and PG program of studies.

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

Following activities are done by the faculty members to improve the teaching learning process:

- 1. Faculty members are not only limited to use traditional chalk and blackboard teaching method but also the modern techniques (i.e. Power Point Presentation, audio-visual teaching along with the traditional one)
- 2. Faculty members provide quality study materials via e-mail, hand-outs etc. to enrich students.
- 3. The course file including syllabus, lecture plan, tutorial plan, evaluation scheme etc are provided to the students by the subject teacher well in advance of the commencement of the class.

4. Students are encouraged to visit NPTEL videos, related to subject concerned to enrich their knowledge base about the subject.

- 5. Students are also facilitated by Central CAD lab to access the internet to acquire the relevant knowledge.
- 6. Apart from the central library, departmental library also facilitate the students in accessing the books.
- 7. Department also conduct Expert lectures, delivered by industry person to enrich the knowledge base of the students about the technology used in industry.
- 8. Students are also encouraged to participate in various technical events, aptitude test, personal Interview, Group discussion, debate etc, conducted by Departmental forum (MEF) for their overall development.

S.No.	Topic of Expert Lecture/Workshop	Date	Resource person with Designation
1.	3D Modelling and Analysis	26-27 Oct 2018	Mr Fijo Raphal, Mr A.Katiyar, CAD Centre Delhi
2	Solidworks and 3D Printer	21/08/2018	Mr Shailendra, CAD Desk Jhansi
3	Scope of Research work on Alternative feuls in mechanical engineering	09/08/2018	Prof(Dr) C.H. Biradar, TEQIP Coordinator PDA College of Engineering, Gulbarga
4	Advanced Vehicle Dynamics and CFD	07-08Apr 2018	Er Oshit Walia , Manager Turbo Racing (Ex-executive Honda R & D) and M S Guglani, Manager Turbo Racing, Racing (Ex-executive Maruti Suzuki R & D)
5	ERP-SAP	24-3-18	Er. Amit Tripathi Manager , ERP NTPC Noida
6.	Virtual instrumentation in Mechanical Engineering	29-30 March,2017	 1.Dr. C. Singh (IIT Kanpur) 2.Prof. P.Singh (Ex-Principal MMMEC Gorakhpur) 3. Prof. S. Jharkharia (IIM Rohtak)
7.	Manufacturing Industry-An overview & relevance of knowledge obtained during technical course	28-1-2017	Er. Raman Kumar BHEL Jhansi
8.	Concept of thermal power plant station	25-4-2016	Er. K.K. Samele, PTPP Jhansi

5.6.1 Methods to improve Teaching and Learning Process
9.	Concept of virtual instrumentation in Mechanical Engineering	18-2-2016	Er. Rahul Kumar, Application Engineer, National Instruments, New Delhi
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Pradhan Mantri Kaushal Vishash Yojna (PMKVY)

 AC Specialist (ASC/Q 1416), Level IV of ASDC (Automotive Skills Development Council) for Pradhan Mantri Kaushal Vikas Yojna (PMKVY) was run in department of mechanical engineering from 01 Dec 2016 to 30 Apr 2017.

FDP/STC/Workshop Organized

S.T.C for one week on 'Role of Nano-Composites in Science and Engineering' (RNSE 2018) held at B.I.E.T. Jhansi under TEQIP III from Dec 18-22, 2018.

Workshop for two days on '3D Modelling and Analysis' under TEQIP III held at B.I.E.T. Jhansi from Oct 26-27, 2018.

Workshop for one day on 'Solid-Works and 3D Printer' held at B.I.E.T. Jhansi on 21 Aug 2018.

Workshop for two days on 'Advanced Vehicle Dynamics and CFD' held at B.I.E.T. Jhansi from Apr 07-08, 2018.

• F.D.P. for one week on 'Emerging Trends in Mechanical Engineering' (ETME 2018)' held at B.I.E.T. Jhansi under TEQIP II from Mar 13-17, 2018.

S.T.C for one week on 'Climate Change and Disaster Management' (CCDM 2017) through ICT by N.I.T.T.T.R. Chandigarh at remote center, BIET Jhansi from Nov 06-11, 2017.

Workshop on Choice based credit system (CBCS) in UG and PG programs on 31 Mar 2017.

Workshop on 'Virtual Instrumentation in Mechanical Engineering (VIME 2017)' held at B.I.E.T. Jhansi under TEQIP II from Mar 29-30, 2017

• F.D.P. for one week on 'Recent Trends in Mechanical Engineering (RTME 2017)' held at B.I.E.T. Jhansi under TEQIP II from Mar 21-25, 2017.

S.T.C for one week on 'Skill India' through ICT by N.I.T.T.R. Chandigarh at remote center B.I.E.T. Jhansi from 27 Feb to 03 Mar, 2017.

• F.D.P. for one week on 'Advances in Thermal Sciences and Engineering (ATSE 2016)' held at B.I.E.T. Jhansi under TEQIP II from Oct 17-21, 2016.

S.T.C for one week on 'Climate Change and Disaster Management' (CCDM 2016) through ICT by N.I.T.T.T.R. Chandigarh at remote center, BIET Jhansi from Oct 03-07, 2016.

5.7. Faculty as participants in Faculty Development/ Training Activities /STTPs (15)

A Faculty scores maximum five points for participation

A: Participation in (2 to5days) Faculty Development Program:	3 Points
B: Participation in (>5days) Faculty Development Program:	5 Points

Name of Faculty		Max. 5 per Faculty				
	CAYm1(2018- 19)	CAYm1(2017- 18)	CAYm2(2016- 17)	CAYm3(2015- 16)		
Dr Sanjay	3					
Agarwal		5	-	-		
Dr N P Yadav	0	5	5	3		
Dr Tarun Soota	3	5	5	5		
Dr Arun Kumar	3					
Pandey		5	-	-		
Dr A K Padap	3	5	5	3		
Dr Narendra	5					
Kumar		5	5	5		
Dr Ajay	3					
Suryavanshi		5	5	3		
Dr S K Rajput	3	5	5	5		
Dr.Vijay Verma	3	5	5	5		
Sum	26	45	35	29		
RF= Number of Faculty required to comply with 20:1 Student- Faculty ratio as per 5.1	10	10	10	10		
Assessment = 3 × (Sum/0.5 RF) (Marks limited to 15)						
	Average asses	27 ssment over last 15) =20.2	21 t three years (M 5(Max 15)	arks limited to		

Table B.5.7

5.8. Research and Development (75) 5.8.1. Academic Research (20)

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

- Number of quality publications in refereed/SCI Journals, citations, Books/Book Chapters etc. (15)
- Ph.D. guided /Ph.D. awarded during the assessment period while working in the institute (5)

S.No.	. Faculty Number of quality publications in refereed /SCI Journals citations,		Books/Book Chapters
1.	Dr Sanjay Agarwal	07	-
2.	Dr N P Yadav	10	-
3.	Dr Tarun Soota	09	-
4.	Dr Arun Kumar Pandey	14	01 Book chapter
5.	Dr A K Padap	04	-
6.	Dr Narendra Kumar	17	02 Book chapters
7.	Dr Ajay Suryavanshi	01	01 Book chapter
8.	Dr S K Rajput	15	-
9.	Dr.Vijay Verma	3	-

(i) List of Publications (during assessment period)

Table 5.8.1.(i)

(ii) PhD Guidance

Faculty Name (research guide)	Name of the scholar	Topic of research	University & year of registration	Status
Prof. Sanjay Agarwal	Awdhesh Gaur	Some Investigations on hard turning of AISI 4340 steel with coated carbide tools	Shilong University,2009	Completed
Prof. Sanjay Agarwal	M.D. Gupta	EDM of conductive SIC	AKTU,Lucknow,2014	Ongoing
Prof. Sanjay Agarwal	Sayyad Hussain Rizvi	EDM of AISI 4340 steel	Integral University, Lucknow,2016	Ongoing
Prof. Sanjay Agarwal	Rahul Shukla	Performance improvement in turning operation	AKTU,Lucknow,2017	Ongoing
Prof. Sanjay Agarwal	Shubham Mishra	Characterization of Radar Materials	AKTU,Lucknow,2018	Ongoing
Prof. N.P.Yadav	Madhuri	Prediction of the Performance of Heat Pipe Using Different Working Fluid,	AKTU/2017 (regular)	undergoing
Prof. N.P.Yadav	Kuldeep Kumar Yadav	Predicting the Performance of Rectangular and Triangular Profile of the Fin	AKTU/2017	undergoing
Prof. N.P.Yadav	Keshav Gupta	Computational Modeling of Non-Premixed Combustion in Turbulent Flow Field	AKTU/2015	undergoing
Prof. N.P.Yadav	Deepti Verma	Computational Modelling of Solidification Process in Mould Cavity during Sand Casting	AKTU/2014	undergoing
Prof. N.P.Yadav	Satyendra Upadhyay	Computational Study of Solidification Behaviour of AL Alloy during Continuous Casting Process	AKTU/2013	undergoing
Dr. Tarun Soota	Jitendra Kumar	Benchmarking the performance of production system using MCDM	AKTU Lucknow, 2017	Ongoing
Dr. Tarun Soota	Praveen Kumar Mishra	Optimization of wire EDM process parameter	AKTU Lucknow 2017	Ongoing

		1		
		Experimental Investigation of Laser	Jaypee University of	Submitted
Dr. A. K. Pandey	Mr. Prashant Kumar	Cutting of Inconel-718	Engineering and	
	Shrivastava		Technology, Guna(MP)	
			India, July, 2014	
		Modelling and Optimization of Laser	Jaypee University of	
Dr. A. K. Pandey	Mr. Kedari Lal	Treapan Drilling of Advanced Materials	Engineering and	
	Dhaker		Technology, Guna (MP)	Ongoing
			India, July, 2014	
		A study on the laser cutting of Kevlar and	Jaypee University of	
Dr. A. K. Pandey	Mr. Girish Dutta	Basalt fiber reinforced polymer composites	Engineering and	
	Gautam		Technology, Guna(MP)	Ongoing
			India, July, 2015	
	Mr. Satish Kumar	Experimental Investigation of Laser	Manipal University	
Dr. A. K. Pandey	Namdeo	Cutting of Biocompatible Materials	Jaipur July, 2015	Ongoing
Dr. A.K. Padap	Jitendra Verma	Friction Stir Welding of Ultrafine Grained	AKTU Lucknow,	Ongoing
		Aluminium Alloy Developed by	July 2015	
		Accumulative roll Bonding		
Dr. A.K. Padap	Vishal Arya	Mechanical and dry sliding Wear	AKTU Lucknow, July	Ongoing
		Behaviour of Composite processed by	2015	
		multi-axial Forging		
Dr. Narendra Kumar	Mukesh Dubey	Synthesis and tribological characterization	AKTU Lucknow,2017	Ongoing
		of aluminum based self-lubricating hybrid		
		composites		

Table 5.8.1.(ii)

(iii) Faculty PhD awarded (during assessment period)

S.No.	Faculty name	University	Year of award	
1.	Dr. S.K. Rajput	IIT Roorkee	2015	
2.	Dr. Narendra Kumar	IIT (BHU) Varanasi	2016	
3.	Dr. Ajay Suryavanshi	MNNIT Allahabad	2016	
4	Dr Vijay Verma	MNNIT Allahabad	2018 Dec	

Table 5.8.1.(iii)

5.8.2. Sponsored Research (20) (during assessment period)

S.No.	Faculty	Title of project	Funding agency	Amount (Lacs)	Duration
			NIL		

Table 5.8.2.

S.No.	Faculty	Product development	Research laboratories	Instructional Materials	Working models/charts/ monograms etc
1.	Dr Sanjay Agarwal	-	Advance Machining Lab	Lab Manual	Lab Charts
2.	Dr N P Yadav	-	Advancement in thermal/heat transfer lab	Lab Manual	Lab Charts
3.	Dr Tarun Soota	-	CAD Lab	Lab Manual	Lab Charts
4.	Dr Arun Kumar Pandey	-	-	Lab Manual	Lab Charts
5.	Dr A K Padap	-	Wear Testing Machine	Lab Manual	Lab Charts
6.	Dr Narendra Kumar	-	-	Lab Manual	Lab Charts
7.	Dr Ajay Suryavanshi	-	-	Lab Manual	Lab Charts
8.	Dr S K Rajput	-	Optical Microscope	Lab Manual	Lab Charts
9.	Er.Vijay Verma	-	-	Lab Manual	Lab Charts

5.8.3. Development Activities (15) (during assessment period)

Table 5.8.3.

SAE India Collegiate Club

SAE India has recognized the formation of SAE India collegiate Club in Department of Mechanical engineering in the session 2018-19.

5.8.4. Consultancy (from Industry) (20)

S.No.	Faculty	Title of project	Funding agency	Amount	Duration
-	-		NIL		

Table 5.8.4.

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

Faculty members have to perform a variety of tasks pertaining to diverse roles. In addition to instruction, Faculty members need to conduct research for their self-renewal, keep abreast with changes in technology ,and to develop expertise for effective implementation of curricula. They are also expected to provide services to the industry and community for understanding and contributing to the solution of real life problems in industry.

Another role relates to the shouldering of administrative responsibilities and co-operation with other Faculty, Heads-of- Departments and the Head of Institute. An effective performance appraisal

system for Faculty is vital for optimizing the contribution of individual Faculty to institutional performance.

The assessment is based on following

Well-defined system for faculty appraisal through A.C.R. for each assessment year

- Annual teaching load
- Research and development activities
- M.Tech /PhD guidance
- FDP/ Workshop organised and attended
- Conference organised and attended
- Professional Society Membership
- Examination conducted at parent and other institutions/universities
- Question papers setting of parent and other institutions/universities
- Evaluation of examination copies at parent and other institutions/universities
- Improvements in Teaching-Learning Process and Pedagogical Innovations
- Research Publications

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

NIL

CRITERION 6	Facilities and Technical Support	80
CRITERION 6	Facilities and Technical Support	80

6.1 Adequate and well-equipped laboratories, and technical manpower (40)

	Name of	No. of students	Name of the Important Equipment	Weekly utilization status (all	Technic	al Manpow	er support
Sr.No.	the Laboratory	per Setup (Batch Size)		the courses for which the lab is utilized)	Name of the technical staff	Designation	Qualification
1	Mechanics lab	6	Screw Jack, Wheel and Differential Axle, Compound wheel and Axle, Worm and Worm wheel, Moment of inertia of flywheel, Parallelogram of force apparatus, Inclined plane.	5	Mr. S.N.Chaturvedi	Lab Technician	Diploma Mechanical
			Capstan Lathe, Wood working lathe, Slotting	5	Mr. Prem Kumar	Foreman	Diploma
			Machine, Power hacksaw, Bench Vice, Drilling	5	Mr Vinod Sharma	Mech Gr A	Diploma
2	Workshop	6	machine, Milling machine, Shaper, Arc		Mr S K Singh	Mech Gr A	Diploma
			Welding machine, Pedestal Grinder, Tool and		Mr Yashwant Yadav	Mech Gr B	ITI
			Cutter grinder.		Mr Shobaram	Mech Gr B	ITI
3	Central CAD lab	3	20 system with i7 processor, with 8 GB Ram, Printer	2	Mr. M.C. khard	Foreman	Diploma Mechanical
4	Seminar room	50	50 chairs, One Projector, One Desktop	2	All Faculty member	NA	NA
5.	Departmental library		15 chairs, and approximately 400 books.	6	Mr. S. N. Chaturvedi	Lab Technician	Diploma Mechanical

6	Measurement and metrology	3	Model cutter, Vacuum Dust Collector, Surface plate, Dial Calliper gauge, Screw thread micrometre, Vernier calliper, V-Block and clamp, Sine bar set with rollers and blocks, Screw Pitch Gauge, Profile Projector, Surface Roughness Tester	2	Mr. M.C.khard	Foreman	Diploma Mechanical
7	Theory of machine lab	3	Universal Governor apparatus, Cam Analysis machine, Epicyclic gear, train or gear apparatus, centrifugal plate clutch, motorised gyroscope, quick return motor mechanism, whirling of shaft.	2	Mr.S. N. Chaturvedi	Lab Technician	Diploma Mechanical
8	Manufacturing	3	Central Lathe, Surface grinder, Radial Drilling	2	Mr. M.C. Khard	Foreman	Diploma
9	RAC lab	3	Refrigeration tutor, air conditioning trainer, recirculating air reconditioning trainer, dissert collar test rig, Experimental water- cooling tower, Air and water heat pump, Vapour absorption system.	2	Mr. Prem Kumar	Foreman	Diploma Mechanical
10	CAM Lab	3	CNC lathe Machine CNC Milling Machine.	2	Mr. M.C. khard	Foreman	Diploma Mechanical
11	Heat and Mass Transfer lab	3	Heat transfer through composite wall with DTI, heat transfer through DTI, Stefin boltzman apparatus, critical heat flux apparatus, natural convection and forced convection through pin fin, Thermal conductivity, Heat pipe demonstrator, Emissivity measurement apparatus.	2	Mr Prem Kumar	Foreman	Diploma Mechanical

12	Automobile Engineering lab	3	Sliding Mesh Gear box, Models of Differentials, Multi-cylinder Diesel and Multi-cylinder Petrol Engines, Working model air brake system, single cylinder petrol engine, Electric wiring system	2	Mr. P.S.Kushwaha	Lab Assistant	Diploma
13	Material Testing lab	3	Universal Trinocular Microscope, Muffle furnace, Ultrasonic flaw detector, Abrasive cut off wheel machine	2	Mr. M.C. khard	Foreman	Diploma Mechanical
14	Thermodynamics lab	3	Working model of four-cylinder model engine, Working model of two stroke of diesel engine, Working model of four stroke of diesel engine, Working model of two stroke of petrol engine, Working model of four stroke of petrol engine, Model of Lancashire boiler, Model of Locomotive boiler.	2	Mr P.S.Kushwaha	Lab Assistant	Diploma

6.3. Safety measures in laboratories (10)

Safety measures:

- 1. All the laboratories should have First Aid box.
- 2. All the laboratories should equip with fire extinguisher

Sr. No.	Name of the Laboratory	Safety measures
1.	Mechanics lab	1) Please keep working area clean and tidy
		2) Please follow equipment or machine operating instructions
		3) No food or beverage in the laboratory.
		4) Do not wear sandals or slippers
2.	Workshop	1)Must wear safety shoes for machining or sample preparation
		2) Must tie up and cover long hair, if you have
		3) Must wear safety goggles or face shield for machining
		4) Must be familiar with the location of emergency stop button to turn off
		all electrical power for emergency
		5) Do not wear loose hanging garment

		6) Students are required to clear off all tools and materials from
		machine/work place.
3.	Heat and Mass Transfer Lab	1) Please follow equipment or machine operating instructions
		2) Keep all the assembly undisturbed.
		3) Operate all the switches and controls gently
		4) Always ensure that the equipment is earthed properly before switching
		on the supply.
		5) Ensure steady state heat transfer before noting down the readings.
4.	Measurement and Metrology	1) Do not touch anything with which you are not completely familiar.
		2) Please follow instructions precisely as instructed by your supervisor.
		3) If any part of the equipment fails while being used, report it immediately
		to supervisor.
		4) Do not crowd around the equipment's & run inside the laboratory.
5.	Theory of Machine	
		1) Please follow equipment or machine operating instructions
		2) Keep all the assembly undisturbed.
		3) Please keep working area clean and tidy
6.	Manufacturing Science Lab I and II	1) Must wear safety shoes for machining or sample preparation
		2) Must wear safety goggles or face shield for machining
		3) To avoid injury, the student must take the permission of the laboratory staff
		before handling any machine.
		4) Students must ensure that their work areas are clean and dry to avoid slipping.
		5) Students are required to clear off all tools and materials from machine/work
		place.
7.	RAC Lab	1) Please follow equipment or machine operating instructions
		2) Keep all the assembly undisturbed.
		3) Operate all the switches and controls gently
8.	Applied Thermodynamics Lab	1) Please keep working area clean and tidy
		2) Please follow equipment or machine operating instructions
		3) no food or beverage in the laboratory.
		4) Do not wear sandals or slippers

6.4. Project laboratory (20)

All Laboratory facilities may be utilized by the students for their project work. Besides this after the laboratory classes they are utilized by the students like UTM machine, CNC machine, etc assisted by the respective laboratory OC and staff members.

CRITERION 7	Continuous Improvement	75

7.1 Action taken based on the results of evaluation of each of the CO's PO's & PSOs (30).

POs	Target level	Attainment Level	Observations
PO1: Engineering k	nowledge: Apply l	knowledge of mathematics,	science and engineering to analyze, design and
evaluate mechanical	components & sys	tems using state -of-the-art	IT tools.
	2.5	2.14	 Some lateral entry students are not exposed to fundamental in the mathematics/Science subjects before joining their engineering course Some students find it difficult to understand mathematical based engineering subjects. Some students can't relate basic engineering subject to core engineering subject.
Action 1: Additional theory science and engineer 2: More practical tea 3: More problems ar	classes and tutoria ing subjects. ching has been em e given for practice	l classes were conducted to phasized.	introduce and understand the concepts of basic
PO2: Problem analy industrial systems to	vsis: Analyze probl formulate design r	ems of mechanical enginee equirements	ring including thermal, manufacturing and
	2.00	1.93	 Some lateral entry students are not exposed to fundamental in the mathematics /Science subjects before joining their engineering course Some students find it difficult to understand analytical based engineering subjects. Some students find difficulty in core engineering subject.
Action 1: Additional theory science and engineer 2: More practical tea 3: More problems ar	classes and tutoria ing subjects. ching has been em e given for practice	l classes were conducted to phasized.	introduce and understand the concepts of basic
PO3: Design/develo considering public h	pment of solution ealth, safety, cultur	s: Design, implement, and al, societal and environmer	evaluate mechanical systems and processes ntal issues.
01	2.0	1.65	 Lack of knowledge of product development, materials and hands on practical experience/ process. Subject involves both analysis and design.

			3.	Solving design problems found to be lengthy			
Action	fa sturin a Dus se		- h - 1				
1. Material /Manu	facturing Proce	esses are taught with th	e help of	NPTEL video presentation.			
2. Additional classes to be conducted to introduce Mechanical Engineering fundamental.							
3. More design cla	3. More design classes to be taught in tutorial classes						
4. More emphasis	on mathematic	al basic to be given in	the previ	lous course			
5. Practical approx	ach of teaching	to be adapted.					
6. More problems	will be given f	or assignment practice					
PO4: Conduct inves	tigations of comp	lex problems: Design and	conduct ex	periments using domain knowledge			
and analyze data to an	rive at valid concl	usions					
	2.00	1.76	1.	Lack of knowledge materials			
				and hands on practical			
				experience/ process.			
			2.	Subject involves both analysis			
				and design.			
			3.	Solving design problems found			
				to be lengthy			
Actions							
1. Additional clas	ses to be condu	cted to introduce Mech	nanical er	ngineering fundamental.			
2.More emphasis	on mathematica	al basic to be given in t	he previo	ous course			
3. Practical approx	ach of teaching	to be adapted.	-				
4. More problems	will be given f	or practice.					
5. Conduction of	Science Fest an	d motivating students t	to prepar	e/built prototype models.			
		C	1 1	1 71			
PO5: Modern tool u	sage: Apply curren	nt techniques, skills, knowl	edge and c	computer based methods & tools to			
develop mechanical s	ystems, understan	ding of the limitations					
	2.00	1.72	1.	Use of CAD and analysis tools must be			
			-	done by the students for project work.			
			2.	Students were also need these			
				and/or higher studies			
Actions				and/or higher studies.			
Actions 1 Additional alag	age to be condu	atad to intraduce prest	ical know	vladaa			
2. Students should	ses to be collau	ridual Systems to yyarl		vieuge.			
2. Students should	i de given indiv	Idual Systems to work	on som	vare s.			
3. Use of Projecto	r will be more		,· ,	1			
4. More problems	will be given f	or practice and conduc	ting extra	a classes.			
PO6: The engineer a	nd society: Analy	ze the local and global impa	act of mod	ern technologies on individual			
organizations, society	and culture and p	rofessional engineering pra	ctice.				
	2.0	1.8	1.	Many of the students do not			
				consider social issues in their			
				habits or study.			
			2.	Students are not always aware			
				that they are the part of the			
				common society and they are			
				destined to serve the society.			
Actions	I	1		Solice			
1 Additional clas	ses to be condu	cted to teach managem	ent hase	d subjects			
2. Practical approx	ach of teaching	method should be ada	nted.				
			r				

PO7: Environment and sustainability: Apply knowledge of contemporary issues to investigate and solve problems with a concern for sustainability and eco-friendly environment.

	1.5	1.36	1.	Students are not properly
				concerned with the
				environmental issues.
			2.	Students lack the understanding
				that technological development
				cannot sustain without
				environmental concern for
				sustainability.
Actions				
1 Additional clas	ses to be condu	cted to introduce relev	ant issu	es

2. More examples on the subject to be practiced by students in extra classes

3. More emphasis on understanding environmental issues.

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

1.0	0.86	1.	Some students tend to ignore
			ethics in engineering education
			and management.
		2.	Students are not clear about the
			ethical practices in engineering
			education

Actions

1. Additional classes to be conducted to introduce

2. More examples on the subject to be practiced by students in extra classes

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

1			
	1.00	0.98	1. Students are not showing interest in Real time projects.
			2. Students find it difficult to solve
			the application oriented/practical
			engineering problems.
			3. Sometimes, absence of
			correlation among the team
			members during the project
			work

Actions

1. Additional classes to be conducted to motivate students to do projects.

- 2. Students should be sent to Industries to do project.
- 3. Students should be sent to other colleges/universities to contact higher resource persons.
- 4. Students should be sent to nearby testing centers to conduct any tests/experiments.

PO10: Communication: Communicate effectively in diverse groups and exhibit leadership qualities, to							
comprehend and write	e effective reports	5.					
	1.0	0.67	1.	Moderate	communication	and	
			presentation skill.				

Actions:

1. More problems will be given for practice.

PO11: Project management and finance: Apply management principles to manage projects in multidisciplinary								
environment.								
	2.00	1.36	1.	Few	students	are	having	less

less

			• • • • • • •
			 2. Some students are unaware of the impact of project management in Mechanical Engineering
Actions:			Engineering.
1. More prob	olems will be gi	ven for practice.	
PO12: Life-long lea	rning: Pursue life-	long learning as a means to	enhance knowledge and skills.
	2.0	1.39	 Few students find it difficult to understand concepts for lifelong learning. Some students are not aware that
			learning is a never ending process which needs to be carried out through the concept of subjects taught in their engineering course,
Actions:	•		
1. More examples	s on design to b	e practiced by students	s in extra classes
2. Practical appro	ach of teaching	to be adapted.	
	e	1	
PSO1: To empower	the students to app	ly practical skills , knowled	lge in major streams such as design, thermal,
manufacturing and ir	dustrial engineerin	1g	
	2.00	1.77	 Students will learn basic & fundamentals of engineering and mechanical engineering in specific. Students will build confidence in solving real life career in the
			specific field.
Actions	I	1	
1. Students a	are encouraged	to read fundamental re	search papers.
2. Encourage	ed for discovery	/ innovation.	e en en Fulferer
PSO2: To enable	the student to t	take up career in indus	tries or to pursue higher studies in
mechanical and in	nterdisciplinary	programs with regard	for ethics, environment and society.
	2.0	1.52	1. Students will have specialization
			in the selected area of
			mechanical engineering.
			2. Students can also show their
			proficiency and build career in this specific field.
Actions	1	1	1 1
1. Students a	re encouraged	for specialization.	
L	6	1	

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) The department is following a two tier academic audit system. The first tier for academic audit consists of Board of Studies (BOS). All faculty members of the department are its members, along with some outstanding academicians and few members from reputed industries constitutes the board. The meeting of BOS shall be convened twice a year to continual monitor the progress and give the necessary recommendations for improving the quality of education in the department. The details of agenda and minutes of the last meeting are attached. Recently the department organized an ICC meet to have an interaction with the industries and to take suggestions for the necessary amendments in the course curriculum to enhance the employability of the students and to cater the needs of the modern industries. The minutes of the ICC meeting are attached.

Over the BOS the second tier focuses on academic audit of the students which is done through Academic Council. The regular meeting of the Academic Council is scheduled by the Institute and Head of the Department along with one senior faculty member are the members of the same.

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

Assessment is based on improvement in:

A) Placement: number, quality placement, core industry, pay packages etc.

Session	No. of students	Package/Annum
2015-2016	08	3.34 Lacs and Higher
2016-2017	19	-
2017-2018	09	-

B) Higher studies: performance in GATE, GRE, GMAT, CAT etc., and admissions in premier institutions

Session	Higher studies	Total no. of students	No. of students appeared	No. of students Qualified	MIN. ALL INDIA Rank	Max. ALL INDIA rank
2016-17	GATE- 2017	51	30	16	400	26069
2017-2018	GATE- 2018	49	36	16	1337	51023
2017-2018	CAT- 2018	1	1	1	-	-

C) Entrepreneurs - Nil

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

Assessment is based on improvement in terms of ranks/score in qualifying state level/national level entrances tests, percentage marks in Physics, Chemistry and Mathematics in 12th Standard and percentage marks of the lateral entry students.

		CAY (18-19)	CAYm1 (2017-18)	CAYm2 (2016-17)
	No. of Students admitted	-	-	-
National Level Entrance Examination (Name of the	Opening Score/Rank	-	-	-
Entrance Examination)	Closing Score/Rank	-	-	-
State/Institute/Level Entrance	No. of Students admitted	46	46	43
Examination/Others	Opening Score/Rank	1965	2464	2038*
(Name of the Entrance Examination) SEE	Closing Score/Rank	57976	100194	2796*
	No. of Students admitted	9	7	9
Name of the Entrance Examination for Lateral Entry :SEE or	Opening Score/Rank	67*	68	43*
lateral entry details	Closing Score/Rank	621*	1001	60*
Average CBSE/Any other Board students (Physics, Chemistry & I	Result of admitted Mathematics)			

CRITERION 8

8.1 First Year Student Faculty Ratio (FYSFR) (5)

Year	Number of students (approved intake strength)	Number of faculty members (considering fractional load)	FYSFR	*Assessment = (5 ×20)/ FYSFR (Limited to Max. 5)
2018-19	345	15	23	5.0
2017-18	345	17.5	19.7	5.0
2017-16	345	17.5	19.7	5.0
2015-16	345	17.5	19.7	5.0
Average	345	16.9	20.5	5.0

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	Ŷ	RF	Assessment of faculty qualification $(5x + 3y)/RF$
2018-19	8.5	6.3	17.3	3.55
2017-18	13.5	4	17.3	4.6
2016-17	13.5	4	17.3	4.6
2015-16	13.5	4	17.3	4.6

Table B.8.2

8.3. First Year Academic Performance (10)

Academic Performance = ((Mean of 1st Year Grade Point Average of all successful Students on a 10 point scale) or (Mean of the percentage of marks in First Year of all successful students/10)) x (number of successful students/number of students appeared in the examination) Successful students are those who are permitted to proceed to the second year.

	Mean of the percentage of marks in first year of all	Number of successful	Number of Students appeared in the	First Year Academic
Academic Year	successful students	students	examination	Performance
2018-2019	*	*	*	*
2017-2018	65.45	379	402	61.71
2016-2017	66.68	368	381	64.40
2015-2016	65.94	319	331	63.54
2014-2015	68.71	350	359	66.98

*Session 2018-19 is still in progress

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)

Data collection processes may include specific exam questions, laboratory tests, internally developed assessment exams, oral exams assignments, presentations, tutorial sheets etc.

Internal Tests/ Exams:

- The Faculty Coordinator will design the flow of curriculum, Laboratory related problems and distribute to the students.
- After commencement of the course, the faculty coordinator will conduct 3 tests in a given semester distributed as one test per month.
- Faculty coordinator will follow the scheme of evaluation set by the department and evaluate the paper.
- It is preferable that a student shall obtain not less than 50% of the maximum marks prescribed for the course.
- The final Internal Assessment marks will be based on the average of the two tests.
- End semester University exam performance of students for the maximum mark of 80 will be considered for external exam performance.
- The summation of these two performances is considered as cumulative assessment for a prescribed course out come.
- For laboratory assessment, the performance of a student in conduction of each experiment (40 marks), and external lab exam (60 marks) is considered.

S.No	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	EAS 103: Mathematics I	3	2.33	1		1.5									
2	EAS 101: Engg. Physics I	2	1				1	1							
3	EME 102: Engineering Mechanics	3	3	2.75	2								1	1.8	1
4	EAS 104: Professional Communication									2	2.67	1			1
5	EAS 105: Environment and Ecology	3		2				1.67	3					1.5	2.75
6	EAS 203: Mathematics II	3	3	3	2.75	3									
7	EAS 201: Engg. Physics II	2													
8	EAS 202: Engg. Chemistry	2													
9	EME 201: Manufacturing Process	1.5	2.5	1.5	1.5	1								1.5	1.67

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

Course Articulation Matrix

Table 8.4.2.2: Course Outcomes and mapping of EAS 103: Mathematics I

СО	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EAS 103.1	Apply Leibnitz theorem to successive differentiation, understand the concepts of partial d	3	2	1											
EAS 103.2	Identify the applications of partial differentiation in evaluating Jacobian, approximate values and extrema of functions of several variables.	3	2												
EAS 103.3	Apply the concepts of elementary transformations to find the inverse of a matrix, rank of matrix, solve the system of linear algebraic equations and will able to determine Elgen values, Eigen vectors and diagonalize a matrix.	3	3	1		2									

EAS 103.4	understand the concepts of double and triple integrals, Beta and Gamma functions and apply them to evaluate areas and volumes	3			1					
EAS 103.5	Compute curl, divergence, and gradient and apply the concepts of calculus of vectors for evaluating line, surface and volume integrals	3								
EAS 10	03: Mathematics I	3	2.33	1	1.5					

Table 8.4.2.3: Course Outcomes and mapping of EAS 101: Engg. Physics I

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EAS	To develop the understanding of														
101.1	relativistic mechanics, frames of														
	references & variation of mass with	2	1				1								
	velocity	2	1				1								
EAS	To develop the understanding of laws														
101.2	of wave optics and its applications	2													
EAS	To develop the understanding of laser														
101.3	and its applications	2					1	1							
EAS	To develop basic understanding of														
101.4	fibre optics and holography	2						1							
EAS 10	1: Engg. Physics I	2	1				1	1							

Table 8.4.2.4: Course Outcomes and mapping of EME 102: Engineering Mechanics

СО	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 102.1	Determine resultants and apply conditions of static equilibrium to plane force systems. Analyze problems related to friction	2	2	2	1								1	2	
EME 102.2	Generate and sketch shear force and bending moment diagrams for statically determinate beams. Analyze systems to determine the forces in members of trusses	3	3	2	2								1	2	1
EME 102.3	Determine the centroid and moment of inertia	3	3	2	2								1	2	
EME 102.4	Solve problems in kinematic and dynamic systems	3	3	2	1								1	1	
EME 102.5	Derive and apply stress and strain relationships in single and compound members subject to axial force, bending moment and torsion	3	3	3	1								1	2	
EME 10	02 : Engineering Mechanics	3	3	2.75	2								1	1.8	1

Table 8.4.2.5: Course Outcomes and mapping of EAS 104: Professional Communication

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EAS 104.1	Understand the ways of devising communication strategies for professional platforms									2	3				
EAS 104.2	Students will be able to identify and apply the correct channels and forms of organisational communication with confidence and clarity														1
EAS 104.3	Develop proficiency in technical writing by appropriate understanding and application of specific genres of communication such as memorandums, proposals, business letters etc										3				
EAS 104.4	Understand and demonstrate the effective use of audio visual aids in order to enhance the dynamics of writing as well as oral communication									2					
EAS	Learn writing styles paragraph										2	1			

104.5	formation art of brevity, clarity, accuracy, honesty, avoidance of ambiguity, coherence etc.									
EAS 10	04: Professional Communication					2	2.67	1		1

Table 8.4.2.6: Course Outcomes and mapping of EAS 105: Environment and Ecology

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EAS 105.1	Understand the scope and importance of environment and ecology and the effect of human activities on environment.	3		1				2							3
EAS 105.2	Acquire the knowledge of different types of energy resources and natural resources (like water resources, mineral resources) their availability and quality aspects.	3						1						1	3
EAS 105.3	Understand different types of pollutions and their effects also to understand the natural and anthropogenic causes of pollution.	3		3				2						2	3
EAS 105.4	Understand the legal aspects of environment protection, role of government and NGOs and also the environment and women education.								3						2
EAS 105: Environment and Ecology		3		2				1.67	3					1.5	2.75

Table 8.4.2.7: Course Outcomes and mapping of EAS 203: Mathematics II

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EAS 203.1	Acquire basic knowledge of ordinary differential equations and use appropriate method to solve them and their use in analysing typical engineering system	3	3	3	3	3									
EAS 203.2	Find the series solution of second order differential equations and find the solution of special differential equations (Bessel and Legendre differential equations)	3	3	3											
EAS 203.3	Understand the concepts of laplace transform and able to apply for the solution of differential equations	3	3	3	3	3									
EAS 203.4	Expand any periodic function in terms of fourier series	3	3	3	2	3									
EAS 203.5	Able to form and solve linear, non- linear partial differential equations and also will be able to solve wave, heat and Laplace equation in engineering problems	3	3	3	3	3									
EAS 20	EAS 203: Mathematics II		3	3	2.75	3									

Table 8.4.2.8: Course Outcomes and mapping of EAS 201: Engg. Physics II

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EAS	To aware of limits of classical														ĺ
101.1	mechanics and to understand the														Í
	concept of wave mechanics	2													
EAS	To understand the electric and														
101.2	magnetic properties of materials	2													
EAS	To formulate and solve the basic														ĺ
101.3	engineering problems in														
	electromagnetism and														
	electromagnetic field theory	2													Í
EAS	To understand the concept of														
101.4	101.4 superconductivity and nanomaterials														
EAS 20	EAS 201: Engg. Physics II														

					1		8 -		1						
CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EAS 202.1	Discuss the construction, electrochemistry and applications of														
	selected primary batteries and secondary lead acid battery	2													
EAS 202.2	Explain effect of functionality on structure of polymers, different types of classifications of polymers, types of polymerization, polymer processing techniques, preparation properties and applications of few plastics and elastomers	2													
EAS 202.3	Apply the chemical principles of combustion to calculate the quantity of air required for combustion of a given fuel. Calculate proximate and ultimate analysis of coal	2													
EAS 202.4	Discuss the properties and application of selected solid, liquid and gaseous fuels	2													
EAS 202.5	Apply the knowledge of nature of polymeric materials for their application in technological fields and fuels for their conservation	2													
EAS 20	EAS 202: Engg. Chemistry														

Table 8.4.2.9: Course Outcomes and mapping of EAS 202: Engg. Chemistry

Table 8.4.2.10: Course Outcomes and mapping of EME 201: Manufacturing Process

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
EME 201.1	Understand different ferrous and non- ferrous metals and alloys and their														
	properties.	1		2										1	
EME 201.2	Basic knowledge of forming and casting processes and their applications.	2	2		1									1	2
EME 201.3	Introduction to basic fabrication processes such as welding and machining	1	3	1										2	1
EME 201.4	Elementary knowledge of nano- metallic material and other process used in engineering	2			2	1								2	2
EME 201: Manufacturing Process		1.5	2.5	1.5	1.5	1								1.5	1.67

8.5. Attainment of Program Outcomes from first year courses (20)

8.5.1. Indicate results of evaluation of each <u>relevant</u> PO and/or PSO if applicable (10)

The relevant program outcomes that are to be addressed at first year need to be identified by the institution. Program Outcome attainment levels shall be set for all relevant POs and/or PSOs through first year courses. (The assessment processes demonstrates the degree to which the Program Outcomes and Program Specific Outcomes attained through first year courses.)

The following attainment levels are used

Attainment Level 1: 40% of students scoring more than university average marks or set attainment level. Attainment Level 2: 50% of students scoring more than university average marks or set attainment level. Attainment Level 3: 60% of students scoring more than university average marks or set attainment level.

Table 8.5.1.1:	: PO &	PSO	Attainment	Values
----------------	--------	-----	------------	--------

	1	-	1	1	1	1		-	,	1	1	-				1	1
S.No	Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	РО 9	PO 10	PO 11	PO 12	PSO1	PSO2	Average CO Assessme nt	Overall CO Att.level
1	EAS 103: Mathematics I	1.0	0.8	0.3		0.5										0.4	1
2	EAS 101: Engg. Physics I	0.7	0.3				0.3	0.3								0.50	1
3	EME 102: Engineering Mechanics	2.0	2.0	1.8	1.3								0.7	1.2	0.7	0.50	2
4	EAS 104: Professional Communication									1.3	1.8	0.7			0.7	0.57	2
5	EAS 105: Environment and Ecology	2.0		1.3				1.1	2.0					1.0	1.8	0.53	2
6	EAS 203: Mathematics II	1.0	1.0	1.0	0.9	1.0										0.45	1
7	EAS 201: Engg. Physics II	2.0														0.75	3
8	EAS 202: Engg. Chemistry	2.0														0.73	3
9	EME 201: Manufacturing Process	0.5	0.8	0.5	0.5	0.3								0.5	0.6	0.45	1
	PO Attainment	1.4	0.98	0.98	0.9	0.6	0.3	0.7	2	1.3	1.8	0.7	0.7	0.9	0.95		

CRITERION 9

9. Student Support Systems (50)

Student Activity Centre (SAC) and Auditorium



9.1 Mentoring system to help at individual level (5)

Objective

To provide guidance to students towards achieving professional fulfilment and assessment of his/her academic progress as well as personal growth.

Mentor Management Committee – Duties & Responsibilities

- At BIET the mentorship programme is mentioned in the semester routines to ensure students awareness regarding the same
- The mentorship programme at BIET comprises of a 1:15 ratio; that is, each mentor is allocated 15 students under his/her mentorship
- Agreeing to the parameters of the mentoring role and allocating responsibilities within the Committee to certain work areas
- Recruit, interview and select (including taking up references) Academic Mentors in an equality conscious manner
- > Ensure all those selected to be Academic Mentors to complete a comprehensive training programme
- Ensuring the presence of relevant student representatives to guarantee students views
- Mentoring potential future Academic Mentors in order to sustain and grow the Mentoring population
- > Dealing with any issues/problems arising from the mentoring process or relationship
- > Ensuring continuous support and development for Academic Mentor
- Ensuring all Mentees receive documentation and guidance on the mentoring relationship
- ▶ Giving feedback to the Director, Dean of Students, Senior Tutors and other Supporting Staff

Mentor: Roles & Responsibilities at BIET

Support the Mentee to make an 'Action Plan' outlining their motivation and goals

- > Meet on a one to one or group basis to review the Mentee's progress towards their desired goals
- Use questioning techniques to facilitate the Mentee's own thought processes in order to identify solutions and actions
- > Utilize listening and communication skills to ensure the needs of the Mentee
- Share relevant Academic experiences/problems that are overcome(if appropriate)
- Facilitate and encourage enquiry-based learning, providing the Mentee with the tools to find their own answers

Mentee: Roles & Responsibilities at BIET

- A desire and ability to engage in the mentoring process
- > The time and commitment to pursue their goals by being punctual
- > An understanding of the role and boundaries of the Mentor
- Must respect the confidentially of the relationship
- Mentees must take ownership of the process

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

Three types of Feedback systems are followed:

1. DIRECT FEEDBACK FROM THE STUDENTS

Every department have feedback mechanism for collecting feedback from students with the help of faculty members. Student are required to express their view on subjects on the Academic Environment of the department and which is collected and submitted to the HOD for further actions.

STUDENT FEEDBACK

A. Significance of Student Feedback

The Institute aims to offer the best possible environment and learning experience to encourage students to perform to their full potential. The teacher plays an important role as a facilitator, spectator and an evaluator. The students need to be guided on all front to enhance students overall appearance. The teacher must put forth all parameters of development towards the students. Teacher should motivate the students and maintain a positive/ healthy attitude for learning. Teacher should watch, take part, evaluate, command and advise individual student as per their requirement.

Students play a critical part in the process of evaluation, development and enhancement of this learning experience. Feedback from students allows the Institute to evaluate how its service provision is viewed by the most important group of the Institute, namely its students.

BIET has put an increasing importance on the need for involvement of students in the quality assurance of higher education through student feedback process. Student involvement requires that students act as collaborators, rather than merely passive receivers of, teaching and learning. The method suggests correcting mistakes in the learning process.

B. The Process of obtaining Student Feedback

Students are invited, by means of email providing a link, to complete a brief online feedback form, or on an anonymous basis, towards the end of selected study-units. This process occurs on half-yearly basis during the spread of one academic year. The process of student feedback is conducted once each at the end of odd/ even semester in one academic year. In each case, feedback is collected after students have been assessed on particular unit/ parameter, prior to publication of semester results.

C. Focus of the Student Feedback Form

The student feedback-form focuses on the following issues:

- i. General questions on the study-unit
- ii. Comparison between study-unit description and actual delivery
- iii. Lecture delivery methodology
- iv. Lecturer attributes
- v. Method of assessment
- vi. Administration and resources
- vii. Additional comments (if any)

D. Objectives of Student Feedback on Study-units

Student feedback on study-units has the following main objectives:

- I. To provide students an opportunity to comment on the quality of learning experiences, as required in preparation for and as part of review processes;
- II. To assess the success of academic provision in relation to the expectations of students;
- III. To provide feedback in order to improve delivery and/or content of the study-unit.

E. Anonymity of Student Feedback

The student feedback exercise is entirely confidential and anonymous.

The procedures below have been put in place to maintain anonymity and to ensure that students are not adversely affected by the feedback submitted. Students who complete the form are not asked at any stage for their names or any other personal details which may be used to identify them. Student response data is grouped together for the entire class for the purpose of data analysis. It is therefore impossible to associate comments and responses provided with any individual student. Faculty members receive the aggregated results of student feedback after they have submitted the grades for study-units being reviewed. This ensures that the grades of students, even though not identifiable on an individual basis, are not affected as a group by the feedback which is submitted. Only those studyunits attended by a considerable number of students are included in the student feedback exercise;

Participation in student feedback is entirely on voluntary basis. There is also no penalty for abstaining from submission of feedback, since all grades are published irrespective of participation or non-participation in the student feedback exercise. Nonetheless, students are strongly encouraged to provide their feedback and use this opportunity to voice their opinions and enable continuous improvement of teaching at the Institute.

F. How is Student Feedback used in the Quality Assurance Process?

After each semester, only a selected of study-units are evaluated to avoid student fatigue associated with this exercise, however all study-units will ultimately be evaluated over a definite period. Results of the feedback process are made available to the faculty mebers of the study-units concerned. The results of the student feedback process, as well as the recommendations and the action taken are important considerations which each Department is required to undertake. The teacher should ensure that the students are not losing their motivation by being corrected after the process.

2. FACULTY APPRAISAL

Faculty appraisal report consists of the appraisal of annual confidential report, (ACR) on a prescribed format submitted by each faculty members highlighting his load for odd and even semesters. They also submitted are the training programmes coordinated, organized and attended. The conference attended, publications are submitted to the Head of Department. The Head of departments gives his feedback and assessment of the report, which is finally sent to the director for his evaluation.

9.3 Feedback on facilities (5)

FEEDBACK ON FACILITIES

The college has formal and informal mechanisms to obtain feedback from students through various committees, associations, organizations, etc. The aim of the institute is to provide the best facilities for the students. The feedback forms are circulated among a handful of students,

STUDENT'S FEEDBACK:

The final year students are provided with feedback forms for the the betterment of the institution.

- **Merits:** The students have given overall thumbs up for the facilities provided. They were satisfied with the faculties and overall computing and library facilities provided at the college.
- **Demerits:** The students however felt that the number of computers needs to be increased for browsing information. They have also requested for high speed Wi-Fi access throughout the college for better sharing of information. They have also requested to extend the library working hours during exam-time.

A. INFRASTRUCTURE

1. CLASS ROOM

- i) Size: satisfied
- ii) Lighting and Ventilation: Almost satisfied
- iii) Audio & Video Quality in Smart Classroom: almost satisfied
- iv) Quantity of Furniture: almost satisfied
- (v) Cleanliness: almost satisfied

2. <u>COMPUTER LABS</u>

- i) No of Computers: improvement required
- ii) Availability of Software: satisfactory but still improvement required
- iii) Maintenance: improvement requirement
- iv) Connectivity: satisfied
- v) Anti-Virus: almost satisfied
- vi) Wi-Fi

Accessibility of Wi-Fi in your institute with adequate bandwidth: almost satisfied Reliability of Wi-Fi: improvement required

Availability of Support Staff to entertain student's queries: Important improvement required

4. FOOD

- (i) Food Prices: satisfied
- (ii) Hygienic & Good Quality Food: Almost satisfied.
- (iii) Timings: satisfied
- (i) Menu: satisfied
- (ii) Service: improvement required
- (iii) Adequate sitting arrangement: satisfied

5. WASHROOM & DRINKING WATER

- i) No of Washrooms: almost satisfied.
- ii) Cleanliness of Washroom all the time: almost satisfied
- iii) Availability of ample water supply in washrooms: not satisfied
- iv) Quality of drinking Water: almost satisfied

6. LABS

- i) Number of machines in your labs: satisfied
- ii) Technology of machines: satisfied
- iii) Type of machines in your workshop: satisfied
- iv) Maintenance of machines in lab: improvement required
- v) Availability of technician to assist students: improvement required

7. WORKSHOPS

- i) Are you satisfied with the kind of technical workshops being held in your college: satisfied
- ii) Are you satisfied with the learning you get from technical workshops: satisfied

8. GYM

- i) Variety of Gym Equipment: satisfied
- ii) Timings: satisfied
- iii) Fees: free
- iv) Availability of Gym Instructor: no

B. COURSE-CURRICULUM & EXAMINATION

- i) Starting time of Classes in Morning: satisfied
- ii) Duration of hour lectures in a day: satisfied.
- iii) Total no of lectures in a week: satisfied
- iv) Assignment plan of each subject: satisfied
- v) Assessment criteria of assignments: Almost satisfied
- vi) Course Coverage in Exam: Almost satisfied
- vii) Pattern of Internal Exam: Almost satisfied
- viii) Encouragement in participation in technical events: satisfied
- ix) Availability of enough study material: satisfied
- x) **Opportunity to participate in class discussion:** satisfied
- xi) Clearing of doubts during class: Almost satisfied
- xiii) Number of elective subjects being offered: mostly satisfied
- xiv) Attendance policy: satisfied

C. FACULTY

- i) Faculty inspires to perform well: Almost satisfied
- ii) Enthusiasm in teaching from faculty members: Almost satisfied
- iii) Overall personality development of students: Almost satisfied
- iv) Individual attention during workshops and lab sessions: Almost satisfied
- v) Availability of faculty for discussion on non-academic issues: Almost satisfied
- vi) Guidance on project: Almost satisfied

(D) EXTRA-CURRICULAR ACTIVITIES & SPORTS

- i) Support and promotion of sports activities by college authorities: Almost satisfied
- ii) Enough space available to play sports in college: satisfied
- iii) Number of competitions being held department wise: Almost satisfied
- iv) Availability of extra time to prepare for college fest: Almost satisfied
- v) Motivation from college authorities to participate & other college's fest: Almost satisfied

9.4 Self-Learning (5)

- Value added lab sessions beyond syllabus are conducted to expose the students to software / hardware trends not included in their curriculum.
- Hobby lab enables students to do something on their own, test them- know by doing discussions, brainstorming and problem solving focused on outputs of learning and academic careers.
- > Professional skill development courses are arranged.
- ➢ Do it yourself.
- Engaged to work in Industries during vacation and have Industrial training
- Language lab facilities provided
- > Industrial visits, arranged by the Departments.
- Technical talks by external/internal experts
- Seminars for senior students.

Generation of Self-Learning Facilities and Motivation:

- For lab courses, the lab manuals are issued, and certificates given based on a test at the end of the session.
- Intranet facilities are provided
- ➢ Wi Fi zone enables the students to use the facility any time (even beyond college hours)
- ➢ Browsing centre open for 12 Hrs. a day
- Students motivated by sending them to write research papers and present papers in conferences. College bears the expenditure.
- ▶ Learning material are put on the Intranet students are encouraged to do exercises
- Labs are open to students to experiment on their ideas
- Encouraging students to put innovation on web

Availability of Learning Beyond Syllabus Contents and Promotion:

- > Intranet facility provides learning of subjects not necessity in the curriculum
- Problem solving techniques
- Social service field work offers service learning opportunities to students

Literature on professional ethics, personality development, even English literature are put on the Intranet

9.5 Career Guidance, Training, Placement (10)

Training & Placement Cell (TPC) is to place the student in competitively good companies by identifying their knowledge skills, attitude matrices of every individual student, creating job profiles for them, identifying areas of training & various methods as per the training requirement, formulate sequence of activities to meet the training schedules for appropriate placement. TPC always involves in the following activities:

- Assist students develop /clarify their academic and career interests, and their short and long term goals through individual counselling and group sessions
- Provide resource and activities to facilitate the career planning process
- Organizing pre-placement training for students (Soft-skills, Aptitude, Technical and Mock Interviews)
- > Empower students with life-long career decision-making skills
- Up gradation of the students skill sets commensurate with the expectations of the industry

Placement policy

A. Placement policy for students

- Students are required to register themselves with the training and placement cell (T& P cell) as per the stipulated time period to avail further support extended for placement related activities. All students are required to read, understand and adhere to all the terms laid down by the T& P cell.
 - i. Minimum 75% attendance is mandatory in semester classes.
 - ii. Attendance is mandatory in any campus recruitment drive for registered students.
 - iii. Students need to submit their updated resume with pasted color photograph, photocopy of all testimonials and certificates.
- 2. Once registered, students will not be allowed to withdraw their candidature from a particular campus recruitment drive. Exceptions can be made only after the consent of the placement committee/ concerned authority. Any student, who withdraws candidature, rejects offer at any stage, absents from any rounds during recruitment process without sufficient reason, will not be allowed to sit for further campus drives
- 3. No further attempts will be permitted to the students who have already secured one job offer. Thus, students can have only one job offer. All the students who secure an offer will have to compulsorily join the company. These selected students may be considered in further campus

drive based on different factors that will be decided by the placement committee/concerned authority on case to case basis.

- 4. The decision regarding making job offers is left to the discretion of the companies participating in the recruitment drive. At the end of academic year, if any student, who is not placed, T & P cell will extend support to such students only for off campus recruitment drives, till scopes available in the next session.
- 5. Grooming classes are organized for students with a vision to make them efficient and more skilled before participating in upcoming recruitment drives.
- Students, who miss two (2) consecutive campus drives, will not be allowed to sit for next two (2) campus drives.
- 7. Students should intimate the valid reason to the T & P cell in case of absenteeism in any training & placement related activities.
- 8. Attending training classes is mandatory for placement support from T& P cell
- 9. Students have to furnish an undertaking from their parents confirming that every registered student will maintain minimum 75% attendance during all the classes. Failing to which, no further placement support will be offered from the T & P cell. Placement committee/ authority will hold no responsibility towards placing those students.

B. Placement Policy for participating industries

- 1. The training and placement cell (T & P) will invite the prospective industries for the recruitment of final year students from August / September of every academic calendar.
- 2. As per the criteria and parameter of the company, T& P cell of the institute will share the detailed database of the respective final year students opting for placement, along with mutually convenient date for the campus recruitment drive.
- 3. On the receipt of detailed campus drive (date of campus event, job description, stipend and salary details, eligible students, eligibility criteria, required domain knowledge, no. Of requirements, selection process, requirement of infrastructure for conducting campus drive, travel plan, details of visiting officials & other details (if any)), T& P cell will inform the respective student through official notice and ask them to register with T& P cell in person within a stipulated time frame.
- 4. As per the given details by the employer, the institute will make necessary arrangements for campus drive.
- 5. A pre-placement talk (PPT) will be arranged on the day of campus event where the participating company will address the attended students regarding their company and job details

- 6. The company will try to complete the whole process (online / written test, group discussion, technical and HR interview) as per their given schedule and will announce the result as soon as possible (preferably on the same day)
- 7. The organisation that is unable to finalise the result of selected student on the same day and wish to have one more round of interview at their office may do so with.

7. Placement Committee for Career Guidance (Placement, Higher Study and Entrepreneurship)

The Placement Committee was formed to monitor the activities of the Training & Placement Cell. Their functions are:

A. Functions

- > To enhance the employability of engineering students and to cater to the needs of the industry.
- To create a platform where the students can work towards accessing the skills required to get into industry.
- > To bridge the gap between industry and educational institutions.
- > To provide both technical and soft skill to people to facilitate their employability.
- To reinforce the students skills and acquire industry-specific knowledge from trained faculty and experts from industries
- > Counselling for higher studies and preparing for GATE
- > Motivation for Entrepreneurship and arrangement of workshop
- Encourage for PSU Jobs

Sl. No.	Constitution	Designation
01	Prof. Manoj Kumar Gupta	Chairman
02	Dr. Deepak Nagaria	O/C
03	Dr. (Ms.) Sheetal V Singh	PDT
04	One faculty member from each academic department	Coordinator
05	Students Member (Boys)	Counselor
06	Students Member (Girls)	Counselor

Training and Placement Cell

9.6 Entrepreneurship Cell (5)

E-Cell was established with the support of competent authority of the institute and with involvement of active and interested student and faculty members from each department, to run with strong spirit and innovative idea. It focuses on creating entrepreneurs from institute every year. Entrepreneurship is the buzz word in today's environment for start-ups. On an overall perspective, E-cell has conceptualized entrepreneurship in a scientifically proven way to assist students in transforming their ideas into ventures at an early stage of their educational career.

A. Objectives

- 1. To inculcate the entrepreneurial culture into student minds.
- 2. To prepare the platform for the students to take up the entrepreneurship as a career
- 3. To create environment for innovation, self-employment, incubation and Entrepreneurship development through formal and non-formal programs
- 4. To establish a platform for effective interactions among existing and budding entrepreneurs.
- 5. To promote employment opportunities
- 6. To act as an institutional mechanism for providing various services including information on all aspects of enterprise building to science and technology.

9.7 Co-curricular and Extra-curricular Activities (10)

The all-round development and proficiency of an individual (holistic development) is only possible through balanced development of scholastic as well as non-scholastic aspects in the formal, in-formal and non-formal educational setups in the society. Particularly, in the modern era where individuals have to pass through phases of undue anxiety and over-stress, that sometimes it leads to various types of depression and even loss of life. Here, the individual's involvement in the co-curricular activities becomes more significant because these activities stop various types of anxieties and stress of an individual. Today, the burdens of students in education i.e. marks, grades, divisions etc. are also becoming fatal for growth and life of individuals across all societies in the world. The co-curricular/extracurricular activities help the student to overcome the stress of students and allow the holistic development of individual. In order to attain the PEOs the following additional co-curricular activities are undertaken:

- Sports Activities: Athletics, Field and Track, In-door and Out-door games
- Cultural Activities: Music, singing and dancing, Dramatist and Play, Assembly, Debating and Speaking, Spic-Macay Programs
- Literary Activities: Literary Writing, School Publications (i. e. Magazine, Wall Bulletins etc.)
- Hobby Club: Modeling and simulation of Engineering Applications
- Photography and Fine Arts Activities: Amateur Photography, Sketch and Painting, Cartoonist and Creativity
- Social Trips/ Tours / Field Works / Social Events / Community Work / Spiritual Lecture Sessions
- Honors, Prizes and Awards

• Students Forum and Societies

Co-curricular Activities	Extra-curricular Activities
First Year Induction Program	Sports: Annual Sports Meet (Indoor/Outdoor)
Diagnostic Tests	Inter collegiate/University Sports/Cultural Events/IIT Kanpur
Activities under Students	Annual Cultural Meet: Instrumental Music, Skit & Play, Solo
Forum/Councils	and Group Singing/Dancing, Fashion Show, Kavi Sammelan
Students Seminar	Hobby Club
Soft Skill Training and Grooming	Fine Arts and Photography
Classes	
Spoken Tutorials	Literary
Personality Development Training	
Educational Tours	
Industrial Visit/Training	
GATE Ventures	

- > Cultural activities include debating, quizzing, music, photography etc., where students have excelled.
- Annual Days like Independence Day, Republic Day, as well as Teachers Day, Fresher's Welcome, Engineers' Day, Viswakarma Puja, Gandhi Jayati, Durga Puja, National Unity Day, Run for Unity, Education Day, Saraswati Puja, and Colour festival Holi etc. are observed.
- Classes on soft skills and grooming are regularly conducted by the in-house resources and also using external agencies.
- Departmental seminars are organized regularly by all core Departments for the students and the faculties as well.viz.
- Departmental Forums organizes intra college level events i.e. quiz competition, some indoor/outdoor games, students seminars, fests, cultural events, etc.
- For every co-curricular activity the Institute has separate council to monitor the students' co-curricular activities i.e. Sports Council, Cultural Council, Literary Council, Photography and Fine Arts Council, Council for hobby club. These all councils function throughout the whole academic year and assess the performance of the student and award cumulative 'General Proficiency' marks (50 marks), once in each semester.

10.1. Organization, Governance and Transparency (55)

10.1.1. State the Vision and Mission of the Institute (5)



Vision a Mission statements of the Institute were defined by involving the stakeholders.

- Analysis was conducted on basis of feedback forms by considering internal stakeholders including administrative and alumni.
- Armed with the information thus collected, the institutional faculty met number of times to develop and cultivate a strong and meaningful vision and mission. The mission was also finalised based on the following components.
 - Quality Education
 - Professional career
 - ➢ Higher Education
 - ➢ Innovation
 - ➤ Creativity
 - ➢ Life- long learning

Our dedication and commitment is to achieve sustainable and unmatched excellence in Technical Education. To this end, we are pursuing continuous development of infrastructure and enhance state-of-the art equipment to provide our students a technologically up-to-date and intellectually inspiring environment of learning, research, creativity, innovation and professional activity and inculcate in them ethical and moral values.

Vision of the Institution:

"To Transform The Institute as a Premier Centre for Imparting Technical Education to Produce Quality Professionals to Meet the Global Challenges and Societal Needs"
Mission of the Institution:

- I. To create an academic ambience leading to quality professionals.
- II. To design and implement the curriculum to meet the needs of the industry and society.
- *III.* To collaborate with premier academic institutions, research organizations and industry to enhance skills and employability

To provide an innovative, creative and environmentally-aware learning experience for those who seek technological education, Institute follows moral principles as stated below.

	Quality	Striving towards excellence through teamwork and sustained effort.
	Integrity	Behaving with the highest integrity and transparency in all aspects of
	Integrity	work.
	Landarshin	Instilling, in students the leadership qualities to motivate
Our	Leavership	and transform society.
Values	Innovation	Embracing and encouraging new knowledge, research
		and entrepreneurial approaches.
	Social Degrangibility	Understanding the physical, cultural and social environment in
	Social Responsibility	which we operate, respecting the right sand need so fall.
	Ethics	Upholding the highest ethical standards in all activities and
	Etilits	imparting those ideals to students and staff.

Sl. No.	Place of Dissemination	Meant For
1	Display Board at the entrance of department	Internal Stakeholder
2	Departmental Notice Board	Internal Stakeholder
3	Departmental Laboratories	Internal Stakeholder
4	Institute Website	Internal & External Stakeholder
5	Student – Teacher Committee Meeting	Internal Stakeholder
6	Faculty Development Program	Internal & External Stakeholder
7	Seminar	Internal Stakeholder
8	Workshop	Internal & External Stakeholder
9	Induction Program	Internal & External Stakeholder

With the continuous efforts, the focus is on developing

- The quality and ambience of campus life
- Meeting the requirements of affiliation and standards
- Identifying and meeting student learning expectations
- Strengthening Teaching Learning process
- Conducting International Conferences
- Introduction of performance Management
- Aligning Every Stakeholders to vision and mission.
- Create conducive environment of continuous learning and research.

10.1.2. Availability of the Institutional Strategic Plan and its Effective Implementation and Monitoring (25)

10.1.2.1Institutional Development Plan(2017-2030)

(A) Introduction of the Institute

Bundelkhand Institute of Engineering and Technology, Jhansi (Formerly Bundelkhand Engineering College, Jhansi) was established in the year 1986 with an objective to develop Bundelkhand region, basically a backward region of state of Uttar Pradesh, through growth of technical education and industrial research. Subsequently, basic infrastructural facilities, on an area encompassing about 240 acres of land, were developed. The institute was started initially with two branches, viz., Computer Science & Engineering and Electronics and Instrumentation Engineering, with an intake of 30 students in each.

The campus was gradually developed into a neat, clean and green campus adding two additional branches, Mechanical Engineering and Civil Engineering with an intake of 20 students each in 1990. Moving ahead on the path of progress, in 1997, Chemical Engineering with an intake of 30 students was started and in 2000 Information Technology with an intake of 40 students was added (under self-finance scheme). In the same year, the intake of Mechanical Engineering and Computer Science & Engineering were raised to 45 and 60 students respectively, and Electronics & Instrumentation Engineering was renamed as Electronics & Communication Engineering and intake was raised to 60. In 2006, the intake of Civil Engineering was increased to 45. From session 2007-08, a four-year B. Tech programme in Electrical Engineering (under SFS) with an intake of 60 students has been added to the existing six B. Tech programmes.

In addition to these undergraduate programmes from session 2005-06, two post graduate programmes in (i) Environmental Engineering and (ii) Construction Technology & Management in Civil Engineering Department and one in 2006 Manufacturing Science & Technology in Mechanical Engineering Department with intake of 18 students each, had been started. From the session 2006-07 a M. Tech. Programme in Digital Communication System in Electronics & Communication Engineering Department with intake of 20 students had also been added to the list of P.G. programmes being run by the institute. From session 2007-08, a two-year management programme leading to M.B.A. degree with an intake of 60 students has also been started. In this way the total intake of students in the institute including M. Tech. programmes is 528. It may be mentioned that all PG programmes are running under Self Finance Scheme (SFS).

(B) Details of existing programmes

S.	Title of programme	Level	Duratio	Year of	AICTE	Total
No		(UG/	n	starting	sanctione	students
		PG/	(Years)		d annual	strength in
		Ph.D.)			intake	all years of
						study
1	Chemical Engineering	U G	4	1996	30	112
2	Civil Engineering	U G	4	1990	45	194
3	Mechanical Engineering	U G	4	1990	45	193
4	Electrical Engineering	U G	4	2007	60	234
5	Electronics Engineering	U G	4	1989	60	232
6	Computer Science &	U G	4	1989	60	263
	Engineering					
7	Information Technology	U G	4	2001	40	151
8	Environmental Engineering	P G	2	2005	18	19
9	Construction Technology &	P G	2	2005	18	29
	Management					
10	Manufacturing Science &	P G	2	2005	18	20
	Technology					
11	Digital Signal System	P G	2	2006	20	24
12	MBA	P G	2	2007	60	95
13	Thermal Engineering	PG	2	2012	18	27
14	Bio Medical Engineering	PG	2	2014	18	7
15	Energy System	PG	2	2014	18	4

(C) <u>Details of financial status of last 05 years up to 31st March 2017</u>

Fina	(Rs	s.in lacs)			
S. No.	G.O. No.	Date	Head	Amount sanctioned	Amount spent
1.	1365/2011-Solah-1-9(Budget-1)/2011	08-04-2011	Salary and allowances	54.29	54.29
2.	1364/2011-Solah-1-9(Budget-1)/2011	08-04-2011	Other than salary and allowances	10.89	10.89
3.	3310/2011-Solah-1-9(Budget-1)/2011	01-09-2011	Salary and allowances	54.30	54.30
4.	3309/2011-Solah-1-9(Budget-1)/2011	01-09-2011	Other than salary and allowances	10.90	10.90
5.	2555/2011-Solah-1 (6)1//2009	06-07-2011	Extension of Vrindavan Hostel	45.00	45.00
	Total			175.38	175.38

Financial Year 2012-13 (Rs.in						
S.	G.O. No.	Date	Head	Amount	Amount spent	
No.				sanctioned		
1.	1621/2012-Solah-1-9(Budget-1)/2011	18-05-2012	Salary and allowances	40.91	40.91	
2.	1620/2012-Solah-1-9(Budget-1)/2011	13-05-2012	Other than salary and allowances	07.26	07.26	
3.	3009/2012-Solah-1-9(Budget-1)/2011	30-08-2012	Salary and allowances	81.84	81.84	
4.	3010/2012-Solah-1-9(Budget-1)/2011	30-08-2012	Other than salary and allowances	14.53	14.53	
5.	920/2012-Solah-1-9(Budget-1)/2011	31-03-2013	Remaining amount of Vrindavan hostel	78.02	78.02	
6.	919/2012-Solah-1-9(Budget-1)/2011	31-03-2013	Hostel for PG Students	86.67	86.67	
	Total			309.23	309.23	

Mech.Engg.Dept. B.I.E.T. Jhansi

Fina	ancial Year 2013-14			(R	s.in lacs)
S.	G.O. No.	Date	Head	Amount	Amount spent
No.				sanctioned	
1.	1050/2013-Solah-1-9-(Budget-1)/2011	18-04-2013	Salary and allowances	61.37	61.37
2.	1049(1)/Solah-1-2013-9-(Budget-1)/2011	18-04-2013	Other than salary and allowances	10.89	10.89
3.	2557/2013-Solah-1-9(Budget-1/)/2011	11-09-2013	Salary and allowances	61.38	61.38
4.	3065/Solah-1-2013-9(Budget-1)/2011	23-09-2013	Other than salary and allowances	10.90	10.90
	Total			144.54	144.54

Fina	ancial Year 2014-15		(Rs.in lacs)			
S. No.	G.O. No.	Date		Amount sanctioned	Amount spent	
1.	1141/2014-Solah-1-9-(Budget-1)/2011	07-04-2014	Salary and allowances	40.91	40-91	
2.	1140/2014-Solah-1-9-(Budget-1)/2011	07-04-2014	Other than salary and allowances	07.26	07.26	
3.	2446/2014-Solah-1-9-(Budget-1)/2011	14-08-2014	Salary and allowances	81.84	81.84	
4.	2863/2014-Solah-1-9-(Budget-1)/2011	19-09-2014	Other than salary and allowances	14.53	14.53	
5.	1302/Solah-1-2013-9(Budget-04)/2011	22-08-2014	Construction of Community Centre	90.00	90.00	
6.	2020/Solah-1-2014-09-(Budget-11)/2011 TC-01	09-09-2014	Hostel for PG student	79.10	79.10	
7.	2339/Solah-1-2014-09(Budget-10)/2008	14-11-2014	Construction of Kalpana Chawala Hostel	111.91	111.91	
8.	3589/2014-Solah-1-14(20)/2010	10-12-2014	Arrear to faculty six pay commission	228.97	228.97	
9.	630/Solah-1-2015-14(05)/2015	23-02-2015	Establishment of virtual class room	20.00	20.00	
10.	842/Solah-1-2015-5(Rit-82)/2012	26-03-2015	Payment of compensation to landowners with increased rate	181.38	181.38	
	Total			855.90	855.90	

Mech.Engg.Dept. B.I.E.T. Jhansi

<u>Fin</u> :	ancial Year 2015-16			(Rs	s.in lacs)
S. No.	G.O. No.	Date	Head	Amount sanctioned	Amount spent
1.	1160/2015-Solah-1-9-(Budget-1)/2011	13-04-2015	Salary and allowances	176.00	176.00
2.	1159/2015-Solah-1-9-(Budget-1)/2011	13-04-2015	Other than salary and allowances	10.90	10.90
3.	3100/Solah-1-2015-9(Budget-1)/2011	15-09-2015	Salary and allowances	176.00	176.00
4.	3554/Solah-1-2015-9(Budget-1)/2011	09-12-2015	Other than salary and allowances	10.89	10.89
5.	4078/Solah-1-2015-9(Budget-4)/2011	21-12-2015	Construction of underground water tank	55.00	55.00
6.	1365/Solah-1-2016-14-(05)/2015	30-03-2016	Establishment of virtual class room	27.78	27.78
7.	404/Solah-1-2016-09(Budget-11)/2011 TC	31-03-2016	Construction of 144 seated boys hostel	209.29	209.29
	Total			665.86	665.86

S. .	Particulars of work	Date	Amount sanctioned	Amount spent	Unspent amount
No.					
1.	Construction of Hostel for SC/ST students	31-03-2013	100.00	100.00	_
2.	Construction of Hostel for SC/ST students	30-01-2015	78.54	78.54	-
3.	Construction of Hostel for SC/ST students	06-03-2017	20.00	20.00	_
		Total	198.54	198.54	-

Grant received from AICTE New Delhi and expenditure against it. (Rs.in lacs)

Grant received from AKTU, Lucknow and expenditure against it.			(Rs.in lacs)			
S.	Particulars of work	Date	Amount sanctioned	Amount spent	Unspent amount	
No.				_	_	
1.	For construction and purchase work	31-11-2015	400.00	95.27	304.73	

Grant received from World Bank Project (TEQIP-II) and expenditure against it.			(Rs.in lacs)		
S.	Particulars of work	Date	Amount received	Amount spent	Unspent amount
No.					
1.	For Technical education quality improvement	29-08-2014	600.00	681.34	118.66
	program	31-03-2017	200.00		
		Total	800.00	681.34	118.66

(D) <u>Details of financial status of FY 2016-17 up to 31st March 2017</u>

Fina	<u>ancial Year 2016-17</u>	(Rs.in lacs)			
S. No.	G.O. No.	Date	Head	Amount sanctioned	Amount spent
•	1674/Solah-1-2016-9(Budget-1)/2011	29-04-2016	Salary and allowances	188.32	188.32
2.	2338/Solah-1-2016-9(Budget-1)/2011	10-06-2016	Other than salary and allowances	10.90	10.90
3.	3764/Solah-1-2016-9(Budget-1)/2011	23-09-2016	Salary and allowances	188.32	188.32
4.	4554/Solah-1-2016-9(Budget-1)/2011	23-11-2016	Other than salary and allowances	10.89	10.89
5.	3860/Solah-1-2016-9(Budget-4)/2011	28-09-2016	 04 houses of type-III Maintenance of roads Electric substation work 	33.35 45.15 53.42	33.35 45.15 53.42
6.	4619/Solah-1-2016-14-09(Budget-11)/2011 TC	21-12-2016	Construction of 144 seated boys hostel	646.31	646.31
7.	5107/Solah-1-2016-14 (-20)/2016	30-03-2016	For Wi-Fi facility	15.00	15.00
8.	1126/Solah-1-2017-9(Budget-4)/2011	30-12-2016	04 houses of type-IIIMaintenance of roadsElectric substation work	33.36 45.14 53.43	33.36 45.14 53.43
	Total			1323.59	1323.59

S.	Financial	Construction	Name of	Funding	Received	Expenditure	Outcome
110.	year	agency		Agency	(in lacs)		70
1.	2012-13	U.P.R.N.N. Ltd.	36 seated P.G. hostel (A.I.C.T.E grant)	A.I.C.T.E., New Delhi	193.03	193.03	100%
2.	2014-15	U.P.R.N.N. Ltd.	 Community Centre Dr. APJ Abdul Kalam Hostel (PG Hostel) Kalpna Chawala Girls Hostel 	UP Govt. UP Govt. UP Govt.	89.30 79.10 111.91	89.30 79.10 111.91	100% 100% 100%
3.	2015-16	PACFED	300 KL underground water tank	UP Govt.	55.00	55.00	100%
		U.P.R.N.N. Ltd.	Construction of ramp in academic buildings	Dr. A.P.J. Abdul Kalam Tech. Univ., Lko.	36.67	36.67	100%
		U.P.R.N.N. Ltd.	Renovation of toilets in Yashodhara Bhawan Hostel	Univ., Lko. Dr. A.P.J. Abdul Kalam Tech. Univ., Lko.	58.60	58.60	100%
4.	2016-17	U.P. Avas Vikas Parishad	144 seated hostel	UP Govt.	855.60	855.60	65%(work in progress)
		U.P.P.C.L.	Maintenance of roads	UP Govt.	90.29	90.29	90% (work in progress)
		U.P.P.C.L.	Construction of 4 Nos. type III residnces	UP Govt.	66.71	66.71	60% (work in progress)
		U.P.P.C.L.	Strengthening of Electrical Sub Station	UP Govt.	106.85	106.85	5% (Work in progress)

(E) <u>Expected outcomes of the construction schemes and their progress</u>

(F) No change is required in existing projects.

Proposed changes in the existing programmes upto2030

Sr. No.	Financial Year	Program	Intake (UG+PG)	Total Faculty Required as per AICTE	Existing Faculty	Additional Faculty Required	Additional Staff Required	Budget required in Rs. (Lacs)
1	2017-18	7UG+8PG	1360+376	91 + 32	50 + 0	40 + 32	35	1300.00
2	2018-20	03 New PG Program in (EE + CS + IT)	54	9	Nil	9	5	360.00
		Increase in B. Tech intake (ME+CE+CH+IT)	320	22	Nil	22	-	27.50
3	2020-24	04 New PG Program in (EE+ EC+ IT + CS)	72	12	Nil	12	6	216.00
4	2024-30	03 New PG Program in (2 IT + 1 ME)	54	9	Nil	9	5	360.00

(a). Faculty & Staff requirement

Sr. No.	Financial Year		Activities	
1	2017-18	Academic	Budget requirement for Faulty & Staff as per AICTE norms	1300.00
			NBA Accreditation of running UG & PG programs by AICTE New Delhi	30.00
		R & D	Establishment of Central instrumentation laboratory	50.00
		Construction/ Refurbishment/	 Renovations of kitchen and Brickova work of roofs in Saket Hostel 	42.93
		Infrastructure development	 Renovations of kitchen and Brickova work of roofs in Pachwati Hostel 	43.96
			Renovations of toilets in Pachwati Hostel	59.92
			Renovations of toilets in Saket Hostel	48.94
			Wooden Flooring for Basketball and Badminton court	43.68
			Equipments for Gymnasium	25.00
			Virtual Class room	100.00
			Wi-Fi Facility	20.00
			Ambulance Facility	12.00
		Society/Commur Development wo	 Adoption of a village Under Clean India Mission to educate society for cleanliness 	15.00
			• To organize courses 3-5 days courses under PMKVY	20.00
			Total	1811.43
2	2018-20	Academic	Implementation of Choice Based Credit System (CBCS)	2.00
			03 New PG Program in	360.00
			EE: Power System & Electric Drives	
			CS: Computer Sc. & Engineering	
			IT: Soft Computing	
		-	with an intake of 18 in each programme	27.50
			• ME: From 45 to 60	27.50
			 CE : From 45 to 60 	
			 CH : From 30 to 60 	
			 IT : From 40 to 60 	
			Strengthening of laboratories of all departments	400.00
			Transformation of the institute into State University	10000.00
		R&D	Strengthening of Central instrumentation laboratory	50.00
			Establishment of Innovation & Incubation Centre &	1000.00
			Industry Institute Interaction Cell (with infrastructure)	
		Construction/	Yoga & Meditation Centre	500.00
		Refurbishment/	 Central library cum training placement building 	895.28
		Infrastructure	Construction of Stadium	1287.53
		development	Construction of Auditorium	2384.77
		-	Construction of Lawn tennis and Basketball court	100.00
			Construction of cricket Playground	100.00
			Establishment of Solar Panel	150.00
		Society/Comme	Establishment of Innovation and Incubation Centre	1500.00
		Development wo	 Continuation of a cleanliness program of an adopted village Under Clean India Mission 	100.00

			• To organize courses 3-5 days courses under PMKVY	200.00
			Swachh Bharat Abhiyan	150.00
			Sugam Bharat Abhiyan	100.00
			Digital India	150.00
		Green Campus	Energy Audit and Promotion of low energy systems	200.00
			 Integrated Waste Management system for campus and Waste composting 	200.00
			 Wastewater Recycling system for campus horticulture 	100.00
			Plantation and Forestation	150.00
			Total	20107.08
3	2020-24	Academic	04 New PG Program in	216.00
•			With an intake of 18 in each programme	210.00
			• EE : Power Electronics	
			EC : Micro Electronics	
			 IT : Robotics & Intelligence System 	
			CS : Software Engineering	
			with an intake of 30 in each program	
			M.Sc. in Applied Physics	
			M.Sc. in Applied Chemistry	
			M.Sc. in Applied Mathematics	
		R&D	Establishment of Research centre for Drought Management	100.00
			Establishment of Research centre for Microwave	100.00
			Communication	
			Establishment of Research centre for Nano technology	100.00
		Construction/	Construction of lecture hall Complex (eight lecture hall)	1200.00
		Refurbishment/	Construction of Central Parking	500.00
		Infrastructure	Construction of swimming pool (International standard)	500.00
		development	Hospital (10 beds) along with all necessary equipment	500.00
			Faculty residences 72 Nos.	1300.00
			Staff quarters 48 Nos.	500.00
			Construction of MBA Department t.	1200.00
			Construction of Chemical Engineering Department	1200.00
			Construction of Electrical Engineering Department	1200.00
			Construction of Applied Science Department	1200.00
		Society/Commur	Continuation of a village Under Clean India Mission to	35.00
		Development wo	educate society for cleanliness	
			• To organize courses 3-5 days courses under PMKVY	
			Total	9851.00
4	2024-30	Academic	03 New PG Program in	360.00
			with an intake of 18 in each programme	
			IT : Software Quality Engineering	
			IT : Data Mining	
			ME : Nano Manufacturing	

	 5 Years integrated programs in Physics, Chemistry, Mathematics with an intake of 30 in each programme 	
R & D	Research centre for Nano manufacturing	100.00
Construction/ Refurbishment/ Infrastructure Development	Vice Chancellor Office/Dean Office Complex	2500.00
Society/Commun Development wo	Development of medicinal/aromatic plant park	5.00
	Total	2965.00
	Gross Total	34734.51

Sr.	Time Period	Proposed Amount (Bs. In	Duration	Generation of Fund from	Fund required from other
	renou	lacs)	(in year)	Present (Rs. In lacs)	
1	2017-18	Rs. 1811.43 + 925.00 (Salary) = 2736.43	1	Rs. 1100.00	Rs. 1100.00 lacs will be received by doubling the fee and rest amount Rs. 736.00 lacs will be required from Govt.
2	2018-20	Rs. 20107.08 + 1850.00 (Salary) = 21957.08	2	Rs. (1100.00x2 = 2200.00)	Rs. 2200.00 lacs will be received by doubling the fee and rest amount Rs. 19557.00 lacs will be required from Govt.
3	2020-24	Rs. 9851.00 + 4000.00 (Salary) = 13851.00	4	Rs. (1100.00x4 = 4400.00)	Rs. 4400.00 lacs will be received by doubling the fee & institute consultancy and rest amount Rs. 9451.00 lacs will be required from Govt.
4	2024-30	Rs. 2965.00 + 7000.00 (Salary) = 9965.00	6	Rs. (1100.00x6 = 6600.00)	Rs. 6600.00 lacs will be received by doubling the fee & consultancy and rest amount Rs. 3365.00 lacs will be required from Govt.

Financial requirement for new proposals

The required administrative and financial approval from the competent authority along with the availability of funds in a time bound manner shall facilitate the timely completion of the proposed projects. For this purpose appropriate decision within a limit of one month shall help in the implementation of the proposed plans.

Other financial sources

The major financial sources for generation of the required funds shall be:

1. Enhancement in fee structure of students

- 2. Internal resource generation through testing and consultancy projects
- 3. From various external agencies
- 4. Through Corporate Social Responsibility (CSR) from various industries/corporate houses.

10.1.3. Governing body, administrative setup, functions of various bodies, service rules, procedures, recruitment and promotional policies (10)



Board of Governors

Sl. No.	Constitution	Designation	Name
01	Eminent Academician/Industrialist to be nominated by Govt. of Uttar Pradesh	Chairman	Er. Rakesh Kumar Gupta
02	Principal Secretary/Secretary Technical Education, Government of Uttar Pradesh	Chairman	Mr. Bhuvnesh Kumar IAS
03	Secretary Finance or his/her nominee not below the rank of Joint Secretary	Member	Mr. Sanjeev Mittal IAS
04	Vice-Chancellor of the University to which the Institute is affiliated	Member	Prof. Vinay Kumar Pathak, VC, AKTU Kucknow
05	Director, Indian Institute of Technology, Kanpur	Member	Prof. Abhay Karandikar
06	Director, Indian Institute of Technology, Roorkee	Member	Prof. Ajit Kumar Chaturvedi
07	Director Uttar Pradesh Technical Education, Kanpur	Member	Mr. R. C. Rajpoot
08	A Nominee of the All India Council of Technical Education	Member	Prof. H. D. Charan, VC, RTU, Kota Rajshtan
09	One eminent technologist/engineer having specialization in the field advent to the institute to be nominated by the Board	Member	Er. P A Kharwadkar, MD, Karona Plus Industries, Kaushalpuri, Kanpur
10	Two Professors to be nominated by the board	Member.	(i) Prof, M K Gupta, APSH (ii) Prof. Anil Kumar CS/IT
11, 12. 13	Three eminent persons in the field of technical education to be nominated by the state Govt.	Member.	 (i) Prof. S G Deshmukh, Director, AVBIIITM Gwalior (MP) (ii) Prof. V K Yadav, Director, NIT Hamirpur (HP) (iii) Prof. Aqil Ahmad, COE, Integral University Lucknow (UP)
14	One eminent person from Industry nominated by the State Govt.	Member	Er. D. K. Dixit Executive Director, BHEL Jhansi

Sl. No.	Constitution	Designation	Name
15	One person from S.C. category nominated by the Chairman governing body from amongst reputed teachers/educationalist/industrialist	Member	Prof. D. B. Shakywar Principal Scientist, ICAR, Central Sheep & Wool Research Institute Avikanagar, Jaipur, Rajshtan- 304501
16	One person from O.B.C. category nominated by the Chairman governing body from amongst reputed teachers/educationalist/industrialist	Member	Prof. Gauri Shankar, Retd Prof. & HOD, HBTU Kanpur
17	Director, BIET Jhansi	Member/ Secretary	Prof. V. K. Tyagi

The meetings of Board of Governors normally held quarterly in an academic year. The true copy of the minutes of the meetings are sent to the members for comment. These are also up-loaded to the Institute web-site: <u>www.bietjhs.ac.in</u>.

Finance Committee

Sl. No.	Constitution	Designation	Name
01	Principal Secretary/Secretary Technical Education, Government of Uttar Pradesh	Chairman	Mr. Bhuvnesh Kumar IAS
02	Secretary Finance or his/her nominee not below the rank of Joint Secretary	Member	Mr. Sanjeev Mittal IAS
03	Director Technical Education (UP)	Member	Mr. R. C. Rajpoot
04	Two persons to be nominated by the Chairman BOG	Member	Er. G. P. Verma Chief General Manager, PTPP, Parichha, Jhansi
05	Director, BIET Jhansi	Member/ Secretary	Prof. V. K. Tyagi

Administrative Committee

Sl. No.	Constitution	Designation	Name
01	Principal Secretary/Secretary Technical Education, Government of Uttar Pradesh	Chairman	Mr. Bhuvnesh Kumar IAS
02	Director, BIET Jhansi	Vice- Chairman	Prof. V. K. Tyagi
03	Representative Finance not below the rank of Joint Secretary	Member	Mr. Sanjeev Mittal IAS
04	Director Technical Education (UP)	Member	Mr. R. C. Rajpoot
05	One other member of the BOG nominated by the Chairman	Member	
06	Registrar, BIET Jhansi	Member/ Secretary	Prof. N. P. Yadav (Officiating)

Building and Works Committee

Sl. No.	Constitution	Designation	Name
01	Director, BIET Jhansi	Chairman	Prof. V. K. Tyagi
02	Chief Engineer PWD of the zone	Member	Er. Sanjay Goel
03	General manager Construction Agency of the zone (UPRNN)	Member	Er. Kamla Shankar
04	One senior Engineer and one architect to be nominated by Chairman BOG	Member	Er. Anurag Gupta, AGM, BHEL Jhansi (UP) Prof. Jagbir Singh Amity University Lucknow (UP)
05	Registrar, BIET Jhansi	Member	Prof. N. P. Yadav (Officiating)
06	Head of Civil Engineering Department	Member/ Secretary	Prof. A. K. Nigam

Central Purchase Committee

Sl. No.	Constitution	Designation	Name
01	Director, BIET Jhansi	Chairman	Prof. V. K. Tyagi
02	Senior Member of Faculty nominated by BOG	Member	Prof A K Nigam
03	Head of Indenting Department	Member	Concerned HOD
04	One member nominated by Govt. of Uttar Pradesh	Member	Treasury Officer, Jhansi (Mr. Sachin Dixit)
05	Finance and Accounts Officer, BIET Jhansi	Member	Mr. S. K. Jain
06	Registrar, BIET Jhansi	Member	Prof. N. P. Yadav (Officiating)

Departmental Purchase Committee

Sl. No.	Constitution	Designation	Name
01	Head of Concerned Department	Chairman	
02	One Senior Member of Concerned Department nominated by HOD	Member	
03	One Faculty Member of the other Department of the Institute Nominated by the Director	Member	

Academic Committee

Sl. No.	Constitution	Designation	Name
01	Director, BIET Jhansi	Chairman	Prof. V. K. Tyagi
02	All HOD of Teaching Department	Members	
03	Dean Academic or in his absence Registrar	Member	Prof. Sanjay Agrawal

Director

- a) The Board with the approval of the state government shall appoint the Director, provided that the state government shall appoint the first Director.
- b) The Director shall be the Director Academic, and executive officer of the Institute and shall be responsible for the proper administration of the Institute and for imparting of instructions and maintenance of discipline therein and shall perform such other duties as may be delegated to him by the Board.

Head of Departments

The Head of Department shall be responsible for the entire working of the Department subject to the overall control of the Director.

Registrar

- a) The Registrar shall be whole-time officer of the Institute and be appointed by the Board on such terms and conditions as may be laid down in the bye-laws.
- b) He shall be the custodian of the records and funds of the Institute as the Board may assign to him.

SI. No.	Name	Designation	
01	Dr. MukeshShukla	Chief Proctor	
02	Dr. Mahendra Kumar	Proctor	
03	Dr. SumanYadav Assistant Proctor		
04	All the heads of the departments		
05	Prof. Anil Kumar Chief Warden		
06	All hostel Wardens.		

Proctor Board

Functions of Various Bodies

Statutory Body Functions:

- AICTE: Programme Approvals, Increase in Intakes, Faculty positions, Cadre Ratios and others
- > AKTU: Affiliation, Course Content, Degree Conferment
- **GOVERNMENT:** Admission permission, Reservation norms, Pay scales
- > SOCIAL WELFARE: Scholarship, Fee payments of Reservation category students

- **FEE FIXATION COMMITTEE:** Fixation of fees
- SOCIETY: Purchase/ Budget, Committee formation, Recruitment and approvals, Appraisals andawards, Financial Transactions, Promotions, Campus

FUNCTIONS OF KEY ADMINISTRATIVE POSITIONS:

The functions of various key positions are depicted in the Table below:

Establishment/Administration (Registrar)	 ✓ Maintaining Institute bye-laws, code of conduct, service rules, leave rules and its public notification ✓ Recruitments ✓ Maintaining service books and records of individual faculty and staffs, leaves and PF ✓ Convening BOG meetings , etc.
Finance and Accounts (F&AO)	 ✓ Proposing annual budget ✓ Budget Allocation under different heads ✓ Financial evaluation and recommendation of the proposals ✓ Tax assessment and deduction ✓ Assets management
Store and Purchase (Prof. I/c)	 ✓ Maintenance of stock register/inventory/indent book ✓ Execute the purchase process under the consultation of the HODs and the sectional in-charges. ✓ Tender process, award of work/purchase letter ✓ annual physical verification
Academic Affairs (Dean of Academic)	 ✓ Admission, enrollment, MIS ✓ Maintenance of Fee records, Students academic records/TR/degrees/transcripts/marks sheets ✓ Scholarship and other students welfare schemes
Examination Cell (Controller of Examination/Center Superintendent)	 Conduction of internal examinations Monitoring/conduction of end sem. examinations Evaluation and results Students feed back Collective attendance of students
Librarian	 Plan and execute modus-operandi of routine activity of the library Plan and propose expansion /development Maintain library discipline and culture Prepare annual budget for the library Annual physical verification

Training & Placement Officer	 ✓ Liaison with industry ✓ Student Training and Placement ✓ Identify and provide for training needs of students ✓ Arrange campus interviews ✓ Proposing annual T & P budget
Counseling Cell	 ✓ Facilitate career guidance to students ✓ Assist students suffering from psychological disorders ✓ Arrange for professional counselors ✓ Maintain record of counseling activities ✓ Student academic council ✓ Arrange remedial classes for weaker students
Maintenance (Chairman- Maintenance)	 ✓ Executing civil and electrical maintenances/house and campus up-keeping and landscaping ✓ Proposing annual maintenance budget ✓ Allocation and distribution of budgets into different maintenance heads ✓ Water and electricity supply and assessment/billing ✓ Maintaining Water harvesting system
Alumni Association	 ✓ Arrange periodic meetings of student council ✓ Ensure alumni registration ✓ Prepare alumni newsletter ✓ Proposing annual budget

10 (A) RECRUITMENT

• Recruitment of Teaching Staff/Librarian:

Appointment

- a. All appointment to any category of post in respect of teaching shall be made by Appointing Authority on the recommendation of the Selection Committee constituted by competent authority fulfilling the minimum AICTE norms wherever applicable.
- b. The Appointing Authority may from time to time appoint Guest/Part time/Contract/Adhoc faculty fulfilling AICTE norms.

Procedure for recruitment

For initiating the process of recruitment, Institute will normally advertise the posts in leading newspaper, mentioning qualification, experience & age required for the posts. However, the requisite qualification & experience of the faculty shall be as per the guide line of AICTE, shall be followed.

Probation

Unless otherwise specified or decided by the Appointing Authority all Appointments against permanent posts will normally be on probation for a period of one year.

The period of probation may be extended in individual cases if considered necessary by the Appointing Authority. Each extension of probationary period, where considered desirable, shall be for six months and not more than two extensions shall be allowed where after probation and service of the employee would stand dispensed with.

Confirmation

- i. On satisfactory completion of probation, an employee shall be considered for confirmation. He/she will not be confirmed unless a letter of confirmation, specifying the date of confirmation, has been issued to him/her by the Appointing Authority.
- ii. For confirmation of service the Reporting Authority should give his/her performance report and recommend to the Appointing Authority with justification/appraisal for confirmation.

Appraisal

- i. The Faculty up-gradation shall be considered strictly as per AICTE norms. Promotion in respect of member of faculty would be as per the guidelines of career advancement scheme (CAS) formulated by AICTE.
- ii. Assured carrier progress (ACP) of other categories of staff, are decidedafter recommendations made by duly constituted committee and approved by the competent authority.

Superannuation/Retirement

- i. All employees would superannuate as per AICTE/Institute norms and the retirement benefits on superannuation will be as per terms of the Institute.
- ii. The date on which an employee attains the age of compulsory retirement shall mean the last date of the month in which he/she attains the age / 62 years for teaching faculty and 60 years for non-teaching staffs.

Termination of Service

i. The Institute reserves the right to terminate the service of an employee by giving due notice in writing without assigning any reason whatsoever or by paying one month's salary for temporary or by paying three month's salary including all allowances for the equivalent period in lieu thereof as agreed upon on case to case basis.

- ii. The Institute shall have the right to dismiss an employee summarily without any compensation whatsoever if the employee is found guilty of breach of trust, insobriety, addiction to drugs or alcoholism, dishonesty, neglect of duty, moral turpitude, erosion of conduct, plural marriage, loss of mental balance which are considered detrimental to the Institute/Office/Trust.
- iii. An employee also reserves the right to resign from the services of the Institute/Office by giving the Institute one month's notice in case of probationers and temporary service holders and three months' notice in case of confirmed employees, as applicable in writing or by paying equivalent salary including allowances in lieu thereof. Faculty members and members of technical staff are normally not allowed to leave the services of the Institute during continuance of the semester. Legal steps may be taken in case an employee leaves without notice.

Recruitment of Non-Teaching Staff

Institute will normally advertise the posts in leading newspaper, mentioning qualification, experience & age required for the posts. Local Selection Committee of the Institute comprising of the Director, the head of the department and one or two experts in the subject concerned. The staff will be put on probation for two years, on satisfactory completion of temporary service period of one year.

B. SERVICE BOOK

A service book shall be maintained by the Registrar or any other officer duly authorized by the Director for the staff of the Institution and shall contain such information regarding date of birth, date of appointment, qualifications, scale of pay, increments, probation, particulars of leave and such other information as the Competent Authority may prescribe. The entries in the service book shall be brought to the notice of the teacher concerned after the end of the year and his/her signature obtained.

C. PAY SCALE

- a) An Employee shall begin to draw the pay and allowance attached to a post to which he/she has been appointed with effect from the date he/she assumes the duties of that post and shall cease to draw the same when he/she ceases to discharge these duties.
- b) Pay scale for the faculty will be as per AICTE norms.
- c) For officers and others staff, the norms as approved by the Competent Authority will be followed.
- d) Unless otherwise specified in the appointment letter, on first appointment to a post, the pay shall be fixed at the minimum of the scale attached to that post.

e) The increments are given annually after confirmation according to scale of pay in which he/she is confirmed subject to his/her satisfactory performance with the approval of Appointing Authority.

Incentives for higher qualification	AICTE norms will be followed.
<u>Career Advancement</u> –	AICTE norms will be followed.

D. BENEFITS TO THE STAFF

i) Provident Fund

- a) G. P.F. /NPS is applicable to all staff members @10% on wages.
- b) Newly recruited staff shall submit the Form No.11 duly filled in to administration office along with the required KYC documents mentioned in the form, immediately after joining the Institute.
- c) Each Staff shall submit the nomination form for G.P.F. along with necessary documents mentioned in it

ii) Gratuity:

Gratuity shall be applicable to the staff who have completed minimum five years of continuous service

iii) Dearness Allowances, House Rent Allowances and Medical Allowances.

Employees shall be entitled to the Dearness Allowance, House Rent Allowance and Medical Allowance as per the policy of the Institute.

iv) Travelling allowances

This shall be decided from time to time by the Competent Authority.

v) Income Tax

Institute will deduct Income Tax from the salary at source of the employee as per the provision of the IT Act 1961. A salary certificate to this effect will be issued to the employee by end of April each year.

(E) LEAVE RULES

CATEGORIES OF LEAVE

- i. Casual Leave,
- ii. Compensatory Casual Leave
- iii. Medical Leave
- iv. Earned Leave

- v. Maternity Leave
- vi. Study Leave

(F) DISCIPLINARY ACTION AND PROCESS FOR IMPOSING PENALTIES

As per Institute norms laid in the bye-laws, service rule and code of conduct.

10.1.4. Decentralization in working and grievance redressal mechanism (5)

GRIEVANCE REDRESSAL PROCEDURE

(i) A women's Grievance Redressal Cell is functioning separately for taking up issues related to the woman independently.

SI. No.	Name	Designation
01	Dr. Mukesh Shukla	Chairman
02	Dr. (Mrs.) Shahnaz Ayub	Member
03	Dr. SumanYadav	Member

(ii) The students can complain in writing to the concerned departments/sections. The objectives and duties & responsibilities of the departments/sections shall have the following approaches as per Institute's norms for disposal of complains.

Objective

The approach of grievance resolution emphasizes:

- Fairness and impartiality
- The handling of grievances informally where possible
- The principles of natural justice and procedural fairness
- Effective, reciprocal communication and feedback
- Resolution of grievances as early as possible and as close as possible to the source of dissatisfaction

Duties & Responsibilities

- 1. To develop a responsive and accountable attitude among all the students in order to maintain a harmonious educational atmosphere in the Institute.
- 2. Grievances received in writing from the students about any of the following matters:-

- <u>Academic</u> Matters: Related to timely issue of duplicate Mark-sheets, Transfer Certificates, Conduct Certificates or other examination related matters.
- b. <u>Financial Matters:</u> Related to dues and payments for various items from library, hostels etc.
- c. Complaints, of alleged discrimination of students, from the Scheduled Castes, the Scheduled Tribes, Other Backward Classes, Women, Minority or Disabled categories;
- 3. Any other related work assigned by the Director

Proctor Board/Anti Ragging Committee

SI. No.	Name	Designation	
01	Dr. Mukesh Shukla Chief Proctor		
02	Dr. Mahendra Kumar Proctor		
03	Dr. SumanYadav Assistant Proctor		
04	All the heads of the departments		
05	Prof. Anil Kumar Chief Warden		
06	All hostel Wardens.		

10.1.5. Delegation of financial powers (5)

All departmental funding proposals and approvals are coordinated by the accounts department of the Institute.

Any requirement of any department/sections is addressed by its HOD/sectional in-charges in consultation with the Director. Each departmental head has been allocated with an amount of Rs. 2500/- for running the expenses of the department.

10.1.6. Transparency and availability of correct/unambiguous information in public domain (5)

The institution maintains transparency in all its operation and working. Information such as Internal marks scored by students, Shortage of attendance, if any, Availability of scholarships, Opportunities for students, etc, are promptly displayed on Notice Boards.

All the information essential for the stakeholders is made available in the institution's website: <u>www.beitjhs.ac.in</u>.

10.2. Budget Allocation, Utilization, and Public Accounting at Institute level (15)

Total Income at Institute level: For CFY, CFYm1, CFYm2 & CFYm3

CFY: Current Financial Year – CFYm1 (Current Financial Year minus 1), CFYm2 (Current Financial Year minus 2), CFYm3 (Current Financial Year minus 3)

Tota	al Income (2017-18)	e in CFY:)		Actual expenditure in CFY		Total No. of students in CFY:	
Fee	Govt.	Grant(s)	Other Sources (specify)	Recurring including Salaries	Non- recurring	Special Projects/Any other, specify	Expenditure per student
1105.78	178.03	513.55	1772.45	732.50	42.40	106.69	51858.00

Table B.10.2a For CFY

Items	Budgeted in CFY	Actual expenses in CFY	Budgeted in CFYm1	Actual Expenses in CFYm1	Budgeted in CFYm2	Actual Expenses in CFYm2	Budgeted in CFY <i>m</i> 3	Actual Expenses in CFY <i>m</i> 3
Infrastructure Built-Up	685.01	685.01	930.16	918.51	664.29	150.27	560.93	540.92
Library	36.71	04.19	3.00	2.62	6.00	2.45	03.00	01.76
Laboratory equipment	20.00	04.86	35.00	32.75	43.78	31.53	16.00	10.44
Laboratory consumables	6.00	3.27	05.00	4.90	07.00	3.61	06.00	03.82
Teaching and non-teaching staff salary	1190.00	1096.87	1075.00	925.96	1015.	869.40	1058.97	1030.49
Maintenance and spares	70.00	42.46	88.00	42.58	52.00	50.40	39.00	39.00
R&D	06.00	0.15	02.00	0.10	1.00	0.33	01.00	0.17
Training and Travel	08.00	3.64	08.00	3.29	8.00	3.12	07.00	5.02
Miscellaneous								
expenses *	1158.70	422.24	296.60	246.76	277.35	250.79	231.35	230.00
Otners,	10.00	22.00	10.00	24.62	20.00	27.75		
specify Total	40.00	32.96	40.00	34.62	30.00	27.75	30.00	20.35
10181	3220.42	2295.65	2482.76	2212.09	2104.42	1389.65	1955.25	1881.97

Note: Similar tables are to be prepared for CFYm1, CFYm2 & CFYm3.

* Items to be mentioned.

10.2.1. Adequacy of budget allocation (10)

Budget requirements under 'recurring' and 'non-recurring' heads are collected from all the departments and units before the commencement of the financial year. Allocations are made as per the availability of funds. Spending is monitored by the accounts section. Supplementary allocations are made in special cases, if needed. The institution carefully monitors the expenses such that the necessities are met without affecting the smooth working of the institution. The management has been very efficiently and effectively doing this over the past several years that the institution ever had any serious budget crunch that affected the normal functioning of the institution

10.2.2. Utilization of allocated funds (20)

All the Heads of the departments are intimated of the extent of funds allocated against their budget proposals. Major works like construction, up gradation of existing infrastructure, procurement and maintenance of common utilities, house-keeping, procurement of furniture, etc., are controlled by the Director with the consultation of the central purchase committee and the departmental purchase committee.

10.2.3. Availability of the audited statements on the institute's website (5)

As of now, the audited statements of accounts of the institution are not made available on the institution's website. However, this can be done with the permission of the Governing Body.

10.3. Program Specific Budget Allocation, Utilization (30)

Total Budget at program level: For CFY, CFY*m1*, CFY*m2*& CFY*m3* CFY: Current Financial Year – CFY*m1* (Current Financial Year minus 1) CFY*m2* (Current Financial Year minus 2) CFY*m3* (Current Financial Year minus 3)

Total Budge	t in CFY:	Actual expendence	nditure in Y	Total No. of students in CFY:
Non recurring	Recurring	Non Recurring	Recurring	Expenditure per student
				Total
			6050+10848+	Expenditure
		2,27,400	148,693	3,92,991/-
		2,27,400	1,65,591	1,881/-

Table B.10.3a
For CFY

Total Budget in CFY:		Actual expenditure in CFY		Total No. of students in CFY:
Non recurring	Recurring	Non Recurring	Recurring	Expenditure per student
			15,114+17,940+	Total
			13,673+115,427+	Expenditure
		61,26,435	47,599	64,36,208/-
		61,26,435	209,773	33,349/-

Total Budget	in CFYm2:	Actual exper CFYr	nditure in n2	Total No. of students in CFYm2:
Non recurring	Recurring	Non Recurring	Recurring	Expenditure per student
		6028300	2500+120+2500 +5250+11206+5 000+3500+1050 0+18194+14043 +35258	Total Expenditure 61,36,371
		60,28,300	1,08,071	31,961/-

Items	Budgeted in CFY	Actual expenses in CFY (till)	Budget ed in CFYm1	Actual Expenses in CFY <i>m</i> 1	Budgeted in CFY <i>m</i> 2	Actual Expenses in CFY <i>m</i> 2	Budgeted in CFY <i>m</i> 3	Actual Expenses in CFY <i>m</i> 3
Laboratory equipment		2,27,400		61,26,435		60,28,300		
Software								
Laboratory consumable				15,114+17,940		2500+120+ 2500+5250+ 11,206		
Maintenance and spares		6050				5000+3,500+ 10,500		
R & D				115,427		14,043		
Training and Travel		1,48,693		47,599		35,258		
Miscellaneous expenses *		10,848		13,673		18,194		
Total		3,92,991/-		64,36,208/-		61,36,371		

Note: Similar tables are to be prepared for CFYm1, CFYm2 & CFYm3.

Table B.10.3b

10.4. Library and Internet (20)

10.4.1. Quality of learning resources (hard/soft) (10)

Relevance of availability learning resources including e-resources

With the growing popularity of e-resources, the traditional libraries are gradually migrating from print documents to e-resources where providing access to information is considered more important than owning it. Therefore institute has subscribed / implemented following learning and e-learning resources.

Learning Resources	Number
Books	35,000
e-Journals/e-Books	14,000
List of print journals/Magazine	86
List of Newspapers	08
Dissertations/Thesis	20
CD/DVD	4,000

B.I.E.T. Central Library is member of following international organisation. Anyone in the campus can freely access the following link using LAN or library internet facility.

- IEEE <u>http://ieeexplore.ieee.org/</u> (For Electronics and Computer Science)
- ASME Mechanical Engineering
 <u>http://asmedigitalcollection.asme.org</u>

- ASCE Civil Engineering <u>http://ascelibrary.org/</u>
- McGraw Hill General Engineering and Reference Books & Journals
 <u>http://accessengineeringlibrary.com/</u>
- J-Gate Engineering & Technology & Management Science <u>http://www.jgateplus.com/jgateadmin/</u>
- Springer Computer Science & Electrical & Electronics Engineering <u>http://link.springer.com/</u>
- ASTM Digital LibraryEngineering Subject <u>http://enterprise.astm.org/</u>
- Emerald Management first database http://www.emeraldinsight.com/products/collections/afe.htm
- Elsevier Engineering +Computer Science <u>http://www.sciencedirect.com/</u>
- Tata McGraw hill E-Text Book :- (Physics-11,Chemistry-18, Math.-20, CS & IT-68, EC &EE-74, CE-29, ME-31, CH-23, MBA-32 Total E-books =306) http://mcgrawhilleducation.pdn.ipublishcentral.com/

In addition to above learning and e-learning resources, following e-resources are also available, which can assessed by students on institute's LAN and smart class rooms.

- National Programme on Technology Enhanced Learning (NPTEL)
- Swayam Portal
- Other MOOC resources (eg. Edx United States / Udacity / United States etc)

Accessibility to Students

Library Services

Carpet Area of Library (m ²)	170
Reading space (in m2)	80
Number of seats in reading space	60
Number of Library Staff	8
Timings: During working day, weekend, and	9:00A.M. to 5:00 P.M. all week days and
vacation	except Sundays

E-Resources

- E-Resources are assessed by all students and faculty through Campus Wide Network (CWN)
- Computer laboratory of departments and Computer centre of institute can be assessed for eresources portal
- Swayam Channel and other Channels are assessed through smart class rooms.

Support to Students for Self Learning activities

- Laboratories and Library is made available beyond working hours to help the students in self-learning.
- The campus is fully residential which enables learning beyond working hours with formal and Informal interaction with faculty and peer groups.

- Students are encouraged to involve themselves in various co-curricular and extra-curricular activities at Institute and Department level activities.
- Many eminent personalities are invited to interact with students on many occasions to help students learn recent trends in engineering, technology.
- This apart, students are also endowed with various resource materials by the teachers for their self-development and they are also encouraged by them to participate in various competitions of technical innovations for which again they have to participate in innovative thinking and experimentations.
- The Tech-Fest organized by the institute also serves to create opportunities for students' selfdevelopment based on extra-syllabus technological knowhow.
- The Department of Humanities regularly organizes Soft Skill classes for various departments, based on availability and requirement, to enhance the students' communication skills, grooming and body language to equip them for the professional world.

10.4.2. Internet (10)

- Name of the Internet provider: (i)BSNL through NMICTE, (ii) NKN and (iii) Relience Jio
- 2. Available bandwidth: (i) 40 Mbps (ii) 1 Gbps (iii) 1Gb data per user per month
- 3. Wi Fi availability: Around academic and hostel areas through NKN and Relience Jio
- 4. Internet access in labs, classrooms, library and offices of all Departments: Available
- 5. Security arrangements: Fire Wall an ISO support certification, ICSA lab certified, EAL4+ certified, residing on flash, Complying FCC and CE norms, matching the essential securities features/criterion.

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.

VILLY

Date: 28/01/19 Place: Jhansi

Signature & Name

Head of the Institution with seal Director Bundelkhand luminute of Engineering & Technology J H A N S I

28/01/19

2015 29.1

HEAD Deptt. of Mechanical Enge. B.LE.T., JHANSI

Prof. Abhai Kumar Vares Co-ordinator N.B.A. Accreditat B.I.E.T., JHANSI (U.

ANNEXURE I

(A) PROGRAM OUTCOMES

Engineering Graduates will be able to:

PO1 Engineering knowledge:

Apply knowledge of mathematics, science and engineering to analyze, design and evaluate mechanical components & systems using state -of-the-art IT tools.

PO2 Problem analysis:

Analyze problems of mechanical engineering including thermal, manufacturing and industrial systems to formulate design requirements.

PO3Design/development of solutions:

Design, implement, and evaluate mechanical systems and processes considering public health, safety, cultural, societal and environmental issues.

PO4 Conduct investigations of complex problems:

Design and conduct experiments using domain knowledge and analyze data to arrive at valid conclusions.

PO5 Modern tool usage:

Apply current techniques, skills, knowledge and computer based methods & tools to develop mechanical systems, understanding of the limitations.

PO6 The engineer and society:

Analyze the local and global impact of modern technologies on individual organizations, society and culture and professional engineering practice.

PO7 Environment and sustainability:

Apply knowledge of contemporary issues to investigate and solve problems with a concern for sustainability and eco friendly environment.

PO8 Ethics:

Apply ethical principles and commit to professional ethics and legal responsibilities and social norms of the engineering practice.

PO9 Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 Communication:

Communicate effectively in diverse groups and exhibit leadership qualities, to comprehend and write effective reports. **PO11 Project management and finance**:

Apply management principles to manage projects in multidisciplinary environment.

PO12 Life-long learning:

Pursue life-long learning as a means to enhance knowledge and skill.

PSO1: To empower the students to apply practical skills, knowledge in major streams such as design, thermal, manufacturing and industrial engineering

PSO2: To enable the student to take up career in industries or to pursue higher studies in mechanical and interdisciplinary programs with regard for ethics, environment and society.