

**PART B: Program Level Criteria**

<b>CRITERION 1</b>	<b><i>Vision, Mission and Program Educational Objectives</i></b>	<b>50/50</b>
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**1.1 State the Vision and Mission of the Department and Institute (5)**

**INSTITUTE**

**About NIT Srinagar**

National Institute of Technology Srinagar (Formerly REC Srinagar) is one of the thirty NITs in the Northern Regions of the country, established in 1960 as Regional Engineering College sponsored by the Govt. of India during the 2nd Plan. The Institute acquired the status of National Institute of Technology with deemed to be University status during August, 2003 and attained full autonomy in its Academics.

The Institute is situated at the banks of world-famous Dal Lake, with the far-famed Hazratbal Shrine on other side of the campus. NIT Srinagar is a residential Institute with accommodation facility in Hostels and Staff-Quarters. There are eight Boys and two Girls hostel which have a capacity of about 1820 boys and 228 girls. Besides running the B.Tech Programme the Institute also offers M.Tech programme in many streams. In additions to that a large number of students are registered for M.Phil and Ph.D Programmes in different disciplines.

Facilities and amenities are available at the institution such as NSS, Bank, Shopping Complex, Recreational Centre, Dispensary with Ambulance, Guest House, Students Activity Centre, Gymnasium, Internet Centre, Fax Services, Generator, Bus Facility. The Institution has an Industry Interaction cell which was established in 1989 with the aim to remain at the fore-front on the Scientific and Technological development and to share its experience with industries in utilizing. Man-power and other resources are available at the institute effectively with the assistance of the participating industries. The Institute has one of the best technical libraries in J&K State. It has a collection of over 60,000 books on Engineering Science and humanities and about 6,000 bound volumes/Journals, both foreign and Indian. It has on line repository of A.S.C.E, A.S.M.E.A.E.L, J.C.C.C etc in addition to journals through I.N.S.E.S, COMSORTIEM. It also has a collection of I.S.I codes, in the form of soft copy.

**VISION OF THE INSTITUTE**

To establish a unique identity of a pioneer technical Institute by developing a high quality technical manpower and technological resources that aim at economic and social development of the nation as a whole and the region in particular keeping in view the global challenges.

**MISSION STATEMENT OF THE INSTITUTE**

- M1.** To create a strong and transformative technical educational environment in which fresh ideas, moral principles, research and excellence nurture with international standards.
- M2.** To prepare technically educated and broadly talented engineers, future innovators and entrepreneurs, graduates with understanding of the needs and problems of the industry, the society, the state and the nation.
- M3.** To inculcate the highest degree of confidence, professionalism, academic excellence and engineering ethics in budding engineers.

**QUALITY POLICY OF THE INSTITUTE**

NIT Srinagar shall strive to impart knowledge, hone skills and nurture creativity for all stakeholders.

**DEPARTMENT**

**About Mechanical Engineering Department**

The Department of Mechanical Engineering offers a unique opportunity in terms providing first-class pedagogy and world class facilities for conducting cutting-edge research. Being one of the oldest departments of NIT Srinagar, the department has evolved into one of the finest in terms of teaching curriculum and methodology supported by a well-organised and adequately funded research program. We have a very well-established B. Tech program complemented by two M. Tech programs in Mechanical System Design and Industrial Tribology and Maintenance Management. The masters’ students are admitted on the basis of a valid GATE score, and some additional seats are reserved for meritorious sponsored candidates. The Research Scholars (PhD) are admitted to the department every year on the basis of a rigorous examination conducted by the department. Our curriculum is designed to

cater to the needs and aspirations of the industry, and our top class faculty ensures that the students acquire the necessary technical and decision making skills to be the leaders in the dynamic world of industry.

Our department is, perhaps, the most versatile in terms of the range of specializations of its faculty members. We have faculty members who specialize in Haptics and MEMS on one end to High-temperature Tribology, Manufacturing Strategies and Quality Control on the other. The traditional areas of Mechanical Engineering such as Machine Design, Fluid Mechanics and Thermal Sciences are also well-represented. The department has a very strong group working in the area of Friction, Lubrication and Wear, with state-of-the-art research facilities and equipment. Our academic curriculum has improved considerably with the passage of time. Regular Board of Studies meetings are conducted to remove any inadvertent deficiencies. Periodic feedback is taken from the students to improve the quality of the education imparted. Feedback is also taken from the visiting companies during the placement season to orient the curriculum towards the needs of the Industry. Specialized courses are floated to cater to the needs of the PhD scholars, preparing them for subsequent research. We strive to produce engineering graduates of high quality who are team players, accountable, resourceful and above all, technically competent.

**VISION OF THE DEPARTMENT**

To nurture Mechanical Engineers with a passion for professional excellence, who are ready to take on global challenges and serve the society with high human values.

**MISSION STATEMENT OF THE DEPARTMENT**

- M1.** To provide facilities and infrastructure for academic excellence in the field of Mechanical Engineering.
- M2.** To inculcate in the students a passion for understanding professionalism, ethics, safety, and sustainability, and enable them to contribute to the society.
- M3.** To nurture creativity of the students and encourage them to come up with innovative solutions to real life problems.
- M4.** To prepare the student for lifelong learning with global perspective.

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

(State the PEOs (3 to 5) of program seeking accreditation

**PROGRAM EDUCATIONAL OBJECTIVES**

**PEO1:** To prepare students to get employment and pursue research in Mechanical Engineering and allied fields.

**PEO2:** To train students to identify and analyze Mechanical Engineering problems using an iterative approach that involves defining, quantifying, testing and review of the identified challenges.

**PEO3:** To enable students to plan, organize, schedule, execute and communicate effectively as an individual, as a team member, or as a leader in a multidisciplinary environment.

**PEO4:** To provide the students an academic environment that makes them appreciate excellence in the field of Mechanical Engineering and empowers them to understand the significance of lifelong learning.

**1.2.1 Program Specific Outcome (PSOs)**

**PSO 1.** Apply the knowledge of basic sciences, mathematics and Mechanical Engineering to real life problems.

**PSO 2.** Inculcate the advance level skills in academic and research pursuits relevant to Mechanical Engineering and other interdisciplinary streams.

**PSO 3.** Ability to integrate major Mechanical Engineering streams with innovative and entrepreneurial activities ensuring high standards of professional ethics.

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

Locations where the Vision, Mission, PEOs and PSOs are published:

Sr. No.	Location	Institute		Department			
		Vision	Mission	Vision	Mission	PEO	PSO
1.	Institute Website	✓	✓	✓	✓	✓	✓
2.	Department News Letter & Notice Board	✓	✓	✓	✓	✓	✓
3.	Course file	✓	✓	✓	✓	✓	✓
4.	Lab manual	✓	✓	✓	✓	✓	✓
5.	Conference workshop/Brochures	✓	✓	✓	✓		

Locations where the Vision, Mission, PEOs and PSOs are disseminated:

Sr. No.	Location	Institute		Department			
		Vision	Mission	Vision	Mission	PEO	PSO
1.	Mechanical Department Office	✓	✓	✓	✓	✓	✓
2.	HOD room	✓	✓	✓	✓	✓	✓
3.	Class rooms	✓	✓	✓	✓	✓	✓
4.	Laboratories	✓	✓	✓	✓	✓	✓
5.	Department Notice Board	✓	✓	✓	✓		
6.	Seminar Hall	✓	✓	✓	✓	✓	✓
7.	Committee Room	✓	✓	✓	✓	✓	✓
8.	Corridor	✓	✓	✓	✓	✓	✓

Apart from this, Vision, Mission and PEOs and PSOs are disseminated to all the stakeholders of the programs through faculty meetings, student awareness workshops, student induction programs, placement and training activities and parent-teachers meetings at regular intervals.

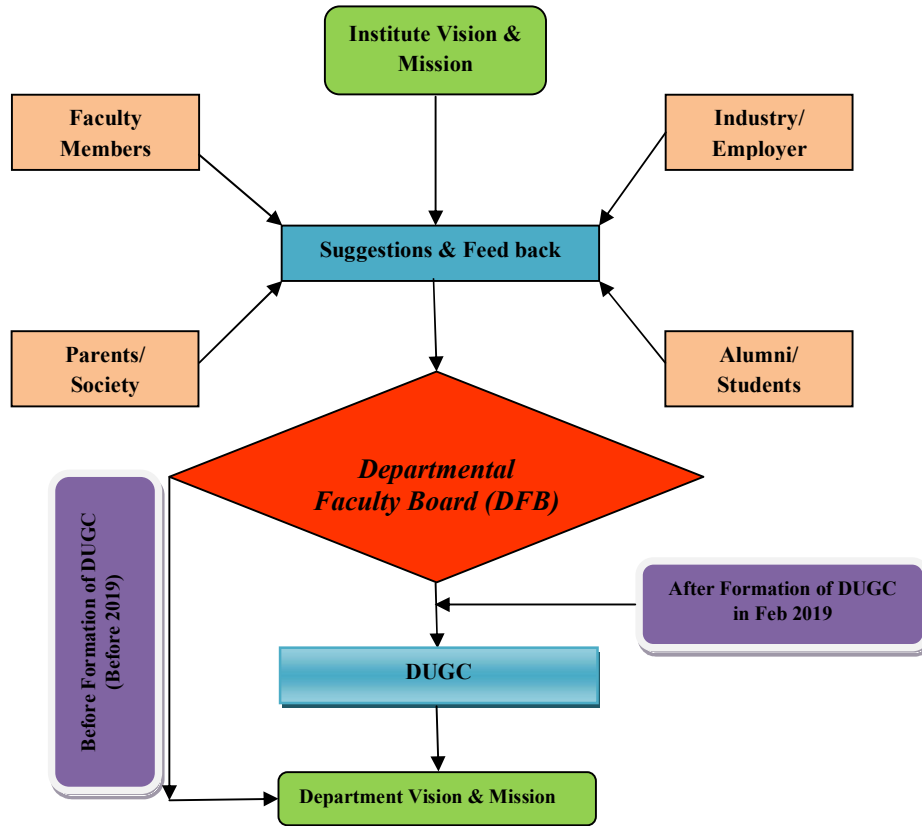
**1.4 State the process for defining the Vision and Mission of the Department, and PEOs of the program (15)**

(Articulate the process involved in defining the Vision and Mission and PEOs of the Department)

The Department established the Vision and Mission through a consultative process involving the stakeholders of the Department, the future scope of the Department and the societal requirements as shown in figure 1.1. In establishing the Vision and Mission of the Department the following steps were followed.

<b>Step 1:</b>	The Vision and Mission statements were first proposed by the committee setup by the department under chairmanship of Head of the Department.
<b>Step 2:</b>	Proposed Vision and Mission Statements have been circulated among the faculty members of the Departments and the stake holders.
<b>Step 3:</b>	Deliberations were held on the suggestions/feedback regarding new draft of Vision and Mission statements involved all the faculty members of the Department. The Vision and Mission Statements were modified as per feedback received.
<b>Step 4:</b>	Discussion with external members (Two Professors from academia) in light of

	Steps 1-3.
<b>Step 5:</b>	Vision and Mission statements were finalized.
<b>Step 6:</b>	Departmental Faculty Board (DFB) approved the Vision and Mission Statements under the chairmanship of Head of the department.
<b>Step 7:</b>	Approved by Chairman Senate.



**Figure 1.1: Process of Establishing Vision and Mission of the Department**

**Process for defining the PEOs of the Department**

For defining the Program Educational Objectives (PEO) of the Mechanical Engineering Department, the following steps were followed. (Figure 1.2)

<b>Step 1:</b>	The Program Educational Objectives (PEO’s) of the department were first outlined by the committee setup by the Head of the Department.
<b>Step 2:</b>	Proposed Program Educational Objectives (PEO’s) have been circulated among the faculty members of the Department and the stake holders.

<b>Step 3:</b>	Deliberations were held on the suggestions/feedback regarding new draft of Vision and Mission Statements and Program Educational Objectives by all the faculty members of the department. The Vision and Mission Statements and Program Educational Objectives were modified as per suggestions/feedback.
<b>Step 4:</b>	Discussion with external members (Two Professors from academia) in light of Steps 1-3.
<b>Step 5:</b>	Program Educational Objectives were finalized.
<b>Step 6:</b>	Departmental Faculty Board (DFB) approved the PEO's under the chairmanship of Head of the Department.
<b>Step 7:</b>	Approved by Chairman Senate.

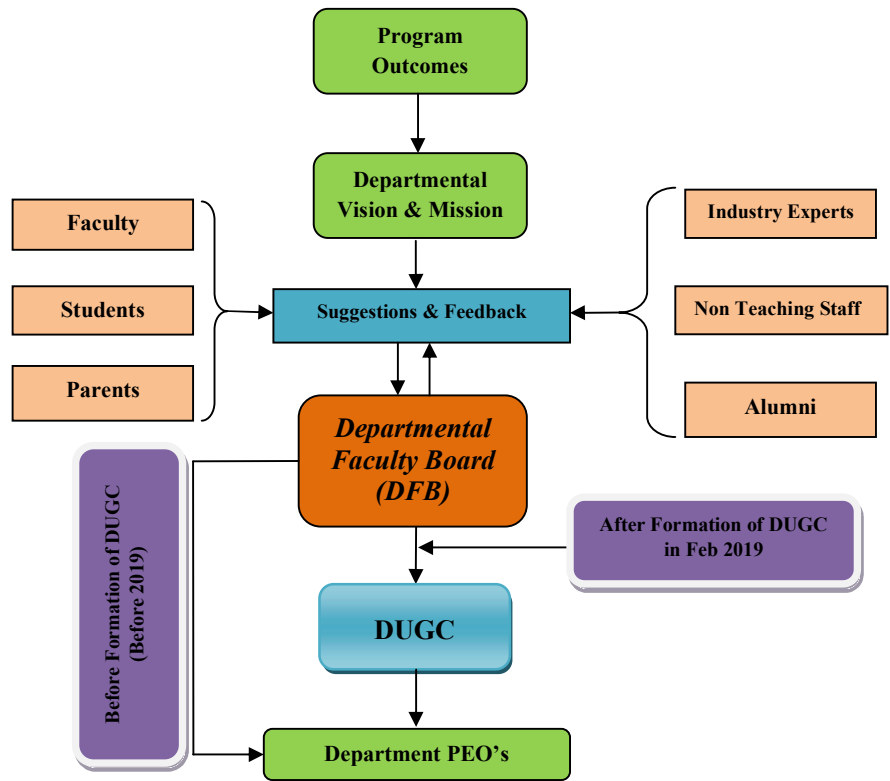


Figure 1.2: Process for defining the PEOs of the Department

1.5 Establish the consistency of PEO's with the mission of the department

1.5.1 Establish the consistency of PO's with the PEO's of the department

PEO v/s PO & PSO Mapping					
Program Outcomes & Program Specific Outcomes PO / PSO		PEO 1	PEO 2	PEO 3	PEO 4
		To prepare students to get employment and pursue research in Mechanical Engineering and allied fields.	To train students to identify and analyze Mechanical Engineering problems using an iterative approach that involves defining, quantifying, testing and review of the identified challenges.	To enable students to plan, organize, schedule, execute and communicate effectively as an individual, as a team member, or as a leader in a multidisciplinary environment.	To provide the students an academic environment that makes them appreciate excellence in the field of Mechanical Engineering and empowers them to understand the significance of lifelong learning.
		Mapping	Mapping	Mapping	Mapping
PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	3			
PO2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	3	3		



PO3	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	3	3		3
PO4	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	3	3		3
PO5	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.	3	3		3
PO6	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.			3	3
PO7	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for			3	3

	sustainable development.				
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			3	3
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			3	
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.			3	
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.			3	3
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	3	3		3

PSO1	Apply the knowledge of basic sciences, mathematics and Mechanical Engineering to real life problems.	3	3	3	3
PSO2	Inculcate the advance level skills in academic and research pursuits relevant to Mechanical Engineering and other interdisciplinary streams.	3	3		3
PSO3	Ability to integrate major Mechanical Engineering streams with innovative and entrepreneurial activities ensuring high standards of professional ethics.			3	3

**1.5.1.1 Justification of consistency established between PEO's with PO's and PSO's**

Correlated Parameter	Correlation	Justification
PEO 1 – PO1	3	Students will be taught the basics of engineering rigorously to make them industry ready
PEO 1 – PO2	3	Students will be taught to analyse the problems during lecture and lab sessions
PEO 1 – PO3	3	Students will be able to design and develop the solutions of engineering problems
PEO 1 – PO4	3	Students will be able to investigate the research based problems
PEO 1 – PO5	3	Students will be able to use the modern tools for analysis of problems
PEO 1 – PO6	-	No Correlation
PEO 1 – PO7	-	No Correlation

<b>PEO 1 – PO8</b>	-	No Correlation
<b>PEO 1 – PO9</b>	-	No Correlation
<b>PEO 1 – PO10</b>	-	No Correlation
<b>PEO 1 – PO11</b>	-	No Correlation
<b>PEO 1 – PO12</b>	3	Students will develop lifelong learning by solving investigative problems
<b>PEO 1 – PSO1</b>	3	Students will be creative enough to solve the complex problems by applying non conventional approach
<b>PEO 1 – PSO2</b>	3	Students will be able to get engaged in field of research and academia
<b>PEO 1 – PSO3</b>	-	No Correlation
<b>PEO 2 – PO1</b>	-	No Correlation
<b>PEO 2 – PO2</b>	3	Students will be able to analyse the engineering problems
<b>PEO 2 – PO3</b>	3	Students will be able to design the solutions by reviewing the problem
<b>PEO 2 – PO4</b>	3	Students will be able to conduct research based solutions for the given engineering problems
<b>PEO 2 – PO5</b>	3	Training will be provided to students for modern tool usage in order to analyse the complex problems
<b>PEO 2 – PO6</b>	-	No Correlation
<b>PEO 2 – PO7</b>	-	No Correlation
<b>PEO 2 – PO8</b>	-	No Correlation
<b>PEO 2 – PO9</b>	-	No Correlation
<b>PEO 2 – PO10</b>	-	No Correlation

<b>PEO 2 – PO11</b>	-	No Correlation
<b>PEO 2 – PO12</b>	3	Students will develop a sense of lifelong learning by applying iterative and research based approach for solution of engineering problems
<b>PEO 2 – PSO1</b>	3	Students will develop an imaginative thinking to apply different technique to solve the problems
<b>PEO 2 – PSO2</b>	3	Students will be able to solve the problems given, in order to get qualified to pursue their research in mechanical engineering
<b>PEO 2 – PSO3</b>	-	No Correlation
<b>PEO 3 – PO1</b>	-	No Correlation
<b>PEO 3 – PO2</b>	-	No Correlation
<b>PEO 3 – PO3</b>	-	No Correlation
<b>PEO 3 – PO4</b>	-	No Correlation
<b>PEO 3 – PO5</b>	-	No Correlation
<b>PEO 3 – PO6</b>	3	Students will be able to design and develop the components with an assessment of societal parameters like health, safety and other issues
<b>PEO 3 – PO7</b>	3	Students will be able to understand the impact of their designed solutions on environment and thus the design will be more environment friendly
<b>PEO 3 – PO8</b>	3	Students will be ethical in designing the solutions of problems
<b>PEO 3 – PO9</b>	3	Students will be able to work in a team for effective and faster results
<b>PEO 3 – PO10</b>	3	Students will be able to communicate effectively to reach out to the people with their effective problem analysis and respective solutions
<b>PEO 3 – PO11</b>	3	Students will be able to manage the project as team leader and will effectively manage the financial issues
<b>PEO 3 – PO12</b>	-	No Correlation

<b>PEO 3 – PSO1</b>	3	Being an ethical and responsible graduate, students will be able to serve in organisations for a better society
<b>PEO 3 – PSO2</b>	-	No Correlation
<b>PEO 3 – PSO3</b>	3	Students will be able to prove themselves as an entrepreneur with a moral and ethical values towards the society
<b>PEO 4 – PO1</b>	-	No Correlation
<b>PEO 4 – PO2</b>	-	No Correlation
<b>PEO 4 – PO3</b>	3	Students will provided with an environment to better understand the complex problems and solve them
<b>PEO 4 – PO4</b>	3	Students will be able to conduct research based solutions for the given engineering problems
<b>PEO 4 – PO5</b>	3	Students will be able to use the modern tools for the solutions of problems in mechanical engineering
<b>PEO 4 – PO6</b>	3	Graduates will develop the responsibility towards the society
<b>PEO 4 – PO7</b>	3	Students will be able to understand the impact of their designed solutions on environment and thus the design will be more environment friendly
<b>PEO 4 – PO8</b>	3	Ethics will be developed in the students for a better working space
<b>PEO 4 – PO9</b>	3	Students will be able to work in a team for effective and faster results
<b>PEO 4 – PO10</b>	-	No Correlation
<b>PEO 4 – PO11</b>	3	Students will be able to manage the project as team leader and will effectively manage the financial issues
<b>PEO 4 – PO12</b>	3	Students will develop a sense of lifelong learning by applying iterative and research based approach for solution of engineering problems
<b>PEO 4 – PSO1</b>	3	Students will be creative enough to solve the complex problems by applying non conventional approach

<b>PEO 4 – PSO2</b>	3	Students will be able to solve the problems given, in order to get qualified to pursue their research in mechanical engineering and have a lifelong learning of the course
<b>PEO 4 – PSO3</b>	3	Students will be able to prove themselves as an expert in mechanical engineering with moral and ethical values towards the society

1.5.2 Establish consistency of PEOs with Mission of the Department

(10)

Mission Statements		M1	M2	M3	M4
<i>PEO statements</i>		To provide facilities and infrastructure for academic excellence in the field of Mechanical Engineering.	To inculcate in the students a passion for understanding professionalism, ethics, safety, and sustainability, and enable them to contribute to the society.	To nurture creativity of the students and encourage them to come up with innovative solutions to real life problems.	To prepare the student for lifelong learning with global perspective.
<b>PEO1</b>	To prepare students to get employment and pursue research in Mechanical Engineering and allied fields.	3	3	2	3



<b>PEO2</b>	To train students to identify and analyze Mechanical Engineering problems using an iterative approach that involves defining, quantifying, testing and review of the identified challenges.	3	3	3	3
<b>PEO3</b>	To enable students to plan, organize, schedule, execute and communicate effectively as an individual, as a team member, or as a leader in a multidisciplinary environment.	2	3	3	3

PEO4	To provide the students an academic environment that makes them appreciate excellence in the field of Mechanical Engineering and empowers them to understand the significance of lifelong learning.	3	2	3	3
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**Note:** M1, M2.... Mn are distinct elements of Mission Statement. Enter correlation levels 1, 2 or 3 as defined below:  
 1: Slight (low) 2: Moderate (Medium) 3: Substantial (High). If there is no correlation, put “-”

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### 1.5.2.1 Justification of PEO statements mapped with mission statements:

**J1:**

1. PEO1–M1: Substantially developed qualitative education environment so that graduate acquire professionalism.
2. PEO1– M2: Highly correlate to promote a teaching and learning process that yields advancement in field of mechanical engineering.
3. PEO1–M3: Students summarizes moderately innovative solutions to real life problems.
4. PEO1–M4: Able to demonstrate lifelong learning process which is substantial to student.

**J2:**

1. PEO2–M1: Student able to analyze problems using an iterative approach which substantial provide academic excellence.
2. PEO2–M2: Highly correlate to reviews the identified challenges and in turn contributes to the society.
3. PEO2–M3: Quantifying the identified challenges and students come up substantially with innovative solutions to real life problems.
4. PEO2–M4: Students able to contrasts the different challenges which is important for lifelong learning.

**J3:**

1. PEO3–M1: Moderately correlated to provide facilities and infrastructure in the field of Mechanical Engineering.
2. PEO3–M2: Highly correlate to create multidisciplinary environment in order to develop professionalism and student able to contribute to industry.
3. PEO3–M3: Substantially encourages the student to act as a leader and find solution to real life problems.
4. PEO3–M4: Substantially create multidisciplinary environment for students to comprehend with global perspective.

**J4:**

1. PEO4–M1: Highly correlate to appraise the students an academic environment that makes them appreciates excellence in the field of Mechanical Engineering.
2. PEO4–M2: Moderately correlate to understand professionalism empowers students to interpret the significance of lifelong learning.
3. PEO4–M3: Substantially demonstrate an innovative solution to real life problems empowers students to understand the significance of lifelong learning.
4. PEO4–M4: Highly correlate to apply excellence in the field of Mechanical Engineering and a student is able to extend with global perspective.