Marathwada Mitra Mandal's
COLLEGE OF ENGINEERING, PUNE
Accredited with 'A' Grade by NAAC

POLICY FOR EXAMINATION REFORMS

Institution focuses on designing and implementing strategies based on outcome based education. Various innovative resources that are made available by AICTE and MHRD are used by teachers to improve quality of teaching. Teaching strategies, learning activities, assessments and resources are designed and organized to help students achieve the learning outcomes at the course level.

Student's quality of education is decided by conducting examinations on regular basis as a part of continuous evaluation. It is a measure to decide whether the desired learning outcomes have been achieved. It also helps in student's continuous assessment and quality improvement.

STRATEGY FOR OUTCOME BASED EDUCATION

A) Course Outcomes

Course outcomes describe what a student is expected to know and to be able to do by the end of the of course. Statements of learning outcomes should explain to students what they will learn on successful completion of a subject or course.

When writing learning outcomes we should bear in mind:

1) The kind of knowledge and skills that are involved
2) The level of understanding desirable for students to achieve
3) How this learning is to be demonstrated.

A common way of approaching for course outcomes is to use Bloom's taxonomy of knowledge. It is recommended that one CO be assigned per unit per course, as such there would be total six CO`s per course.

B) CO-PO/PSO Mapping:

CO-PO/PSO mapping is an indicator of different levels: High, Medium, and Low. If a course outcome statement strongly complies with a particular PO/PSO statement then mapping level is high. If the course outcome attains respective PO/PSO partially then the attainment level should be medium. If the course outcome attains respective PO/PSO to some extent then the attainment level should be low. If the course outcomes do not correlate with respective PO/PSO, we can keep the attainment level null and try to find gap identification to achieve that CO.

C) CO-PO/PSO Mapping Justification:

As per CO-PO/PSO mapping levels identified in point B above, justification should be written. Justification should include CO related keywords from PO/PSO.

D) CO Assessment Tools- Targets- Levels:

Assessment Tools for Outcome Based Education (OBE)

Assessment tools for SE

<table>
<tr><th>Course Outcome</th><th>Assessment Tool</th></tr>
<tr><td>CO1</td><td rowspan="4">Online Test of 10 marks on each Unit</td></tr>
<tr><td>CO2</td></tr>
<tr><td>CO3</td></tr>
<tr><td>CO4</td></tr>
<tr><td>CO5</td><td rowspan="2">Unit Test of 10 marks each based on Unit No.5 & Unit No.6 for half hour duration</td></tr>
<tr><td>CO6</td></tr>
</table>

Assessment tools for TE/BE

<table>
<tr><th>Course Outcome</th><th>Assessment Tool</th></tr>
<tr><td>CO1</td><td rowspan="2">Unit Test of 10 marks on each Unit</td></tr>
<tr><td>CO2</td></tr>
</table>

CO3	
CO4	Theory assignments per unit. Each assignment of 10 marks and will contain 4/5 questions per batch
CO5	
CO6	

Bloom's Taxonomy is applied for Assessment Design

Blooms taxonomy is used for defining, updating and verifying outcomes for the course, setting Unit Test question papers and setting Assignments. It helps in mapping the COs with POs at higher levels.

Guidelines deciding levels for CO-PO Mapping

1) Assessment questions/method decides level of CO-PO mapping. Ex. If CO has apply/analyze etc. keywords of these types then questions must be framed in such a manner which will assess the apply/analyze of the topic.
2) Blooms Taxonomy Keywords: adapt, build, change, choose, combine, compile, compose, construct, create, elaborate, estimate, formulate, imagine, improve, maximize, minimize, modify, originate, propose, plan, solve, test deduct, justify, measure, compare, determine, recommend, decide, analyze, categorize etc. is to be used to achieve the Levels.

PO's	Level – 1 (Low)	Level – 2 (Moderate)	Level – 3 (High)
PO-1: Engineering Knowledge **Assessment Tool(D/I):** Unit Test /Assignments/Online Test	Understand, Remember	Classify, Describe, Discuss, Locate, Recognize, Select	Apply, demonstrate, execute, implement, solve, develop, design,
PO-2: Problem Analysis **Assessment Tool(D/I):** Unit Test	Review, Find, Recognize the engineering problems	Identify, Determine, Diagnose	Formulate, Analyze, Deduce, Interpret, Figure out, Arrive at, Ascertain, Derive

/Assignments/Online Test			
PO3: Design/Development of Solution **Assessment Tool(D/I):** Unit Test /Assignments/Online Test	Identify, Determine, Select Solution w.r.t. problems based on public health and safety, and the cultural, societal and environment	Design, Propose, Recommend Solution w.r.t. problems based on public health and safety, and the cultural, societal and environment	Develop, Establish the Solution OR Extend, Expand, Modify, Update the existing solutions w.r.t problems based on public health and safety, and the cultural, societal and environment
PO4: Conduct investigations of complex problems **Assessment Tool(D/I):** Research Papers	Reviewing, investigating, and understanding engineering problems through research papers	Interpretation and Synthesis of engineering problems through research papers	Design, analysis and publication of solution of engineering problems through research papers
PO5: Modern tool usage **Assessment Tool:** Assignments/ Projects	Selecting, learning, understanding Modern engineering techniques /IT Tools etc.	Applying, utilizing Modern engineering techniques /IT Tools etc. for solving complex engineering problems	Creating, Developing, Modifying, Extending, Updating Modern engineering techniques /IT Tools etc. for solving complex engineering problems
PO6: The engineer and society **Assessment Tool:** Audit Course/ Co-curricular/Extra-	Understanding, learning societal, health, safety, legal and cultural issues	Applying reasoning/engineering knowledge to address societal, health, safety, legal and cultural issues	Evaluating, resolving and providing solutions for societal, health, safety, legal and cultural issues

curricular activity.			
PO7: Environment and Sustainability **Assessment Tool:** Audit Course/ Co-curricular/Extra-curricular activity.	Understanding, learning societal & environmental issues	Demonstrate engineering knowledge to address societal and environmental issues	Evaluating, resolving and providing solutions for societal and environmental issues
PO8: Ethics **Assessment Tool:** Lab Manuals/Lab Journals/ TE/BE Project Report	Understand ethical practice in engineering like writeup, assignments, coding and for solving engineering problems etc. (50% or more plagiarism)	Apply ethical practice in engineering like writeup, assignments, coding and for solving engineering problems etc. (10% plagiarism)	Demonstrate ethical practice in engineering like writeup, assignments, coding and for solving engineering problems etc. (Zero plagiarism)
PO9: Individual and Team work **Assessment Tool:** Project/Seminar/Co-curricular/Extra-curricular activity.	Contribution/ Participation as an individual or in a team/batch/classroom at very Low Level.	Contribution/ Participation as an individual or in a team/batch/classroom at Medium Level.	Contribution/ Participation as an individual or in a team/batch/classroom at very High Level.
PO10: Communication **Assessment Tool:** Project/Seminar activities	Low Level Communication/Presentation on complex engineering activities with low level documentation and unclear instructions.	Medium Level Communication/Presentation on complex engineering activities with medium level documentation and instructions.	Effective Communication/Presentation on complex engineering activities with high quality/high level documentation and clear instructions.
PO11: Project management and finance	Understanding of the engineering and management	Apply knowledge of the engineering and management principles.	Demonstrate engineering and management

Assessment Tool: Project/Seminar activities.	principles in multidisciplinary environments as a member/ Team leader to manage mini projects/ BE projects.		principles as a member/Team leader, to manage projects.
PO12: Life-long learning **Assessment Tool:** Project/Seminar activities	Recognize the need for broadest context of technological change in terms of solving Problems.	Preparation for life-long learning in the broadest context of technological change by adopting latest/new/recent methodologies.	Able to demonstrate broadest context of technological change by adopting latest/new/recent methodologies.

PROGRAM OUTCOMES (POs)

PO1- Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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.

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

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

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

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

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

PO8 - Ethics: Apply ethical principles and commit to professional ethics and responsibilities and 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 on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 - Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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.

GUIDELINES FOR SETTING QUESTION PAPER

- Conduction of Unit Test is responsibility of respective course coordinator during their lectures after completion of respective unit syllabus
- Question paper should be displayed on LCD projector or classroom board during unit test (No hard copy of Unit test question paper will be given to student)
- Questions in question paper should be from Question bank which is shared with students
- Prepare question paper as per **Blooms Taxonomy** (Please refer following levels of questions Blooms Level 1 (BL1) , Blooms Level 2 (BL2), Blooms Level 3 (BL3)
- Levels of question : BL1, BL 2 & BL3

BL1: Questions contains list, define, tell,describe, recite, recall,identify, show,label, tabulate

BL2: Questions contains apply, solve ,illustrate, use, demonstrate, determine, model, experiment, show, examine, modify, categorize, analyze, diagram, compare

BL3: Questions contains assess, decide, choose, rank, grade, test, measure, defend,recommend, convince,select, judge, support, conclude, argue, justify, summarize, evaluate

As per AICTE ,for outcome-based education, a "design down" process is employed which moves from POs to Course Outcomes (COs) and outcomes for individual learning experiences. Outcomes at each successive level are aligned with, and contribute to the Program Outcomes.

Functional Head
Academic Monitoring Committee

Dean Academics