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SHRI SANT GAJANAN MAHARAJ COLLEGE OF ENGINEERING
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CRITERION II -TEACHING-LEARNING AND EVALUATION

Key Indicator 2.6 - Student Performance and Learning Outcomes

Metric No	Assessment Indicators	Evidences
2.6.2	Attainment of Programme outcomes and course outcomes are evaluated by the institution.	COs-POs/PSOs Attainment and Assessment :Manual
		COs Attainment
		POs Attainment

Shri Sant Gajanan Maharaj College of Engineering SHEGAON 444 203

PRINCIPAL
Shri Sant Gajanan Maharaj
College of Engineering,Shegaon.

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CO-PO/PSO Attainment and Assessment Guide

The Essentials of Outcome-Based Education: An Overview

Outcome-Based Education (OBE) is an educational approach that focuses on defining specific learning outcomes or objectives that students should achieve by the end of a course or program. Rather than concentrating solely on what is taught (content or curriculum), OBE emphasizes what students should be able to do or demonstrate as a result of their learning.

Key components and concepts of OBE include

Clear Learning Outcomes: OBE starts with the clear articulation of what students are expected to know, understand, or be able to do by the end of their educational experience. These learning outcomes are specific, measurable, and achievable.

Alignment: The curriculum, teaching methods, assessment strategies, and educational activities are aligned with the defined learning outcomes. This ensures that everything in the educational process is directed toward achieving those outcomes.

Assessment of Outcomes: Assessment methods are designed to measure whether students have achieved the specified learning outcomes. These assessments can take various forms, such as exams, projects, presentations, or portfolios.

Continuous Improvement: OBE emphasizes ongoing assessment and feedback to improve the educational process. Data and feedback from assessments are used to refine teaching methods, curriculum, and learning experiences.

Student-Centered Approach: OBE places the learner at the center of the educational process. It focuses on meeting the needs of individual students and helping them progress toward achieving the defined outcomes.

Transparency: OBE promotes transparency in educational goals and outcomes. Students, faculty, and stakeholders should have a clear understanding of what is expected in terms of learning.

Accountability: OBE can enhance accountability in education by providing clear benchmarks for achievement. It allows institutions to demonstrate the effectiveness of their programs and the value they provide to students.

Real-World Relevance: OBE encourages the integration of real-world skills and competencies into the curriculum. It prepares students for practical application in their careers or further studies.

Flexibility: OBE recognizes that students may progress at different rates and may have different starting points. It accommodates individual differences and encourages personalized learning paths.

Quality Assurance: OBE can be used as a quality assurance mechanism, helping institutions meet accreditation standards and demonstrate the quality of their programs.

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VISION AND MISSION AND CORE VALUES of THE INSTITUTE

VISION

To impart world-class Engineering and Management education in an environment of spiritual foundation to serve the global society

MISSION

To develop excellent learning center through continuous design and up gradation of courses in closed interaction with R&D centers, Industries and Academia.

To produce competent, entrepreneurial and committed Technical and managerial human, with Spiritual foundation to serve the society.

To develop state-of-the-art infrastructure, centers of excellence and to pursue research of global and local relevance.

To strive for 'Sarve Bhanvantu Sukhinah' - The Ideal of our Parent Organization Shri Gajanan Maharaj Sansthan, Shegaon through symbiosis of Science and Spirituality

CORE VALUES

Personal Excellence

It is an ability to fully unleash and utilize one's potential in all walks of life.
It is to improve your performance consistently and continuously so that you can improve every aspect of your life.

Key Behaviour Indicators

- Knows one's passion, strengths and weaknesses
- Has SMART goals in place
- Setting benchmarks for self and raising them from time to time.
- Proactively engages in learning through networking with other universities and Industry related to your field of work across different countries.
- Steps outside of one's comfort zone to do something new and creative.
- Approaches situations with scientific mind set.
- Builds a trusted connection with a mentor and seeks advice when needed.
- Be brand ambassador for SSGMCE to the external world.

Value Statement:

Explores to unleash one's potential through proactive awareness, research attitude, continuous learning, accountability and innovation in every sphere of life.

Accountability

Accountability is accepting responsibility for your action and being willing to own the outcome of your choices, decision and action.

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Key Behaviour Indicators

- Takes responsibility for all work activities.
- Follows through on commitments, implements decision that has been agreed upon.
- Maintains confidentially with sensitive information.
- Acknowledges and learn from mistakes without blaming others.
- Recognizes the impact of one's behaviour on others.

Value Statement:

Each individual at SSGMCE is a firm believer of being accountable to one's role, goal and development.

Trustworthiness

Trustworthiness is the ability of a person to be relied on as honest or Trustworthiness.

Key Behaviour Indicators

- Respect self and others.
- Walk your talk.
- Maintains Confidentiality.
- Maintain consistency, therefore they are reliable and resourceful to the people.
- Keep promises / commitments.
- Value people's time and efforts.
- Express gratitude to their family, friends and co-worker, Support and encourage them.

Value Statement

Build trust through honesty, integrity, consistency, transparency and keep promises.

Holistic Development

Holistic Development means development of a person in all dimensions: physical, Mental, Social, Emotional and Spiritual to unleash his/her potential and is capable of facing the demands and challenges of personal and professional life.

Key Behaviour Indicators

- Plan and Invest time in regular, physical fitness exercise like sports, gymnastics yoga and etc.
- Plan and proactively invest time to update his knowledge and skills related to his personal and professional role.
- Plan and invest time in networking and meaningfully contributing to the relationships personally and professionally important through regularly communicating, sharing knowledge and resources, working in a team through coordinating and cooperation, understand and know to manage emotions of self and others.
- Maintain consistency therefore they are reliable and resourceful to the people.

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- Think beyond self and plan and invest time for community development.
- Engages in practices which are environment friendly.
- Optimally uses natural resources like Water and Electricity.

Value Statement:

SSGMCE provides a system to incorporate and sustain holistic development (Physical, Mental, Social, Emotional and Spiritual).

Creativity and Innovation

The ability to go beyond traditional ideas, rules, patterns, relationship or the like and to create meaningful value adding new ideas, forms, unconventional method, interpretations etc.

Key Behaviour Indicators

- Develops new useful ideas/ approach / programs that prove to be effective.
- Think outside of the box.
- Takes 'SMART' risk, including trying new and different ways to get work done.
- Embraces diverse perspective to promote nurture innovation.
- Generate and employs original ideas for tackling both simple and complex problems.
- Fosters Interdisciplinary work.

Value Statement:

Include innovation / creativity through resourcefulness, sharing and employing new ideas, possibility thinking.

PROGRAM OUTCOMES (POs) (UG Programs)

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 analyse 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.

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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

PROGRAM OUTCOMES (POs) (PG Programs)

PO1: An ability to independently carry out research /investigation and development work to solve practical problems.

PO2: Ability to write and present a substantial technical report/document.

PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program

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The Revised Bloom's Taxonomy

The Revised Bloom's Taxonomy, often referred to as the "Revised Bloom's," is an updated version of Benjamin Bloom's original cognitive taxonomy developed in the 1950s. The revised version was created in the early 2000s by a group of educators and researchers led by Lorin Anderson, to better align with modern educational practices and terminology. It's a framework used by educators to classify educational objectives and define the cognitive skills students should acquire at different levels of complexity.

The Revised Bloom's Taxonomy consists of six cognitive domains, just like the original, but the terminology and definitions have been revised and expanded to better reflect contemporary educational practices.

Here are the six cognitive domains of the Revised Bloom's Taxonomy

Remembering:

This corresponds to Bloom's Knowledge level. It involves recalling or recognizing facts, information, or concepts.

Example action verbs: recall, list, identify, memorize.

Understanding:

This corresponds to Bloom's Comprehension level. It focuses on grasping the meaning, interpretation, and summarization of information.

Example action verbs: explain, describe, summarize, and interpret.

Applying:

This is similar to Bloom's Application level. It requires students to use their knowledge and understanding to solve problems, apply principles, or execute procedures.

Example action verbs: apply, use, solve, demonstrate.

Analyzing:

Analyzing is analogous to Bloom's Analysis level. It involves breaking down complex information into its constituent parts, examining relationships, and identifying patterns.

Example action verbs: analyze, compare, contrast, differentiate, deduce.

Evaluating:

This corresponds to Bloom's Evaluation level. Students at this level make judgments, assess the value or quality of something, and provide evidence for their opinions.

Example action verbs: evaluate, assess critique, justify, and conclude.

Creating:

Creating is the highest level, analogous to Bloom's Synthesis and Evaluation levels. It involves the creative integration of information from various sources or the generation of new ideas, concepts, or solutions.

Example action verbs: create, design, compose, invent, formulate.

Institute's Implementation of OBE Framework

The institute follows a structured approach to implement Outcome-Based Education (OBE)

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Phase I: Before the Start of the Semester

Faculty members work on defining clear and measurable learning outcomes for each course

Faculty members identify and secure the necessary resources, including textbooks, materials, and equipment required for effective course delivery.
Faculty creates Lesson Plan and lecture plan of the assigned course

Data and feedback from the previous semester are reviewed, if applicable, to make improvements and adjustments to the course materials and teaching strategies.

Phase II: During the Semester

Faculty conducts regular assessments to measure student progress and comprehension of course material.

Faculty promotes active student participation through discussions, group work, and interactive activities.

Faculty adapts teaching methods based on ongoing assessment results and feedback from students to address areas needing improvement.

Faculty provides academic support through mentoring programs or offer additional tutoring sessions for students in need of extra assistance.

Phase III: End of the semester

Faculty conducts assessments and evaluations to measure the attainment of Course Outcomes (COs) and Program Outcomes (POs) and comprehensively analyzes the results.

Faculty shares the analysis findings with the Head of Department (HOD) for further review and action.

Faculty administers surveys to collect feedback from students regarding the effectiveness of the course, teaching methods, and overall learning experiences.

External experts or evaluators are engaged to review the course materials, teaching methods, and assessment strategies from an objective perspective.

Guidelines for Course Outcome Statements

The development of Course Outcomes (COs) involves the following steps:

Formation of COs:

The number of COs should typically range from 4 to 6.

Active Verbs:

Formulate COs using active verbs that describe the actions students will perform (e.g., analyze, design, evaluate).

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Alignment with Revised Bloom's Taxonomy:

COs should be based on the principles of the Revised Bloom's Taxonomy.

Alignment with Course Content:

COs should closely align with the course content, reflecting the key concepts and topics covered in the course.

Clarity and Specificity:

COs must be written with clarity and specificity, leaving no room for ambiguity regarding what students are expected to learn and demonstrate.

Measurability:

COs should be designed in a way that makes them measurable, allowing for assessment through various means such as tests, assignments, projects, and practical exercises.

Relevance to Program Objectives:

COs should be directly linked to the broader program objectives and goals, ensuring that each course contributes to the overall educational mission of the program.

Adaptability:

COs may be adjusted or refined based on changes in course content, teaching methods, or industry demands to ensure their ongoing relevance and effectiveness.

Feedback Loop:

Feedback from students, faculty, and industry experts is often used to assess the attainment of COs and make improvements to the course or curriculum as needed.

Coverage of Entire Syllabus:

COs should comprehensively cover the entire syllabus, ensuring that students have the opportunity to achieve the desired learning outcomes for the course.

CO –PO Mapping Guidelines

AICTE Examination Reform Policy of 2018 has been instrumental in enhancing the assessment strategy for OBE by providing a structured approach to defining and measuring program outcomes, aligning them with examinations, and assessing the skills and competencies developed through the curriculum.

Examination reforms propose a two-step process that aims to provide clarity in several crucial areas:

- Defining Program Outcomes (PO) and Mapping: These reforms help in clearly defining Program Outcomes (PO) and establishing a systematic mapping of these

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outcomes to examinations and examination tools.

- Identifying Skills and Competencies: Additionally, they assist in identifying the specific skills and competencies that a curriculum of a program is designed to develop.
- Establishing Performance Indicators: The reforms also emphasize the importance of establishing performance indicators that enable educators to assess these competencies effectively.

Implementation of Competency and Performance Indicators:

Each department within the institute defines specific competencies (skills) that students should acquire for each PO. To assess the attainment of these competencies, departments establish Performance Indicators.

To ensure the effectiveness and adherence to best practices in the assessment process, sample competencies and performance indicators as provided by the AICTE Exam Reforms for various programs are referred.

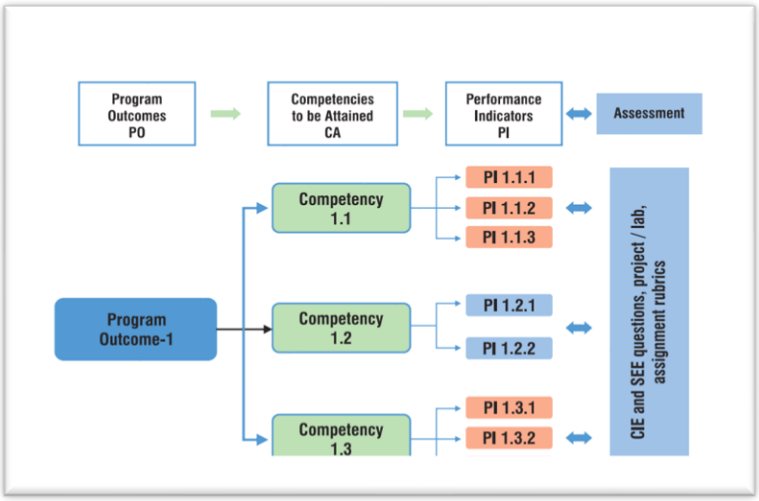

Figure 1: Connecting POs to Assessment. (REFORMS, 2018)

CO-PO Mapping Process

The methodology for implementing CO-PO mapping based on competencies and performance at SSGMCE is structured as follows:

In each department, the Program Assessment Committee defines the competencies that learners can demonstrate from the program curriculum. These competencies are aligned with the respective Program Outcomes (PO).

To assess these competencies, specific performance indicators are defined. These performance indicators serve as criteria for evaluating the attainment of competencies.

The CO-PO mapping process begins with faculty members mapping CO (Course Outcomes) statements with POs, taking into consideration the associated competencies and performance

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indicators for their respective courses.

The initial CO-PO mapping is presented to the Program Assessment Committee for review and approval.

If the committee suggests any corrections or modifications, these are incorporated into the mapping.

Once the committee approves the mapping, it is considered final and serves as a basis for determining the attainment of Program Outcomes.

This revised version provides a clearer and more concise explanation of the CO-PO mapping methodology at your institute.

Program Outcomes – Competencies – Performance Indicators

The following table provides a list of competencies and their associated performance

indicators for each of the Program Outcomes (POs) in the Electrical Engineering Program. Similarly, competencies and PIs are defined for other programs within the institute

PO	Competency No.	Competency	PI Number	Performance Indicator (PI)
PO1 Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems	1.1	Demonstrate competence in mathematical modelling	1.1.1	Apply knowledge of mathematics to model and solve Electrical Engg Problems
	1.2	Demonstrate competence in basic sciences	1.2.1	Apply laws of basic science to an engineering problem
	1.3	Demonstrate competence in engineering fundamentals	1.3.1	Apply fundamental engineering concepts to solve engineering problems
	1.4	Demonstrate competence in specialized engineering knowledge to the problem	1.4.1	Apply Electrical engineering concepts to solve engineering problems
PO2 Problem analysis: Identify, formulate, research literature, and analyze complex	2.1.	Formulate problem statements and identify objectives, identify problems	2.1.1	Formulate problem statements and identify objectives, identify problems
	2.2.	Identify engineering systems, variables, and	2.2.1	Identify engineering systems, variables, and parameters to

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engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.		parameters to solve the problems		solve the problems
			2.2.2	Identify the mathematical, engineering and other relevant knowledge that applies to a given problem
	2.3	Demonstrate an ability to formulate and interpret a model	2.3.1	Formulate and interpret model
	2.4	Demonstrate an ability to execute a solution process and analyze results	2.4.1	Perform experimentation, interpret and analyze results; use tools
			2.1.1	Formulate problem statements and identify objectives, identify problems
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 public health and safety, and cultural, societal, and environmental considerations.	3.1	Demonstrate an ability to define a complex/ open-ended problem in engineering terms	3.1.1	Define problem statement, objectives, scope as per the requirement of stakeholder
	3.2	Demonstrate an ability to generate a diverse set of alternative design solutions	3.2.1	Explore existing design alternatives
			3.2.2	Build models/prototypes to develop a diverse set of design solutions
	3.3	Demonstrate an ability to select an optimal design scheme for further development	3.3.1	Evaluate alternative design solutions with suitable criteria & select the optimal solution
	3,4	Demonstrate an ability to advance an engineering design to defined end state	3.4.1	Refine design solution
			3.4.2	Provide valid conclusions to prove functionality correctness
PO4 Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and	4.1	Demonstrate an ability to conduct investigations of technical issues consistent with their level of knowledge and understanding	4.1.1	Examine the issue by applying appropriate instrumentation and/or software tools to make measurements of physical quantities.
			4.1.2	Provide valid conclusion
	4.2	Demonstrate an ability to design experiments to solve open-ended	4.2.1	Design and develop an experimental approach, specify appropriate

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interpretation of data, and synthesis of the information to provide valid conclusions.		problems		equipment and procedures
	4.3	Demonstrate an ability to analyze data and reach a valid conclusion	4.3.1	Analyze the collected data for trends and correlations, stating possible errors and limitations
			4.3.2	Synthesize information and knowledge about the problem from the raw data to reach appropriate conclusions
PO5 Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.	5.1	Demonstrate an ability to identify/ create modern engineering tools, techniques and resources	5.1.1	Identify modern engineering tools such as computer-aided modeling and analysis; techniques and resources for engineering activities
			5.1.2	Create/adapt/modify/extend tools and techniques to solve engineering problems
	5.2	Demonstrate an ability to select and apply discipline- specific tools, techniques and resources	5.2.1	Demonstrate proficiency in using discipline-specific tools
	5.3	Demonstrate an ability to evaluate the suitability and limitations of tools used to solve an engineering problem	5.3.1	Discuss limitations and validate tools, techniques and resources
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	6.1	Demonstrate an ability to describe engineering roles in a broader context, e.g. pertaining to the environment, health, safety, legal and public welfare	6.1.1	Identify and describe various engineering roles; particularly as pertains to protection of the public and public interest at the global, regional and local level
	6.2	Demonstrate an understanding of professional engineering regulations, legislation and standards	6.2.1	Interpret legislation, regulations, codes, and standards relevant to your discipline and explain its contribution to the protection of the public

practice.				
PO7- Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable development.	7.1	Demonstrate an understanding of the impact of engineering and industrial practices on social, environmental and in economic contexts	7.1.1	Identify risks/impacts in the life-cycle of an engineering product or activity
			7.1.2	Understand the relationship between the technical, socio-economic and environmental dimensions of sustainability
	7.2	Demonstrate an ability to apply principles of sustainable design and development	7.2.1	Apply principles of preventive engineering and sustainable development to an engineering activity or product relevant to the discipline
PO8- Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	8.1	Demonstrate an ability to recognize ethical dilemmas	8.1.1	Identify situations of unethical professional conduct and propose ethical alternatives
	8.2	Demonstrate an ability to apply the Code of Ethics	8.2.1	Examine and apply moral & ethical principles in profession
PO9- Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings	9.1	Demonstrate an ability to form a team and define a role for each member	9.1.1	Implement the norms of practice (e.g. rules, roles, charters, agendas, etc.) of effective team work, to accomplish a goal.
	9.2	Demonstrate effective individual and team operations--communication, problem- solving, conflict resolution and leadership skills	9.2.1	Demonstrate effective communication, problem-solving, conflict resolution and leadership skills
	9.3	Demonstrate success in a team-based project	9.3.1	Present results as a team, with smooth integration of contributions from all individual efforts
PO10- Communication:		Demonstrate an ability to comprehend	10.1.1	Read, understand and interpret technical and non-

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Communicate effectively on complex engineering activities with the engineering community and with the 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		technical literature and document project work		technical information
			10.1.2	Produce clear, well-constructed, and well-supported written engineering documents
	10.2	Demonstrate competence in listening, speaking, and presentation	10.2.1	Deliver effective oral presentations to technical and non-technical audiences
	10.3	Demonstrate the ability to integrate different modes of communication	10.3.1	Create engineering-standard figures, reports and drawings to complement writing and presentations
PO11- Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	11.1	Demonstrate an ability to evaluate the economic and financial performance of an engineering activity	11.1.1	Analyze different forms of financial statements to evaluate the financial status of an engineering project
	11.2	Demonstrate an ability to compare and contrast the costs/benefits of alternate proposals for an engineering activity	11.2.1	Analyze and select the most appropriate proposal based on economic and financial considerations.
	11.3	Demonstrate an ability to plan/manage an engineering activity within time and budget constraints	11.3.1	Identify the tasks required to complete an engineering activity, and the resources required to complete the tasks.
			11.3.2	Use project management tools to schedule an engineering project, so it is completed on time and on budget.
PO12- Life-long learning: Recognise the need for, and have the preparation and ability to engage in	12.1	Demonstrate an ability to identify gaps in knowledge and a strategy to close these gaps	12.1.1	Identify deficiencies or gaps in knowledge and demonstrate an ability to source information to close this gap
	12.2	Demonstrate an ability	12.2.1	Identify historic points of

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independent and life-long learning in the broadest context of technological change.		to identify changing trends in engineering knowledge and practice		technological advance in engineering that required practitioners to seek education in order to stay current
	12.3	Demonstrate an ability to identify and access sources for new information	12.3.1	Source and comprehend technical literature and other credible sources of information

CO-PO Mapping Level

CO-PO mapping levels are determined for each PO statement based on competencies and Performance indicators,

In the table below, for a specific course, four Course Outcomes (COs) are defined. Competencies and Performance Indicators (PIs) are specified for PO2. The Total Performance Indicator is TPI and MPI represents the number of PIs mapped to the corresponding CO

Here, the TPI for PO2 is TPI=6.

PO	Competency No.	Competency	Performance Indicator (PI)	**CO1**	**CO2**	**CO3**	**CO4**
PO2: Problem analysis: Identify, formulate, research literature, and analyses complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	2.1	Demonstrate an ability to identify and formulate complex engineering problem	2.1.1: Formulate problem statements and identify objectives, identify problems	Yes	Yes	Yes	Yes
	2.2	Demonstrate an ability to formulate a solution plan and methodology for an engineering problem	2.2.1: Identify engineering systems, variables, and parameters to solve the problems	Yes	Yes	Yes	Yes
			2.2.2: Identify the mathematical, engineering and other relevant knowledge that applies to a given problem	Yes	Yes	Yes	Yes
	2.3	Demonstrate an ability to formulate and	2.3.1: Formulate and interpret model	Yes	No	Yes	Yes

		interpret a model					
	2.4	Demonstrate an ability to execute a solution process and analyze results	2.4.1: Perform experimentation, interpret and analyze results; use tools	Yes	Yes	Yes	NO
			2.4.2: Extract desired understanding and provide valid conclusions	Yes	Yes	Yes	NO
	Total PI(TPI) =6		Mapped PI(MPI)	6	5	6	4

Percentage MappingLevel (%MPL) = (Mapping Performance Indicator/Total PI) *100
CO-PO mapping level ranges are defined as,
Level1 (Low Mapping) : If 1 < % MPL<=33
Level 2 (Medium Mapping) : If 34< % MPL<=66,
Level 3 (High Mapping) : If % MPL>66,

Mapping Level derived for above example		
Corse Outcome	% Mapping Level	Mapping Level
CO1	100	3
CO2	83	3
CO3	100	3
CO4	67	3

Assessment tools for Course Outcomes (COs)

Course Attainment is the sum of Direct Attainment and Indirect Attainment. Direct Attainment is computed based on the marks obtained by students in the respective Assessment Tools and Indirect Attainment is computed from the Course Exit Survey

Assessment tools established to calculate the CO attainment of Theory Courses, Laboratory Courses, Projects, and Seminar Courses are defined as below

Course Type	Assessment tools	Internal Assessment	External Assessment	Attainment Type
Theory Course	Class Tests	TEC(Assignment)	University Examination	Direct Attainment
		Tutorials on Syllabus points		
		Presentation/Seminar on extension of the course		
		Mini Projects		
		New Experiment development and testing		
		Open book test		
		Surprise test		
		Quiz / Group Discussion		
		Field/Industrial work		

		Industrial visit and report writing Tutorials on Syllabus points		
Laboratory Course	Continuous monitoring in regular lab sessions	Lab Test	Lab University Examination	
Project	Project Progress Monitoring Rounds (Phase I to Phase V)		University examination	
Seminars	Technical Seminars			
Theory Course	Course Exit Survey			Indirect Attainment

Attainment of Course Outcomes (COs)

Course Attainment is the sum of Direct Attainment and Indirect Attainment. Direct Attainment is computed based on the marks obtained by students in the respective Assessment Tools and Indirect Attainment is computed from the Course Exit Survey.

Assessment Tool	Description	Evaluation
Theory Course		
Class Tests	Two class tests are conducted: the first one covers two units of the syllabus, and the second is conducted at the end of the semester, addresses the remaining two units of the syllabus. Each class test is one hour long and is worth a total of 30 marks. Appropriate weighting is assigned to all the Course Outcomes (COs) associated with the portion covered by each class test. Additionally, each question's CO and its corresponding Bloom's taxonomy level are indicated	Average of both the class tests is considered in internal evaluation for 10 Marks
TEC(Assignment)	Assignments are employed to assess students' comprehension and enhance their knowledge of the given topic. In each course, assignments take various forms, including Mini/Term/Short Projects (involving Design/Fabrication/ Simulation/ Software/Hardware Development), Surveys, Case Studies, the development and testing of new experiments, Presentations/Seminars extending the course content, Quizzes, Group Discussions, Industrial visits, and report writing, as well as Tutorials covering syllabus points. Faculty members evaluate students' performance on these diverse parameters using rubrics, and based on this assessment, marks are awarded, accounting for 30 marks.	The faculty assesses students' performance on various parameters using rubrics, and based on that assessment, assigns a total of 30 marks. Additionally, the internal marks for any course are calculated by averaging the scores from two class tests and assignments, resulting in a total of 20 marks.
University Examination	The End examination carries a total of 80 marks, and the question paper is set by a paper setter appointed by the University.	The evaluation of this exam is done by an external examiner at the university level.
Laboratory Courses		
Continuous Evaluation in regular lab sessions	During each laboratory session, every student is assessed and given a score out of 10 based on various criteria, including the submission of lab records, the quality of their journal write-up, their execution of experiments, and their	The average of all the lab sessions is taken into account to determine the internal marks, which are awarded

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	performance during viva or oral examination. These criteria are used to evaluate the students' performance in the laboratory	out of a total of 20.
Internal Laboratory Test	A lab test is conducted at the end of semester. The lab test is conducted for 25 Marks. The rubric parameters for evaluation include Write-Up, Record, Viva and Execution.	The marks obtained in the lab test are converted proportionally to a scale of 5 marks
University Laboratory Exam	The University Examination is conducted with a total of 25 marks, and the evaluation criteria includes Record Write-Up, Execution, Results, and Viva-Voce	The assessment of students involves the joint evaluation of both the External Examiner and the Internal Examiner.
Project Work		
Final Year Project (Internal submission)	The evaluation of the final year project takes place in five phases, each with its set of defined rubrics. The first three phases are assessed for a total of 50 marks, while the fourth phase carries a weightage of 75 marks. Projects in all four phases are evaluated based on these rubrics. The project panel, appointed by the Head of the Department (HOD), is responsible for assessing the students' project performance. Phase V is evaluated by Project Guide for 75 Marks. The total marks obtained in all five phases are converted proportionally to a scale of 75 marks	The internal evaluation of project work is carried out by a panel of faculty members, and the assessment is conducted according to the defined rubrics for each phase. Guides oversee the progress of the work on a weekly basis to ensure that high-quality work is being conducted, which can ultimately lead to paper publication.
Final year Project (University Exam)	The University administers a Project Evaluation examination, with an External Examiner appointed by the University overseeing the process. During this evaluation, students present their entire project work to the External Examiner, including a practical demonstration.	Both the Internal Examiner and the External Examiner assess the External Project Presentations.
Seminars	In the seventh semester, students are expected to give a 15-minute seminar on the most recent trends in engineering. The assessment of the student presentations is conducted by a panel designated by the Head of the Department, following established rubrics.	A Seminar Panel, designated by the Head of the Department, assesses the individual students' performance based on predefined rubrics.
Assessment Tool for Indirect Attainment		
Course Exit Survey	After the completion of the course, the course teacher collects feedback from the students through a course exit survey.	The course exit survey collects students' perceptions regarding their ability to achieve the Course Outcomes. Subsequently, the average of student responses for each Course Outcome is computed.

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Course Outcomes (CO) Direct Attainment Levels

Assessment Tool	Maximum marks	Target Set (Threshold value)	Attainment level Criteria	Attainment level
(Theory Course) Class test	30	Average marks of class	At least 70 % of students scoring above the threshold value	3
			At least 60 % of students scoring above the threshold value	2
			At least 50 % of students scoring above the threshold value	1
Assignment	30	Average marks of class	At least 70 % of students scoring above the threshold value	3
			At least 60 % of students scoring above the threshold value	2
			At least 50 % of students scoring above the threshold value	1
University Examination	80	Average marks of class	At least 70 % of students scoring above the threshold value	3
			At least 60 % of students scoring above the threshold value	2
			At least 50 % of students scoring above the threshold value	1
Laboratory Course (Continuous Assessment+ Lab test)	25	Average marks of class	At least 70 % of students scoring above the threshold value	3
			At least 60 % of students scoring above the threshold value	2
			At least 50 % of students scoring above the threshold value	1
Laboratory Course (University Examination)	25	Average marks of class	At least 70 % of students scoring above the threshold value	3
			At least 60 % of students scoring above the threshold value	2
			At least 50 % of students scoring above the threshold value	1
Final Year Project (Continuous Internal evaluation)	75	Average marks of class	At least 70 % of students scoring above the threshold value	3
			At least 60 % of students scoring above the threshold value	2
			At least 50 % of students scoring above the threshold value	1
Final Year Project(University Examination)	75	Average marks of class	At least 70 % of students scoring above the threshold value	3
			At least 60 % of students scoring above the threshold value	2

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			At least 50 % of students scoring above the threshold value	1
Seminar (Internal)	50	Average marks of class	At least 70 % of students scoring above the threshold value	3
			At least 60 % of students scoring above the threshold value	2
			At least 50 % of students scoring above the threshold value	1

Computation of CO Direct Attainment in the course

Direct CO Attainment = 20% of Internal Attainment Level + 80% University Examination Attainment Level

Computation of CO Indirect Attainment from course exit survey

Indirect CO Attainment is calculated based on student responses in a course exit survey, where students rate their course attainment using a weighted scale:

"Good" is weighted at 4.

"Average" is weighted at 3.

"No opinion" is weighted at 2.

"Below Average" is weighted at 1.

The formula for calculating Indirect CO Attainment is as follows:

CO Attainment = (A * 4 + B * 3 + C * 2 + D * 1) / (4 * Total Number of Students)

In this formula, A, B, C, and D represent the percentages of students who selected each respective course attainment level. The result reflects students' perceived course attainment, with different levels of attainment weighted accordingly.

CO Attainment Levels:

CO Attainment levels are used to categorize the overall CO Attainment score:

Level 3 is achieved if CO Attainment is greater than 80%.

Level 2 is attained if CO Attainment is greater than 70%.

Level 1 is reached if CO Attainment exceeds 60%.

Attainment of Program Outcomes (POs) and Program Specific Outcomes (PSOs)

Program outcomes (PO) represent the specific knowledge, skills, and abilities that students are expected to acquire by the time they graduate. These outcomes encompass a wide range of competencies that students develop throughout their academic journey.

To measure the attainment of these program outcomes (PO/PSO Attainment), a holistic approach is adopted, combining both direct and indirect assessment methods:

Attainment of PO & PSO = 80% of Direct Attainment + 20% of Indirect Attainment

Direct Attainment (80%):

This component primarily relies on evaluating the Course Outcome (CO) Attainment for all courses within the program. It measures how well students achieve specific learning

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objectives within these courses.

Indirect Attainment (20%): Indirect assessment is based on gathering insights and feedback from various sources:

Alumni Survey (5%): This involves collecting feedback from program graduates regarding their experiences and perceptions of the learning outcomes achieved.

Students' Program Exit Survey (5%): This survey captures feedback from students as they complete their program, providing valuable insights into their educational journey.

Employer's Survey (5%): Feedback is solicited from employers, offering perspectives on the skills and competencies demonstrated by graduates in the workplace.

Course Exit Survey (5%): This survey is taken at the end of each semester from every student for each course to check the achievements of course objectives

By combining these direct and indirect assessment methods, the program can comprehensively evaluate how well students are meeting the defined program outcomes. This balanced approach ensures a thorough understanding of students' preparedness upon graduation and facilitates ongoing program improvement.

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Rubrics for Continuous Evaluation in Lab Sessions

Parameter	Marks	High	Medium	Low
Conduction of Experiment	4	Experiment conducted / Program executed along with necessary calculations& obtained the result	Experiment conducted//Program executed but not done necessary calculation	Experiment not conducted// Program Not executed
Record Writing	3	Neat and clean along with complete practical details submitted	Record submitted but incomplete	Record not submitted
Post experimental Viva	3	Students answered most of the questions	Students answered few questions	Students did not answer any viva questions
		3 or 4	1-2	0

Rubrics for Project Internal Evaluation (Max marks 75)

Rubrics	Phase / Monitoring Round	Marks
R1	PPM1	50
R2	PPM2	50
R3	PPM3	50
R4	PPM4	75
R5	Evaluation by Guide	75
Total Weightage		Marks obtained in R1, R2,R3, R4 and R5

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Rubrics# R1 Phase I (PPM1) Max Marks (50)

Parameters	Marks Allocated	High	Medium	Low
		10-15 marks	5-9 Marks	0-4 Marks
Literature Survey	15	Reviewed wider range of relevant literature from multiple sources Literature survey is relevantly summarized to formulate the problem	Reviewed limited literature Summarized Literature survey to formulate the problem	Reviewed literature is brief and insufficient Literature survey is not relevant to the formulated problem
Topic selection	15	Innovative and useful to society, Industry based problem solving	Less innovative and useful to society	Useful to limited group and not innovative
Objectives of Proposed work	20	14-20	7-13	0-6
		All objectives of the proposed work well explained	Average explanation of the objectives	Objectives of the proposed not well defined

Rubrics# R2 Phase II (PPM2) Max Marks (50)

Parameters	Marks Allocated	High	Medium	Low
		10-15 marks	5-9 Marks	0-4 Marks
Planning of work	15	50 % or more work completed	30 % work completed	10 % work completed
Problem Statement& Methodology	15	Problem statement is clearly specified Relevant and clearly defined methodology	Problem statement is clearly specified. Average explanation of methodology	Problem statement is vague. Methodology not defined
Presentation	20	Presentation with good technical details and good communication skills	Presentation with average technical details	Presentation with poor technical details and poor communication skills
		14-20	7-13	0-6

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Rubrics# R3 Phase III (PPM3) Max Marks (50)

Parameters	Marks Allocated	High	Medium	Low
		10-15 marks	5-9 Marks	0-4 Marks
Percentage of work completed	15	75 % or more than 75 % work completed	50 % work completed	30 % work completed
Demonstration and Presentation	35	Objectives of the proposed work well defined and steps to solve the problem clearly specified	Objectives of the proposed work well defined and steps to solve the problem are not clearly specified	Steps to be followed to solve the problem not defined
		25-35	10-24	0-9

Rubrics# R4 Phase IV (PPM Final) Max Marks (75)

Parameters	Marks Allocated	High	Medium	Low
		10-15 marks	5-9 Marks	0-4 Marks
Incorporated suggestions	15	All suggestion given by Project evaluation committee during PPM1 to PPM3 are incorporated	Moderate suggestions are incorporated	Suggestions not implemented
		20-30	9-19	0-8
Demonstration and Presentation	30	Able to justify and articulate all the above parameters	All the criteria are justified but still scope for improvement	Not able to justify most of the parameters
Results and Conclusions	30	Presented the results and discussion properly Provides clear interpretations that emerge from analysis	Presented the results and discussion Provides interpretations that emerge from	Presented results and conclusions not adequate

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Rubrics# R5 (Project Guide) Max Marks (75)

Parameters	Marks Allocated	High	Medium	Low
		15-20	07 - 14	0-06
Publication on project work/ Participation in project Expo	20	Publication in highly reputed Journal/IEEE International Conference / Participation at national level	Publication in reputed Journal /International Conference / Participation at state level	Publication in Journal/ National Conference / Participation at institute level
		10-20	6-9	0-5
Attendance and consistency of work	15	Regularly reports to guide and consistency in work	Reports to Guide but lacks in consistency	Irregular in attendance and does not show consistency
Team work and Group Dynamics	15	Good coordination among the members Synergy	Fair team work and majority of the members functions adequately	Lack of coordination
		15-25 marks	08-14 Marks	0-07 Marks
Project Report	25	Format for text, tables, figures, charts, etc. is strictly followed; Organization of the content is in logical order with all sections mentioned in the Guidelines; Explanations are clear with properly placed figures and tables; Contents are properly cited.	Format is as per the set standards; Organization of the content is somewhat in logical order with all sections mentioned; Explanations are adequate with most of the figures and tables properly placed; Most of the contents are cited.	Format is not as per standards; • Organization not in logical order; • Explanations in the report are not clear; • Citations are improper

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Rubrics#Seminar
MaxMarks(50)

PerformanceCriteria	MarksAllocated	High	Medium	Low
		7-10Marks	4-6Marks	0-3Marks
Organization	10	Objective is clearly stated and information is provided in a logical and is easy tofollow	Objective is clearly stated but information is not relevant	Objective is not clearly stated and information is also not relevant
DemonstrationandKnowledge	10	Shows complete understanding of the problem Demonstrates full knowledge of the subject with explanations and elaboration	Response shows some understanding of the problem Few points are explained clearly	Response shows poor understanding of the problem And no clear explanation
Presentationand communicationskills	10	Presentation with good technical details and good communication skills ,refers the slides to explain the points and completely engaged with audience	Presentation with good technical details and average communication skills,but eye contact not proper	Presentation with poor technical details reads the slides and no eye contact
ImpactofVisualaids	10	Visual /PPTs are clear and readable and free of errors/typos	Visual/PPTsare clear and readable but includes few errors	Visual /PPTs are not clear and contain errors
Question/Answer	10	Defends all questions by providing clear and in sightful answers to the questions	Answers few questions	Does not provide any answers to the questions

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Dr.S.B. Somani
Principal

Shri Sant Gajanan Maharaj College of Engineering, Shegaon

Department of Electrical Engineering

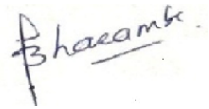
2023-24

CO (Course Outcome) attainment of all courses in BE Electrical Engineering (Electronics & Power)

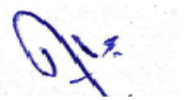
Sub code	Subject	CO-1	CO-2	CO-3	CO-4	CO-5	CO-6	Overall CO Attainment	Faculty
1A1	ENGG. MATH-I	0.20	0.20	0.20	0.20	0.60	0.60	0.33	KPD
1A2	ENGG PHYSICS	0.80	1.00	0.80	0.80	0.80		0.84	RGR
1A3	ENGG. MECHANICS	1.00	1.00	1.40	1.00	1.00	1.40	1.13	GSW
1A4	COMP. PROG	1.00	8.00	1.20	0.80	1.40	1.40	2.30	NNG
1A5	Workshop Practice	2.80	2.80	2.80	2.80	2.80	2.80	2.80	PTP
1B1	ENGG MATH-II	1.00	1.00	0.80	0.80	1.00	1.00	0.93	NAP
1B2	ENGG CHEMISTRY	1.80	1.80	1.80	1.80	1.80	1.80	1.80	RMK
1B3	ELECT ENGG	2.40	1.00	1.20	1.40			1.50	RSK
1B4	ENGG. GRAPHICS	3.00	3.00	3.00	3.00			3.00	NBB
1B5	Comm Skill	3.00	3.00	3.00	3.00			3.00	SVB

3EP01	MATHS-III	2.40	2.40	2.40	2.40	2.40	2.40	2.40	JSG
3EP02	ECA	1.80	1.80	1.60	1.60	1.80		1.72	VSK
3EP03	EM - I	0.20	0.20	0.20	0.40	0.40		0.28	BSR
3EP04	ERG	1.60	1.80	1.80	1.80			1.75	MRC
3EP05	EDC	1.20	1.20	1.20	1.20	3.00		1.56	GNB
3EP09	ET Lab	3.00	3.00	3.00	3.00			3.00	RSP
4EP01	EMF	1.80	1.80	1.60	1.60			1.70	AUJ
4EP02	EMI	3.00	2.20	1.60	2.40			2.30	UAJ
4EP03	CS	0.80	3.00	1.80	1.80			1.85	GNB
4EP04	NMOT	2.00	2.00	2.20	1.80	2.20		2.04	BSR
4EP05	ADC	1.00	1.20	1.00	1.00	1.40		1.12	SSJ
4EP09	EXT Lab	3.00	3.00	3.00	3.00			3.00	PRD
5EP01	PS-I	3.00	3.00	2.80	2.80	3.00	3.00	2.93	PRD
5EP02	MPMC	0.20	0.20	1.20	1.20			0.70	SSJ
5EP03	EM - II	2.80	2.80	2.80	2.40	3.00		2.76	PRB
5EP04	SS	0.80	0.80	0.80	1.40			0.95	AUJ
5FEET05	OE - WC	0.80	1.00	1.00	1.00			0.95	
5EP09	ICT Lab	3.00	3.00	3.00	3.00			3.00	RSK

6EP01	PE	1.20	1.20	1.00	1.00			1.10	VSK
6EP02	EEDU	1.00	1.00	1.00	1.00	1.00	1.00	1.00	SRP
6EP03	CAEMD	2.60	2.60	2.60	2.60	2.60		2.60	PRB
6EP04	ACS	0.60	0.20	0.00	0.00			0.20	AUJ
6EP09	CT Lab	3.00	3.00	3.00	3.00			3.00	GNB
7EP01	PS-II	0.40	0.40	0.00	0.00	0.20		0.20	SRP
7EP02	DSP	3.00	3.00	3.00	3.00	3.00	3.00	3.00	PRD
7EP03	EPM	0.60	0.60	0.40	0.20	0.20		0.40	WZS/LBD
7EP04	PSOC	1.60	1.60	1.60	2.20	2.20		1.84	RSK
7EP05	AI	0.80	0.80	1.00	1.00			0.90	SSJ
7EP05	ED&C	0.80	0.80	1.20	1.20	1.00		1.00	RKM
8EP01	PSP	0.40	0.00	0.00	0.40	0.40		0.24	PRB
8EP02	CMPSA	0.00	0.80	1.00	1.00	1.40	1.40	0.93	RKM
8EP03	HVE	0.00	0.00	0.00	0.60	0.60		0.24	RSK
8EP04	PQ	0.60	0.60	0.20	0.00			0.35	PRD
8EP04	EECA	1.40	1.40	1.40	1.40	1.40	1.40	1.40	MRC



P. R. Bharambe
Coordinator



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Department of Electrical Engineering

2023-24

PO & PSO attainment Report
in BE Electrical Engineering (Electronics & Power)

Subject	Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
MATH-I	1A1	0.22	0.20	0.20	0.20								0.20	0.20	0.20
PHYSICS	1A2	0.85	0.85	0.57	0.58	0.57					0.57		0.28	0.28	0.42
ENGG. MECHANICS	1A3	0.75	0.81	0.38	0.38						0.76				0.40
COMP. PROG	1A4	1.02	1.16	0.63	0.80	0.40			0.53	0.39	0.51	0.39	0.77	0.61	0.73
Workshop Practice	1A5	0.93	0.93							0.93	0.93		0.93		
MATH-II	1B1	0.62	0.31	0.31	0.31								0.31	0.31	0.31
CHEMISTRY	1B2	0.60	0.80	0.60	0.60		0.60	0.60	0.60		0.60	0.60	0.60	0.59	0.59
ELECT ENGG	1B3	1.5	0.67	0.58	0.5	0.58		0.47	0.4	0.4	1.12	1.5	1	1.08	1.10
ENGG. GRAPHICS	1A4	0.99		1.25	1	1					1			1.00	1.00
Comm Skill	1B5	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	-	-

ENGG MATHS-III	3EP01	1.47	0.80		0.80	0.80			0.80	0.80		0.80		0.80	0.80
ECA	3EP02	1.88	1.88	1.07	1.24	1.25					0.76		1.25	0.57	1.03
EM - I	3EP03	0.28	0.23	0.15	0.19	0.17				0.20	0.16	0.10	0.11	0.23	0.28
ERG	3EP04	1.17	0.88	1.32	0.88	0.88	0.58	1.00		0.88		0.88	0.88	1.47	1.17
EDC	3EP05	1.40	1.07	1.60	0.80	1.70		0.80		0.60	0.93	1.20		0.56	0.56
ET LAB	3EP09	2.8	2.6	3	1.67	3	-	1	-	2.6	2.8	3	1.8	1.00	1.00
EMF	4EP01	1.70	1.40	1.40	1.70	0.57					1.13		0.57	0.57	0.57
EMI	4EP02	2.10	1.53	0.77	1.53	1.53	1.53	0.77	2.30	0.77	2.30	0.77	1.53	0.77	0.69
CS	4EP03	1.70	1.55	1.17	1.38	1.70	1.20			0.62	1.85		1.85	0.60	1.25
NMOT	4EP04	1.08	1.17	2.05	2.00	1.67	2.00	1.50	1.92	1.49	2.00	2.04	2.00	0.67	0.67
ADC	4EP05	1.05	1.05	0.99	0.81	0.81					0.37		0.75	0.80	0.98
EXT LAB	4EP09	2.00	2.00	2.00	2.00	2.00				2.00	2.00		2.00	2.00	2.00
PS-I	5EP01	2.27	1.64	1.44	1.97	1.96	1.13	1.14		1.29	1.96		1.96	1.96	1.13
MPMC	5EP02	0.68	0.57	0.42	0.71	0.68			0.70	0.73	0.70		0.23	0.47	0.47
EM - II	5EP03	2.76	1.84		1.84	0.90			0.92	1.84	1.84			2.40	2.76
SS	5EP04	0.95	0.95	0.63	0.58	0.63					0.63		0.32	0.32	0.45
ICT LAB	5EP09	2.20	3.00	2.00	3.00	2.50			3.00	2.20	2.20		3.00	3.00	3.00

PE	6EP01	1.10	1.10	1.10	1.10	0.73		0.36	0.73	0.73	1.10		0.37	0.36	0.63
EEDU	6EP02	1.00	0.67	0.39	0.67	0.89	1.00	0.67	0.93	1.00	1.00		1.00	0.67	0.67
CAEMD	6EP03	2.44	1.63		1.63	0.82			0.81	1.63	1.63			2.40	2.44
ACS	6EP04	0.20	0.60	0.60	0.60	0.40					0.20		0.20	0.13	0.60
OE - WC	6FEET05	0.73	0.63	0.32	0.32	0.63	0.73	0.95			0.95		0.63	0.32	
CT LAB	6EP09	2.20	3.00	2.00	3.00	2.50			3.00	2.20	2.20		3.00	3.00	3.00
PS-II	7EP01	0.20	0.17	0.08	0.20	0.07		0.07		0.07	0.20		0.20	0.15	0.15
DSP	7EP02	2.00	2.00	1.33	1.67	1.67	1.00	1.00	1.00	1.67	1.67		1.67	2.00	1.50
EPM	7EP03	0.35	0.40	0.40	0.40	0.40	0.40	0.30	0.40	0.20	0.30	0.40	0.60	0.30	
PSOC	7EP04	1.59	1.13	0.77	0.83	0.85	1.23	1.12	1.07	0.60	0.97	0.84	1.73	1.77	
AI	7EP05	0.77	0.60	0.62	0.62	0.77			0.90	0.90	0.90		0.90	0.60	0.60
ED&C	7EP05	3.00	1.40	2.60	1.50	2.80	1.80			2.20			2.20		0.67
Seminar presentation	7EP06	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

PSP	8EP01	0.24	0.16		0.16	0.07			0.08	0.16	0.16			0.40	0.24
CMPSA	8EP02	0.93	0.75	0.37	0.84	0.80			0.37				0.75	0.93	
HVE	8EP03	0.24	0.16	0.20	0.20	0.24	0.20	0.24	0.27	0.20	0.12	0.13	0.24	0.16	0.08
PQ	8EP04	0.22	0.17	0.23	0.17	0.17	0.12	0.18		0.18		0.17	0.17	0.30	
EECA	8EP04	1.24	1.09	0.93	0.93	0.65	1.24	1.40			0.93	0.93	1.40	0.47	0.47
Project Work	8EP05	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Direct Attainment		**1.31**	**1.17**	**1.06**	**1.10**	**1.14**	**1.26**	**1.03**	**1.25**	**1.20**	**1.24**	**1.21**	**1.19**	**1.01**	**1.04**
Indirect Attainment		**2.45**	**2.46**	**2.43**	**2.44**	**2.48**	**2.3**	**2.3**	**2.35**	**2.3**	**2.36**	**2.36**	**2.32**	**2.38**	**2.38**
Overall Attainment		**1.54**	**1.43**	**1.33**	**1.36**	**1.41**	**1.47**	**1.28**	**1.47**	**1.42**	**1.47**	**1.44**	**1.42**	**1.28**	**1.31**

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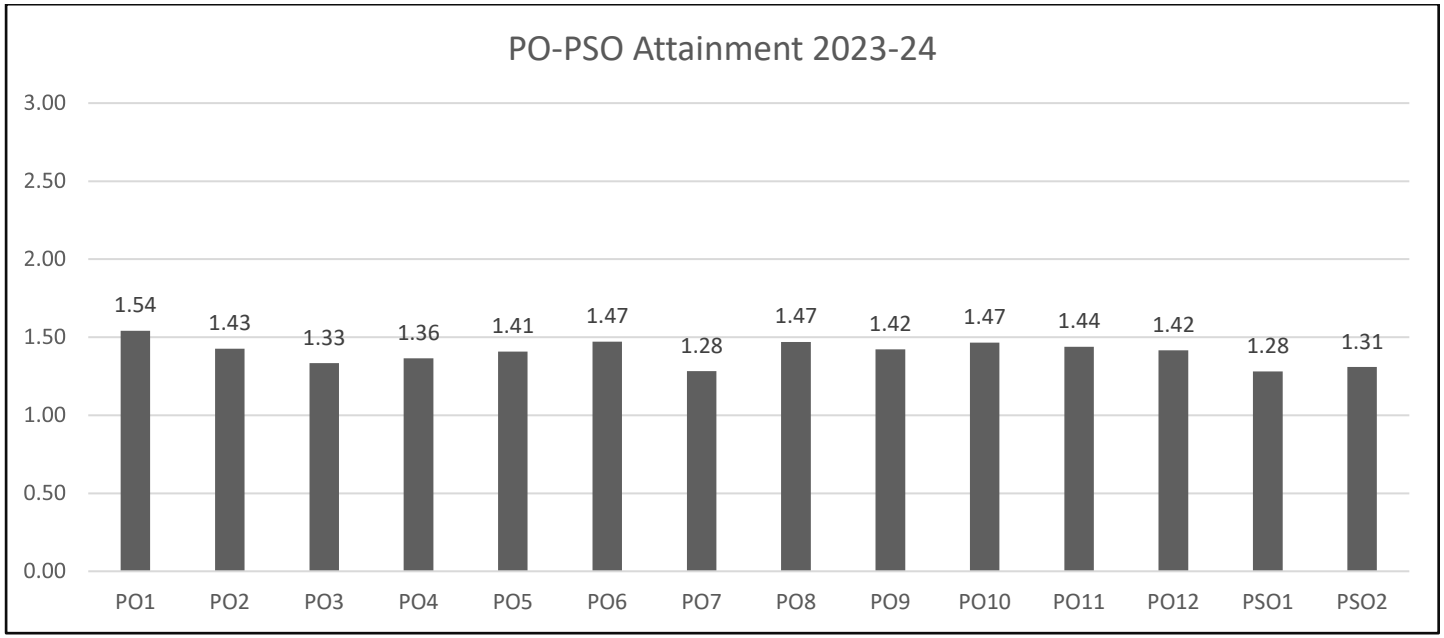

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