



## Exam Reform Policy as per AICTE

(For Computer Science Engineering & Information Technology)

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**Exam Reform Policy Link -**

<https://www.aicte-india.org/sites/default/files/ExaminationReforms.pdf>

The document outlines a new Examination Reform Policy from the All India Council for Technical Education (AICTE) with the following key points:


- ❖ The policy aims to improve the quality of technical education in India by moving assessments beyond rote memorization to higher order skills like critical thinking and problem solving.
- ❖ It recommends aligning exam questions to course outcomes and using Bloom's Taxonomy as a framework to incorporate questions testing different cognitive levels.
- ❖ The policy provides guidance on improving assessment methods, aligning questions to learning outcomes, and choosing action verbs to assess higher order skills.


EXAM REFORM POLICY (AICTE Nov.'2018)				
Program Outcomes - Competencies & Performance Indicators				
Program Outcomes	C. No.	Competencies	PI No.	Performance Indicators
<b>PO1: Engineering Knowledge:</b>  Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complete engineering problems.	1.1	Demonstrate competence in mathematical modelling	1.1.1	Apply the knowledge of discrete structures, linear algebra, statistics and numerical techniques to solve problems.
			1.1.2	Apply the concepts of probability, statistics, and queuing theory in the modelling of computer-based systems, data, and network protocols.
	1.2	Demonstrate competence in basic sciences	1.2.1	Apply laws of natural science to an engineering problem
	1.3	Demonstrate competence in engineering fundamentals	1.3.1	Apply engineering fundamentals
	1.4	Demonstrate competence in specialized engineering knowledge to the program	1.4.1	Apply theory and principles of computer science and engineering to solve an engineering problem

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<p><b>PO2: Problem Analysis:</b> identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.</p>	2.1	Demonstrate an ability to identify and formulate complex engineering problem	2.1.1	Evaluate problem statements and identify objectives.
			2.1.2	Identify processes/ modules/ algorithms of a computer-based system and parameters to solve a problem
			2.1.3	Identify mathematical algorithmic knowledge that applies to a given problem
	2.2	Demonstrate an ability to formulate a solution plan and methodology for an engineering problem	2.2.1	Reframe the computer-based system into interconnected subsystems
			2.2.2	Identify functionalities and computing resources.
			2.2.3	Identify existing solutions/methods to solve the problem, including forming justified approximations and assumptions
			2.2.4	Compare and contrast alternative solutions/ methods to select the best methods
	2.3	Demonstrate an ability to formulate and interpret a model	2.2.5	Compare and contrast alternative solution processes to select the best process
			2.3.1	Able to apply computer engineering principles to formulate modules of a system with required applicability and performance

  
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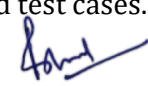


			2.3.2	Identify design constraints for required performance criteria.
	2.4	Demonstrate an ability to execute a solution process and analyze results	2.4.1	Applied engineering mathematics to implement the solution.
			2.4.2	Analyze and interpret the results using contemporary tools.
			2.4.3	Identify the limitations of the solution and sources/causes.
			2.4.4	Arrive at conclusions with respect to the objectives
<p><b>PO3: Design &amp; 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.</p>	3.1	Demonstrate an ability to define a complex/ open-ended problem in engineering terms	3.1.1	Able to define a precise problem statement with objectives and scope.
			3.1.2	Able to identify and document system requirements from stakeholders.
			3.1.3	Able to review state-of-the-art literature to synthesize system requirements.
			3.1.4	Able to choose appropriate quality attributes as defined by ISO/IEC/IEEE standards.
			3.1.5	Explore and synthesize system requirements from larger social and professional concerns.
		3.1.6	Able to develop software requirement specifications (SRS).	
	3.2	Demonstrate an ability to generate	3.2.1	Able to explore design alternatives.

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		a diverse set of alternative design solutions	3.2.2	Able to produce a variety of potential design solutions suited to meet functional requirements.	
			3.2.3	Identify suitable non-functional requirements for the evaluation of alternate design solutions.	
	3.3	Demonstrate an ability to select optimal design scheme for further development	3.3.1	Able to perform systematic evaluation of the degree to which several design concepts meet the criteria.	
			3.3.2	Consult with domain experts and stakeholders to select candidate engineering design solutions for further development	
	3.4	Demonstrate an ability to advance an engineering design to a defined end state	3.4.1	Able to refine architecture design into a detailed design within the existing constraints.	
			3.4.2	Able to implement and integrate the modules.	
			3.4.3	Able to verify the functionalities and validate the design.	
	<b>P04: Conduct Investigation of Complex Problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.	4.1	Demonstrate an ability to conduct investigations of technical issues consistent with their level of knowledge and understanding	4.1.1	Define a problem for purposes of investigation, its scope and importance
				4.1.2	Able to choose appropriate procedure/algorithm, dataset, and test cases.
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				Able to choose appropriate hardware/software tools to conduct the experiment.
	4.2	Demonstrate an ability to design experiments to solve open-ended problems	4.2.1	Design and develop appropriate procedures/methodologies based on the study objectives
	4.3	4.6 Demonstrate an ability to analyze data and reach a valid conclusion	4.3.1	Use appropriate procedures, tools, and techniques to collect and analyze data
			4.3.2	Critically analyze data for trends and correlations, stating possible errors and limitations
			4.3.3	Represent data(in tabular and/or graphical forms) so as to facilitate analysis and explanation of the data and drawing of conclusions
			4.3.4	Synthesize information and knowledge about the problem from the raw data to reach appropriate conclusions
<b>P05: Modern Tools Usage:</b> create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an	5.1	Demonstrate an ability to identify/create modern engineering tools, techniques, and resources	5.1.1	Identify modern engineering tools, techniques, and resources for engineering activities.
			5.1.2	Create/adapt/modify/extend tools and techniques to solve engineering problems

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understanding of the limitations.	5.2	Demonstrate an ability to select and apply discipline-specific tools, techniques, and resources	5.2.1	Identify the strengths and limitations of tools for (i) Acquiring information, (ii) modelling and simulating, (iii) monitoring system performance, and (iv) Creating engineering designs.
			5.2.2	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
			5.3.2	Verify the credibility of results from tool use with reference to the accuracy and limitations, and the assumptions inherent in their use.
<b>P06: 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.	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 pertain to protection of the public and public interest at the global, regional, and local level.
	6.2	Demonstrate an understanding of professional engineering regulations,	6.2.1	Interpret legislation, regulations, codes, and standards relevant to your discipline and explain its contribution to the protection of the public

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		legislation and standards		
<b>P07: Environment &amp; Sustainability:</b> understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and 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	Describe management techniques for sustainable development
			7.2.2	Apply principles of preventive engineering and sustainable development to an engineering activity or product relevant to the discipline
<b>P08: Ethics:</b> apply ethical principles and commit to professional ethics and responsibilities and norms of 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	Identify tenets of the ASME professional code of ethics
			8.2.2	Examine and apply moral & ethical principles to known case studies
<b>P09: Individual &amp; Teamwork:</b> 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	Recognize a variety of working and learning preferences; appreciate the value of diversity on a team
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				Implement the norms of practice (e.g. rules, roles, charters, agendas, etc.) of effective teamwork, 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
			9.2.2	Treat other team members respectfully
			9.2.3	Listen to other members
			9.2.4	Maintain composure in difficult situations
	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
<b>PO10: Communication:</b> 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.	10.1	Demonstrate an ability to comprehend technical literature and document project work	10.1.1	Read, understand, and interpret technical and non-technical information
			10.1.2	Produce clear, well-constructed, and well-supported written engineering documents
			10.1.3	Create flow in a document or presentation - a logical progression of ideas so that the main point is clear
	10.2	Demonstrate competence in listening, speaking, and presentation	10.2.1	Listen to and comprehend information, instructions, and viewpoints of others
			10.2.2	Deliver effective oral presentations to technical and non-technical audiences

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	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
			10.3.2	Use a variety of media effectively to convey a message in a document or a presentation
<b>PO11: Project management &amp; Finance:</b> 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.	11.1	Demonstrate an ability to evaluate the economic and financial performance of an engineering activity	11.1.1	Describe various economic and financial costs/benefits of an engineering activity
			11.1.2	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	11.1.3	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 budget
	12.1	Demonstrate an ability to identify gaps in knowledge	12.1.1	Describe the rationale for the requirement for continuing professional development

independent and life-long learning in the broadest context of technological change.		and a strategy to close these gaps	12.1.2	Identify deficiencies or gaps in knowledge and demonstrate an ability to source information to close this gap
	12.2	Demonstrate an ability to identify changing trends in engineering knowledge and practice	12.2.1	Identify historic points of technological advance in engineering that required practitioners to seek education in order to stay current
			12.2.2	Recognize the need and be able to clearly explain why it is vitally important to keep current regarding new developments in your field
	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
			12.3.2	Analyze sourced technical and popular information for feasibility, viability, sustainability, etc.

  
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