

# **Computer Science Department**

## **BS Software Engineering Program**

### **Program Educational Objectives (PEOs):**

**PEO 1:** Our graduates will have professional career in industry, academia, and R&D organizations or in a self-initiated entrepreneurial undertaking.

**PEO 2:** Our graduates will be able to analyze problems and create sustainable solutions using their domain knowledge and modern IT tools. Also, they will have the ability to adapt to the changes in technology and the needs of society.

**PEO 3:** Our graduates will continue to seek knowledge for professional advancement and enhanced awareness about computing practices and societal concerns.

**PEO 4:** Our graduates will manage assigned projects as individuals or as a part of an interdisciplinary team. They will be effective communicators and will conduct themselves with integrity, upholding the principles of ethics and social responsibility.

# Computer Science Department

## BS Software Engineering Program

### Program Learning Outcome (PLOs)

Computing programs prepare students to attain educational objectives by ensuring that students demonstrate achievement of the following outcomes.

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<b>1. Engineering Knowledge</b>	An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
<b>2. Problem Analysis</b>	An ability to identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principals of mathematics, natural sciences and engineering sciences.
<b>3. Design/ Development of Solutions</b>	An ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
<b>4. Investigation</b>	An ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions.
<b>5. Modern Tool Usage</b>	An ability to 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.
<b>6. The Engineer and Society</b>	An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems.
<b>7. Environment and Sustainability</b>	An ability to understand the impact of professional engineering solutions in societal and environmental context and demonstrate knowledge of and need for sustainable development.
<b>8. Ethics</b>	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
<b>9. Individual and Team Work</b>	An ability to work effectively, as an individual or in a team, on multifaceted and/or multidisciplinary settings.
<b>10. Communication</b>	An ability to communicate effectively, orally as well as in writing, 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.

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**11. Project Management** An ability to demonstrate management skills and apply engineering principles to one’s own work, as a member and /or leader in a team, to manage projects in a multidisciplinary environment.

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**12. Lifelong Learning** An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

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## Course Learning Outcomes

Course learning outcome is developed using Bloom’s Taxonomy that involves three learning domains: cognitive, affective, and psychomotor which has six cognitive levels, five affective levels and seven psychomotor levels

Learning Domain	Learning Level	Level Attributes	Keywords
Cognitive	C1 Knowledge	Rote memorization, recognition, or recall of facts.	Find, define, label, describe, memorize, locate, recognize, identify, record, name, tell, list, recite, select, relate
	C2 Comprehension	Understanding what the facts mean.	Convert, transform, examples, match, restate, paraphrase, change, rewrite, give, express, illustrate, extend, generalize, summarize, interpret, compare, explain, predict
	C3 Application	Correct use of the facts, rules, or ideas.	Use, apply, change, solve, choose, sketch, modify, make, dramatize, discover, classify, prepare, show, produce, construct, paint, demonstrate, illustrate
	C4 Analysis	Breaking down information into component parts.	Analyze, classify, survey, separate, distinguish, infer, categorize, subdivide, inquire, differentiate, probe, attributes, investigate, select, experiment, point out, compare, contrast

	C5 Synthesis	Combining parts to make a new whole.	Plan, role-play, compose, invert, hypothesis, design, revise, construct, develop, collect, predict, formulate, create, organize, originate, combine, arrange
	C6 Evaluation	Judging the value or worth of information or ideas.	Appraise, deduce, critique, defend, recommend, conclude, decide, criticize, evaluate, consider, weight, judge, support, rate
<b>Affective</b>	A1 Receiving phenomena	Willingness to receive information.	Ask, choose, identify, point out, reply, select, name, give, follow, hold, use, describe
	A2 Responding phenomena	Individual actively participating in his or her own learning.	Read, answer, select, recite, discuss, write, greet, present, form, help, practice, perform, conform, comply, aid, assist, read
	A3 Valuing	The ranges from simple acceptance of a value to one of commitment.	Work, justify, differentiate, invite, initiate, study, join, share, propose, report, select, explain, demonstrate
	A4 Organizing values	Individuals go through as they bring together different values, resolve conflicts among them and start to internalize the values.	Integrate, relate, complete, organize, defend, identify, synthesize, modify, generalize, formulate, prepare, compare, combine, adhere, arrange
	A5 Internalizing value	Individual has a value system in terms of their beliefs, ideas and attitudes that control their behavior in a consistent and predictable manner	Display, discriminate, verify, modify, revises, serve, listen, practice, influence
<b>Psychomot</b>	P1 Perception	The ability to use observed cues to guide physical activity.	Detect, describe, differentiate, isolate, distinguish, choose, select, relate, identify

	P2 Set	The readiness to take a particular course of action	Begin, explain, show, volunteering, proceed, move, state, display
	P3 Guided Response	The trial-an-error attempts at acquiring a physical skill. With practice, this leads to better performance.	Copy, trace, react, response, reproduce, follow
	P4 Mechanism	Learned responses become more habitual and movements can be performed with some confidence and level of proficiency.	Mix, assemble, measure, dismantle, construct, calibrate, grind, fix, fasten, mend, sketch, manipulate, heat, display
	P5 Complex Overt Response	Responses are automatic and proficiency is indicated by accurate and highly coordinated performance with a minimum of wasted effort.	Build, organize, mend, sketch, manipulate, heat, display
	P6 Adaptation	Skills are well developed and the individual can modify movements to deal with problem situations or to fit special requirements.	Adapt, change, reorganize, alter, vary, rearrange, reorganize, revise
	P7 Origination	The skills are so highly developed that creativity for special situations is possible.	Arrange, originate, create, design, initiate, compose, combine