Course Outcomes (CO) and their mapping with Program outcomes (PO) and Teaching-Learning Assessment methods (divided in two sections). Second section achieves the requirements of complex engineering problem. First Section (Before MID, achieved by lab based individual examination: CO1, CO2). Second Section (After MID, achieved by a group project of five members: CO3-Rest).

CO No.	**CO Statements: Upon successful completion of the course, students should be able to:**	Corresponding POs (Appendix-1)	Bloom's taxonomy domain/level (Appendix-2)	Delivery methods and activities	Assessment Tools	Ks	Ps	As
CO1	Use a modern/popular IDE (database software/tool) to manage database systems.	5(e)	1/Apply	Lecture, Problem Solving	Lab Task(1)[1], Lab Exam with Viva(2)[1]	**K3, K5, K6**	**P1, P3, P7**	**A1, A5**
CO2	Construct standard queries using Structured Query Languages (SQL) to store, retrieve and manipulate data.	2(b)	1/Apply	Lecture, Problem Solving	Lab Task(1)[2], Lab Exam with Viva(2)[2]			
CO3	Develop an entity relationship model based database system for complex engineering problem.	1(a)	1/Create	Lecture	Report(4)[1], Project Viva(5)[1]			
CO4	Identify the relationship sets of the proposed solution by applying the standards of Entity-Relationship model.	2(b)	1/Analyze	Lecture	Report(4)[2] +Project idea Presentation (3)[1]			
CO5	Implement an executable solution for the proposed database system. Verify and validate the solution by Project description, Entity Relationship model, backend database design, and Query implementation.	3(c)	1/ Analyze	Lecture, Practice	Continuous Project Evaluation project demonstration(6)[1], Video Presentation(3)[2], Report(4)[3]			
CO6	Assess societal, health, safety, legal and cultural issues related to the project.	5(f)	1/Understand	Lecture	Report(4)[4]			
CO7	Recognize ethical and professional responsibilities in engineering situations.	8(h)	3/Valuing	Lecture	Project Viva(5)[2]			
CO8	Work effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	9(i)	3/Characterizing	3/Characterizing	Continuous Project Evaluation(6)[2], Project Viva(5)[3]			
CO9	Communicate effectively through presentation and write effective reports and documentation on the project.	10(j)	1/Apply	Lecture,	Report(4)[5], Project Viva(5)[4]			

Appendix-1:
Washington Accord Program Outcomes (PO) for engineering programs:

(a) Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in K1 to K4 respectively to the solution of complex engineering problems.

(b) Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (K1 to K4)

(c) 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. (K5)

(d) Conduct investigations of complex problems using research-based knowledge (K8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

(e) 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 their limitations.

(f) 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 solutions to complex engineering problems. (K7)

(g) Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (K7)

(h) Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (K7)

(i) Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

(j) 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.

(k) Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

(l) 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.