

Course Name: PHYSICS FOR COMPUTER SCIENCE AND ENGINEERING STREAM	
Course Code : BPHYS12/22	
Semester : 1/2	
Academic Year :2022-23	
After studying this course, a student will be able to	
CO1	Describe the principles of LASERS and Optical fibers and their relevant applications.
CO2	Discuss the basic principles of Quantum Mechanics
CO3	Comprehend the applications in Quantum Computing
CO4	Understand the importance of electrical, thermal and superconducting properties of materials and its applications in quantum computing
CO5	Illustrate the application of physics in design and data analysis.
CO6	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

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CO-PO MAPPING												
CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1		1					1	1		1
CO2	2	1		1					1	1		1
CO3	2	1		1					1	1		1
CO4	2	1		1					1	1		1
CO5	2	2	1	1					1	1		1
CO6	2	1	1	1	1				2	2		1
CO	2	1.17	1	1	1				1.17	1.17		1

CO-PO Allocation Justification for the subject
PHYSICS FOR COMPUTER SCIENCE AND ENGINEERING STREAM

COs		POs	Weight age	Justification
CO1	Describe the principles of LASERS and Optical fibers and their relevant applications.	PO1	2	Moderate scientific and engineering knowledge of Lasers and Optical fibers were imparted.
		PO2	1	A minimal mathematical analysis and logical thinking required for the problem analysis is also taught
		PO4	1	By indicating areas of application in lasers and by indicating potential research possibilities we are encouraging them to conduct investigation on complex problems
		PO9	1	Individual and team-work fostered through a small experiential learning group activity.
		PO10	1	Communication attribute exercised during the demonstration of experiential learning activity together with proper documentation, report preparation.
		PO12	1	Any meaningful learning of any topic forms a part of life-long learning, which in turn furthers the technology
CO2	Discuss the basic principles of Quantum Mechanics	PO1	2	Moderate scientific and engineering knowledge of Quantum Physics was imparted.
		PO2	1	A minimal mathematical analysis and logical thinking required for the problem analysis is also taught
		PO4	1	By indicating areas of application in quantum mechanics and by indicating potential research possibilities we are encouraging them to conduct investigation on complex problems
		PO9	1	Individual and team-work fostered through a small experiential learning group activity.
		PO10	1	Communication attribute exercised during the demonstration of experiential learning activity together with proper documentation, report preparation.
		PO12	1	Any meaningful learning of any topic forms a part of life-long learning, which in turn furthers the technology
CO3	Comprehend the applications in Quantum Computing	PO1	2	Moderate scientific and engineering knowledge of Quantum computation was imparted
		PO2	1	A minimal mathematical analysis and logical thinking required for the problem analysis is also taught
		PO4	1	By indicating areas of application of quantum computing and by indicating potential research possibilities we are encouraging them to conduct investigation on complex problems

		PO9	1	Individual and team-work fostered through a small experiential learning group activity.
		PO10	1	Communication attribute exercised during the demonstration of experiential learning activity together with proper documentation, report preparation.
		PO12	1	Any meaningful learning of any topic forms a part of life-long learning , which in turn furthers the technology
CO4	Understand the importance of electrical, thermal and superconducting properties of materials and its applications in quantum computing	PO1	2	Moderate scientific and engineering knowledge of electrical and thermal physics were imparted.
		PO2	1	A minimal mathematical analysis and logical thinking required for the problem analysis is also taught
		PO4	1	By indicating potential research possibilities and applications in the field of superconductivity we are encouraging them to conduct investigation on complex problems
		PO9	1	Individual and team-work fostered through a small experiential learning group activity.
		PO10	1	Communication attribute exercised during the demonstration of experiential learning activity together with proper documentation, report preparation.
		PO12	1	Any meaningful learning of any topic forms a part of life-long learning , which in turn furthers the technology
CO5	Illustrate the application of physics in design and data analysis.	PO1	2	Moderate scientific and engineering knowledge were imparted.
		PO2	1	A minimal mathematical analysis and logical thinking required for the problem analysis is also taught
		PO3	1	The student is encouraged to design and develop a solution of various statistical and other problems.
		PO4	1	By indicating areas of application of physics in design and data analysis, and by indicating potential research possibilities we are encouraging them to conduct investigation on complex problems
		PO9	1	Individual and team-work fostered through a small experiential learning group activity.
		PO10	1	Communication attribute exercised during the demonstration of experiential learning activity together with proper documentation, report preparation.
		PO12	1	Any meaningful learning of any topic forms a part of life-long learning , which in turn furthers the technology
		PO1	1	The required scientific and engineering knowledge to perform the experiments were

CO6	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.			imparted.
		PO2	1	A minimal mathematical analysis and logical thinking required for the problem analysis is also taught
		PO3	1	The student is taught to design and develop a solution of various statistical and other problems, aided by computers.
		PO4	1	By indicating areas of application and by indicating potential research possibilities we are encouraging them to conduct investigation on complex problems
		PO5	1	The student is encouraged to design and develop a solution of various statistical and other problems, aided by computer programs and various ready to use online platforms
		PO9	1	Individual and team-work fostered through a small experiential learning group activity.
		PO10	1	Communication attribute exercised during the demonstration of experiential learning activity together with proper documentation, report preparation.
		PO12	1	Any meaningful learning of any topic forms a part of life-long learning , which in turn furthers the technology

PO	Description
1	Engineering knowledge: Apply (Get) the knowledge of mathematics, science, Engineering fundamentals, & an Engineering specialization for the solution of complex engineering problems.
2	Problem analysis: Identify, formulate, research literature, & analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and Engineering sciences.
3	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
4	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.
5	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.
9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	Communication: 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.
12	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.

Discussed and approved by Course Instructors:

1. Dr. Pramod Gopal Pai, HOD, Dept of Physics
2. Dr. Prasad N Bapat, Course-coordinator – CSE Stream
3. Ms. Rashmi H S