



DEVI AHILYA VISHWAVIDYALAYA, INDORE

School of Physics

1.1.1

Program outcome and course outcome



Program outcomes, Program specific outcomes, course outcomes and course specific outcomes for all Programs offered by the School of Physics

Program outcomes:

The programs develop competitive spirits, nurture individual thinking and groom the students in order to enable them to meet with the scientific and technological challenges in the global arena. We also develop professionally competent, environmentally and socially conscious, value imbued and ethical students.

Program specific outcomes:

The Department runs six (6) programs which include, M.Sc. (Physics), M.ScPhysics(Material Science), M.Tech(Lasers Science and Applications), M.Phil and PhD.

M.Sc(Physics) and M.Sc Physics(Material Science) programs educate and prepare students to accept the national and global challenges in the field of Physics and provides them the knowledge base to serve the society through their active participation in scientific institutions and educational institutions.

M.Tech(Lasers Science and Applications) educates the student in the field of lasers and make them capable of handling various kinds of lasers for the diversified applications which include applications in medical sciences, material science, communication, imaging etc.

M.Phil. and PhD. Programs are designed to give elaborate exposure to student in the front line areas of physics and makes globally competent scientific manpower.

Course outcomes:

M.Sc. courses are designed to develop and improvise basic concepts of the students and prepares them to undertake scientific challenges and enrich teaching fraternity. M.Tech. courses not only prepares the students with state of knowledge in lasers and their applications. It also makes them technically sound and competent in handling lasers for various applications. The M.Phil. and PhD courses are subject specific and prepares the students in the frontline areas of Physics.

COURSE SPECIFIC OUTCOMES (CSO):

M.Sc. (Physics), M.Sc. Physics (material Science)

PHY-501 Classical Mechanics & PHY-601 Classical Mechanics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Classical mechanics.

PHY-502 Statistical Mechanics & PHY-602 Statistical Mechanics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Statistical Mechanics.

PHY-503 Mathematical Physics & PHY-603 Mathematical Physics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Mathematical Physics

PHY-504 Solid State Physics-I & PHY-525 Solid State Physics-II

PHY-604 Solid State Physics-I & PHY-625 Solid State Physics-II

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Solid State Physics

PHY-505 Quantum Mechanics-I & PHY-523 Quantum Mechanics-II

PHY-605 Quantum Mechanics-I & PHY-623 Quantum Mechanics-II

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Quantum Mechanics.

PHY-506 Classical Electrodynamics-I & PHY-521 Classical Electrodynamics-II

PHY-606 Classical Electrodynamics-I & PHY-621 Classical Electrodynamics-II

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Classical Electrodynamics.

PHY-507 Electronics & PHY-607 Electronics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Electronics.

CSO3: They acquire knowledge in the field of electronics are capable applying them to the practical situations. The electronics experiments enable them to make electronic circuits for practical applications.

PHY-508 Atomic and Molecular Physics & PHY-608 Atomic and Molecular Physics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Atomic and Molecular Physics.

PHY-509 Laboratory Course-I (Electronics) & PHY-609 Laboratory Course-I (Electronics)

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Electronics.

CSO3: They acquire knowledge in the field of electronics are capable applying them to the practical situations. The electronics experiments enable them to make electronic circuits for practical applications.

PHY-510 Laboratory Course-II(Optics) & PHY-610 Laboratory Course-II (Optics)

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications.

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Optics.

PHY-511 CBCS- I Numerical techniques using C++ & PHY-611 CBCS- (IDC-I)

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications.

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Numerical techniques using C++

PHY-522 Research Project Work/ Laboratory Course-IV (Microprocessor) &

PHY-630 Research Project Work/Practicals

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Microprocessor.

PHY-524 Digital Electronics and Microprocessor & PHY-622 Digital Electronics & Microprocessor

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of Digital Electronics and Microprocessor.

CSO3: They acquire knowledge in the field of electronics and microprocessor are capable applying them to the practical situations. The electronics and microprocessor experiments enable them to make electronic circuits for practical applications

PHY-526 Laser Physics & PHY-624 Laser Physics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of laser physics.

CSO4: They have the basic knowledge of lasers and their applications and are able to handle He-Ne lasers.

PHY-527 Nuclear and Particle Physics & PHY-627 Nuclear and Particle Physics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications.

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of nuclear and particle physics.

PHY-528 Plasma Physics & PHY-628 Plasma Physics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of plasma physics.

PHY-529 CBCS- II Numerical techniques using C++ & PHY-629 CBCS (IDC-II)

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of C++.

PHY-530 Materials Science & PHY-626 Material Science

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of materials science.

CSO3: They also have basic knowledge of material science and are capable of understanding X-ray diffraction data, magnetization as well as conductivity of materials including that of Nano- particles.

PHY-531 Research Project Work/Laboratory Course-III (Computer oriented numerical methods) & PHY-631 Research Project Work/ Practicals

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of computer oriented numerical methods.

PHY-532 Optoelectronics

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of optoelectronics.

PHY-534 Nanomaterials

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of nanomaterials.

PHY-536 Transducers and characterization techniques

CSO1: Students at School of Physics are imparted knowledge to improve conceptual physics and their applications

CSO2: Students will be able to demonstrate sound knowledge and ability to identify and solve problems in the area of transducers and characterization techniques.

M.Tech. (Lasers Science and Applications)

LA-701 Applied Optics

CSO1: Students at School of Physics are imparted knowledge to improve concepts in Applied Optics.

CSO2: They study Applied Optics enabling them to undertake problems on optical imaging, optical communication and sensor applications.

CSO3: They can work on research related problems on linear and Nonlinear Optics.

LA-702 High Voltage Engineering for Lasers

CSO1: Students at School of Physics are imparted knowledge to improve concepts in high voltage engineered lasers.

CSO2: They have the exposure to most modern lasers available in the country and can participate in laser applications.

CSO3: They acquire knowledge in the field of high voltage engineered lasers and are capable applying them to the practical situations.

LA-703 Laser Physics

CSO1: Students at School of Physics are imparted knowledge to improve concepts in laser physics.

CSO2: They have the exposure to most modern lasers available in the country and can participate in laser applications.

CSO3: They acquire knowledge in the field of lasers and are capable applying them to the practical situations.

LA-704 Laser Systems and Applications

CSO1: Students at School of Physics are imparted knowledge to improve concepts in Laser Systems and Applications.

CSO2: They have the exposure to most modern lasers available in the country.

CSO3: They acquire knowledge in the field lasers and are capable applying them to the practical situations.

LA-705 Fiber Optics

CSO1: Students at School of Physics are imparted knowledge to improve concepts in Fibre Optics.

CSO2: They study Fiber enabling them to undertake problems on optical imaging, optical communication and sensor applications.

CSO3: They can work on research related problems on Fiber Optics.

LA-706 Semiconductor Lasers

CSO1: Students at School of Physics are imparted knowledge to improve concepts in semiconductor lasers.

CSO2: They have the exposure to most modern semiconductor lasers available in the country.

CSO3: They can work on research related problems on semiconductor lasers.

LA-707 Laser Applications

CSO1: Students at School of Physics are imparted knowledge to improve concepts in Laser Systems and Applications.

CSO2: They have the exposure to most modern lasers available in the country.

CSO3: They acquire knowledge in the field lasers and are capable applying them to the practical situations.

LA-708 Free Electron Lasers

CSO1: Students at School of Physics are imparted knowledge to improve concepts in Free Electron Lasers.

CSO2: They have the exposure to most modern free electron lasers available in the country.

CSO3: They can work on research related problems on Free electron laser and Laser- plasma interaction.

LA-709 Practical-I

CSO1: Students learn the handling of lasers, their alignment and they are made safety conscious.

CSO2: They carry out laser application based experiments

CSO3: They can also characterize the lasers.

CSO4: They have the exposure to most modern lasers available at RRCAT, Indore and can participate in laser applications especially in medical applications.

LA-710 Practical-II

CSO1: Students at School of Physics are imparted knowledge to improve concepts in Applied Optics and verify some of them experimentally in the laboratory.

CSO2: They study Applied Optics, Fiber Optics as well as Optical Communication enabling them to undertake problems on optical imaging, optical communication and sensor applications.

CSO3: They can work on research related problems on Free electron laser, Nonlinear Optics and Laser- plasma interaction.

CSO4: They have the exposure to most modern lasers available in the country and can participate in laser applications specially in medical applications.

LA-712 Optical Communication and Optical Switching

CSO1: Students at School of Physics are imparted knowledge to improve concepts in Optical Communication and Optical Switching.

CSO2: They study Optical Communication and Optical Switching enabling them to undertake problems on optical imaging, optical communication and sensor applications.

CSO3: They can work on research related problems on Optical Communication and Optical Switching.

LA-721, LA-722 Project(Part-I, Part-II)

CSO1: Students carry out one year project at RRCAT, Indore.

CSO2: They have the exposure to most modern lasers in the country.

CSO3: They can work on research related problems on Free electron laser, Nonlinear Optics and Laser- plasma interaction, medical applications of laser .

LA-723 Numerical Techniques based on C++

CSO1: Students at School of Physics are imparted knowledge to improve concepts in Numerical Techniques.

CSO2: They study various programmable techniques to solve mathematical problems

CSO3: They can work on solving problems through programming language

LA-724 Seminar

CSO1: Students are encouraged to deliver seminars. This activity improves their communication ability.

M.Phil and Ph.D.

PHY-801 Review of Related Literature

CSO1: Students will be able to demonstrate research skill by working on problems that involve study of literature, methodologies, techniques, and tools, and conduct of experiments needing data interpretation in the fields of (i) Material Science (ii) Plasma Physics (iii) Insertion devices (iv) magnetic properties (v) Laser Physics and nonlinear Optics (vi) High power microwaves as well as interdisciplinary subjects.

CSO2: Students will be able to demonstrate an ability to critically examine scientific problems and to come up with solutions that may require collaborative, multidisciplinary and innovative approach.

CSO3: Students will have the knowledge of what has been done in research area and what needs to be done.

PHY-802 Seminar

CSO1: Students are encouraged to deliver seminars. This activity improves their communication ability.

PHY-803 Research Methodology

CSO1: Students will be able to demonstrate research skill by working on problems that involve study of literature, methodologies, techniques, and tools, and conduct of experiments needing data interpretation in the fields of (i) Material Science (ii) Plasma Physics (iii) Insertion devices (iv) magnetic properties (v) Laser Physics and nonlinear Optics (vi) High power microwaves as well as interdisciplinary subjects.

CSO2: Students will be able to demonstrate an ability to critically examine scientific problems and to come up with solutions that may require collaborative, multidisciplinary and innovative approach.

CSO3: Students will be able to demonstrate ability to use modern scientific equipment, various software to analyse and solve scientific problems.

PHY-804 Term/Paper Assignment

CSO1: Students will be able to self analyse by various assignments.

CSO2: Students will know their weak points and will have opportunity to improve them through means of assignments.

PHY-805 Computer Application

CSO1: Students will be able to demonstrate the use of computer applications in research skill by working on problems that involve study of literature, methodologies, techniques, and tools, and conduct of experiments needing data interpretation in the fields of (i) Material Science (ii) Plasma Physics (iii) Insertion devices (iv) magnetic properties (v) Laser Physics and nonlinear Optics (vi) High power microwaves as well as interdisciplinary subjects.

CSO2: Students will be able to demonstrate an ability to critically examine scientific problems and to come up with solutions that may require collaborative, multidisciplinary and innovative approach using computer applications.

CSO3: Students will be able to demonstrate ability to use modern scientific equipment, various software to analyse and solve scientific problems.

PHY-806 Dissertation/Project

CSO1: Students will be able to demonstrate research skill by working on problems that involve study of literature, methodologies, techniques, and tools, and conduct of experiments needing data interpretation in the fields of (i) Material Science (ii) Plasma Physics (iii) Insertion devices (iv) magnetic properties (v) Laser Physics and nonlinear Optics (vi) High power microwaves as well as interdisciplinary subjects.

CSO2: Students will be able to demonstrate an ability to critically examine scientific problems and to come up with solutions that may require collaborative, multidisciplinary and innovative approach.

CSO3: Students will be able to demonstrate ability to use modern scientific equipment, various software to analyse and solve scientific problems.

PHY-807 Subject Specific-I

CSO1: Students are given exposure to the frontline areas of research as well as recent trends in the field of Physics.

CSO2: Students will be able to demonstrate an ability to critically examine scientific problems and to come up with solutions that may require collaborative, multidisciplinary and innovative approach.

CSO3: Students will be able to demonstrate ability to use modern scientific equipment, various software to analyse and solve scientific problems.

PHY-809 Subject Specific-II

CSO1: Students are given exposure to the frontline areas of research as well as recent trends in the field of Physics.

CSO2: Students will be able to demonstrate an ability to critically examine scientific problems and to come up with solutions that may require collaborative, multidisciplinary and innovative approach.

CSO3: Students will be able to demonstrate ability to use modern scientific equipment, various software to analyse and solve scientific problems.

