



# SACRED HEART COLLEGE (AUTONOMOUS)

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Ready for  
Every Good Work

A Don Bosco Institution of Higher Education, Founded in 1951 \* Affiliated to Thiruvalluvar University, Vellore \* Autonomous since 1987

Accredited by NAAC (4<sup>th</sup> Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

Name of the Course	Course Code	Name of the Program	Activities with direct bearing on Employability/ Entrepreneurship/ Skill development	Year of introduction
Mechanics	P113	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> Centre of gravity, Projectiles, Circular motion, Impact and Dynamics of rigid bodies, Moment of inertia and the method of determining the Moment of Inertia of compound pendulum, Hydrostatics and Hydrodynamics. <b>Activities:</b> Hands-on-training to determine 'g' using compound pendulum, Quiz on Fluid Motion, E-Assignments on problems in centre of gravity, Interactive sessions on Bernoulli's Theorem, Brain storming investigations on collision, impulse and impact.	2021-22

Properties of matter	P114	B. Sc. Physics	<p><b>Employability:</b></p> <p><b>Contents:</b> Bending of beams, Viscosity – Streamline and turbulent flow, Variation of viscosity with temperature and lubrication, Variation of viscosity with temperature and lubrication, surface tension - molecular theory-Osmosis-Reverse osmosis</p> <p><b>Activities:</b> Group discussion , Problem solving, Interactive session-Practical hands on training will be provided to the students and will ensure the employability in the field of construction of buildings, chemical industries and in the osmosis related.</p>	2021-22
Heat and Thermodynamics	P212	B. Sc. Physics	<p><b>Employability:</b></p> <p><b>Contents:</b> Calorimetry, Heat transfer Processes, Production of low temperature, Liquefaction of gases, Adiabatic demagnetization, Superconductivity- Type I and type II, Meissner effect, Applications of superconductors. Otto engine,</p>	2021-22

			<p>Thermodynamic potentials: Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwell's relations &amp; applications. Studying these topics may help the students i) to get employment in Automobile industries, Refrigerator industries, Air-conditioning systems manufacturing industries, Heat pump manufacturing industries, etc, ii) to face competitive exams with confidence, and iii) to get employment as teachers and excel in teaching profession.</p> <p><b>Activities:</b> Seminars, Group discussions, MCQ tests, Problem solving</p>	
Optics	P315	B. Sc. Physics	<p><b>Employability:</b></p> <p><b>Contents:</b> Dispersion produced by a prism, Aberration in lenses, methods to minimize spherical aberrations, Plane transmission grating - determination of wavelength, Applications of a Lasers: Lasers in medicine and surgery - Laser in holography</p> <p><b>Activities:</b> Illustrative</p>	2021-22

			demonstration on working of lasers. Demonstration on applications of Lasers, quiz on principles of Lasers.	
Modern Physics	P415	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> Positive ray analysis: Thomson's Parabola method, Vector atom model - spatial quantization and electron spin, Magneto Optical Properties of Spectrum: Stern and Gerlach experiment, fundamental laws of absorption <b>Activities:</b> PPT Presentation, Seminar, Assignments, Problem solving, Quiz.	2021-22
Electromagnetism	P416	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> Self inductance – mutual inductance – BG – Electromagnetic devices such as earth inductor, AC generator – Maxwell's equations to describe electromagnetic waves. <b>Activities:</b> Problem solving, Assignment writing, Seminars, Demonstrations.	2021-22

Classical Mechanics and Statistical Physics	P541	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> 100 % <b>Activities:</b> Interactive discussions on Lagrangian methods, Quiz on Central force motion, Assignments and Problem solving in thermodynamical distributions	2021-22
Semiconductor devices and their Applications	P542	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> Classification of amplifiers- Voltage gain of feedback amplifier - Advantages negative feedback Amplifiers - Applications of OP-AMP: Scale changer, phase shifter, Summing amplifier, Integrator, Differentiator. <b>Activities:</b> Circuit demonstration on OPAMP parameters, group discussions on Applications of OPAMP.	2021-22
Solid State Physics	P543	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> Ferrite and their applications, Polarization, frequency and temperature dependence on polarization, Conductivity of semiconductors, Hall Effect,	2021-22

			Semiconductors: Conductivity, Superconductivity: Type I and Type II superconductors. <b>Activities:</b> Problem solving, Assignments, Seminars, Quiz, Group discussion, Outcome based questions and answers, PPT Presentation.	
Mathematical Physics	P544	B. Sc. Physics	<b>Employability (100%): Contents:</b> Vectors, Beta, Gamma and Dirac-Delta functions, Fourier series and Partial differential equations <b>Activities:</b> Problem Solving, MCQs and Group Discussions	2021-22
Nanomaterials and their Applications	P545A	B. Sc. Physics	<b>Employability: Contents:</b> Preparation of nanomaterials and nanostructured thin films, different deposition techniques, various characterization techniques, different applications of nanomaterials are some of the important topics covered that can help the students get placed in higher education institutes and research laboratories not only across the country but	2021-22

			also abroad. The scope of being appointed in projects as JRFs, Project Assistants and Research assistants or scope of clears exams for Scientists Cadets increases as the student is being introduced to latest deposition and characterization techniques. <b>Activities:</b> Quiz, Assignment, Group Discussion, PPT presentation	
Electronic Communication Systems	P545B	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> Electromagnetic spectrum and frequency bands, Modulation techniques, Digital modulation, cellular mobile communication- 2G, 3G and 4G concepts, Fiber optic communication system, Radar, Microwave communication, Satellite Communication. Studying these topics may help the students i) to get placement in Telecommunication industries, Mobile phones manufacturing and servicing industries, Cellular communication	2021-22

			industries, Fiber optic cable manufacturing industries etc. and ii) to face competitive exams with confidence. Activities: Seminars, Group discussions, MCQ tests, Field visits	
Renewable Energy and Energy Harvesting	P545C	B. Sc. Physics	<p><b>Employability:</b></p> <p><b>Contents:</b> Solar energy collector – Solar water heater - Solar pump, Power from the wind-Power from the wind-Conversion technologies - Wet process – photosynthesis Energy storage systems - Energy action planning. <b>Activities:</b> Mind mapping, Group discussion, Assignment, Problem solving, Interactive session- data collection: These activities will enhance the candidate knowledge and can be able to get employment in the energy production and distribution sector.</p>	2021-22
Medical Physics	P546C	B. Sc. Physics	<p><b>Employability:</b></p> <p><b>Contents:</b> Blood pressure – Radiation exposure – Radiation detectors, mainly GM counter and</p>	2021-22



			Scintillation counter – Diagnostic systems mainly X-ray unit, CT scan and MRI scan, ECG, ENG and Endoscope. <b>Activities:</b> Field visit, demonstrations, Hands on learning, internship training from reputed medical institutions.	
Applied Electronics	P637	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> Rectifiers, Amplifiers, oscillators, multivibrators are some of the important topics that are necessary in most of the electronic industries. <b>Activities:</b> Quiz, Assignment, Group Discussion and PPT Presentation.	2021-22
Nuclear and Particle Physics	P638	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> Particle detectors – ionization chamber – proportional counter – GM counter – scintillation counter – nuclear emulsions – radiation units – mean lethal dose and permissible radiation dose – personal dosimeter and survey dosimeter – chemical –Thermo luminescent dosimeter(TLD) – biological effects of radiation – protection	2021-22

			from radiation <b>Activities:</b> Learning on the counters and dosimeters the students will be able to get job opportunity in radiation related places.	
Quantum Mechanics and Relativity	P639	B. Sc. Physics	<b>Employability:</b> <b>Contents:</b> 100% <b>Activities:</b> Illustrative Discussions, Trouble shooting problems in relativity and QM approach. problem solving on relativistic mechanics.	2021-22