## B.Sc. PHYSICS – PROGRAMME STRUCTURE 2014-17

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| IV | 4BCHA2 | ALLIED COURSE II – GENERAL CHEMISTRY – II |
| IV | 7BCHAP1 | Allied Practical – II – Volumetric Analysis |
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Total: 22 30 -- -- 600

Grand Total: 140 182 -- -- 4100
ARUMUGAM PILLAI SEETHAI AMMAL COLLEGE, TIRUPATTUR.

PHYSICS

2014-2017

PROGRAMME OUTCOME

- Students will demonstrate an understanding of core knowledge in physics, including the major premises of classical mechanics, E&M and Modern Physics.
- Students will demonstrate written and oral communication skills in communicating physics-related topics.
- Students will design and conduct an experiment (or series of experiments) demonstrating their understanding of the scientific method and processes. Students will demonstrate an understanding of the analytical methods required to interpret and analyze results and draw conclusions as supported by their data.
- Students will demonstrate proficiency in the acquisition of data using a variety of laboratory instruments and in the analysis and interpretation of such data.
- Students will utilize a wide range of printed and electronic resources and information technologies to support their research on physical systems and present those results in the context of the current understanding of physical phenomena.
- Students will demonstrate understanding of the applications of numerical techniques for modeling physical systems for which analytical methods are inappropriate or of limited utility.
- Students will demonstrate a thorough understanding of the analytical approach to modeling of physical phenomena.
- Students will demonstrate an understanding of the impact of physics and science on society.
PROPERTIES OF MATTER AND ACOUSTICS

COURSE CODE: 4BPH1C1

OBJECTIVE:

- This subject is useful in engineering applications.
- It gives details about physical properties of materials.

OUTCOME:

- Understand the basic laws and concepts of dynamic bodies.
- Gain knowledge about the properties of materials.
- Understand the basic concepts of elasticity.
- Study the motion of viscous fluids by understanding Poiseuille’s method.
- Provide an in-depth knowledge about gravitation, satellite and rocket propulsion system.
- Acquire the knowledge about properties of sound and ultrasonic’s.

Mechanics and Relativity - 4BPH1C2

Mechanics and Relativity is the second core paper for a B.Sc., (Physics) student in the first semester. This core paper has four out of thirty credits in the first semester. This paper correlated two extremes. Objects moving with velocity much less than that of light are studied in the part of Mechanics whereas objects moving with velocity equal to light are examined in Relativity part of the syllabus. This syllabus will cater the basic requirements for their higher studies.

Objectives
The objectives of the paper “Mechanics and Relativity” are
• To make the students to have a firm grasp of the theories that form the basis of mechanics
• To enlighten the students about the forces that is responsible for an object to stay at rest (Statics) in air and in water medium (Hydrostatics).
• To enlighten the students about the forces that is responsible for an object to move (Dynamics) in air and in water medium (Hydrodynamics).
• To make the students to understand the role of Gravity in our life
• To make the students to understand the dynamics involved in a rigid body
• Relativity provides intellectual food for students interested in theoretical studies.

Learning Outcomes
After course completion the students will have the following learning outcomes
• Have practical knowledge which helps the student in their everyday life.
• Have that required basic knowledge when the students opt for higher studies in Physics.

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<th>Title of the Course</th>
<th>Cr.</th>
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4BMAA1 ANCILLARY MATHS-I

Course Description
Elementary techniques of integration, introduction to differential equations, applications to several mathematical models in the life and social sciences, partial derivatives, and some additional topics. One-semester review of manipulative algebra, introduction to functions, some topics in matrices, and that portion of trigonometry needed for calculus.

Course Objectives: At the end of this course, students shall be able to
Apply matrix operations to solve the relevant real life problems in Science subjects.
Formulate a mathematical model for three dimensional objects and solve the concerning problems.
Find area and volume based on a function with one or more variables.

Learning Outcomes
Apply matrix operations to solve the relevant real life problems in science subjects.
Formulate a mathematical model for three dimensional objects and solve the concerning problems.
Find area and volume based on a functions with one or more variables.

Course Material: Text Book is
The foremost objective of this paper is to develop the scientific knowledge of the students by doing experiments. General physics practical – I is the practical paper for a B.Sc., Physics (Major) student in the first year. This paper has four credits. The external examination will be conducted at the end of first year. The students will be evaluated by an external examiner, who is appointed by the university, for 60 marks, and the internal examiner will evaluate the students for 40 marks. The syllabus is framed in such a way that the students can verify the theorems and laws, which he/she studied in the class room, by doing experiments.

Objectives:
The objectives of the paper “General Physics Practical – I” are

- To identify phenomena or object related to mechanics, properties of matter
- Learn facts/concept/relationship/theory/model related to mechanics, properties of matter

Learning Outcomes
After course completion the students will have the following learning outcomes

- Have the ability to plan a scientific experiment
- Have the ability to design a scientific experiment
- Have the ability to carry out a scientific experiment
- To interpret their findings in a scientific experiment

Name of the Subject: Thermal and Statistical Physics
Subject Code: 4BPH2C1
Credit: 4
No.of Hours: 4
Internal Marks: 25
External Marks: 75
Course Description: This course introduces the concept of heat, entropy, thermodynamical laws, production of low temperature, liquefaction of gases, transmission of heat and statistical methods.

Course objectives

- Develops the understanding of mass, energy, heat, work, efficiency, ideal and real thermodynamic cycles and processes.
- Teaches first and second laws of thermodynamics, perfect gas law, properties of real gases, and the general energy equation for closed and open systems.
- It also exposes the production of Low temperature, superconductors and methods of liquefaction of gas.
- Explain various types of transmission of heat and the measurement of various constants related to it tools for the arrangement of microscopic particles.

Course outcomes

Students completing the course will be able to:

- Understand the concepts of heat, work and energy
- Explain basic thermodynamic properties and units.
- Develop and apply the continuity equation for open and closed systems.
- Derive and discuss the first law of thermodynamics.
- Understand the methods of production of very Low temperature
- Gather the knowledge about solar constant and its measurements.
- Know the different forms distribution of Sub atomic particles in the system using statistical methods.

Texts Prescribed

- Brijjal and Subramanyam – Heat and Thermodynamics, 2002
- D.S. Mathur – Heat and Thermodynamics
- R. Murugesan and KiruthigaSivaprasath – Thermal Physics

Core: Electricity, Magnetism and Electromagnetism (4BPH2C2)

Aim and Objective:

❖ To understand the basic concepts of Electric field and Electric Potential.
❖ To enrich their knowledge in thermo electricity and chemical effects on current.
❖ To learn and understand the magnetic field and magnetic properties of the matter.
❖ To familiarize with the laws of electromagnetic induction.
To understand the concept of Maxwell’s equation.
To study and analyze the electromagnetic waves.
To study the concept of poynting vector.

Course outcomes:

- Gain knowledge of Gauss laws and solve the electric field for various geometric objects.
- Enable to understand the concept of electrical conductivity and Gibbs Helmholtz equation.
- Gain knowledge of seebeck effect, Peltier effect and Thomson effect.
- Enable to understand the concept of magnetic field.
- Thorough knowledge in the basic concept of electromagnetic induction.
- Able to derive the Maxwell’s equation in free space and material media.

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4BMAA2 ANCILLARY MATHS-II

Course Description
Elementary techniques of integration, introduction to differential equations, applications to several mathematical models in the life and social sciences, partial derivatives, and some additional topics. One-semester review of manipulative algebra, introduction to functions, some topics in matrices, and that portion of trigonometry needed for calculus.

Course Objectives: At the end of this course, students shall be able to
- Apply matrix operations to solve the relevant real life problems in Science subjects.
- Formulate a mathematical model for three dimensional objects and solve the concerning problems.
- Find area and volume based on a function with one or more variables.

Learning Outcomes
Apply matrix operations to solve the relevant real life problems in science subjects.
Formulate a mathematical model for three dimensional objects and solve the concerning problems.
Find area and volume based on a functions with one or more variables.

Course Material: Text Book is
ENVIRONMENTAL STUDIES

COURSE CODE : 4BES2

OBJECTIVES :

- Environmental education should be compulsory, right from the primary up to the post graduate stage.
- Environmental education should take into account the historical perspective, the current and the potential historical issues.
- Environmental education should emphasise the importance of sustainable development i.e., economic development without degrading the environment.
- Environmental education should emphasise the necessity of seeking international cooperation in environmental planning.
- Environmental education should lay more stress on practical activities and first hand experiences.

OUTCOME :

- Demonstrate a general understanding of the breadth and interdisciplinary nature of environmental issues.
- Demonstrate a general understanding of the qualitative and quantitative research methods to gain empirical evidence bearing on evaluation of environmentally sustainable alternatives
- Demonstrate depth of critical analysis and writing of environmental problems that span popular, ‘gray’ and primary publications.
- Demonstrate the ability to locate, interpret and apply published research and lessons from successful projects to a focused environmental solution with potential regional stakeholders.
- Design, conduct and present (orally and in writing) independent research that is consistent with the highest standards and practices of research in environmental science.

Part – III

III Year – III Semester

Course Code: 4BPH3C1

Core Course – Optics and Spectroscopy
Course Description

With the introduction of this course, the students will understand the basic physics of optics and modern spectroscopy ideas.

Course Objectives

- Students completing this course will understand geometrical optics, eyepieces and spectroscopic design.
- This course reveals the light properties such as interference, diffraction and polarisation.
- Last section of this course covers different spectroscopic ideas and their details.

Course Outcomes

This course objective will give clear idea in geometrical optics, optical properties, optical instruments and spectroscopic applications to the students.

COURSE CODE: 4BCHA1
ALLIED COURSE-1-GENERAL CHEMISTRY-I

Course Description:

This course gives an introduction to the basic concepts of Atomic structure and kinetics. Topics covered include Gaseous state, Solid state, colloids, Metallurgy and Chromatography.

Course Objectives:

- Principles of Physical Chemistry”, B.R.Puri, L.R.Sharma and M.S.Pathania
- “Physical Chemistry”, N.Kundu and SN.Jain
- To apply gas laws in various real life situations.
- To explain the behavior of real and ideal gas.
- To differentiate between gaseous state and vapour.
- To explain the types of emulsions.
- Explain the properties of liquids.
- To describe condition required for liquefaction of gases.
- To write the expressions for rate constant and entropy.
- To study the Hess’s law and first law of thermodynamics.
To understand various types of colloids and its applications

Course Outcome (COs):

Upon successful completion students should be able to:

- State and apply the laws of thermodynamics; perform calculations with ideal and real gases; design practical engines by using thermodynamic cycles; predict chemical equilibrium and spontaneity of reactions by using thermodynamic principles.
- To apply the concepts of colloids and gels
- To learn depth knowledge about liquid states.

Course title: PART IV (I) – (C)- Non – major elective

Course II– Employability skills

Course code: 4NME3C

Program: B.SC., Physics (II –Year)

Course description:

The aim of this course will help the students to give the extended knowledge of the preparing the curriculum and the facing interview. This course covers the interpersonal, group discussion and review of team work, motivational behavior.

Course objective:

- To prepare the curriculum
- To understanding good leadership behaviors
- To develop competent of group discussion skills in the areas of team work
- To Perform facing the interview effectively.

Course outcome:

Students should be able to,

- Understand to prepare the bio-data.
- Study the good leadership behavior.
- Developing competent of group discussion and interpersonal communication.
COMPETITIVE EXAMINATION SKILLS

COURSE CODE : 4SBS3A1

OBJECTIVES:

➢ To know the pattern of Various Examinations.
➢ To get the information about the exams conducted for the entry into jobs.
➢ To become aware about the various soft skills.

OUTCOME:

➢ To use the time effectively To become aware about the goals of life.
➢ To develop Quarantine ability and data interpretation.
➢ To improve Verbal ability and Logical Reasoning.
➢ To study the English for the competitive Examination.
➢ To develop the skill of clerical aptitude.
➢ To solve the problems with accuracy.
➢ To introduce shortcut methods in numerical ability.

Course title: Course II - Executive skills
Course code: 4SBS3A2
Program: B.SC., Physics (II – Year)

Course description:

The aim of this course will help the students to enhance their the understanding the challenges which confront today’s business professionals. In addition to specific skill development in the areas of problem solving, written and oral communications, leading teams, decision making, and the role of organizational change agents.
Course objective:

- To understanding good leadership behaviors
- To prepare themselves for training after reviewing administrative matters and making introduction
- To understand qualities and strengths
- To understand housekeeping and documentation skill

Course outcome:

Students should be able to,

- Understand the concept of basic professional qualities of an executive.
- The importance of preparation to attend office meetings and hold the office meetings.
- Acquire the knowledge of importance of report writing.
- Understand the importance of table manners, body language and maintaining the PC, file.

Extension Activity (4BEA3)

Aim and objective:

- To enrich the students to handle the social relation to the public and government higher secondary students.
- To acquire the knowledge to solve the environmental issues.
- To able to handle the classes for higher secondary students both theory and practical.
- To create the awareness to eradicate the plastics and planted the seed saplings to our environment.
- To make the interest to the students to grow saplings for their birthday occasion.

Course outcome

- Able to handle the social relation between the public and students.
- Familiarize the students to handle the environmental issues.
- According to the need for higher secondary students, educate the school students both theory and practical.
- Eradicate the plastics in and around the school and college.
• Make interest to plant saplings in and around the school and college ground.

**Course title:** Core VII – General Physics practical - II

**Course code:** 4BPH4P1

**Program:** B.Sc., Physics (II –Year)

**Course Description:**
This course will help the students to introduce the fundamental knowledge about the experimental techniques. It provides sufficient background in devices, circuits employed in systems, which enable the students to design, build and test the equipment.

**Course objectives:**
- To calibrate low & high range voltmeter using potentiometer.
- To analyze the specific heat capacity of a liquid.
- To determine the thermal conductivity by Lee’s disc method.
- To determine the refractive index of the given solid &Biprism.
- To calculate the thickness of a thin wire by Air wedge method.
- To determine radius of curvature by Neuton’s rings

**Course outcome:**

**Student should be able to,**
- Understand the knowledge in electrical devices such as ammeter and voltmeter.
- Analyze the specific heat capacity, refractive index as per the standard procedure.
- Understand the standard values of each results.
- Study the emf, resistance behavior of the materials.

Part – III

**III Year – IV Semester**

**Course Code:** 4BPH4C1

**Core Course – Atomic and Nuclear Physics**

**Course Description**
This subject satisfies the needs of the students on modern physics of atomic and nuclear ideas and their developments.

**Course Objectives**

- Students are revealed and can get good knowledge on positive rays and vector atom model.
- This course is very useful to understand X-ray ideas and crystallographic structure.
- The explanations are extended in radioactivity basics, nuclear fission and nuclear fusion, elementary particles and advanced quark model.

**Course Outcomes**

Students can attempt better insight by understanding this course and shall give clear idea in nano-technology in higher study

**COURSE CODE: 4BCHA2**

**ALLIED COURSE-II-GENERAL CHEMISTRY-II**

**Course Objectives:**

- To understand the key features of coordination compounds, including:
  - the variety of structures.
  - oxidation numbers and electronic configurations.
  - coordination numbers.
  - ligands, chelates.
  - bonding, stability of complexes.
- To be able to use Crystal Field Theory to understand the magnetic properties (and in simple terms the colour) of coordination compounds.
- To be able to describe the shapes and structures of coordination complexes with coordination numbers ranging from 4 to 12.
- To be able to describe the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters from them.
- To be able to recognize the types of isomers in coordination compounds.
- To be able to name coordination compounds and to be able to draw the structure based on it's name.
- To become familiar with some applications of coordination compounds.
- To study about the concepts of Biochemistry.
Course Outcome (COs):

Students will gain an understanding of:

- predicting geometries of simple molecules
- the fundamentals of the chemistry of the main group elements, and important real world applications of many of these species
- the use of group theory to recognize and assign symmetry characteristics to molecules and objects, and to predict the appearance of a molecule’s vibrational spectra as a function of symmetry
- the bonding models, structures, reactivity’s, and applications of coordination complexes, boron hydrides, metal carbonyls, and organometallics
- Apply the knowledge in biochemical reactions.

Course title: Course I - Accounting skills
Course code: 4SBS4B1
Program: B.SC., Physics (II –Year)

Course description:

The aim of this course will help the students to give the knowledge about the concept of basic accounting principles. It includes preparation of financial statements, accounting techniques and specific skill development in the areas of accounting.

Course objectives:

- To introduce basic Accounting principles, ethics in accounting and preparation of financial statements.
- To analyze the business problem by incorporating diverse perspective of accounting techniques and to develop competent decision skills in the areas of accounting

Course outcome:

Students should be able to,
• Understand the concept of basic accounting principles.
• Analyze the business problem by incorporating diverse perspective of accounting techniques
• Develop competent decision skills in the areas of accounting
• Acquire the knowledge of importance of preparing financial statements.
• Understand the important ethics in accounting.

Course title: Course II - Emergency and medical lab skills
Course code: 4SBS4B2
Program: B.SC., Physics (II – Year)

Course description:
The aim of this course will help the students to give the knowledge based on assessment findings of the patient's condition. It includes the basic ideas about first aid for fracture and drowning, traffic rules and regulations, advantages of 108, clinical test and awareness program.

Course objectives:
• To recognize the nature and seriousness of the patient's condition or extent of Injuries to assess requirements for emergency medical care
• Administer appropriate emergency medical care based on assessment findings of the patient's condition
• To Perform safely and effectively the expectations of the job.

Course outcome:
Students should be able to,
• Understand the emergency medical care based on assessment findings of the patient's condition
• Acquire the knowledge of importance of traffic rules and advantages of 108.
• Understand the basic knowledge of first aid for fracture and drowning and snakebite.
• Discuss the importance of lab test.
Part – IV
II Year – IV Semester
Course Code: 4BVE4
Name of the course – Value education

Course Description
The students are really practiced to become a good citizen and will give external value
of all actions

Course Objectives
- It will give definition to value education and literature idea about various religious.
- This course includes Hindu Dynasties, Social reformers and their role in value education.
- It will discuss problems on transition from School to college, ways of inculcating in
teaching equity and extracurricular activities.

Course Outcomes
The course will create awareness to values among learners to help them in their lives.

MANAVALAKALAI YOGA - 7BMY4
This paper comes under Part-IV for the B.Sc., Physics major students in the fourth
semester. The title is the need of the hour in a country like India. This paper is assigned with two
credits and two hours per week. The students will be evaluated by an external examiner for 75
marks and by an internal examiner for 25 marks.

Objectives:
- To train and develop the physical body for leading a healthy life.
- To rejuvenate the life energy, to retard the ageing process and to achieve spiritual
development
- To offer meditation practices and introspection so as to strengthen the mind, increase its
will power, concentration, creativity and receptivity and ultimately to transform the mind
to achieve self realization
• To help every individual to realize the enduring values of peace, non-violence and harmony to revitalize human society for restoring its sanity and strength

Learning Outcomes
After course completion the students will have the following learning outcomes

• Able to understand the concept of Yoga
• Able to do meditation and Yoga individually
• Will train others in meditation and Yoga
• Understand and spread the concept of non-violence
• Able to lead a healthy life.

II Year – IV Semester
Course Code: 4BWS4
Name of the course – Introduction to Gender Studies

Course Description
This course offers an introduction to Women's and Gender Studies that explores the meaning of gender in society. The primary goal of this course is to familiarize students with key issues, questions and Women's and Gender Studies scholarship, both historical and contemporary. Gender scholarship critically analyzes themes of gendered performance and power in a range of social spheres, such as law, culture, education, work, medicine, social policy and the family.

Course Objectives

• To gain knowledge on gender ideology
• To understand the concepts of HDI, GDI and GEM
• To know the women development policies and programmes

Course Outcomes

➢ On successful completion of this course students will be able to investigate issues and debates around gender, particularly in relation to Australian society.
➢ This course explains the ways in which gender shapes our everyday lives through the intersections of gender, race, class, sexuality, age, religion, culture, and nation.
➢ It will discuss the ways in which systems of power, privilege, and oppression shape our experiences as individuals and members of communities.

Name of the Subject: Analog Electronics
Subject Code: 4BPH5C1
Credit: 6 No. of Hours: 6 (per week)
Internal Marks: 25 External Marks: 75

Course Description: This course introduces the characteristics and applications of semiconductor devices and circuits. Emphasis is placed on analysis, selection, biasing, and applications.

Course objective
1. To give the idea about fundamental properties of semiconductors.
2. To prepare students to perform the analysis of any Analog electronics circuit.
3. To empower students to understand the design and working of diode rectifiers, Transistor amplifiers, oscillators.
4. To prepare the students for get the knowledge about Operational Amplifier working as adder, subtractor, differentiators, integrator etc.,

Course Outcomes
1. Acquire basic knowledge of physical and electrical conducting properties of semiconductors.
2. Develop the Ability to understand the design and working of Transistor amplifiers.
3. Able to design amplifier circuits using Transistor and observe the amplitude and frequency responses of common amplifier circuits
4. Observe the effect of negative feedback on different parameters of an Amplifier and different types of negative feedback topologies.
5. Observe the effect of positive feedback and able to design and working of different Oscillators using Transistor.
6. Develop the skill to build, and troubleshoot basic Analog circuits.

Texts Prescribed

**Computer programming in C – 4BPH5C2**

“Computer programming in C” is one of the major papers in the fifth semester for a B.Sc Physics student. The syllabus of Computer programming in C is applicable to those who have joined between 2017 and 2020 academic years and this core paper has four out of twenty two credits in the fifth semester. Few programs based on C are also included in the III year practical to test the students programming skills.

**Prerequisite**
- Students should have basic knowledge of algorithmic logic so that he can understand control structures, functions, arrays, etc.

**Objectives**
The objectives of the paper “Computer programming in C” for a B.Sc., Physics students are
- To make them familiar with understanding of code organization and functional hierarchical decomposition using complex data types.
- To enhance their structural and procedural programming skills.

**Learning Outcomes**
After course completion the students will have the following learning outcomes
- Concept of thinking within the framework of C Program.
- To write a C program with characters, special characters, strings and numbers.
- To write a C program with arrays of complex objects.
- To define and manage data structures based on problem.
- Functional hierarchical code organization.
- To overcome the errors during program execution.

**Core Mathematical Physics (4BPHE1A)**
Aim and objective:
To enable the students to familiarize with vector concepts.
To encourage the students to understand matrices and make use of them.
To be aware the partial and ordinary differential equation to solve physics problem.
To enable students to get an exposure on basic of beta and gamma function.
To give enough knowledge about complex variables and solve the physics oriented problems.

Course outcome

- Familiarize with vector concepts.
- Ability to understand matrices and make use of them.
- Ability to understand homogeneous and non-homogeneous linear equation.
- Apply Fourier series and integrals to solve Physics problems.
- Familiarize with alpha and beta function.

Name of the Subject: NON-CONVENTIONAL ENERGY SOURCES
Subject Code: 4BPHE1B
Credit: 5
No.of Hours: 5 (Per week)
Internal Marks: 25
External Marks: 75

Course Description: This course will cover the topics contained in the five units of the syllabus. This course introduce the energy availability and the demands. It also includes nonconventional energies and utilization.

Course objectives
Make the students to
- Understand the various forms of conventional energy resources.
- Learn the present energy scenario and the need for energy conservation
- Explain the concept of various forms of renewable energy
- Outline division aspects and utilization of renewable energy sources for both domestics and industrial application
- Understand the process of conversion and storing the nonconventional energy.

Course outcome
Upon completion of the course, the student will be able to:
- Identify energy demand and relate with available energy resources. Comparing the various conventional energy systems, their prospects and limitations.
- Know the need of renewable energy resources, historical and latest developments.
- Describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc.
- Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
- Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications

Books for Reference

Part – III

III Year –V Semester
Course Code: 4BPHE1C

Name of the course – Elective Course I (C) Laser Physics and Fibre Optics

Course Description
The course provides detailed idea into the physical principles of operation of lasers and their applications in other areas of science and industry. It also provides fundamentals of fibre optics and optical communication

Course Objectives
- This course provides an introduction to Laser Physics, different types of lasers and output modulation methods.
- It discusses applications in industry, applications of holography
- The structure, fabrication and their types of optical fibre are explained.
- Learning principles of the key components used in optical telecommunications are provided.
Course Outcomes

The course provides students with a working knowledge of laser physics and provides introduction into fibre optics. In addition it provides a good understanding of the critical laser parameters. Students will understand trends of development of modern lasers.

Course title: Elective II - A - Communication Electronics
Course code: 4BPHE2A
Program: B.SC., Physics (III –Year)

Course description:

This course will help the students to introduce the fundamental principles of communication systems, AM , FM , and PM , Demodulation, Amplitude and frequency shifting keying, satellite communication, network, basic fibre optic system. It provides sufficient background in theory, devices, circuits employed in systems, which enable the students to design, build and test the communication system.

Course objective:

- To explain the basic idea of communication system.
- To give a basic knowledge of principle and basic theory of modulation and demodulation.
- To explain the detailed theory of broad band communication, fibre optic communication.
- To analyze the networking system and their applications.

Course outcome:

Student should be able to,

- Understand the basic concepts of communication system.
- Analyze the network
- Classify AM, FM and PM
• Understand the basic concepts of optical fibres and their applications.

Part – III

III Year – V Semester

Course Code: 4BPHE2B

Name of the course – Elective Course II (B) – Numerical methods and Statistics

Course Description

The students are trained to meet the requirement for mathematics and programming ideas. This course will also be useful to the students appearing for mathematical competitive examinations.

Course Objectives

• Standard topics in numerical methods such as curve fitting, algebraic and transcendental equations.
• Simultaneous equations, numerical differentiations and integrations are discussed.
• Correlation, Regressions and different distributions are included.

Course Outcomes

The course which has gained immense speculation and has grown tremendously in dealing with numerical problems.

Course title: Elective II – C - Solid State Physics

Course code: 4BPHE2C

Program: B.SC., Physics (III – Year)

Course description:

The aim of this course will help the students to give the extended knowledge of the principles and techniques of solid state physics. This course covers the physical understanding of matter from an atomic view point. Fundamental theories in solid state physics are introduced to important application in current day technology and makes extensive use of examples.
Course objective:

- To give a broad knowledge in chosen discipline in its elective subjects.
- To give a basic knowledge of force between atoms and bond structure of materials.
- To describe physical behavior of solid and electronic devices.
- To explain the detailed theory of semiconductors, dielectric and superconducting materials.
- To discuss applications of electronic devices.

Course outcome:

Student should be able to,

- Acquire the basic concepts of force between atoms and bonding between molecules.
- Analyze the structural properties of elemental solids
- Classify magnetic and superconducting behavior of solids
- Understand the properties of semiconductors and the application of semiconductor devices.

Name of the Subject: ENTREPRENEUR DEVELOPMENT SKILLS

Subject Code: 4SBS5A3
Credit: 2
No.of Hours: 2(Per week)
Internal Marks: 40
External Marks: 60

Course Description: This course has five units of syllabus which introduces the concept of Entrepreneurship, basic methods to select the business. It also includes the preparation of project skills, marketing skills, management of men, material and money and industrial management

Course objectives:

- To understand the concept of Entrepreneur.
• To expose business management idea.
• To impart the knowledge of marketing skills, management of men, material and money
• To empower to become successful Entrepreneur.

Course outcome:
Upon completion of the course, the student will be able to develop understanding of:
• Entrepreneurship scenario in the country
• Attractions for and challenges of an entrepreneur
• Business generation idea
• The legal and regulatory environment
• Basic principle of economics and management
• Role of public and partnership

List of References
3. Entrepreneurship Development – S.P.Saravanan, Sul

Name of the Subject: HERITAGE & TOURISM
Subject Code: 4SBS5A4
Credit: 2
No.of Hours: 2(Per week)
Internal Marks: 40
External Marks: 60

Course Description: Culture and heritage are intricately connected to the appeal of tourist destinations. This course introduces the relationship between culture, heritage and contemporary tourism, exploring the phenomenon of cultural tourism. In this course, both positive and negative effects of global tourism on heritage destinations are mainly focused

COURSE OBJECTIVES:
• To introduce the concept and significance of tourism.
• To Discuss the importance of Effects of Tourism – Social, Economic and Environmental aspects – Human Rights
• To understand Brief history of the heritage spots – The role of heritage spots in promoting tourism – UNESCO guidelines on Heritage
To know the role of Guide and their skills.
To arrange the Field visit to heritage and tourism spots in different Districts and submission of a report

Course Outcomes:
On successful completion of the course students will be able to:
- Demonstrate a critical understanding of the relationships between culture, heritage and tourism;
- Analyze the role that tourism plays in the production and consumption of culture;
- Evaluate both the positive and negative impacts of tourism on cultures and communities;
- Identify current issues in the development and management of cultural and heritage tourism products;
- Describe cultural and heritage tourism policy, planning and management issues;
- Explain cultural sustainability and sustainable tourism principles.

Texts Prescribed:
- Ananand M. M – Tourism and Hotel Industry in India (Sterling Publishers (P) Ltd., New Delhi)
- Acharya Ram – Tourism and Cultural Heritage (Rosa Publications: Jaipur, 1986)
- Jha, S.M – Tourism Marketing (Himalaya Publishing House)

MARKETING AND SALES MANAGEMENT

COURSE CODE : 4SBS5A5

OBJECTIVES :

- Discuss the sales, sales management and related concepts.
- Explain the structure and objectives of a sales organisation.

OUTCOME :

- Create a complete business plan for a start up business that you could actually take to a bank to secure financing
- Craft a retail store layout and merchandise plan
➢ Budget, schedule, and create an advertising campaign for a product or business

➢ Sell in multiple selling situations including to a real business buyer

➢ Work with an area business in a consulting role to create a marketing plan and promotion pieces

➢ Develop a territory plan for a business to business sales territory

➢ Job shadow with business to business sales reps

➢ Attend several business conferences

➢ Earn on the job experience with the company of your choice through an internship

Name of the Subject: General Physics Practical (III)
Subject Code: 4BPH6P1
Credit: 5
No.of Hours: 3 (Per week)
Internal Marks: 40
External Marks: 60

Course Description:
This laboratory based course provides the ‘hands on’ experience in a number of experimental techniques, and develops competence in the instrumentation typically used in Physics. The course assumes a familiarity with optics and electromagnetism, electricity and programming in computer.

Course objectives:
➢ To determine the refractive index of the given small angle and biprism.
➢ To find the Self-induction of a coil using the electrical brides.
➢ To determine the Electro Chemical Equivalent of copper. of the mercury spectrum.
➢ To determine capacitance of a capacitor by comparing the capacitances.
➢ To write the C program for the different applications.
Course outcome: The students are able
- To understand theoretical principles of optics in the experimental method through the determination of refractive index of the prism using the spectrometer.
- To acquire the acknowledge in electrical devices such as ammeter voltmeter, millimeter and spot galvanometer etc.,
- To understand the process of electrolysis.
- To write the application programs in ‘C’ “Language.

ELECTRONICS PRACTICAL
COURSE CODE : 4BPH6P2

OBJECTIVES :
- To indentify the basic electronic devices like diode, transistor, led,ujt and scr.
- To observe the characteristics of diodes like PN, Zener diode.
- To Know diode as a rectifier and adding filters to see the ripple free output.
- To observe the characteristics of transistors, SCR & UJT.
- To analyze transistor amplifiers and their frequency responses.

OUTCOME :
- Understand the diode and transistor characteristics.
- Verify the rectifier circuits using diodes and implement them using hardware.
- Design the biasing circuits like self biasing.
- Design various amplifiers like CE, CC, common source amplifiers and implement Them using hardware and also observe their frequency responses
- Analyze the concepts of SCR and observe its characteristics.
- Remember the concepts of unipolar junction transistor and observe its characteristics.
- Understand the construction, operation and characteristics of JFET and MOSFET, which can be used in the design of amplifiers.

Understand the need and requirements to obtain frequency response from a transistor so that Design of RF amplifiers and other high frequency amplifiers is feasible
Part – III
III Year – IV Semester
Course Code: 4BPH6C1
Core Course – Elements of theoretical physics

Course Description
The course will help the students to expose the knowledge on the latest modern mechanics that is quantum mechanical concept from classical mechanics.

Course Objectives
- Students have been prepared to get ideas on classical mechanics by studying Lagragian theory.
- This course will enter into the quantum theory by studying dual nature of matter on De Broglie view.
- The detailed theory of Schrodinger equations and their applications are discussed.

Course Outcomes
Students can easily understand the classical and quantum mechanical concepts and their applications. It gives proper entry for latest technologies.

DIGITAL ELECTRONICS
COURSE CODE: 4BPH6C2

OBJECTIVES:
- To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
- To prepare students to perform the analysis and design of various digital electronic circuits.

OUTCOME:
- Understand the concepts of Binary codes.
- Understand the concepts of Boolean algebra.
Gain knowledge about designing of arithmetic and logic circuits.
understand the operation of basic digital electronic devices.
Provide strong ideas in Flip flops.
Have foundation in the techniques and designing of counters, registers and converters.

Core. Project (4BPHEPR)

Aim and objective:

- To enrich the knowledge about the electronic components.
- To acquire the thinking towards the amplifiers and oscillators.
- To facilitate the designs of PCBs.
- To equip the knowledge towards the nanoparticle synthesis, material formation mechanism, characterization of as prepared nano materials.
- To give the innovative ideas of material design using simple principles.
- To enable the use of basic literatures and practice them to write the draft of the assigned work.

Course outcome

- Thorough knowledge to design the desired electronic circuits.
- Understand the concept related ideas & design the equipment.
- Able to understand the nano concept, according to our facility, design the nano materials.
- Able to interpret the obtained results.
- Try to apply the energy and environmental issues.

Part – III

III Year – VI Semester

Course Code: 4BPHE3A

Name of the course – Elective Course III (A) – Microprocessors

Course Description
The course is intended for introductory microprocessor in technology and engineering. It is a comprehensive treatment of the microprocessor covering both hardware and software based on the 8085 microprocessor family.

**Course Objectives**

- To understand 8-bit microprocessor concept with machine control and process control.
- To write assembly language program for 8085 microprocessor
- It includes various data transfer between microprocessor and peripherals such as interrupts, interfacing and data converters.

**Course Outcomes**

The course, microprocessor technology is an exciting, challenging and growing field which masters the students in programming techniques, interfacing and design.

**Computer programming in C++ - 4BPHE3B**

“Computer programming in C++” is elective paper for an III B.Sc., Physics student in his sixth semester. This paper has five out of twenty nine credits in the sixth semester. This course is a continuation of the core paper “Computer programming in C” in the fifth semester.

**Prerequisite**

- Students should have programming knowledge, especially in “C” language.

**Objectives:**

The objectives of the paper “Computer programming in C++” for a B.Sc., Physics students are

- To make familiar with the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
- To understand dynamic memory management techniques using concepts like pointers, constructors, destructors.
- To make familiar with concepts like functions and polymorphism.
- Demonstrate the use of various OOPs concepts with the help of programs

**Learning Outcomes**
After course completion the students will have the following learning outcomes

- Concept of thinking within the framework of C++ Program.
- Able to write C++ program using concepts like classes, member functions, stream I/O, inheritance, pointers, arrays, linked lists.
- To overcome the errors during program execution.

**Course title:** Elective III - C – Fundamentals Of Nano Science

**Course code:** 4BPHE3C

**Program:** B.SC., Physics (III –Year)

**Course description:**

This course designed to expose students to the new and rapidly emerging field of nanomaterials and establish a basic understanding of the underlying scientific basis for the behavior of nanomaterials.

**Course objective:**

- To prepare the students for get the knowledge about basic ideas of nanomaterials.
- To give an introduction of CNT and analyze properties and their application.
- To explain the detailed theory of fabrication, characterization of SEM,TEM,AFM.
- To manipulate and fabricate Nano devices.

**Course outcome:**

Student should be able to,

- Understand the basic concepts of nanomaterials.
- Analyze the unique properties associated with nanomaterials
- Familiar with the development of the field of nanoscience.
- Understand the basic concepts of CNT and their applications.
- Familiar with the instrumentation and technologies, currently utilized to manipulate and fabricate a variety of nanomaterials.
COURSE CODE: 4SBS6B3

COURSE I – BASIC INTERNET AND OFFICE AUTOMATION LAB

“Basic internet and office automation lab” is a skill based paper for an III B.Sc., Physics student in his sixth semester. This paper has two out of twenty nine credits in the sixth semester. The syllabus is framed in such a way that all students irrespective of their discipline should be well versed in communicating and drafting various kinds of document using computers.

Objective:
- To realize the power of electronic media through internet,
- To enable the students in crafting professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools.
- To familiarize the students in preparation of documents and presentations with office automation tools.

Learning Outcomes:
By learning the course, the students will be able
- To perform documentation
- To communicate with the help of internet
- To perform accounting operations
- To perform presentation skills

Name of the Subject: Fruits, vegetables preservation skills

Subject Code: 4SBS6B4

Credit: 2

No. of Hours: 2(Per week)

Internal Marks: 40

External Marks: 60

Course Description:
This course introduces the principles methods of preservation skills, study of various type containers and Importance of personal hygiene and sanitary standards.

COURSE OBJECTIVES

General objective: To equip a student with functional knowledge and practical skills in the principles, technologies and processes used in the processing, preservation, extension of shelf life and value addition of fruits and vegetables.

Specific objectives:

1. To furnish and acquaint a student with knowledge and understanding of the basic biological, chemical and physical properties of fruits and vegetables and their contribution to human nutrition and diet
2. To furnish and acquaint a student with knowledge and understanding of the basic post-harvest biological, chemical, physiological and metabolic processes and changes in fruits and vegetables and how these can be controlled to prevent or reduce deterioration and loss of nutritional quality and value in fruits and vegetables production and processing.

Course Outcomes:

Students completing the course will be able to:

- Understand the concept of basic biological, chemical, physical properties of fruits and vegetables.
- The importance of vegetables and fruits in human nutrition diet.
- Acquire the knowledge of importance of processing and methods of processing for the fruits and vegetables.
- Understand the importance of properties of container

COURSE CODE: 4SBS6B5

COURSE III – EQUIPMENT HANDLING SKILLS FOR EVENTS

Objectives:

- To impart the characteristics of various types of electrical and electronic equipments used in events
- To learn about the working, handling and troubleshooting skills on various electrical and electronic gadgets.

Course outcome

- Hands on training to handle the mike, speakers and LCD projectors etc.
- Able to attend the trouble shooting on electronic gadgets.
- Familiarize the working principle of mike, speaker and amplifier.
- Acquire the knowledge to handle the video camera.
- Able to edit the picture which was taken by the camera, using software.
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<th>Cr.</th>
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**III**

- 7BPH5C1: Core – IX – Analog Electronics
- 7BPH5C2: Core – X – Computer Programming in C
- 7BPH6P1: Core – XI – General Physics Practical III
- 7BPH6P2: Core – XII – Electronics Practical IV
- 7BPHE1A/ Elective – I
  - A) Mathematical Physics
- 7BPHE1B/ Elective – II
  - B) Non-Conventional Energy Sources
- 7BPHE1C/ C) Laser Physics and Fibre Optics
- 7BPHE2A/ Elective – II
  - A) Communication Electronics
- 7BPHE2B/ B) Numerical methods and statistics
- 7BPHE2C/ C) Solid State Physics
- 7SBS5A4/ (2) Skill Based Subjects – I
  - Entrepreneurial Development skills
- 7SBS5A5/ Heritage and Tourism
- 7SBS5A6/ Marketing and Sales Management
- 7SBS5A7/ Urban Planning

**IV**

- 7SBS5A4/ (2) Skill Based Subjects – II
  - Fruit and Vegetable Preservation Skills (or)
- 7SBS6B4/ National Service Scheme (NSS) (or)
- 7SBS6B5/ National Cadet Corps (NCC)

**V**

- 7BPH6P1: Core – XI – General Physics Practical III
- 7BPH6P2: Core – XII – Electronics Practical-IV
- 7BPH6C1: Core – XIII – Elements of Theoretical Physics
- 7BPH6C2: Core – XIV – Digital Electronics
- 7BPH6PR: Core XV – Project*
- 7BPHE3A/ Elective – III
  - A) Microprocessors (or)
- 7BPHE3B/ B) Computer Programming in C++ (or)
- 7BPHE3C/ C) Fundamentals of Nano Science

**VI**

- 7BPH6P1: Core – XI – General Physics Practical III
- 7BPH6P2: Core – XII – Electronics Practical-IV
- 7BPH6C1: Core – XIII – Elements of Theoretical Physics
- 7BPH6C2: Core – XIV – Digital Electronics
- 7BPH6PR: Core XV – Project*
- 7BPHE3A/ Elective – III
  - A) Microprocessors (or)
- 7BPHE3B/ B) Computer Programming in C++ (or)
- 7BPHE3C/ C) Fundamentals of Nano Science

**IV**

- 7SBS6B4/ National Service Scheme (NSS) (or)
- 7SBS6B5/ National Cadet Corps (NCC)

**Grand Total**

| Total | 140 | 180 | -- | -- | 4100 |

* Students are advised to visit Industries, academic institutions as part of the educational tour for project or any theoretical or electronics project.

** University Examinations will be held in the Even Semesters only.
PROGRAMME OUTCOME

- Students will demonstrate an understanding of core knowledge in physics, including the major premises of classical mechanics, E&M and Modern Physics.
- Students will demonstrate written and oral communication skills in communicating physics-related topics.
- Students will design and conduct an experiment (or series of experiments) demonstrating their understanding of the scientific method and processes. Students will demonstrate an understanding of the analytical methods required to interpret and analyze results and draw conclusions as supported by their data.
- Students will demonstrate proficiency in the acquisition of data using a variety of laboratory instruments and in the analysis and interpretation of such data.
- Students will utilize a wide range of printed and electronic resources and information technologies to support their research on physical systems and present those results in the context of the current understanding of physical phenomena.
- Students will demonstrate understanding of the applications of numerical techniques for modeling physical systems for which analytical methods are inappropriate or of limited utility.
- Students will demonstrate a thorough understanding of the analytical approach to modeling of physical phenomena.
- Students will demonstrate an understanding of the impact of physics and science on society.
PROPERTIES OF MATTER AND ACOUSTICS

COURSE CODE : 7BPH1C1

OBJECTIVE :

➢ *This subject is useful in engineering applications.*

➢ *It gives details about physical properties of materials.*

OUTCOME :

➢ Understand the basic laws and concepts of dynamic bodies.

➢ Gain knowledge about the properties of materials.

➢ Understand the basic concepts of elasticity.

➢ Study the motion of viscous fluids by understanding Poiseuille’s method.

➢ Provide an in-depth knowledge about gravitation, satellite and rocket propulsion system.

➢ Acquire the knowledge about properties of sound and ultrasonic’s.

Mechanics and Relativity - 7BPH1C2

Mechanics and Relativity is the second core paper for a B.Sc., (Physics) student in the first semester. This core paper has four out of thirty credits in the first semester. This paper correlated two extremes. Objects moving with velocity much less than that of light are studied in the part of Mechanics whereas objects moving with velocity equal to light are examined in Relativity part of the syllabus. This syllabus will cater the basic requirements for their higher studies.

Objectives

The objectives of the paper “Mechanics and Relativity” are
• To make the students to have a firm grasp of the theories that form the basis of mechanics
• To enlighten the students about the forces that is responsible for an object to stay at rest (Statics) in air and in water medium (Hydrostatics).
• To enlighten the students about the forces that is responsible for an object to move (Dynamics) in air and in water medium (Hydrodynamics).
• To make the students to understand the role of Gravity in our life
• To make the students to understand the dynamics involved in a rigid body
• Relativity provides intellectual food for students interested in theoretical studies.

Learning Outcomes
After course completion the students will have the following learning outcomes

• Have practical knowledge which helps the student in their everyday life.
• Have that required basic knowledge when the students opt for higher studies in Physics.

7BPH2P1 – General Physics Practical – I

The foremost objective of this paper is to develop the scientific knowledge of the students by doing experiments. General physics practical – I is the practical paper for a B.Sc., Physics (Major) student in the first year. This paper has four credits. The external examination will be conducted at the end of first year. The students will be evaluated by an external examiner, who is appointed by the university, for 60 marks, and the internal examiner will evaluate the students for 40 marks. The syllabus is framed in such a way that the students can verify the theorems and laws, which he/she studied in the class room, by doing experiments.

Objectives:
The objectives of the paper “General Physics Practical – I” are

• To identify phenomena or object related to mechanics, properties of matter
• Learn facts/concept/relationship/theory/model related to mechanics, properties of matter

Learning Outcomes
After course completion the students will have the following learning outcomes
• Have the ability to plan a scientific experiment
• Have the ability to design a scientific experiment
• Have the ability to carry out a scientific experiment
• To interpret their findings in a scientific experiment

DEPARTMENT OF MATHEMATICS

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7BMAA1 ANCILLARY MATHS-I

Course Description
Elementary techniques of integration, introduction to differential equations, applications to several mathematical models in the life and social sciences, partial derivatives, and some additional topics. One-semester review of manipulative algebra, introduction to functions, some topics in matrices, and that portion of trigonometry needed for calculus.

Course Objectives: At the end of this course, students shall be able to
Apply matrix operations to solve the relevant real life problems in Science subjects.
Formulate a mathematical model for three dimensional objects and solve the concerning problems.
Find area and volume based on a function with one or more variables.

Learning Outcomes
Apply matrix operations to solve the relevant real life problems in science subjects.
Formulate a mathematical model for three dimensional objects and solve the concerning problems.
Find area and volume based on a functions with one or more variables.

Course Material: Text Book is

Name of the Subject: Thermal and Statistical Physics
Subject Code: 7BPH2C1
Credit: 4
No.of Hours: 4
Internal Marks: 25
External Marks: 75

Course Description: This course introduces the concept of heat, entropy, thermodynamical laws, production of low temperature, liquefaction of gases, transmission of heat and statistical methods.

Course objectives

- Develops the understanding of mass, energy, heat, work, efficiency, ideal and real thermodynamic cycles and processes.
- Teaches first and second laws of thermodynamics, perfect gas law, properties of real gases, and the general energy equation for closed and open systems.
- It also exposes the production of Low temperature, superconductors and methods of liquefaction of gas.
- Explain various types of transmission of heat and the measurement of various constants related to it tools for the arrangement of microscopic particles.

Course outcomes

Students completing the course will be able to:

- Understand the concepts of heat, work and energy
- Explain basic thermodynamic properties and units.
- Develop and apply the continuity equation for open and closed systems.
- Derive and discuss the first law of thermodynamics.
- Understand the methods of production of very Low temperature
- Gather the knowledge about solar constant and its measurements.
- Know the different forms distribution of Sub atomic particles in the system using statistical methods.

Texts Prescribed

- Brijlal and Subramanyam – Heat and Thermodynamics, 2002
- D.S. Mathur – Heat and Thermodynamics
- R. Murugesan and KiruthigaSivaprasath – Thermal Physics

Core: Electricity, Magnetism and Electromagnetism (7BPH2C2)
Aim and Objective:

- To understand the basic concepts of Electric field and Electric Potential.
- To enrich their knowledge in thermo electricity and chemical effects on current.
- To learn and understand the magnetic field and magnetic properties of the matter.
- To familiarize with the laws of electromagnetic induction.
- To understand the concept of Maxwell’s equation.
- To study and analyze the electromagnetic waves.
- To study the concept of poynting vector.

Course outcomes:

- Gain knowledge of Gauss laws and solve the electric field for various geometric objects.
- Enable to understand the concept of electrical conductivity and Gibbs Helmholtz equation.
- Gain knowledge of seebeck effect, Peltier effect and Thomson effect.
- Enable to understand the concept of magnetic field.
- Thorough knowledge in the basic concept of electromagnetic induction.
- Able to derive the Maxwell’s equation in free space and material media.

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<td>ANCILLARY MATHS-II</td>
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**7BMAA2 ANCILLARY MATHS-II**

**Course Description**
Elementary techniques of integration, introduction to differential equations, applications to several mathematical models in the life and social sciences, partial derivatives, and some additional topics. One-semester review of manipulative algebra, introduction to functions, some topics in matrices, and that portion of trigonometry needed for calculus.

**Course Objectives:** At the end of this course, students shall be able to
- Apply matrix operations to solve the relevant real life problems in Science subjects.
- Formulate a mathematical model for three dimensional objects and solve the concerning problems.
- Find area and volume based on a function with one or more variables.

**Learning Outcomes**
- Apply matrix operations to solve the relevant real life problems in science subjects.
- Formulate a mathematical model for three dimensional objects and solve the concerning problems.
- Find area and volume based on a functions with one or more variables.

**Course Material:** Text Book is

ENVIRONMENTAL STUDIES

COURSE CODE : 7BES2

OBJECTIVES :

- Environmental education should be compulsory, right from the primary up to the post graduate stage.
- Environmental education should take into account the historical perspective, the current and the potential historical issues.
- Environmental education should emphasise the importance of sustainable development i.e., economic development without degrading the environment.
- Environmental education should emphasise the necessity of seeking international cooperation in environmental planning.
- Environmental education should lay more stress on practical activities and first hand experiences.

OUTCOME :

- Demonstrate a general understanding of the breadth and interdisciplinary nature of environmental issues.
- Demonstrate a general understanding of the qualitative and quantitative research methods to gain empirical evidence bearing on evaluation of environmentally sustainable alternatives.
- Demonstrate depth of critical analysis and writing of environmental problems that span popular, ‘gray’ and primary publications.
- Demonstrate the ability to locate, interpret and apply published research and lessons from successful projects to a focused environmental solution with potential regional stakeholders.
- Design, conduct and present (orally and in writing) independent research that is consistent with the highest standards and practices of research in environmental science.

Part – III
III Year –III Semester

Course Code: 7BPH3C1

Core Course – Optics and Spectroscopy

Course Description

With the introduction of this course, the students will understand the basic physics of optics and modern spectroscopy ideas.

Course Objectives

- Students completing this course will understand geometrical optics, eyepieces and spectroscopic design.
- This course reveals the light properties such as interference, diffraction and polarisation.
- Last section of this course covers different spectroscopic ideas and their details.

Course Outcomes

This course objective will give clear idea in geometrical optics, optical properties, optical instruments and spectroscopic applications to the students.

COURSE CODE: 7BCHA1

ALLIED COURSE-1-GENERAL CHEMISTRY-I

Course Description:

This course gives an introduction to the basic concepts of Thermodynamics and kinetics. Topics covered include Gaseous state, Liquid state and Catalysis.

Course Objectives:

- Principles of Physical Chemistry”, B.R.Puri, L.R.Sharma and M.S.Pathania
- “Physical Chemistry”, N.Kundu and SN.Jain
- To apply gas laws in various real life situations.
- To explain the behavior of real and ideal gas.
- To differentiate between gaseous state and vapour.
- To explain the kinetic theory of gases.
Explain the properties of liquids.
To describe condition required for liquefaction of gases.
To write the expressions for equilibrium constants.
To study the laws of equilibrium.
To understand various types of colloids and its applications

Course Outcome (COs):
Upon successful completion students should be able to:
- State and apply the laws of thermodynamics; perform calculations with ideal and real gases; design practical engines by using thermodynamic cycles; predict chemical equilibrium and spontaneity of reactions by using thermodynamic principles.
- To apply the concepts of colloids and gels
- To learn depth knowledge about liquid states.

Course title: PART IV (I) – (C)- Non – major elective
Course II– Employability skills
Course code: 7NME3C
Program: B.SC., Physics (II –Year)

Course description:
The aim of this course will help the students to give the extended knowledge of the preparing the curriculum and the facing interview. This course covers the interpersonal, group discussion and review of team work, motivational behavior.

Course objective:
- To prepare the curriculum
- To understanding good leadership behaviors
- To develop competent of group discussion skills in the areas of team work
- To Perform facing the interview effectively.
Course outcome:

Students should be able to,

- Understand to prepare the bio-data.
- Study the good leadership behavior.
- Developing competent of group discussion and interpersonal communication.

COMPETITIVE EXAMINATION SKILLS

COURSE CODE : 7SBS3A1

OBJECTIVES :

- To know the pattern of Various Examinations.
- To get the information about the exams conducted for the entry into jobs.
- To become aware about the various soft skills.

OUTCOME :

- To use the time effectively To become aware about the goals of life.
- To develop Quarantine ability and data interpretation.
- To improve Verbal ability and Logical Reasoning.
- To study the English for the competitive Examination.
- To develop the skill of clerical aptitude.
- To solve the problems with accuracy.
- To introduce shortcut methods in numerical ability.

Course title: Course II - Executive skills
Course code: 7SBS3A2
Program: B.SC., Physics (II – Year)
**Course description:**

The aim of this course will help the students to enhance their understanding of the challenges which confront today’s business professionals. In addition to specific skill development in the areas of problem solving, written and oral communications, leading teams, decision making, and the role of organizational change agents.

**Course objective:**

- To understand good leadership behaviors
- To prepare themselves for training after reviewing administrative matters and making introduction
- To understand qualities and strengths
- To understand housekeeping and documentation skill

**Course outcome:**

**Students should be able to,**

- Understand the concept of basic professional qualities of an executive.
- The importance of preparation to attend office meetings and hold the office meetings.
- Acquire the knowledge of importance of report writing.
- Understand the importance of table manners, body language and maintaining the PC, file.

**DISASTER MANAGEMENT**

**COURSE CODE : 7SBS3A3**

**OBJECTIVES :**

- To equip the Organisation to handle all aspects of disasters in Ghana.
- To create awareness on disasters through intensive public education.
- To ensure disaster prevention, risk and vulnerability reduction, as a means of reducing the impact of disasters on society.
• To be in a position to provide the first line response in times of disaster.
• To assist in post-emergency rehabilitation and reconstruction effort.

OUTCOME:

- India Meteorological Department, Central Water Commission, Ministry of Home Affairs, Ministry of Defence, Ministry of Finance, Ministry of Rural Development, Ministry of Urban Development, Department of Communications,
- Ministry of Health, Ministry of Water Resources, Ministry of Petroleum,
- Department of Agriculture & Cooperation, Ministry of Power, Department of Civil Supplies, Ministry of Railways, Ministry of Information and Broadcasting,
- Planning Commission, Cabinet Secretariat, Department of Surface Transport,
- Ministry of Social Justice, Department of Women and Child Development,
- Ministry of Environment and Forest, Department of Food. Each
- Ministry/Department/Organization nominate their nodal officer to the Crisis

Extension Activity (7BEA3)

Aim and objective:

- To enrich the students to handle the social relation to the public and government higher secondary students.
- To acquire the knowledge to solve the environmental issues.
- To able to handle the classes for higher secondary students both theory and practical.
- To create the awareness to eradicate the plastics and planted the seed saplings to our environment.
- To make the interest to the students to grow saplings for their birthday occasion.

Course outcome

- Able to handle the social relation between the public and students.
- Familiarize the students to handle the environmental issues.
● According to the need for higher secondary students, educate the school students both theory and practical.
● Eradicate the plastics in and around the school and college.
● Make interest to plant saplings in and around the school and college ground.

Course title: Core VII – General Physics practical - II

Course code: 7BPH4P1

Program: B.SC., Physics (II –Year)

Course Description:
This course will help the students to introduce the fundamental knowledge about the experimental techniques. It provides sufficient background in devices, circuits employed in systems, which enable the students to design, build and test the equipment.

Course objectives:
- To calibrate low & high range voltmeter using potentiometer.
- To analyze the specific heat capacity of a liquid.
- To determine the thermal conductivity by Lee’s disc method.
- To determine the refractive index of the given solid &Biprism.
- To calculate the thickness of a thin wire by Air wedge method.
- To determine radius of curvature by Neuton’s rings

Course outcome:
Student should be able to,
- Understand the knowledge in electrical devices such as ammeter and voltmeter.
- Analyze the specific heat capacity, refractive index as per the standard procedure.
- Understand the standard values of each results.
- Study the emf, resistance behavior of the materials.

Part – III
III Year –IV Semester
Course Code: 7BPH4C1
Core Course – Atomic and Nuclear Physics
Course Description
This subject satisfies the needs of the students on modern physics of atomic and nuclear ideas and their developments.

Course Objectives
- Students are revealed and can get good knowledge on positive rays and vector atom model.
- This course is very useful to understand X-ray ideas and crystallographic structure.
- The explanations are extended in radioactivity basics, nuclear fission and nuclear fusion, elementary particles and advanced quark model.

Course Outcomes
Students can attempt better insight by understanding this course and shall give clear idea in nano-technology in higher study

COURSE CODE: 7BCHA2
ALLIED COURSE-II-GENERAL CHEMISTRY-II

Course Description:
This course gives an introduction to the basic concepts of Nuclear chemistry and Interhalogens compounds. Topics covered include Bio-inorganic chemistry, Gaseous state, Liquid state and Halogens.

Course Objectives:
- Principles of Physical Chemistry”, B.R.Puri, L.R.Sharma and M.S.Pathania
- “Physical Chemistry”, N.Kundu and SN.Jain
- To apply gas laws in various real life situations.
- To explain the behavior of real and ideal gas.
- To differentiate between gaseous state and vapour.
To explain the kinetic theory of gases.
Explain the properties of liquids.
To describe condition required for liquefaction of gases.
To write the expressions for equilibrium constants.
To study the laws of equilibrium.
To understand various types of colloids and its applications

Course Outcome (COs):

Upon successful completion students should be able to:

- State and apply the laws of thermodynamics; perform calculations with ideal and real gases; design practical engines by using thermodynamic cycles; predict chemical equilibrium and spontaneity of reactions by using thermodynamic principles.
- To apply the concepts of colloids and gels
- To learn depth knowledge about liquid states.

Course title: Course I - Accounting skills
Course code: 7SBS4B1
Program: B.SC., Physics (II –Year)

Course description:
The aim of this course will help the students to give the knowledge about the concept of basic accounting principles. It includes preparation of financial statements, accounting techniques and specific skill development in the areas of accounting.

Course objectives:
- To introduce basic Accounting principles, ethics in accounting and preparation of financial statements.
- To analyze the business problem by incorporating diverse perspective of accounting techniques and to develop competent decision skills in the areas of accounting

Course outcome:
Students should be able to,
• Understand the concept of basic accounting principles.
• Analyze the business problem by incorporating diverse perspective of accounting techniques
• Develop competent decision skills in the areas of accounting
• Acquire the knowledge of importance of preparing financial statements.
• Understand the important ethics in accounting.

Course title: Course II - Emergency and medical lab skills
Course code: 7SBS4B2
Program: B.SC., Physics (II – Year)

Course description:
The aim of this course will help the students to give the knowledge based on assessment findings of the patient's condition. It includes the basic ideas about first aid for fracture and drowning, traffic rules and regulations, advantages of 108, clinical test and awareness program.

Course objectives:
• To recognize the nature and seriousness of the patient's condition or extent of Injuries to assess requirements for emergency medical care
• Administer appropriate emergency medical care based on assessment findings of the patient's condition
• To Perform safely and effectively the expectations of the job.

Course outcome:
Students should be able to,
• Understand the emergency medical care based on assessment findings of the patient's condition
• Acquire the knowledge of importance of traffic rules and advantages of 108.
• Understand the basic knowledge of first aid for fracture and drowning and snakebite.
• Discuss the importance of lab test.
COURSE CODE: 7SBS4B3

COURSE III – YOUTH RED CROSS

Objectives:

- To make the students to know about the birth, organizational set up, principles, emblem and activities of Red Cross society and to develop leadership traits.
- To able to overcome the disaster management.
- To acquire the leadership quality among the students.
- To be able to conduct the camp.

Course outcome

- Familiarization of organizational setup, birth and Red Cross society.
- Practice to console the disaster management.

Part – IV

II Year – IV Semester

Course Code: 7BVE4

Name of the course – Value education

Course Description

The students are really practiced to become a good citizen and will give external value of all actions

Course Objectives

- It will give definition to value education and literature idea about various religious.
- This course includes Hindu Dynasties, Social reformers and their role in value education.
- It will discuss problems on transition from School to college, ways of inculcating in teaching equity and extracurricular activities.
Course Outcomes

The course will create awareness to values among learners to help them in their lives.

MANAVALAKALAI YOGA - 7BMY4

This paper comes under Part-IV for the B.Sc., Physics major students in the fourth semester. The title is the need of the hour in a country like India. This paper is assigned with two credits and two hours per week. The students will be evaluated by an external examiner for 75 marks and by an internal examiner for 25 marks.

Objectives:

- To train and develop the physical body for leading a healthy life.
- To rejuvenate the life energy, to retard the ageing process and to achieve spiritual development
- To offer meditation practices and introspection so as to strengthen the mind, increase its will power, concentration, creativity and receptivity and ultimately to transform the mind to achieve self realization
- To help every individual to realize the enduring values of peace, non-violence and harmony to revitalize human society for restoring its sanity and strength

Learning Outcomes

After course completion the students will have the following learning outcomes

- Able to understand the concept of Yoga
- Able to do meditation and Yoga individually
- Will train others in meditation and Yoga
- Understand and spread the concept of non-violence
- Able to lead a healthy life.
II Year – IV Semester
Course Code: 7BWS4
Name of the course – Introduction to Gender Studies

Course Description
This course offers an introduction to Women's and Gender Studies that explores the meaning of gender in society. The primary goal of this course is to familiarize students with key issues, questions and Women's and Gender Studies scholarship, both historical and contemporary. Gender scholarship critically analyzes themes of gendered performance and power in a range of social spheres, such as law, culture, education, work, medicine, social policy and the family.

Course Objectives
- To gain knowledge on gender ideology
- To understand the concepts of HDI, GDI and GEM
- To know the women development policies and programmes

Course Outcomes
- On successful completion of this course students will be able to investigate issues and debates around gender, particularly in relation to Australian society.
- This course explains the ways in which gender shapes our everyday lives through the intersections of gender, race, class, sexuality, age, religion, culture, and nation.
- It will discuss the ways in which systems of power, privilege, and oppression shape our experiences as individuals and members of communities.

Name of the Subject: Analog Electronics
Subject Code : 7BPH5C1
Credit: 6  No. of Hours: 6 (per week)
Internal Marks: 25  External Marks: 75
**Course Description:** This course introduces the characteristics and applications of semiconductor devices and circuits. Emphasis is placed on analysis, selection, biasing, and applications.

**Course objective**
1. To give the idea about fundamental properties of semiconductors.
2. To prepare students to perform the analysis of any Analog electronics circuit.
3. To empower students to understand the design and working of diode rectifiers, Transistor amplifiers, oscillators.
4. To prepare the students for get the knowledge about Operational Amplifier working as adder, subtractor, differentiators, integrator etc.,

**Course Outcomes**
1. Acquire basic knowledge of physical and electrical conducting properties of semiconductors.
2. Develop the Ability to understand the design and working of Transistor amplifiers.
3. Able to design amplifier circuits using Transistor and observe the amplitude and frequency responses of common amplifier circuits
4. Observe the effect of negative feedback on different parameters of an Amplifier and different types of negative feedback topologies.
5. Observe the effect of positive feedback and able to design and working of different Oscillators using Transistor.
6. Develop the skill to build, and troubleshoot basic Analog circuits.

**Texts Prescribed**

**Computer programming in C – 7BPH5C2**

“Computer programming in C” is one of the major papers in the fifth semester for a B.Sc Physics student. The syllabus of Computer programming in C is applicable to those who have joined between 2017 and 2020 academic years and this core paper has four out of twenty two
credits in the fifth semester. Few programs based on C are also included in the III year practical to test the students programming skills.

Prerequisite
- Students should have basic knowledge of algorithmic logic so that he can understand control structures, functions, arrays, etc.

Objectives
The objectives of the paper “Computer programming in C” for a B.Sc., Physics students are
- To make them familiar with understanding of code organization and functional hierarchical decomposition using complex data types.
- To enhance their structural and procedural programming skills.

Learning Outcomes
After course completion the students will have the following learning outcomes
- Concept of thinking within the framework of C Program.
- To write a C program with characters, special characters, strings and numbers.
- To write a C program with arrays of complex objects.
- To define and manage data structures based on problem.
- Functional hierarchical code organization.
- To overcome the errors during program execution.

Core Mathematical Physics (7BPHE1A)
Aim and objective:
- To enable the students to familiarize with vector concepts.
- To encourage the students to understand matrices and make use of them
- To be aware the partial and ordinary differential equation to solve physics problem.
- To enable students to get an exposure on basic of beta and gamma function.
- To give enough knowledge about complex variables and solve the physics oriented problems.
- Familiarize with vector concepts.
- Ability to understand matrices and make use of them.
- Ability to understand homogeneous and non-homogeneous linear equation.
- Apply Fourier series and integrals to solve Physics problems.
- Familiarize with alpha and beta function.

**Name of the Subject:** NON-CONVENTIONAL ENERGY SOURCES  
**Subject Code:** 7BPHE1B  
**Credit:** 5  
**No.of Hours:** 5(Per week)  
**Internal Marks:** 25  
**External Marks:** 75

**Course Description:** This course will cover the topics contained in the five units of the syllabus. This course introduce the energy availability and the demands. It also includes nonconventional energies and utilization.

**Course objectives**
Make the students to
- Understand the various forms of conventional energy resources.
- Learn the present energy scenario and the need for energy conservation
- Explain the concept of various forms of renewable energy
- Outline division aspects and utilization of renewable energy sources for both domestics and industrial application
- Understand the process of conversion and storing the nonconventional energy.

**Course outcome**
Upon completion of the course, the student will be able to:
- Identify energy demand and relate with available energy resources. Comparing the various conventional energy systems, their prospects and limitations.
- Know the need of renewable energy resources, historical and latest developments.
- Describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc.
- Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
- Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications

**Books for Reference**
Part – III

III Year – V Semester

Course Code: 7BPHE1C

Name of the course – Elective Course I (C) Laser Physics and Fibre Optics

Course Description

The course provides detailed idea into the physical principles of operation of lasers and their applications in other areas of science and industry. It also provides fundamentals of fibre optics and optical communication.

Course Objectives

- This course provides an introduction to Laser Physics, different types of lasers and output modulation methods.
- It discusses applications in industry, applications of holography.
- The structure, fabrication and their types of optical fibre are explained.
- Learning principles of the key components used in optical telecommunications are provided.

Course Outcomes

The course provides students with a working knowledge of laser physics and provides introduction into fibre optics. In addition it provides a good understanding of the critical laser parameters. Students will understand trends of development of modern lasers.

Course title: Elective II - A - Communication Electronics

Course code: 7BPHE2A
Program: B.SC., Physics (III –Year)

Course description:
This course will help the students to introduce the fundamental principles of communication systems, AM, FM, and PM, Demodulation, Amplitude and frequency shifting keying, satellite communication, network, basic fibre optic system. It provides sufficient background in theory, devices, circuits employed in systems, which enable the students to design, build and test the communication system.

Course objective:

- To explain the basic idea of communication system.
- To give a basic knowledge of principle and basic theory of modulation and demodulation.
- To explain the detailed theory of broad band communication, fibre optic communication.
- To analyze the networking system and their applications.

Course outcome:

Student should be able to,

- Understand the basic concepts of communication system.
- Analyze the network.
- Classify AM, FM and PM.
- Understand the basic concepts of optical fibres and their applications.

Part – III

III Year – V Semester

Course Code: 7BPHE2B

Name of the course – Elective Course II (B) – Numerical methods and Statistics

Course Description
The students are trained to meet the requirement for mathematics and programming ideas. This course will also be useful to the students appearing for mathematical competitive examinations.

Course Objectives

- Standard topics in numerical methods such as curve fitting, algebraic and transcendental equations.
- Simultaneous equations, numerical differentiations and integrations are discussed.
- Correlation, Regressions and different distributions are included.

Course Outcomes

The course which as gained immense speculation and has grown tremendously in dealing with numerical problems.

Course title: Elective II – C - Solid State Physics
Course code: 7BPHE2C
Program: B.SC., Physics (III – Year)
Course description:

The aim of this course will help the students to give the extended knowledge of the principles and techniques of solid state physics. This course covers the physical understanding of matter from an atomic view point. Fundamental theories in solid state physics are introduced to important application in current day technology and makes extensive use of examples.

Course objective:

- To give a broad knowledge in chosen discipline in its elective subjects.
- To give a basic knowledge of force between atoms and bond structure of materials.
- To describe physical behavior of solid and electronic devices.
- To explain the detailed theory of semiconductors, dielectric and superconducting materials.
- To discuss applications of electronic devices.
**Course outcome:**

**Student should be able to,**

- Acquire the basic concepts of force between atoms and bonding between molecules.
- Analyze the structural properties of elemental solids
- Classify magnetic and superconducting behavior of solids
- Understand the properties of semiconductors and the application of semiconductor devices.

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**Name of the Subject:** ENTREPRENEUR DEVELOPMENT SKILLS

**Subject Code:** 7SBS5A4

**Credit:** 2

**No.of Hours:** 2(Per week)

**Internal Marks:** 40

**External Marks:** 60

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**Course Description:** This course has five units of syllabus which introduces the concept of Entrepreneurship, basic methods to select the business. It also includes the preparation of project skills, marketing skills, management of men, material and money and industrial management

**Course objectives:**

- To understand the concept of Entrepreneur.
- To expose business management idea.
- To impart the knowledge of marketing skills, management of men, material and money
- To empower to become successful Entrepreneur.

**Course outcome:**

Upon completion of the course, the student will be able to develop understanding of:

- Entrepreneurship scenario in the country
- Attractions for and challenges of an entrepreneur
- Business generation idea
• The legal and regulatory environment
• Basic principle of economics and management
• Role of public and partnership

List of References

Name of the Subject: HERITAGE & TOURISM
Subject Code: 7SBS5A5
Credit: 2
No.of Hours: 2(Per week)
Internal Marks: 40
External Marks: 60

Course Description: Culture and heritage are intricately connected to the appeal of tourist destinations. This course introduces the relationship between culture, heritage and contemporary tourism, exploring the phenomenon of cultural tourism. In this course, both positive and negative effects of global tourism on heritage destinations are mainly focused

COURSE OBJECTIVES:
• To introduce the concept and significance of tourism.
• To discuss the importance of Effects of Tourism – Social, Economic and Environmental aspects – Human Rights
• To understand Brief history of the heritage spots – The role of heritage spots in promoting tourism – UNESCO guidelines on Heritage
• To know the role of Guide and their skills.
• To arrange the Field visit to heritage and tourism spots in different Districts and submission of a report

Course Outcomes:
On successful completion of the course students will be able to:
• Demonstrate a critical understanding of the relationships between culture, heritage and tourism;
• Analyze the role that tourism plays in the production and consumption of culture;
• Evaluate both the positive and negative impacts of tourism on cultures and communities;
• Identify current issues in the development and management of cultural and heritage tourism products;
• Describe cultural and heritage tourism policy, planning and management issues;
• Explain cultural sustainability and sustainable tourism principles.

Texts Prescribed:
• Ananand M. M – Tourism and Hotel Industry in India (Sterling Publishers (P) Ltd., New Delhi)
• Acharya Ram – Tourism and Cultural Heritage (Rosa Publications: Jaipur, 1986)
• Jha, S.M – Tourism Marketing (Himalaya Publishing House)

MARKETING AND SALES MANAGEMENT

COURSE CODE : 7SBS5A6

OBJECTIVES :

➢ Discuss the sales, sales management and related concepts.

➢ Explain the structure and objectives of a sales organisation.

OUTCOME :

➢ Create a complete business plan for a start up business that you could actually take to a bank to secure financing

➢ Craft a retail store layout and merchandise plan

➢ Budget, schedule, and create an advertising campaign for a product or business

➢ Sell in multiple selling situations including to a real business buyer

➢ Work with an area business in a consulting role to create a marketing plan and promotion pieces

➢ Develop a territory plan for a business to business sales territory

➢ Job shadow with business to business sales reps

➢ Attend several business conferences
Earn on the job experience with the company of your choice through an internship

**URBAN PLANNING – 7SBS5A7**

This paper comes under Part-IV, Skill Based Subject for the B.Sc., Physics major students in the fifth semester. This paper is newly introduced for the students who are joining from the academic year 2017 onwards. The title is the need of the hour in a country like India. This paper is assigned with two credits and two hours per week. The students will be evaluated by an external examiner for 75 marks and by an internal examiner for 25 marks.

Objectives:
The objectives of the paper are
- To expose the students the various aspects of urban planning.
- To provide students an exposure to development plans, plan formulation and evaluation.
- To gain a preliminary understanding of urban forms, size and infrastructure

Learning Outcomes
After course completion the students will have the following learning outcomes
- Familiar with the basic definitions related to the urban planning
- Able to differentiate between town and country planning
- Able to evaluate the development plans and plan formulations
- Able to draw the norms and standards of urban planning
- Can analyze the essential services in urban planning

**Name of the Subject:** General Physics Practical (III)

**Subject Code:** 7BPH6P1

**Credit:** 5

**No.of Hours:** 3 (Per week)

**Internal Marks:** 40

**External Marks:** 60

**Course Description:**
This laboratory based course provides the 'hands on' experience in a number of experimental techniques, and develops competence in the instrumentation typically used in Physics. The course assumes a familiarity with optics and electromagnetism, electricity and programming in computer.

Course objectives:

- To determine the refractive index of the given small angle and biprism.
- To find the Self-induction of a coil using the electrical brides.
- To determine the Electro Chemical Equivalent of copper of the mercury spectrum.
- To determine capacitance of a capacitor by comparing the capacitances.
- To write the C program for the different applications.

Course outcome: The students are able

- To understand theoretical principles of optics in the experimental method through the determination of refractive index of the prism using the spectrometer.
- To acquire the acknowledge in electrical devices such as ammeter voltmeter, millimeter and spot galvanometer etc.,
- To understand the process of electrolysis.
- To write the application programs in ‘C’ Language.

ELECTRONICS PRACTICAL

COURSE CODE : 7BPH6P2

OBJECTIVES :

- To indentify the basic electronic devices like diode, transistor, led, ujt and scr.
- To observe the characteristics of diodes like PN, Zener diode.
- To Know diode as a rectifier and adding filters to see the ripple free output.
- To observe the characteristics of transistors, SCR & UJT.
- To analyze transistor amplifiers and their frequency responses.

OUTCOME :

- Understand the diode and transistor characteristics.
- Verify the rectifier circuits using diodes and implement them using hardware.
Design the biasing circuits like self biasing.

Design various amplifiers like CE, CC, common source amplifiers and implement them using hardware and also observe their frequency responses.

Analyze the concepts of SCR and observe its characteristics.

Remember the concepts of unipolar junction transistor and observe its characteristics.

Understand the construction, operation and characteristics of JFET and MOSFET, which can be used in the design of amplifiers.

Understand the need and requirements to obtain frequency response from a transistor so that Design of RF amplifiers and other high frequency amplifiers is feasible.

Part – III

III Year – IV Semester

Course Code: 7BPH6C1

Core Course – Elements of theoretical physics

Course Description

The course will help the students to expose the knowledge on the latest modern mechanics that is quantum mechanical concept from classical mechanics.

Course Objectives

- Students have been prepared to get ideas on classical mechanics by studying Lagragian theory.
- This course will enter into the quantum theory by studying dual nature of mater on De Broglie view.
- The detailed theory of Schrodinger equations and their applications are discussed.

Course Outcomes

Students can easily understand the classical and quantum mechanical concepts and their applications. It gives proper entry for latest technologies.
DIGITAL ELECTRONICS
COURSE CODE : 7BPH6C2

OBJECTIVES :

➢ To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
➢ To prepare students to perform the analysis and design of various digital electronic circuits.

OUTCOME :

➢ Understand the concepts of Binary codes.
➢ Understand the concepts of Boolean algebra.
➢ Gain knowledge about designing of arithmetic and logic circuits.
➢ Understand the operation of basic digital electronic devices.
➢ Provide strong ideas in Flip flops.
➢ Have foundation in the techniques and designing of counters, registers and converters.

Core. Project (7BPH6PR)

Aim and objective:

➢ To enrich the knowledge about the electronic components.
➢ To acquire the thinking towards the amplifiers and oscillators.
➢ To facilitate the designs of PCBs.
➢ To equip the knowledge towards the nanoparticle synthesis, material formation mechanism, characterization of as prepared nano materials.
➢ To give the innovative ideas of material design using simple principles.
➢ To enable the use of basic literatures and practice them to write the draft of the assigned work.

Course outcome

➢ Thorough knowledge to design the desired electronic circuits.
➢ Understand the concept related ideas & design the equipment.
➢ Able to understand the nano concept, according to our facility, design the nano materials.
- Able to interpret the obtained results.
- Try to apply the energy and environmental issues.

Part – III

III Year – VI Semester

Course Code: 7BPHE3A

Name of the course – Elective Course III (A) – Microprocessors

Course Description

The course is intended for introductory microprocessor in technology and engineering. It is a comprehensive treatment of the microprocessor covering both hardware and software based on the 8085 microprocessor family.

Course Objectives

- To understand 8-bit microprocessor concept with machine control and process control.
- To write assembly language program for 8085 microprocessor
- It includes various data transfer between microprocessor and peripherals such as interrupts, interfacing and data converters.

Course Outcomes

The course, microprocessor technology is an exciting, challenging and growing field which masters the students in programming techniques, interfacing and design.

Computer programming in C++ - 7BPHE3B

“Computer programming in C++” is elective paper for an III B.Sc., Physics student in his sixth semester. This paper has five out of twenty nine credits in the sixth semester. This course is a continuation of the core paper “Computer programming in C” in the fifth semester.

Prerequisite

- Students should have programming knowledge, especially in “C” language.
Objectives:
The objectives of the paper “Computer programming in C++” for a B.Sc., Physics students are

- To make familiar with the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
- To understand dynamic memory management techniques using concepts like pointers, constructors, destructors.
- To make familiar with concepts like functions and polymorphism.
- Demonstrate the use of various OOPs concepts with the help of programs

Learning Outcomes
After course completion the students will have the following learning outcomes

- Concept of thinking within the framework of C++ Program.
- Able to write C++ program using concepts like classes, member functions, stream I/O, inheritance, pointers, arrays, linked lists.
- To overcome the errors during program execution.

Course title: Elective III - C – Fundamentals Of Nano Science

Course code: 7BPHE3C

Program: B.SC., Physics (III – Year)

Course description:

This course designed to expose students to the new and rapidly emerging field of nanomaterials and establish a basic understanding of the underlying scientific basis for the behavior of nanomaterials.

Course objective:

- To prepare the students for get the knowledge about basic ideas of nanomaterials.
- To give an introduction of CNT and analyze properties and their application.
- To explain the detailed theory of fabrication, characterization of SEM,TEM,AFM.
- To manipulate and fabricateNano devices.

Course outcome:

Student should be able to,
• Understand the basic concepts of nanomaterials.
• Analyze the unique properties associated with nanomaterials
• Familiar with the development of the field of nanoscience.
• Understand the basic concepts of CNT and their applications.
• Familiar with the instrumentation and technologies, currently utilized to manipulate and fabricate a variety of nanomaterials.

Name of the Subject: Fruits, vegetables preservation skills
Subject Code: 7SBS6B4
Credit: 2
No.of Hours: 2(Per week)
Internal Marks: 40
External Marks: 60

Course Description:
This course introduces the principles methods of preservation skills, study of various type containers and Importance of personal hygiene and sanitary standards.

COURSE OBJECTIVES

General objective: To equip a student with functional knowledge and practical skills in the principles, technologies and processes used in the processing, preservation, extension of shelf life and value addition of fruits and vegetables.

Specific objectives:

3. To furnish and acquaint a student with knowledge and understanding of the basic biological, chemical and physical properties of fruits and vegetables and their contribution to human nutrition and diet
4. To furnish and acquaint a student with knowledge and understanding of the basic post-harvest biological, chemical, physiological and metabolic processes and changes in fruits and vegetables and how these can be controlled to prevent or reduce deterioration and loss of nutritional quality and value in fruits and vegetables production and processing.

Course Outcomes:

Students completing the course will be able to:
• Understand the concept of basic biological, chemical, physical properties of fruits and vegetables.
• The importance of vegetables and fruits in human nutrition diet.
• Acquire the knowledge of importance of processing and methods of processing for the fruits and vegetables.
• Understand the importance of properties of container

COURSE CODE: 7SBS6B5

COURSE III – EQUIPMENT HANDLING SKILLS FOR EVENTS

Objectives:

❖ To impart the characteristics of various types of electrical and electronic equipments used in events
❖ To learn about the working, handling and troubleshooting skills on various electrical and electronic gadgets.

Course outcome

❖ Hands on training to handle the mike, speakers and LCD projectors etc.,
❖ Able to attend the trouble shooting on electronic gadgets.
❖ Familiarize the working principle of mike, speaker and amplifier.
❖ Acquire the knowledge to handle the video camera.
❖ Able to edit the picture which was taken by the camera, using software.

NATIONAL SERVICE SCHEME (NSS) – 7SBS6B6

This paper comes under Part-IV, Skill Based Subject for the B.Sc., Physics major students in the fifth semester. This paper is newly introduced for the students who are joining from the academic year 2017 onwards. The title is the need of the hour in a country like India. This paper is assigned with two credits and two hours per week. The students will be evaluated by an external examiner for 75 marks and by an internal examiner for 25 marks.

Objectives:

• To enable the students to understand the community in which they work
• To develop among themselves a sense of social and civic responsibility
• To develop competence required for group-living and sharing of responsibilities
- To acquire leadership qualities and democratic attitude
- To develop capacity to meet emergencies and national disasters
- To practice national integration and social harmony.

Learning Outcomes
After course completion the students will have the following learning outcomes
- Familiar with the basic definitions related to the National Service Scheme
- Able to understand the Features of Indian constitution, concept of social justice and basic social issues in India
- Be familiar with the activities related to special camps
- Be familiar with the activities related to training and orientation programs related to National Service Scheme
- Understand the concept of social integration

NATIONAL CADET CORPS (NCC)

COURSE CODE : 7SBS6B7

OBJECTIVES :

- NCC works to fulfill the requirements expected in the latest socio-economic scenario in India.
- The organization aims at development of character, discipline, comradeship, secular outlook, ideals of selfless services and adventure spirits amongst large numbers of young citizens.
- NCC aims to create a pool of trained, organized and motivated youth with various leadership qualities in every walk of their live and serve the Nation irrespective of career they choose.
- National Cadets Corps also provide a sound environment conductive towards motivating large numbers of young people of India to join armed forces.

OUTCOME :

- NCC Cadets learn valuable things such as selflessness, honesty, discipline, hard work and ways to build confidence and gain leadership qualities.
NCC cadets learn to take pride in themselves and the training also strengthens the spirit of being an Indian. This helps them gear towards joining the forces and providing their 100% when the country is in need of them.

There are a total of 32 seats which are set aside for cadets who hold NCC certificate provided they have scored 50% in graduation with at least a B grade in C level examination. If all this suffices, then they are eligible for SSC without even qualifying for a CDS written exam. All they have to do is clear the SSB interview*.

Other than SSB they also get a preference over other in the CRF and BSF.

Other than just armed forces there are several central and state Government organisations who give special preference to NCC cadets.