

Programme Project Report for B. Sc PHYSICS

**The Department of Physics
Directorate of Distance Education
Madurai Kamaraj University**

Programme's Mission and Objectives:

Mission

- To provide quality education and skills with updated curriculum, faculty development and the state of the art infrastructure facilities
- To create a learning environment for enhancing their innovation ideas, problem solving skills, leadership quality and team spirit.
- To prepare students to learn beyond the syllabi and texts.
- To train students through periodical implant training and industrial visits.
- To motivate students to pursue higher education through competitive examinations.
- To educate not to reach to reach higher education/Science

Objectives

- B.sc physics degree graduates can have the knowledge of fundamental science and various aspects of matter, motion, energy, time and so on.
- The graduate can have the scope with regard to higher education in various areas like Applied physics, material science, Astrophysics, Nanophysics, Renewable energy etc...
- The graduates can exhibit professionalism, ethical attitude, communication, social responsibilities and adapt the current trends in physics with error free.

Relevance of the programme with HEI's mission and Goals:

- Create a hypothesis and appreciate how it relates to broader theories.
- Evaluate hypotheses, theories, methods and evidence within their proper contexts.
- Solve complex problems by critical understanding, analysis and synthesis.
- Demonstrate engagement with current research and developments in the subject.
- Critically interpret data, write reports and apply the basics of rules of evidence.

- Select, interpret and critically evaluate information from a range of sources that include books, scientific reports, journals, case studies and the internet.
- Develop proficiency in the analysis of complex physical problems and the use of mathematical or other appropriate techniques to solve them.
- Demonstrate skills in the use of computers for control, data acquisition, and data analysis in experimental investigations
- Provide a systematic understanding of core physical concepts, principles and theories along with their applications.
- Function on multidisciplinary teams by working cooperatively, creatively and responsibly as a member of a team.
- Communicate effectively by oral, written, computing and graphical means.
- Recognize the need to engage in lifelong learning through continuing education and research.

Appropriateness of the programme:

- If you studied Physics you can study any other subject, Chemists and biologists can't understand Maths, Mathematician can't understand biology, But physicist can do all subjects including engineering and medicine...
- The graduates can apply for all government jobs that insist graduation as the basic qualification.
- They can seek career opportunities in research organizations and other related areas.
- They can be recruited in space research centres and in research laboratories

Instructional design:

The curriculum of the programme is designed by the efficient in Physics professionals and experts are approved by the Board of studies of the Madurai Kamaraj University, to enlighten the candidates in all aspects of the Electronics and commendation concepts to reach school students.

Procedure for admissions:

Eligibility for admission

- Higher Secondary School Examination (Plus 2 or XII Std.) conducted by the Govt. of Tamil Nadu with Science as one of the subjects.
- Two year Foundation Course Examination conducted by Madurai Kamaraj University and Annamalai University with eligibility to join the degree courses.
- Pre/University Examination of Madurai Kamaraj University or an Examination equivalent thereto conducted by any other statutory recognized University / Board.

- Intermediate Examination of any recognized University in India or of the common wealth.
- The IAF Educational Test for promotion to the Rank of Corporal conducted by the Directorate of Education, Air Head Quarters, New Delhi.
- The Higher Secondary Certificate Examinations conducted by any of the State Statutory Boards of Higher Education in India provided the holder is declared eligible to join the Degree Course in the University concerned and provided the holder also satisfies the age rule.
- Indian School Certificate Examination conducted by the Council for the Indian School Certificate Examination, New Delhi. A pass in one or more sittings, (i.e., in compartment) provided the candidates has been declared to have qualified with a minimum of FIVE subjects of which English should be one and satisfies the age rule prescribed by the University.
- The 12 year School Diploma of High School / Graduation conducted by the Kodaikanal School, Kodaikanal.

A pass in the followed examinations conducted by the State Board of Technical Education and Training of Govt. of Tamil Nadu, Chennai.

a) The two year Diploma Course in Commercial Practice or Diploma in Modern Office Practice.

b) Pre-Technical Examination.

c) I and II year Sandwich Diploma Examination in Mechanical Engineering.

d) Three – year Diploma (after X Std.) – Civil, Mechanical, Electrical, Electronics,

Textile, Fisheries, Commerce, Architecture, Assistantship, Catering Technology etc.

Note: A candidate who has obtained ‘CONDITIONAL PASS’ in the Pre-Technical Examination is NOT• eligible.

A candidate who has passed the First Year Examination of the 3 year Diploma Courses (i.e.,• D.C.E. etc.,) prior to 1963 is NOT eligible.

Cost estimate for the programme:

Honorarium to lesson writers (9000/- per book) : 3,00, 000/- (25 persons)

Printing of study materials (for all 3 years) : 5,00, 000/- (25 books)

Honorarium to resource persons (Rs. 200/-- per hour) : (22+7 persons x 6 hours/day)

I. Program Target Groups

Those who are have completed +2 (Mathematics, Physics and chemistry), completed diploma in poly technique and not to pursue further by the family situation. Those who are working in the preschool teachers are to improve their knowledge in science because they are the only ignition to the future of India.

To provide Higher Education to diverse section of society as an instruments of democratizing Education

To provide Education to such section of society, which are unable to get education through face to face education?

To educate the society, which are deprived educations due to crossing of their age limit

To increase the Gross Enrollment Ratio of State and in turn to Nation

To provide the opportunity to employed person to increase their education Qualification

To provide education of person (Male & Female) working in their business, Housewife or Agriculture

To provide alternative Cost effective non formal Channel for tertiary Education

To encourage the people for Online Transaction

II. Program Requirements

1. Candidate who have passed +2 in Maths, Science (Physics-Chemistry) as main subjects and recognized by State or Central Board.

2. Marks required a student must have passed in his/her +2 level;

III. Degree Overview

Physics is a natural science that involves the study of matter and its motion through space time, along with related concepts such as energy and force. More broadly, it is the general analysis of nature, conducted to understand how the universe behaves.

The duration of B.Sc in Physics is mostly of three academic years

The basic laws of physics are applied in advancements in many areas including modern medical and space-related technologies, climate research as well as energy generation and storage. As the study of physics continues to evolve through new discoveries, we need inquisitive minds to explore the connections between traditional and emerging research areas, including medical and nano-scale physics, and biophysics.

Day to day lesson plan of each Course on the day registration
Distribution of Printing Material of Course on the day of Registration of students
Regular Monitoring of students by faculty members on Phone/Video Calling
Fixing the date of Examination Schedule, Quiz, and Annual Examination
Calling the Students in University Campus for Face to face Interaction, especially when seminar/ conference organization related to their subject

Deputing concern faculty to divisional place and calling all the students of concern subject for face to face interaction, conduction of classes, midterm review, solving the queries of students

IV. Degree Title B.Sc. in PHYSICS

V. Duration of the Program All students must complete the program within three years. The program is dedicated to maintaining a full year-round program with six

semesters. In all the six semester the students may be engaged in mandatory core and optional courses along with first two years languages.

- VI. Program Structure the B. Sc Program in Physics is designed as languages, ancillary and core papers; In first four semesters core with Languages (part-I and Part-II) and Ancillary subjects. In the third year (fifth and sixth semester) only core subjects
- VII. Summary Description
- VIII. X. Details of Syllabi each course has a detailed syllabus structured in terms of Units. The detailed syllabus for all Languages, Ancillary and core subjects has been attached in the Annexure I.
- IX. XI. Time Table for Contact Class theory & Practical
- X. The ODL Regulations insists of minimum 60 hours per semester of which 60 hours are for contact theory class and 60 hours for practical purpose. The following table demonstrates the time allotment for both contact theory and practical totaling 12 hours per week; for a semester there may be available 5 months and one round of contact/counseling class per month is enough to achieve the required hours.
- Scheme of Syllabus

| Papers with Examination Codes | | | | | | | |
|-------------------------------|---|--------|--------|-------------|---|---------|--------|
| I Year | | | | | | | |
| I Semester | | | | II Semester | | | |
| S. N O | Subject | Code | Credit | S. N O | Subject | Code | Credit |
| A | Part 1(Tamil) - இக்காலக் கவிதையும் சிறுகதையும் | Part 1 | 2 | A1 | Part 1(Tamil) - பக்தி இலக்கியமும் நாடகமும் | Part 1a | 2 |
| B | Part 2 (English) – Prose, Grammar and Composition | Part 2 | 2 | B1 | Part 2 (English) - Poetry and Drama – I | Part 2a | 2 |
| 1 | Mechanics and Properties of Mater | CS1 | 4 | 4 | Thermal Physics and Acoustics | CS2 | 4 |
| a | Programming in C | SEC 1 | 2 | b | Solar Energy | SEC 2 | 2 |
| I | Fundamentals of Physics – I | EC1 | 2 | II | Fundamentals of Physics – II | EC2 | 2 |
| i | Mathematics-I | AS1 | 2 | iii | Mathematics-II | AS3 | 2 |
| ii | Chemistry -I | AS2 | 2 | iv | Chemistry -II | AS4 | 2 |
| α | Practical –I | L1 | 3 | β | Practical –II | L2 | 3 |
| | | | | γ | Ancy -Practical -I | AL1 | 2 |
| | | | 18 | | | | 20 |
| II YEAR | | | | | | | |
| III Semester | | | | IV Semester | | | |
| S. N O | Subject | Code | Credit | S. N O | Subject | Code | Credit |

| | | | | | | | |
|-----------------------|--|-------------|--------------------|-----------------------|--|-------------|---------------|
| A | Part 1(Tamil) - காப்பிய இலக்கியமும் புதினமும் | Part 1c | 2 | A2 | Part 1(Tamil) - பண்டைய இலக்கியமும் உரைநடையும் | Part 1d | 2 |
| B | Part 2 (English) – Prose & Composition | Part 2c | 2 | B2 | Part 2 (English) – Poetry and Drama – II | Part 2d | 2 |
| 7 | Electricity and Electromagnetism | CS3 | 4 | 9 | Optics and Spectroscopy | CS5 | 4 |
| v | Mathematical Physics - I | CS4 | 4 | vii | Mathematical Physics -II | CS6 | 4 |
| 8 | Astrophysics | SES 3 | 2 | 10 | Medical Physics | SES 4 | 2 |
| vi | Electronics -I | AS5 | 2 | viii | Electronics -II | AS6 | 2 |
| δ | Practical –III | L3 | 3 | ε | Practical –IV | L4 | 3 |
| | | | | ζ | Ancy -Practical -I | AL2 | 2 |
| | | | 18 | | | | 20 |
| III YEAR | | | | | | | |
| V Semester | | | | VI Semester | | | |
| S. N O | Subject | Code | Credi t | S. N O | Subject | Code | Credit |
| 11 | Modern Physics | CS7 | 4 | 14 | Classical and Statistical Mechanics | CS 10 | 4 |
| 12 | Nuclear Physics | CS8 | 4 | 15 | Solid State Physics | CS 11 | 4 |
| 13 | Analog Electronics | CS9 | 4 | 16 | Digital Electronics | CS 12 | 4 |
| η | Practical –V | L5 | 3 | θ | Practical –VI | L7 | 3 |
| | Practical –VII | L6 | 3 | ι | Practical –VIII | L8 | 3 |
| | | | | κ | Elective -Practical -I | AL3 | 3 |
| | | | 16 | | | | 18 |

Part – Enhancement Subject *CS – core subject, EC – Elective Subject, AS – Ancillary Subject, SES- Skill Enhancement Subject

Scheme of Examination:

Theory : Duration -3 Hrs Max Marks- 100, Passing Min; 35

Practical Lab : Duration -4 Hrs Max Marks- 100, Passing Min; 35

Two days per week time table for theory (6 hrs per day):

Semester I to IV

| Days | First hour | Break | Second hour | Lunch | Third hour Enhancement Subject |
|----------|------------------------|-----------------|------------------------|---------------|--------------------------------------|
| Saturday | 9.00 – 11.00 am CS | 11.15 – 1:15 Pm | 10.00 – 11.15 am AS | 1:15 – 2.00pm | 2:00 to 4:00 pm Part I |
| Sunday | 9.00 – 11.00 am SEC | 11.15 – 1:15 Pm | 10.00 – 11.15 am EC | 1:15 – 2.00pm | 2:00 to 4:00 pm Part II |

Semester IV to VI

| Days | First hour | Break | Second hour | Lunch | Third hour Enhancement Subject |
|----------|-----------------------|-----------------|------------------------|---------------|--------------------------------------|
| Saturday | 9.00 – 11.00 am CS | 11.15 – 1:15 Pm | 10.00 – 11.15 am CS | 1:15 – 2.00pm | 2:00 to 4:00 pm CS |
| Sunday | 9.00 – 11.00 am CS | 11.15 – 1:15 Pm | 10.00 – 11.15 am CS | 1:15 – 2.00pm | 2:00 to 4:00 pm CS |

XII. Evaluation Procedures

- Principles of Evaluation by the rubrics of evaluation of the program will be based on the following principles:

Proof of Initiative, Active immersion, Interaction; Use of DIE - Describe, Interpret, Evaluate; utilizing variety of sources; Analytical Approach.

- Methods of Evaluation the students will be assessed by two pronged evaluation methods:
 - a) Continuous Internal Evaluation;
 - b) End-of-semester evaluation.
 - c) Integration of Continuous and End-of-semester evaluation The following points have been incorporated for effecting the integration of continuous and end-of-semester evaluation
 - d) For practical
 - a. The internal assessment by day today performance, record and vivo vice
 - b. The external examination will be end of semester doing experiment

a) Continuous Internal Evaluation Aiming to assess values, skills and knowledge imbibed by students, internal assessment is to be done by the concerned faculty-member. It would comprise the following steps:

There may be three different modes of continuous internal assessment:

- i. Book Review (BKR)
- ii. Problem Solving (BS)
- iii. Writing Assignment (WRA)

Components for internal evaluation are to have a time-frame for completion (by students), and concurrent and continuous evaluation (by faculty-members).

The evaluation outcome may be expressed either by pre-determined marks
The evaluation reports submitted by all the faculty-members are to be reviewed, from time to time, by the Examination Committee under the chairmanship of Head department in order to ensure transparency,

iv. Fair-play and accountability.

Following the review by the Examination Committee, the outcome of internal evaluation will be announced or displayed on the Notice Board and / or website as per the timeframe or academic calendar.

b) End-of-semester evaluation:-

This is to be carried out at the end of semesters, and will aim to assess skills and knowledge acquired by students through class-room interaction.

The evaluation can be in the form of written examination, or term paper assignment. Evaluation process should be verifiable and transparent.

Towards this end, the following steps have been adopted:

All the students pursuing this program have to undergo external evaluation at the end of first semester as per syllabi; With regard to written examination the internal faculty may associate themselves with the external examiners in the examination process. In the case of written examination, the format of question paper is attached in annexure could be moderated by the Examination Committee. Answer-books or –sheets are to be ‘encoded’ (before being passed on to examiner / evaluator, and decoded (before tabulation).

(c) Integration of Continuous and End-of-semester evaluation, the following points have been incorporated for effecting the integration of continuous and end-of-semester evaluation:

Relational weightage assigned to internal evaluation is 40 percent.

Relational weightage assigned to end of semester evaluation is 60 percent.

Following the integration of internal and external evaluations, the results may be expressed in marks

As soon as the integration of internal and external evaluations has been completed, the results should be announced, in keeping with the academic calendar, to facilitate students’ academic or occupational pursuits.

3. Description of Evaluation

This table lists all the assessment components that make up the course assessment, their weightings and the dates at which coursework are due. The table in the module specification indicates the week in which coursework should be submitted but the exact day may be decided by the concerned course instructor.

The column headed Qual Mark indicates the particular assignment has to be passed.

Course Title Marks Internal, External & Total

| S.No | Subjects | Semester | Internal | External | Total | Credit | Total |
|------|---------------------|----------|----------|----------|-------|--------|----------|
| 1 | Core Papers | I to VI | 40 | 60 | 100 | 4 | 12x4=48 |
| 2 | Language Paper | I to IV | 40 | 60 | 100 | 2 | 8x2 =16 |
| 3 | Ancillary Paper | I to IV | 40 | 60 | 100 | 3 | 6x2 = 12 |
| 4 | Practical core | I to VI | 40 | 60 | 100 | 3 | 8x3 =24 |
| 5 | Ancillary Practical | I to VI | 40 | 60 | 100 | 2 | 3X2 =6 |
| 6 | Elective | I to VI | 40 | 60 | 100 | 2 | 4X3 =12 |
| 7 | Enhancement | I to IV | 40 | 60 | 100 | 2 | 4x2 =08 |
| | | | | Total | | | 124 |

Model Question Paper for End-semester Exam There will be a 3 hour unseen end-semester examination. The question paper for this exam will be set by the respective course coordinator for core courses and by respective course instructor for optional courses. A model question paper has been attached in Annexure II.

Examination Committee: The Head may constitute a Examination Committee consisting of at least two members from the faculty. The Committee will look after the proper and timely completion of internal evaluation and conducting end semester examinations; integrating internal evaluation and end semester evaluation with respective weightage and then final marks.

XII. Program Facilities

1. Library & Documentation Unit:

The Directorate has a full-fledged state of the art reference library of standard text and reference books and research journals and well established documentation unit having NSS, NFHS and Census data.

2. Career Development Committee:

The Director may constitute a Career Development Committee consisting of at least three faculty members of the Directorate to look after the career opportunities of the students of the program. This Committee may undertake necessary initiatives in enhancing capabilities and skills such as English Language proficiency, computer and documentation skills, and competency in project writing; it may organise, if possible, campus recruitment in collaboration with NGO sector and print and visual media.

Practical: LOG BOOK - DDE

| INDEX LOGBOOK | | | | | INDEX | | | | |
|---|------|---------------------------|----------|------------------------|-----------------|------|-----------------------|----------|------------------------|
| NAME: Department of Physics STD: Lab SEC: | | | | | NAME: STD: SEC: | | | | |
| S.No. | Date | Title | Page No. | Teacher's Sign/Comment | S.No. | Date | Title | Page No. | Teacher's Sign/Comment |
| 1 | | Transmitting microscope | 1 | | 31 | | PSP Lab VCR Lab | 31 | |
| 2 | | Young's Modulus Apparatus | 2 | | 32 | | ASTRAE | 32 | |
| 3 | | Micro-meter screw Gauge | 3 | | 33 | | RCNR Oscillators | 33 | |
| 4 | | Optical Lever | 4 | | 34 | | Operational Amplifier | 34 | |
| 5 | | Reading Telescope | 5 | | 35 | | Filters | 35 | |
| 6 | | Compound Pendulum | 6 | | 36 | | Microprocessor | 36 | |
| 7 | | Self start circuit | 7 | | 37 | | Programmer | 37 | |
| 8 | | Transient Pendulum | 8 | | 38 | | Development Board | 38 | |
| 9 | | Automatic Spectrometer | 9 | | 39 | | Bridge | 39 | |
| 10 | | Spectrometer Prism | 10 | | 40 | | Function Generator | 40 | |
| 11 | | Galvanic Suction Lamp | 11 | | 41 | | Power Supply | 41 | |
| 12 | | Transformer | 12 | | 42 | | IC Trainer kit | 42 | |
| 13 | | Sodium Vapor Lamp | 13 | | 43 | | Oscilloscope | 43 | |
| 14 | | Mercury Vapor Lamp | 14 | | 44 | | SCR characteristics | 44 | |
| 15 | | Mercury Vapor Lamp (H.P.) | 15 | | 45 | | Diodes | 45 | |
| 16 | | Diode Rectifier | 16 | | 46 | | Polarizers | 46 | |
| 17 | | Maltese Apparatus | 17 | | 47 | | Amplifier | 47 | |
| 18 | | Tandem Spectrometer | 18 | | 48 | | Hall effect | 48 | |
| 19 | | Photo cell | 19 | | 49 | | Schmitt Trigger | 49 | |
| 20 | | Van de Graaff | 20 | | 50 | | Dielectric method | 50 | |
| 21 | | Local Disc Apparatus | 21 | | 51 | | DVD writer | 51 | |
| 22 | | Stem Cell | 22 | | 52 | | Multi meter | 52 | |
| 23 | | Hot Plate | 23 | | 53 | | Convex Lens | 53 | |
| 24 | | Ammeter | 24 | | 54 | | IC's | 54 | |
| 25 | | Rheostat | 25 | | 55 | | Trans | 55 | |
| 26 | | Telescope | 26 | | 56 | | Resistances | 56 | |
| 27 | | Torsion Pendulum | 27 | | 57 | | Chemicals | 57 | |
| 28 | | Viscosity | 28 | | 58 | | Decade Inductor Box | 58 | |
| 29 | | Vernier Caliper | 29 | | 59 | | Photo Cathode Box | 59 | |
| 30 | | Modulation - Demodulation | 30 | | 60 | | Multi meter Probes | 60 | |

Physics – Electronics - Lab -DDE



Semester wise List of books – Languages books are common to all

| S.No | List of Books | Subject code | Available – CD format | To be write |
|---------------------|-------------------------------------|--------------|-----------------------|-------------|
| I SEMESTER | | | | |
| 1 | Mechanics and Properties of Mater | CS1 | YES | |
| 2 | Programming in C | SEC 1 | YES | |
| 3 | Fundamentals of Physics – I | EC1 | | Yes |
| 4 | Mathematics-I | AS1 | Yes | |
| 5 | Chemistry -I | AS2 | | Yes |
| 6 | Practical –I | L1 | yes | |
| II SEMESTER | | | | |
| 7 | Thermal Physics and Acoustics | CS2 | 50% | 50% yes |
| 8 | Solar Energy | SEC 2 | | |
| 9 | Fundamentals of Physics – II | EC2 | | 100% yes |
| 10 | Mathematics-II | AS3 | Yes | |
| 11 | Chemistry -II | AS4 | | Yes |
| 12 | Practical –II | L2 | YES | |
| 13 | Ancy -Practical -I | AL1 | | Yes |
| III SEMESTER | | | | |
| 14 | Electricity and Electromagnetism | CS3 | YES | |
| 15 | Mathematical Physics - I | CS4 | | 100% yes |
| 16 | Astrophysics | SES 3 | Hard copy | |
| 17 | Electronics -I | AS5 | Yes | |
| 18 | Practical –III | L3 | Yes | |
| IV SEMESTER | | | | |
| 19 | Optics and Spectroscopy | CS5 | Yes | |
| 20 | Mathematical Physics -II | CS6 | | 100% yes |
| 21 | Medical Physics | SES 4 | | 100% yes |
| 22 | Electronics -II | AS6 | Yes | |
| 23 | Practical –IV | L4 | Yes | |
| 24 | Ancy -Practical -I | AL2 | | Yes |
| V SEMESTER | | | | |
| 25 | Modern Physics | CS7 | | 100% yes |
| 26 | Nuclear Physics | CS8 | Yes | |
| 27 | Analog Electronics | CS9 | Yes | |
| 28 | Practical –V | L5 | | 100% yes |
| 29 | Practical –VII | L6 | | 100% yes |
| VI SEMESTER | | | | |
| 30 | Classical and Statistical Mechanics | CS 10 | Yes | |
| 31 | Solid State Physics | CS 11 | | 100% yes |
| 32 | Digital Electronics | CS 12 | Yes | |
| 33 | Practical –VI | L7 | | 100% yes |
| 34 | Practical –VIII | L8 | | 100% yes |
| 35 | Elective -Practical -I | AL3 | | 100% yes |
| | | | 18 | 17 |