

St. Peter's Institute of Higher Education and Research

(Declared under section 3 of UGC Act 1956)
Avadi, Chennai – 600 054.



B.Sc. (PHYSICS) DEGREE PROGRAMME

(I to VI SEMESTERS)

REGULATIONS AND SYLLABI

REGULATIONS – 2016
Choice Based Credit System (CBCS)
(Effective from the Academic Year 2016-'17)

A handwritten signature in blue ink, appearing to be 'S. K.' or similar, is written below the regulations text.

B.Sc. (PHYSICS) DEGREE PROGRAMME
Regulations – 2016
St. Peter's Institute of Higher Education and Research
B.Sc.(PHYSICS)
REGULATION 2016

CHOICE BASED CREDIT SYSTEM

VISION & MISSION OF THE INSTITUTION

Vision

To achieve, Academic Excellence in Engineering, Technology and Science through Teaching, Research and Extension to Society

Mission

By generating, preserving and disseminating knowledge through rigorous academic study, inquisitiveness to understand and explore nature, entrepreneurship with creativity and innovation



J. K.
Registrar
St. Peter's Institute of Higher Education and Research
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VISION & MISSION OF THE DEPARTMENT

Vision

To develop the department as a center for studies in materials science and Technology and to encourage the inquisitiveness in a student and make him understand the fundamentals of physics so as to exploit it for research and implementation of technology.

Mission

- To feed the budding Engineers and physicists with finer aspects of science.
- To make them understand, exploit and innovate the aspects of physics.
- To make the students contribute to the technological advancements of tomorrow.
- To develop among students, sensitivity to contribute to the betterment of society through knowledge in Physics.




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PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

After successful completion of three year degree program in physics a student should be able to:

PEO-1 Demonstrate, solve and understand the major concepts in all Disciplines of physics.

PEO-2 Solve the problem and also think methodically, independently and draw a logical conclusion.

PEO-3 Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments.

PEO-4 Use modern techniques, decent equipment's and Microprocessor kits

PEO-5 Create an awareness of the impact of Physics on the society, and development outside the scientific Community.

PROGRAM OUTCOMES (POs):

Physics Graduates will be:

PO 1: Disciplinary knowledge and skills: Capable of demonstrating good knowledge and understanding of major concepts, theoretical principles and experimental findings in Physics and its different subfields including broader interdisciplinary subfields.

PO 2: Skilled communicator: Ability to transmit complex technical information relating all areas in Physics in a clear and concise manner for better understanding

PO 3: Critical thinker and problem solver: Ability to employ critical thinking and efficient problem solving skills in all the basic areas of Physics.

PO 4: Sense of inquiry: Capability for asking relevant/appropriate questions relating to the issues and problems in the field of Physics, and planning, executing and reporting the results of a theoretical or experimental investigation.

PO 5: Skilled project manager: Capable of identifying/mobilizing appropriate resources required for a project, and manage a project through to completion

PO 6: . National and international perspective: The graduates should be able to develop a national as well as international perspective for their career in the chosen field of the academic activities.

PO 7: Lifelong learners: Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and reskilling in all areas of Physics



PROGRAM SPECIFIC OUTCOMES (PSOS)

PSO-1 Gain the knowledge of Physics through theory and practical.

PSO-2 Understand good laboratory practices and safety.

PSO-3.Develop research oriented skills.

PSO-4 Make aware and handle the sophisticated instruments/equipment

Contribution 1: Reasonable

2: Significant

3: Strong

(Effective from the Academic Year 2016-'2017)

1. Eligibility:

A Candidate who has passed Higher secondary Examination with Mathematics, Physics and Chemistry as main subjects of study or equivalent thereto, as equivalent thereto are eligible for admission to Three Year B.Sc. Programme in Physics.

2. Duration:

Three years comprising 6 Semesters. Each semester has a minimum of 90 working days with a minimum of 5 hours a day.

3. Medium:

English is the medium of instruction and examinations except for the language subjects.

4. Eligibility for the Award of Degree:

A candidate shall be eligible for the award of degree only if he/she has undergone the prescribed course of study in the University for a period of not less than three academic years (6 semesters), passed the examinations of all the six semesters prescribed carrying 152 credits and also fulfilled such conditions as have been prescribed thereof.

5. Choice Based Credit System:

Choice Based Credit System is followed with one credit equivalent to one hour for theory paper and two hours for a practical work per week in a cycle of 18 weeks (that is, one credit is equal to 18 hours for each theory paper and one credit is equal to 36 hours for a practical work in a semester in the Time Table. The total credit for the B.Sc. (Physics) Degree Programme (6semesters) is 152 credits.

6. Weightage for a Continuous and End Assessment:

The weightage for Continuous Assessment (CA) and End Assessment (EA) is 25:75 unless the ratio is specifically mentioned in the Scheme of Examinations. The question paper is set for a minimum of 100 marks.


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7. Course of Study and Scheme of Examinations:**Semester I**

| Course Code | Course Title | L | T | P | Credit | Marks | | |
|-----------------------------------|--|-----------|----------|----------|-----------|------------|------------|------------|
| | | | | | | CA | EA | Total |
| 116UTMT01 / UTET01 / UHIT01 | Part I : Language -I (Tamil / Telugu / Hindi) | 4 | 0 | 0 | 3 | 25 | 75 | 100 |
| 116UEHT02 | Part II: English -I | 4 | 0 | 0 | 3 | 25 | 75 | 100 |
| 116UPHT03 | Mechanics and Properties of Matter | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 116UPHP01 | Major Practical -I | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 116UPHT04 | Allied Paper : Mathematics - I | 5 | 1 | 0 | 5 | 25 | 75 | 100 |
| 116UPHT05 | Non Major Elective I: | 3 | 0 | 0 | 2 | 25 | 75 | 100 |
| 116UCCT01 | Soft Skills (Common to all UG Branches) | 3 | 0 | 0 | 2 | 50 | 50 | 100 |
| | Total | 24 | 1 | 4 | 22 | 215 | 485 | 700 |

Semester II

| Course Code | Course Title | L | T | P | Credit | Marks | | |
|-----------------------------------|--|-----------|----------|----------|-----------|------------|------------|------------|
| | | | | | | CA | EA | Total |
| 216UTMT01 / UTET01 / UHIT01 | Part II : Language -II (Tamil / Telugu / Hindi) | 4 | 0 | 0 | 3 | 25 | 75 | 100 |
| 216UEHT02 | Part II: English -II | 4 | 0 | 0 | 3 | 25 | 75 | 100 |
| 216UPHT03 | Thermal Physics and Acoustics | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 216UPHP01 | Major Practical -II | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 216UPHT04 | Allied Paper : Mathematics - II | 5 | 1 | 0 | 5 | 25 | 75 | 100 |
| 216UPHT05 | Non Major Elective II: | 3 | 0 | 0 | 2 | 25 | 75 | 100 |
| 216UCCT02 | Soft Skills (Common to all UG Branches) | 3 | 0 | 0 | 2 | 50 | 50 | 100 |
| | Total | 24 | 1 | 4 | 22 | 215 | 485 | 700 |



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Out of the following four Non Major Elective papers two electives are to be chosen, one each for I & II semester.

1. Astrophysics
2. Everyday Physics
3. Basic Physics
4. Non-conventional Energy Sources

Mathematics –I & II (For B.Sc Physics, Physics with Computer Application, Chemistry, Bio-Chemistry, Electronic Science, Geophysics and Computer Science, Bachelor of Computer Application (BCA) Major only)

III Semester

| Course Code | Course Title | L | T | P | Credit | Marks | | |
|-----------------------------|--|-----------|----------|----------|-----------|------------|------------|------------|
| | | | | | | CA | EA | Total |
| 316UTMT01 / UTET01 / UHIT01 | Part II : Language -III (Tamil / Telugu / Hindi) | 4 | 0 | 0 | 3 | 25 | 75 | 100 |
| 316UEHT02 | Part II: English –III | 4 | 0 | 0 | 3 | 25 | 75 | 100 |
| 316UPHT03 | Optics | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 316UPHP01 | Major Practical -III | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 316UPHT04 | Allied Paper : Allied Chemistry I | 5 | 1 | 0 | 5 | 25 | 75 | 100 |
| 316UPHP02 | Allied Practical I | 3 | 0 | 0 | 2 | 40 | 60 | 100 |
| 316UCCT03 | Soft Skills (Common to all UG Branches) | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| | Total | 24 | 1 | 4 | 23 | 230 | 470 | 700 |

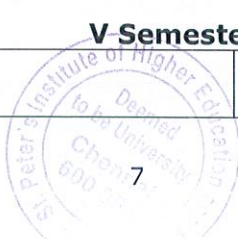
IV Semester

| Course Code | Course Title | L | T | P | Credit | Marks | | |
|-----------------------------|---|-----------|----------|----------|-----------|------------|------------|------------|
| | | | | | | CA | EA | Total |
| 416UTMT01 / UTET01 / UHIT01 | Part II : Language -IV (Tamil / Telugu / Hindi) | 4 | 0 | 0 | 3 | 25 | 75 | 100 |
| 416UEHT02 | Part II: English –IV | 4 | 0 | 0 | 3 | 25 | 75 | 100 |
| 416UPHT03 | Atomic Physics | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 416UPHP01 | Major Practical -IV | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 416UPHT04 | Allied Paper : Allied Chemistry II | 5 | 1 | 0 | 5 | 25 | 75 | 100 |
| 416UPHP02 | Allied Practical II | 3 | 0 | 0 | 2 | 40 | 60 | 100 |
| 416UEST01 | Environmental Science | 3 | 0 | 0 | 2 | 25 | 75 | 100 |
| 416UCCT04 | Soft Skills (Common to all UG Branches) | 3 | 0 | 0 | 3 | 50 | 50 | 100 |
| | Total | 27 | 1 | 4 | 23 | 255 | 545 | 800 |

V Semester

| Course Code | Course Title | L | T | P | Credit | Marks | | |
|-------------|--------------|---|---|---|--------|-------|----|-------|
| | | | | | | CA | EA | Total |
| | | | | | | | | |

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| Course Code | Course Title | L | T | P | Credit | CA | EA | Total |
|------------------|---|-----------|----------|----------|-----------|------------|------------|------------|
| 516UPHT01 | Electricity & Electromagnetism | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 516UPHT02 | Nuclear Physics and Particle Physics | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 516UPHT03 | Solid State Physics | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 516UPHT04 | Elective I | 4 | 0 | 0 | 4 | 25 | 75 | 100 |
| 516UPHP01 | Major Practical -V | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 516UPHP02 | Major Practical -VI | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 516UPHP03 | Major Practical -VII | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 516UVET01 | Part IV : Value Education (Common to all UG Branches) | 2 | 0 | 0 | 2 | 25 | 75 | 100 |
| | Total | 21 | 0 | 8 | 27 | 245 | 555 | 800 |

VI Semester

| Course Code | Course Title | L | T | P | Credit | Marks | | |
|------------------|--|-----------|----------|-----------|-----------|------------|------------|------------|
| | | | | | | CA | EA | Total |
| 616UPHT01 | Relativity and Quantum Mechanics | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 616UPHT02 | Mathematical Methods in Physics | 5 | 0 | 0 | 5 | 25 | 75 | 100 |
| 616UPHT03 | Elective II | 4 | 0 | 0 | 4 | 25 | 75 | 100 |
| 616UPHT04 | Elective III | 4 | 0 | 0 | 4 | 25 | 75 | 100 |
| 616UPHP01 | Major Practical -VIII | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 616UPHP02 | Major Practical -XI | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 616UPHP03 | Major Practical -X | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| 616UEAT01 | Part IV : Extension Activity (Common to all UG Branches) | 0 | 0 | 0 | 1 | - | - | - |
| | Total | 18 | 0 | 12 | 25 | 220 | 480 | 700 |

List of Elective I (V Semester)

| Code No. | Course Title | L | T | P | Credit | Marks | | |
|-----------|-------------------------|---|---|---|--------|-------|----|-------|
| | | | | | | CA | EA | Total |
| 516UPHT04 | Numerical Methods | 4 | 0 | 0 | 4 | 25 | 75 | 100 |
| 516UPHT04 | Low Temperature Physics | 0 | 0 | 4 | 4 | 25 | 75 | 100 |

List of Elective I (VI Semester)

| Code No. | Course Title | L | T | P | Credit | Marks | | |
|-----------|-----------------------------|---|---|---|--------|-------|----|-------|
| | | | | | | CA | EA | Total |
| 616UPHT03 | Microprocessor Fundamentals | 4 | 0 | 0 | 4 | 25 | 75 | 100 |
| 616UPHT04 | Integrated Electronics | 0 | 0 | 4 | 2 | 25 | 75 | 100 |
| 616UPHT05 | Energy physics | 0 | 0 | 4 | 2 | 25 | 75 | 100 |

| S.No. | Code No. | Subject | Credit |
|--|-----------|---------------------------------|--------|
| 1. | 516UPHT04 | Numerical Methods | 4 |
| 2 | 516UPHT04 | | 4 |
| 3 | 616UPHT06 | Microprocessor Fundamentals | 4 |
| 4 | 616UPHT07 | Integrated Electronics | 4 |
| 5 | 616UPHT07 | | |
| Non Major Electives Out of the following four Non Major Elective papers two electives are to be chosen, one each for I & II semester. | | | |
| 1 | 116UPHT05 | Astrophysics | 2 |
| 2 | 116UPHT05 | Non Conventional Energy Sources | 2 |
| 3 | 216UPHT06 | Everyday Physics | 2 |
| 4 | 216UPHT07 | Basic Physics | 2 |

- 8. Passing Requirements:** The minimum pass mark (raw score) be 40% in End Assessment (EA) and 40% in Continuous Assessment (CA) and End Assessment (EA) put together. No minimum mark (raw score) in Continuous Assessment (CA) is prescribed unless it is specifically mentioned in the Scheme of Examinations.

TOTAL CREDITS: 142

9. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

PART – I TAMIL/OTHER LANGUAGES:

TAMIL/OTHER LANGUAGES OTHER THAN ENGLISH: Successful candidates passing the examinations for the Language and securing the marks (i) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND Class respectively. All other successful candidates shall be declared to have passed the examination in the THIRD Class.

PART – II ENGLISH:

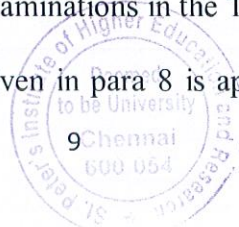
ENGLISH: Successful candidates passing the examinations for English and securing the marks (i) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND Class respectively. All other successful candidates shall be declared to have passed the examination in the THIRD Class.

PART - III CORE SUBJECTS, ALLIED SUBJECTS, AND PROJECT/ELECTIVES :

Successful candidates passing the examinations for Part-III Courses together and securing the marks (i),60 percent and above (ii) 50 percent and above but below 60 percent in the aggregate of the marks prescribed for the Part-III Courses together shall be declared to have passed the examination in the FIRST and SECOND Class respectively. All other successful candidates shall be declared to have passed the examinations in the THIRD Class.

PART-IV: Passing requirement as given in para 8 is applicable for Environmental Studies

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(EVS) and Value Education but there is no classification of successful candidates. Extension Activity is rated as satisfactory by the Head of the Department as requirement for the award of degree.

10. Grading System: Grading System on a 10 Point Scale is followed with 1 mark = 0.1 Grade point to successful candidates as given below.

CONVERSION TABLE
(1 mark = 0.1 Grade Point on a 10 Point Scale)

| Range of Marks | Grade Point | Letter Grade | Classification |
|----------------|-------------|--------------|----------------|
| 90 to 100 | 9.0 to 10.0 | O | First Class |
| 80 to 89 | 8.0 to 8.9 | A | First Class |
| 70 to 79 | 7.0 to 7.9 | B | First Class |
| 60 to 69 | 6.0 to 6.9 | C | First Class |
| 50 to 59 | 5.0 to 5.9 | D | Second Class |
| 40 to 49 | 4.0 to 4.9 | E | Third Class |
| 0 to 39 | 0 to 3.9 | F | Reappearance |

Procedure for Calculation

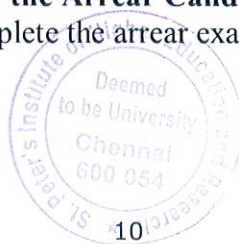
| | |
|---|---|
| <p>Cumulative Grade Point Average (CGPA)</p> <p>Where Weighted Grade Points in each Course</p> <p>Weighted Cumulative Percentage of Marks(WCPM) =</p> | <p>= $\frac{\text{Sum of Weighted Grade Points}}{\text{Total Credits}}$</p> <p>= $\frac{\sum (CA+EA) C}{\sum C}$</p> <p>= Grade Points (CA+EA) multiplied by Credits</p> <p>= (CA+EA)C</p> <p>= CGPAx10</p> |
|---|---|

C- Credit,

CA-Continuous Assessment,

EA- End Assessment

11. Effective Period of Operation for the Arrear Candidates: Two Year grace period is provided for the candidates to complete the arrear examination, if any.



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B.Sc. DEGREE COURSE IN PHYSICS

SYLLABUS

I Semester

116UTM01 - TAMIL - I

அலகு - 1 தமிழ் இலக்கிய வரலாறு

1. நாட்டுப்புற இலக்கிய வரலாறு

நாட்டுப்புறப் பாடல்கள், நாட்டுப்புறக் கதைகள்,
நாட்டுப்புறக் கதைப் பாடல்கள், பழமொழிகள், விடுகதைகள்

2. உரைநடை இலக்கிய வரலாறு

சிறுகதைகள் தோற்றமும் வளர்ச்சியும்

முதல்கள் (நாவல்கள்) தோற்றமும் வளர்ச்சியும்

3. கவிதை இலக்கிய வரலாறு

மொழி கவிதைகள் தோற்றமும் வளர்ச்சியும்

முதல் கவிதைகள் தோற்றமும் வளர்ச்சியும்

4. நாடக இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்

(சிவப்பழிதாயம் முதல் தங்கால நாடகம் வரை)

அலகு - 2

1. வாய்மொழி இலக்கியம்: நாட்டுப்புறப் பாடல்கள்

தாலாட்டு

ஒப்பளி

2. புதுமைப்பித்தன் சிறுகதைகள்

கடவுளும் கந்தசாயி பிள்ளையும்

செலவையா

மணிமுடி அந்திரம்

ஆற்றங்கரைப் பிள்ளையார்

ஒரு நாள் கழிந்தது

அலகு - 3

1. பழந்தமிழ்



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காணி நிலம் வேண்டும்
நல்லதோர் வீணை

2. பாரதிதாசன்:
தமிழ்க் காதல்
தமிழ் வளர்ச்சி
எந்நாளோ?
3. கவிமணி தேசிய விநாயகம் பிள்ளை:
குழந்தைக்கனி
ஆறு தன் வரலாறு சுறுதல்

அலகு - 4

1. சிற்பி:
முள்.. முள்.. முள்
2. அப்துல் ரகுமான்
குருடர்களின் யானை
3. ஈரோடு தமிழன்பன்
ஒரு வண்டி சென்றியு
4. இரா. மீனாட்சி
சிற்ப எழுத்து
5. வைரமுத்து
குண்டுசி
6. பழனி பாரதி
நான்கு மரக்கன்றுகள்

அலகு - 5

பம்மல் சம்மந்த முதலியார் - சந்திரகிரி

அலகு - 6

மொழிப் பயிற்சி

1. பொருந்திய சொல் தருதல்
2. மரபுத் தொடர்கள்
3. கலைச் சொற்கள்



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| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | - | - | 2 | - | - | - | - | - |
| CO2 | - | 2 | - | - | - | - | - | - |
| CO3 | - | - | - | - | 2 | - | - | - |
| CO4 | - | - | - | - | - | - | 2 | - |
| CO5 | - | - | - | - | - | - | 2 | - |
| AVERAGE | - | 0.4 | 0.4 | - | 0.4 | - | 0.8 | - |

Since it is mapped with PO2, PO3, PO5 and PO7 this subject is consider for empolyblity

| CO NO | COURSE OUTCOME | RBT |
|-------|---|-----|
| CO1 | நாட்டுப்புற இலக்கியங்களையும் அதன் வரலாற்றினையும் அறியச் செய்தல். உரைநடை, நாவல், கவிதை, நாடகம் முதலிய வளர்ச்சியையும் இலக்கியங்களின் தோற்றத்தினையும் அறியச் செய்தல். | K2 |
| CO2 | கட்டுரைகள் எழுதும் முறையினை கற்றுக் கொடுத்தல். | K6 |
| CO3 | மரபுக் கவிஞர்களின் கவிதைகள், புதுக்கவிதையின் கவிதைகளை மாணவர்களை அறியச் செய்தல். | K5 |
| CO4 | நாடகம் மற்றும் இலக்கணங்களைக் கற்றுக் கொடுத்தல். | K6 |
| CO5 | எழுத்து பிழையின்றி எழுத கற்றுக்கொடுத்தல் | K3 |



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| Course Code | Course Title | L T P C |
|---|--------------|---------|
| 116UHIT01 | Hindi - I | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To acquire basic communication skills in Hindi ▪ To inculcate role play and educational games in order to improve interaction in Hindi | | |
| PART – I PAPER – I - PROSE, FUNCTIONAL HINDI & LETTER WRITING | | |
| I . PROSE (Detailed Study): HINDI GADHYA MALA | | |
| Ed. by Dr. Syed Rahamathulla | | |
| Poornima Prakashan | | |
| 4/7 Begum III Street | | |
| Royapettah, | | |
| Chennai – 14. | | |
| LESSONS PRESCRIBED : | | |
| 1. Sabhyata ka Rahasya | | |
| 2. Mitrata | | |
| 3. Yuvavon sen | | |
| 4. Paramanu Oorja evam Khadya Padarth Sanrakshan | | |
| 5. Yougyata aur Vyavasay ka Chunav. | | |
| II. FUNCTIONAL HINDI & LETTER WRITING | | |
| Students are expected to know the office and Business Procedures, Administrative and Business Correspondence. | | |
| 1. General Correspondence: | | |
| 1. Personal Applications | | |
| 2. Leave Letters | | |
| 3. Letter to the Editor | | |
| 4. Opening an A/C | | |
| 5. Application for Withdrawl | | |
| 6. Transfer of an A/C | | |
| 7. Missing of Pass Book / Cheque Leaf | | |
| 8. Complaints | | |
| 9. Ordering for Books | | |
| 10. Enquiry | | |
| III. OFFICIAL CORRESPONDENCE: | | |
| 1. Government Order | | |
| 2. Demi Official Letter | | |
| 3. Circular | | |
| 4. Memo | | |
| 5. Official Memo | | |
| 6. Notification | | |
| 7. Resolution | | |
| 8. Notice | | |



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BOOKS FOR REFERENCE :

1. Karyalayeen Tippaniya : Kendriya Hindi Sansthan, Agra
2. Prayojan Moolak Hindi : Dr. Syed Rahamathulla
Poornima Prakashan
4/7, Begum III Street
Royapettah, Chennai – 14.

UNITISED SYLLABUS**UNIT – I****10 hrs**

1. Sabhyata ka Rahasya
2. Personal Applications
3. Leave Letters
4. Government Order
5. Administrative Terminology Hindi to English (25 Words)

UNIT – II**10 hrs**

1. Mitrata
2. Letter to the Editor
3. Opening an A/C
4. Demi Official Letter
5. Administrative Terminology English to Hindi (25 Words)

UNIT-III**10 hrs**

1. Yuvavon Se
2. Application for Withdrawal
3. Circular
4. Memo
5. Administrative Terminology Hindi to English (25 Words)

UNIT-IV**12hrs**

1. Paramanu Oorja evam Khadya Padarth Sanrakshan
2. Transfer of an A/C
3. Missing of Pass Book / Cheque Leaf
4. Official Memo
5. Administrative Terminology English to Hindi (25 Words)

UNIT-V**5 hrs**

1. Yougyata aur Vyavasay ka Chunav
2. Complaints
3. Ordering for Books
4. Notification
5. Official Noting Hindi to English (25 words)

UNIT-VI**7 hrs**

1. Enquiry
2. Resolution
3. Notice
4. Official Noting English to Hindi (25 words)

TOTAL HOURS :54**Books for Reference:****Expected Course Outcomes:**

STUDENTS WILL BE ABLE TO

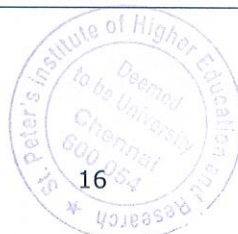
CO1: To acquire basic communication skills in Hindi

CO2: To inculcate role play and educational games in order to improve interaction in

| Course Code | Course Title | L T P C |
|---|--------------|--------------|
| 116UFRT01 | French-I | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To acquire basic communication skills in French ▪ To inculcate role play and educational games in order to improve interaction in French | | |
| Unit I | | 10hrs |
| 1.1 Se présenter à des publics différents et saluer 1.2 Saluer et Prendre congé 1.3 La présentation, <i>s'appeler</i> et <i>être</i> et pronoms sujets, <i>c'est / il est / elle est</i> . 1.5 Articles définis /indéfinis, Voici / voilà/il y a 1.6 Des cartes d'identité. 1.7 Présenter quelqu'un 1.8 Parler de soi 1.9 Les nationalités, les verbes <i>er</i> (commencer, habiter...) 1.2.1 Les chiffres 1 à 50. 1.2.2 Des vedettes et leurs nationalités. 1.2.1 Épreuves | | |
| Unit II | | 10hrs |
| 2.1 Exprimer ses goûts, ses préférences. 2.2 La négation, les articles définis. 2.3 Les mois et les jours / le calendrier. 2.4 Les verbes <i>er</i> (suite). 2.5 L'interrogation avec intonation. 2.6 Décrire un lieu, les noms des différentes salles... 2.7 Les adjectifs qualificatifs et les articles partitif 2.8 Les verbes <i>ir</i> et <i>re</i> , les verbes <i>venir</i> , <i>devoir</i> , <i>faire</i> . 2.9 Les adjectifs possessifs <i>mon</i> , <i>ma</i> , <i>mes</i> et <i>notre</i> , <i>nos</i> . 2.9.1 Épreuves | | |
| Unit III | | 10hrs |
| 3.1 Donner des directions / localiser un lieu/ trouver un lieu 3.2 Les verbes <i>aller</i> et <i>mettre</i> 3.3 L'article contracté et les prépositions de lieu (en, à, au...) 3.4 L'impératif 3.5 Les mots de caractérisation d'un lieu et les lieux urbains 3.6 Les transports | | |
| Unit IV | | 12hrs |
| 4.1 Discuter et acheter des produits, <i>Ça fait...</i> 4.2 Les expressions de quantité 4.3 Les fruits, les légumes, les produits alimentaires | | |



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- 4.4 Les produits propres aux pays différents.
 4.5 La négation
 4.6 Le COD
 4.6 Le conditionnel (je voudrais) et les verbes irréguliers : *pouvoir, vouloir, prendre*.
 4.7 Épreuves

Unit V**12hrs**

- 5.1 Fixer un rendez-vous avec le médecin
 5.2 L'heure et Les nombres de 51 à 100
 5.3 Les verbes *sortir* et *partir*
 5.4 L'interrogation avec *est-ce que*
 5.5 Les parties du corps, *avoir* + les expressions et les maladies communes
 5.6 Les adjectifs possessifs – *notre/nos, votre/vos, sa/ses/son, ...*
 5.7 Le COI
 5.8 L'entraînement DELF et épreuves

TOTAL HOURS :54**Books for Reference:**

1. BAGLIETO, David, GIRARDEAU, Bruno, MISTICHELLI, Marion – *Agenda 1*, Hachette, Paris, 2011
2. POISSON QUINTON, Sylvie, SIREJOLS, Evelyne, *Amical -1*, CLE International, Paris, 2011
3. GIRARDET, Jacky, PECHEUR, Jacques – *Écho A1*, CLE International, Paris, 2010
 MIQUEL, Claire, *Vite et Bien-1*, CLE International, Paris, 2009
4. MERIEUX, Régine; LOISEAU, Yves, *Connexions-1*, Didier, Paris, 2004.
5. CAPELLE Guy; MENAND, Robert *Taxi-1*, Hachette, Paris, 2003

Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

CO1: To acquire basic communication skills in French

CO2: inculcate role play and educational games in order to improve interaction in French

| Course Code | Course Title | L T P C |
|--|--------------|---|
| 116UEHT02 | English I | 4 0 0 3 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ To enable the students to develop their communication skills effectively. ▪ To make students familiar with the English Language. | | |
| Unit - I Preparatory Lessons | | 10 hrs |
| <ol style="list-style-type: none"> 1. Competition Matters - <i>Suzanne Siever</i> 2. A Personal Crisis May Change History - <i>Dr. A.P.J. Abdul Kalam</i> 3. Why Preserve Biodiversity - <i>Prof. D.Balasubramanian</i> 4. A Call to Action - <i>Adapted from Hillary Rodham Clinton's address.....</i> | | |
| Unit - II Prose | | 10 hrs |
| <ol style="list-style-type: none"> 1. My Greatest Olympic Prize - <i>Jesse Owens</i> 2. If You are Wrong Admit it - <i>Dale Carnegie</i> 3. Monday Morning - <i>Mark Twain</i> 4. The Unexpected - <i>Robert Lynd</i> | | |
| Unit - III Poetry | | 10 hrs |
| <ol style="list-style-type: none"> 1. Pulley or Gift of God - <i>George Herbert</i> 2. La Belle Dame Sans Merci - <i>John Keats</i> 3. The Night of the Scorpion - <i>Night of the Scorpion</i> 4. The Death of a Bird - <i>A.D. Hope</i> | | |
| Unit - IV Short Story | | 12 hrs |
| <ol style="list-style-type: none"> 1. Mrs. Packletide's Tiger - <i>Saki</i> 2. A Snake in the Grass - <i>R.K. Narayan</i> 3. Three Questions - <i>Leo Tolstoy</i> 4. The Gift of the Magi - <i>O. Henry</i> | | |
| Unit - V Grammar | | 12 hrs |
| Tense, Aspect, Auxiliaries (Primary and Modal), Negatives, Interrogatives (Yes or No, Wh Questions) Tag questions, completing the sentences, Common errors, Synonym, Antonym, Word class, Use in sentences of words. (Refer to the Grammar exercises in the Text Book) and Part I from Spring Board by Orient Black Swan Pvt. Ltd Rs. 95/- | | |
| Part -I | | |
| Sound Right | | |
| Introduction to the Sounds of the English Language, Word Stress, Strong and Weak Forms, Sentences Stress and Intonation, Voice Modulation. | | |
| | | TOTAL HOURS :54 |
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| Course Code | Course Title | L T P C |
|--|------------------------------------|------------------------|
| 116UPHTT03 | Mechanics and Properties of Matter | 6 0 0 5 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ Understand Mechanics of system of particles. ▪ Know the Rigid Body dynamics ▪ To solve the equation of continuity and solve different theorems ▪ To study the Elastic properties . ▪ To Learn the bending of beams and fluid dynamics | | |
| Unit 1 : Impulse and Impact | | 18hrs |
| Impulse – impact – Laws of impact – direct impact and oblique impact between two smooth spheres – loss of kinetic energy – motion of two interacting bodies – reduced mass. | | |
| Rigid body dynamics | | |
| Compound pendulum – theory – equivalent simple pendulum – reversibility of centers of oscillation and suspension – determination of g and k – center of mass – velocity and acceleration of centre of mass – determination of motion of individual particle – system of variable mass. | | |
| Unit 2 : Centre of gravity and centre of pressure | | 18hrs |
| Centre of gravity of solid and hollow tetrahedron, solid and hollow hemisphere – Centre of pressure – vertical rectangular lamina – vertical triangular lamina. | | |
| Hydrodynamics | | |
| Equation of continuity of flow – Venturimeter – Euler's equation of unidirectional flow – Torricelli's theorem – Bernoulli's theorem and its applications. | | |
| Unit 3 : Elasticity | | 18hrs |
| Hooke's Law – Stress – Strain - Elastic constants – Expressions for Poisson's ratio interms of elastic constants – workdone in stretching and twisting a wire – twisting couple on a cylinder – rigidity modulus by static torsion – torsional pendulum – rigidity modulus and moment of inertia. | | |
| Unit 4 : Bending of beams | | 18 hrs |
| Cantilever – expression for bending moment – expression for depression – cantilever oscillations – Expression for time period – Experiment to find Young's modulus – Non uniform bending – Experiment to determine Young's modulus by Koenig's method – uniform bending – expression for elevation – experiment to determine Young's modulus using microscope. | | |
| Unit 5 : Fluid dynamics | | 18hrs |
| Surface tension-Definition – Excess of pressure over curved surface – Application to spherical and cylindrical drops and bubbles – variation of surface tension with temperature – Jaegar's method | | |
| Viscosity-Definition – Coefficient of viscosity – Rate of flow of liquid in a capillary tube – Poiseuille's formula – variation of viscosity of a liquid with temperature – Application | | |
| | | TOTAL HOURS :90 |

Books for Study

1. Mechanics – Part I and II by Narayanamoorthy, National Publishing Company.
2. Mechanics by D.S.Mathur, S.Chand & Co., 2nd Edition (2001).
3. Mechanics by P. Duraipandian, Laxmi Duraipandian, Muthamizh Jayapragasam, S.Chand & Co., New Delhi (1988).
4. Properties of Matter by Brij Lal and N.Subramaniam, S. Chand & Co., New Delhi (1994).
5. Properties of Matter by R.Murugesan, S. Chand & Co., New Delhi (2001).

Books for Reference

1. General Properties of Matter by C.J. Smith, Orient Longman Publishers (1960).
2. Fundamentals of Physics by D. Halliday, R.Rensick and J. Walker, 6th edition, Wiley, NY (2001).
3. Mechanics and General Properties of Matter by P.K. Chakrabarthy, Books and Allied (P) Ltd. (2001).
4. Fundamentals of General Properties of Matter by H.R.Gulati, S. Chand & Co., New Delhi (1982).

Expected Course Outcomes:

STUDENTS WILL BE ABLE,TO

CO1 : Understand Mechanics of system of particles.

CO2 : Know the Rigid Body dynamics

CO3 : solve the equation of continuity and solve different theorems

CO4 : study the Elastic properties .

CO5 : Learn the bending of beams and fluid dynamics


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Course Code

Course Title

116UPHTT03

Mechanics and Properties of Matter

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Understand the concepts of dynamics of rigid bodies | K2 |
| CO2 | Understand the knowledge of centre of pressure and centre of gravity | K2 |
| CO3 | Acquire knowledge in the basics of hydrodynamics | K3 |
| CO4 | Perform experiments by applying the concepts of elasticity and bending of beams | K3 |
| CO5 | Get the knowledge in the principles of Fluid dynamics | K1 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO4,PO6 this subject is consider Entrepreneurship




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| Course Code | Course Title | L T P C |
|--|---------------|-----------------------|
| 116UPHT04 | Mathematics I | 5 1 0 5 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ To introduce the concepts of approximation values. ▪ To learn the basic need for their major concepts ▪ To train the students in the basic integration. | | |
| UNIT I:Algebra And Numerical Methods: | | 18hrs |
| <p>Algebra: Summation of series - simple problems. Numerical Methods: Operators E, \int, difference tables; Newton-Raphson method; Newton's forward and backward interpolation formulae for equal intervals, Lagrange's interpolation formula. Chapter 2, Section 2.1.3, 2.2, 2.2.1, 2.3, 2.3.3 Chapter 3, Section 3.4.1 and Chapter 5, Section 5.1 and 5.2.</p> | | |
| UNIT II :Matrices | | 18hrs |
| <p>Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and Unitary matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof) – verification- Computation of inverse of matrix using Cayley - Hamilton theorem. Chapter 4, Section 4.1.1 to 4.1.6, 4.5, 4.5.2, 4.5.3.</p> | | |
| UNIT III:Theory of Equations | | 18hrs |
| <p>Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation. Newton's method to find a root approximately - simple problems. Chapter 3, Section 3.1 to 3.4.1</p> | | |
| UNIT IV: Trigonometry | | 18hrs |
| <p>Expansions of $\sin(n\theta)$ and $\cos(n\theta)$ in a series of powers of $\sin\theta$ and $\cos\theta$ - Expansions of $\sin^n\theta$, $\cos^n\theta$, $\tan^n\theta$ in a series of sines, cosines and tangents of multiples of "θ" - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of "θ" – Hyperbolic and inverse hyperbolic functions - Logarithms of complex numbers. Chapter 6, Section 6.1 to 6.5</p> | | |
| UNIT V: Differential Calculus | | 18hrs |
| <p>Successive differentiation, n^{th} derivatives, Leibnitz theorem (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables, Lagrange's multipliers - Simple problems Chapter 1, Section 1.1 to 1.3.2 and 1.4.3</p> | | |
| | | Total Hours-90 |
| Book for Reference: | | |
| <ol style="list-style-type: none"> 1. S. Narayanan and T.K. Manickavasagam Pillai Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai. 2. Allied Mathematics by Dr. A. Singaravelu. | | |

COURSE OUTCOMES On the successful completion of the course, students will be able to

CO 1: Solve algebraic series and solve equations numerically

CO 2: Get knowledge of matrices to find eigen values and eigen vectors.

CO 3: Find roots of equations.

CO 4: Solve all kinds of trigonometric functions.

CO 5: Get the knowledge of radius of curvature.

Mapping with Programme Outcomes

| CO's\PO's\PSO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | - | - | 2 | 2 | 2 | - | 1 | 2 | 2 |
| CO2 | 2 | 2 | 2 | - | 2 | 2 | 1 | 1 | - | 2 | 2 |
| CO3 | 2 | 2 | - | - | 2 | 1 | 1 | 2 | - | 2 | 2 |
| CO4 | - | 2 | 2 | - | 1 | - | 2 | - | - | 1 | 1 |
| CO5 | - | 2 | 2 | - | 1 | - | 1 | - | - | 1 | 2 |

Strong – 3; Medium – 2; Low – 1.

Course Outcomes

On the successful completion of the course, students will be able to

| CO Number | CO Statement | Knowledge Level |
|-----------|---|--------------------|
| CO1 | Solve algebraic series and solve equations numerically | K1, K2, K3, K5 |
| CO2 | Get knowledge of matrices to find eigen values and eigen vectors. | K1, K2, K3, K4, K5 |
| CO3 | Find roots of equations. | K1, K2, K3, K4, K5 |
| CO4 | Solve all kinds of trigonometric functions. | K1, K2, K3 |
| CO5 | Get the knowledge of radius of curvature. | K1, K2, K3, K5 |



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Syllabus for NON MAJOR ELECTIVE I

| Course Code | Course Title | L T P C |
|---|---------------------|----------------|
| 116UPHT05 | Astro Physics | 2 0 0 2 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ To Know the working of telescope and detectors. ▪ To study about solar system and members of solar system. ▪ Learn about the origin of Universe and Galaxies. | | |
| Unit 1: Astronomical instruments | | 8hrs |
| Optical telescopes-refracting telescope-reflecting telescope- types of reflecting telescopes – detectors and image processing. | | |
| Unit 2: Solar system | | 7hrs |
| The Sun- physical and orbital data-photosphere-chromosphere-corona-solar prominences – sunspot - solar flare- mass of the sun- solar constant- temperature of the sun- sources of solar energy-solar wind. | | |
| Unit 3: Members of the solar system | | 7hrs |
| Mercury – Venus- Earth – Mars – Jupiter- Saturn- Uranus- Neptune- Pluto- Moon – Bode’s law – asteroids- comets – meteors. | | |
| Unit 4: Stellar evolution | | 7hrs |
| Birth and death of a star –brightness of a star – stellar distance- Chandrasekar limit-white dwarfs- Neutron stars – black holes- Supernovae. | | |
| Unit 5: Theories of the Universe and Galaxies | | 7hrs |
| Origin of the Universe - the big bang theory- the steady state theory- the oscillating universe theory – Hubble’s law. Galaxies – types of galaxies- Milky way | | |
| TOTAL HOURS :36 | | |
| Books for study : | | |
| <ol style="list-style-type: none"> 1. Astrophysics - a modern perspective by K.S.Krishnaswamy, New Age International (P) Ltd, New Delhi (2002). 2. An introduction to Astro physics by Baidyanath Basu, second printing, Prentice – Hall of India (P) Ltd, New Delhi (2001). | | |
| Books for reference: | | |
| <ol style="list-style-type: none"> 1. Modern Physics by R.Murugesan, 11th edition, S.Chand & Company Ltd, New Delhi (2003). 2. Astronomy by S.Kumaravelu, Janki Calendar Corporation, Sivakasi (1993). 3. Astronomy by Baker and Fredrick, 9th edition, Van Nostrand reinhold Co, New York (1964). 4. Illustrated World of Science Encyclopedia –Vol I to VIII, Creative World Publications, Chicago. 5. Modern Physics by Kenneth S.Krane, John Wiley & Sons Inc., NY (1983). | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: Understand the various astronomical scales in astrophysics | | |
| CO2: Acquire knowledge on astronomical techniques. | | |
| CO3: Learn the concept of physical principles in astrophysics | | |
| CO4: Understand about the sun and origin of solar system.. | | |
| CO5: Gain knowledge on the different types of galaxies | | |

Course Code
116UPHT05

Course Title
Astro Physics

| CO No. | Course Outcome | RB T |
|---------------|--|-------------|
| CO1 | Understand the various astronomical scales in astrophysics | K2 |
| CO2 | Acquire knowledge on astronomical techniques. | K6 |
| CO3 | Learn the concept of physical principles in astrophysics | K1 |
| CO 4 | Understand about the sun and origin of solar system. | K2 |
| CO5 | Gain knowledge on the different types of galaxies | K1 |

CO –PO MATRICES:

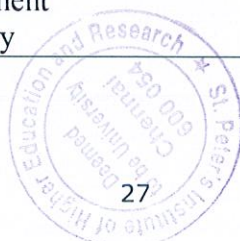
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|------------|------|------|------|------|------|------|-----|
| CO1 | 3 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO2 | 3 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO3 | 3 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO4 | 3 | 1 | 2 | 1 | 2 | 2 | 2 |
| CO5 | 3 | 1 | 2 | 1 | 2 | 2 | 2 |
| AVG | 3 | 1 | 2 | 1 | 2 | 2 | 2 |

Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability, skill development & Entrepreneurship



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| Course Code | Course Title | L T P C |
|--|---------------------------------|-----------------------|
| 116UPHT05 | Non-Conventional Energy Sources | 2 0 0 2 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ Provides Knowledge about various renewable energy resources available at a location and assessments of its potential, using tools and techniques. ▪ Learn about Solar energy radiation, its interactions, measurement and estimation. ▪ Develop and read hydrographs, estimate flow, heat and power. ▪ Acquire knowledge on Geothermal, wave, tidal and OTEC resources, site Selection and bio energy assesment | | |
| Unit 1 : Solar energy | | 7hrs |
| Conventional Energy sources – Renewable Energy sources- solar energy – solar radiation and its measurements- solar energy collectors- parabolic collector- storage of solar energy | | |
| Unit 2 : Applications of solar energy | | 8hrs |
| Solar water heater- solar driers- solar cells- solar electric power generation- solar distillation- solar pumping – solar cooking | | |
| Unit 3: Wind energy | | 7hrs |
| Basic principles of wind energy conversion- power in the wind – forces in the Blades- wind energy conversion- Advantages and disadvantages of wind energy conversion systems (WECS) Energy storage- Applications of wind energy | | |
| Unit 4: Oceanic energy | | 7hrs |
| Energy from the oceans- Energy utilization- Energy from tides- Basic principle of tidal power – Utilization of tidal energy | | |
| Unit 5 : Energy from other sources | | 7hrs |
| Chemical energy – Nuclear energy - Energy storage and distribution | | |
| | | Total Hours-36 |
| Books for study | | |
| <ol style="list-style-type: none"> 1. Non-conventional sources of energy by G.D. Rai, 4th edition, Khanna Publishers, New Delhi (1996). 2. Solar Energy, Principles of thermal collection and storage by S.P.Sukhatme 2nd edition, Tata McGraw-Hill Publishing Co. Ltd., New Delhi (1997). | | |
| Book for reference | | |
| <ol style="list-style-type: none"> 1. Energy Technology by S.Rao and Dr. Paruleka | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: Provides Knowledge about various renewable energy resources available at a location and assessments of its potential, using tools and techniques | | |
| CO2: Learn about Solar energy radiation, its interactions, measurement and estimation | | |
| CO3: Develop and read hydrographs, estimate flow ,heat and power | | |
| CO4: Acquire knowledge on Geothermal, wave, tidal and OTEC resources, site Selection and bio energy assesment | | |
| CO5: Learn about oceanic energy | | |



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Course Code
116UPHT05

Course Title
Non-Conventional Energy Sources

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Provides Knowledge about various renewable energy resources available at a location and assessments of its potential,using tools and techniques | K2 |
| CO2 | Learn about Solar energy radiation, its interactions, measurement and estimation. | K3 |
| CO3 | Develop and read hydrographs,estimate flow ,heat and power. | K6 |
| CO 4 | Acquire 28knowledge on Geothermal, wave, tidal and OTEC resources, siteSelectionand bio energy assessment | K4 |
| CO5 | Learn about oceanicenergy | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|------------|------|------|------|------|------|------|-----|
| CO1 | 2 | 2 | 2 | 2 | - | - | 2 |
| CO2 | 2 | 2 | 2 | 2 | - | - | 2 |
| CO3 | 2 | 2 | 2 | 2 | - | - | 2 |
| CO4 | 2 | 2 | 2 | 2 | - | - | 2 |
| CO5 | 2 | 2 | 2 | 2 | - | - | 2 |
| AVG | 2 | 2 | 2 | 2 | - | - | 2 |

Since it is mapped with PO7, PO8 this subject is considered for employability & skill development




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| Course Code | Course Title | L T P C |
|---|-------------------|------------------------|
| 116UPHP01 | Major Practical-I | 0 0 5 2 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ Understand the concepts of experiments ▪ Understand the fundamentals of circuits ▪ To understand the working of spectrometer | | |
| (Any Eight Experiments) | | |
| <ol style="list-style-type: none"> 1. Young's modulus – Non-uniform bending – Pin & microscope 2. Young's modulus – Uniform bending – Optic lever 3. Rigidity modulus – Torsional pendulum (without identical masses) 4. Rigidity modulus and moment of inertia – Torsional pendulum (With identical masses) 5. Cary Poster's Bridge specific resistance of the given wire. 6. Sonometer – Verification of laws and frequency of tuning fork 7. P.O. Box – Temperature coefficient of resistance 8. Potentiometer – Internal resistance 9. Spectrometer – refractive index of a liquid | | |
| Note : Use of Digital balance is permitted. | | |
| | | TOTAL HOURS :74 |
| Books for Study | | |
| 1. Practical Physics and Electronics, C.C. Ouseph, U.J. Rao.V. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | |
| Books for Reference | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: Understand the concepts of experiment | | |
| CO2 : Understand the fundamentals of circuits | | |
| CO3 : Understand the working of spectrometer | | |
| CO4: Do the experiments relating to potentiometer | | |
| CO5: Understanding the concept of sonometer | | |

Course Code Course Title
116UPHP01 Major Practical-I

| CO No. | Course Outcome | RBT |
|--------|--|-----|
| CO1 | Understand the concepts of experiment | K2 |
| CO2 | Understand the fundamentals of circuits | K2 |
| CO3 | Understand the working of spectrometer | K2 |
| CO4 | Do the experiments relating to potentiometer | K6 |
| CO5 | Understanding the concept of sonometer | K5 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability & skill development & Entrepreneurship




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| Course Code | Course Title | L T P C |
|---|--------------|--------------|
| 116UCCT01 | Soft Skills | 2 0 0 2 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ To Enable students to build functional vocabulary ▪ To comprehend the concept of communication. Carry out all LSRW skills | | |
| Essentials of Language and Communication – Level I | | |
| Unit I | | 12hrs |
| Recap of Language Skills – Speech, Grammar, Vocabulary, Phrase, clause, sentence, Punctuation. | | |
| Unit II | | 12hrs |
| Fluency building What is fluency – Why is fluency important – Types of fluency – Oral fluency – Reading fluency – Writing fluency – Barriers of fluency – How to develop fluency. | | |
| Unit III | | 12hrs |
| Principles of communication: LSRW in communication. What is meant by LSRW Skills – Why it is important – How it is useful – How to develop the skills? | | |
| Oral – Speaking words, articulation, speaking clearly. Written communication – Generating ideas/ gathering data organizing ideas, Setting goals, Note taking, Outlining, Drafting, Revising, Editing and Proof reading. Non verbal communication – Body language, Signs and symbols, Territory/Zone, Object language. | | |
| Total Hours-36 | | |
| Books for Study: | | |
| <ol style="list-style-type: none"> 1. Hewing, Martin. 1999. Advanced English Grammar: A Self-study Reference and practice Book for South Asian Students. Reprint 2003. Cambridge University Press. New Delhi. 2. Lewis, Norman. 1991. Word Power Made Easy. Pocket Books. 3. Hall and Shepherd. The Anti-Grammar Book: Discovery Activities for Grammar Teaching Longman. 4. Powell. In Company. MacMillan. 5. Cotton, et al. Market Lader. Longman. | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: Learn about how to develop their personality skills such as self-confidence and self-disclosure. | | |
| CO2: Gain knowledge on body language. | | |
| CO3: Learn the knowledge of professional ethics. | | |
| CO4: Learning the body knowledge to perform in all activities. CO5: Capability of knowing the professional skills in good manner. | | |

Course Code
116UCCT01

Course Title
Soft Skills

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Learn about how to develop their personality skills such as self-confidence and self-disclosure | K2 |
| CO2 | Gain knowledge on body language. | K6 |
| CO3 | Learn the knowledge of professional ethics. | K3 |
| CO 4 | Learning the body knowledge to perform in all activities. | K1 |
| CO5 | Capability of knowing the professional skills in good manner. | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | - | - | 1 | 2 | - | - | 3 |
| CO2 | - | - | 1 | 2 | - | - | 3 |
| CO3 | - | - | 1 | 2 | - | - | 3 |
| CO4 | - | - | 1 | 2 | - | - | 3 |
| CO5 | - | - | 1 | 2 | - | - | 3 |
| AVG | - | - | 1 | 2 | - | - | 3 |

Since it is mapped with PO2, PO3, PO5 and PO7 this subject is considered for employability



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II Semester

II Semester

216UTM01 - TAMIL - II

அலகு : 1 தமிழ் இலக்கிய வரலாறு

- அ. சிற்றிலக்கிய வரலாறு
- ஆ. கிருத்துவ இலக்கிய வரலாறு
- இ. இசுலாமிய இலக்கிய வரலாறு

அலகு : 2

1. நந்திக் கலம்பகம்
2. முத்தொள்ளாயிரம்
3. தமிழ் வீடு தூது(முதல் 36 கண்ணிகள்)

அலகு : 3

1. திருக்குற்றாலக் குறவஞ்சி (குறத்தி மலைவளம் கூறுதல்)
2. முக்கூடல் பள்ளு (நாட்டு வளம்)
3. இயேசு பிரான் பிள்ளைத் தமிழ் (செங்கீரைப் பருவம் முதல் 5 செய்யுள்கள்)

அலகு : 4

நளவெண்பா (கலி நீங்கு காண்டம்)

அலகு : 5

சீராப்புராணம் (மானுக்குப் பிணை நின்ற பா வம்)

அலகு : 6 மொழிப் பயிற்சி

இலக்கணக் குறிப்புகள்: பண்புத்தொகை, வினைத்தொகை
உடமைத் தொகை, உருவகம், உவமைத் தொகை,
வேற்றுமைத் தொகை, அன்மொழித் தொகை, இருபொருள்
பண்புத்தொகை

ஒரு பொருள் குறித்த பல சொற்க்

பல பொருள் குறித்த ஒரு

அகர வரிசைப்படுத்துதல்

ஒருமை - பன்மை மயக்கம்

பிறமொழிச் சொற்களை நீக்குதல்




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| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | - | - | 2 | - | - | - | - | - |
| CO2 | - | 2 | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | 2 | - |
| CO4 | - | - | - | - | - | - | 2 | - |
| CO5 | - | - | - | - | - | - | - | 2 |
| AVERAGE | - | 0.4 | 0.4 | - | - | -- | 0.8 | 0.4 |

Since it is mapped with PO2, PO3, PO7 and PO8 this subject is consider for employblity and skill development

| CO NO | COURSE OUTCOME | RBT |
|-------|---|-----|
| CO1 | சிறுநிலக்கிய வாலாற்றினையும் வகைகளையும் அறிந்து கொள்ளுதல் | K2 |
| CO2 | சிறுகதை கவிதை திறனை வளர்த்தல். | K6 |
| CO3 | பிள்ளைத்தமிழ் இலக்கணங்களை கற்றல் | K1 |
| CO4 | புராணங்களின் கதைகளை மாணவர்களுக்கு கற்பித்தல் | K2 |
| CO5 | இலக்கணங்களையும், தமிழ் மொழி பிற மொழிக் கலப்பினை நீக்குதல் போன்றவற்றை மாணவர்கள் அறிந்துக்கொள்ளல் | K3 |



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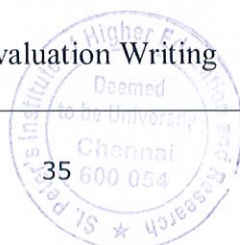
| Course Code | Course Title | L | T | P | C |
|---|--------------|---|---|---|---|
| 216UHIT01 | Hindi II | 4 | 0 | 0 | 3 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ To acquire basic communication skills in Hindi ▪ To inculcate role play and educational games in order to improve interaction in Hindi ▪ To be able to translate English to Hindi | | | | | |
| PART – I PAPER – II – ONE ACT PLAY, SHORT STORY & TRANSLATION | | | | | |
| I. ONE ACT PLAY (Detailed Study): AATH EKANKI Edited By: | | | | | |
| Devendra Raj Ankur, Mahesh Anand | | | | | |
| Vani prakashan | | | | | |
| 4695, 21-A Dariyagunj, | | | | | |
| New Delhi – 110 002 | | | | | |
| LESSONS PRESCRIBED : | | | | | |
| 1. Aurangzeb ki Aakhari Raat | | | | | |
| 2. Laksmi Ka Swagat | | | | | |
| 3. Basant Ritu ka Naatak | | | | | |
| 4. Bahut Bada Sawal | | | | | |
| II. SHORT STORIES (Non- Detailed Study): SWARNA MANJARI Edited by: | | | | | |
| Dr. Chitti. Annapurna | | | | | |
| Rajeswari Publications | | | | | |
| 21/3, Mothilal Street, (Opp. Ranganathan Street), | | | | | |
| T. Nagar, Chennai – 600 017. | | | | | |
| LESSONS PRESCRIBED : | | | | | |
| 1. Mukthidhan | | | | | |
| 2. Mithayeewala | | | | | |
| 3. Seb aur Dev | | | | | |
| 4. Vivah ki Teen Kathayen | | | | | |
| III. TRANSLATION PRACTICE : (English to Hindi) | | | | | |
| BOOKS FOR REFERENCE : | | | | | |
| 1. Prayojan Moolak Hindi : Dr. Syed Rahamathulla | | | | | |
| Poornima Prakashan | | | | | |
| 4/7, Begum III Street | | | | | |
| Royapettah, Chennai – 14. | | | | | |
| 2. Anuvad Abhyas Part III Dakshin Bharat Hindi Prachar Sabha | | | | | |
| T. Nagar, Chennai -17. | | | | | |
| UNITISED SYLLABUS | | | | | |
| UNIT – I | | | | | |
| 1. Auranzeb ki Aakhiri Raat | | | | | |
| 2. Mukthidhan | | | | | |
| 3. Practice of Annotation Writing | | | | | |
| 4. Practice of Summary and Literary evaluation Writing | | | | | |
| UNIT – II | | | | | |

12hrs

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10hrs

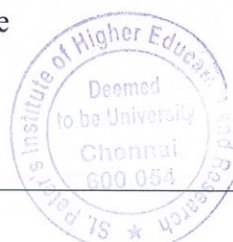


| | |
|--|--------------|
| 1. Laksmi ka Swagat | |
| 2. Mithayeewala | |
| 3. Practice of Annotation Writing | |
| 4. Practice of Summary and Literary evaluation Writing | |
| UNIT-III | 10hrs |
| 1. Basant Ritu ka Natak | |
| 2. Seb Aur Dev | |
| 3. Practice of Annotation Writing | |
| 4. Practice of Summary and Literary evaluation Writing | |
| UNIT-IV | 12hrs |
| 1. Bahut Bada Sawal | |
| 2. Vivah ki Teen Kathayen | |
| 3. Practice of Annotation Writing | |
| 4. Practice of Summary and Literary evaluation Writing | |
| UNIT-V | 10hrs |
| 1. Translation Practice. (English to Hindi) | |
| TOTAL HOURS :54 | |
| Expected Course Outcomes: | |
| STUDENTS WILL BE ABLE TO | |
| CO1: To acquire basic communication skills in Hindi | |
| CO2: To inculcate role play and educational games in order to improve interaction Hindi | |
| CO3: To be able to translate English to Hindi | |




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| Course Code | Course Title | L T P C |
|---|--------------|---------|
| 216UFRT01 | French II | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To acquire basic communication skills in French ▪ To acquire sufficient competence to appear for the Certificate level language proficiency tests in basic French. | | |
| Unit I | | |
| 5.1 Acheter un billet | | |
| 5.2 Les nombres au-delà de 100 | | |
| 5.3 Les différents types de places (fumeur, non fumeur, aller-retour) | | |
| 5.4 Les adjectifs démonstratifs | | |
| 5.5 L'interrogation avec inversion | | |
| 5.6 Les vêtements | | |
| 5.7 L'entraînement DELF | | |
| 5.8 Compréhension/Production écrite | | |
| 5.9 Épreuves | | |
| Unit II | | |
| 1.1 Discuter les plats au restaurant | | |
| 1.2 Les recettes, des plats et boissons différents, les formules de cuisine, des recettes simples des différents pays | | |
| 1.3 Le passé récent | | |
| 1.5 Les pronoms toniques | | |
| 1.6 <i>Il faut</i> + infinitif, Le pronom <i>en</i> | | |
| 1.7 Faire des projets pour les vacances, décrire le temps | | |
| les lieux touristiques et le climat des différents pays | | |
| 1.8 Le futur proche et les adverbes, le <i>il</i> impersonnel, le pronom <i>y</i> | | |
| 1.9 Épreuves et entraînement DELF | | |
| Unit III | | |
| 2.1 Le passé composé | | |
| 2.2 Les pronoms relatifs (qui, que) | | |
| 2.3 Québec et son histoire | | |
| 2.4 Parler du passé et de soi | | |
| 2.5 Compréhension/ production écrite | | |
| 2.6 Entraînement DELF | | |
| 2.7 Épreuves | | |
| Unit IV | | |
| 3.1 Les verbes réfléchis | | |
| 3.2 Les pronoms relatifs (dont, où) | | |
| 3.3 L'impératif négatif | | |
| 3.4 Québec et son histoire | | |
| 3.5 Parler du passé et de soi | | |
| 3.6 Compréhension/ production écrite | | |
| 3.7 Entraînement DELF | | |
| 3.8 Épreuves | | |
| Unit V | | |
| 4.1 L'imparfait | | |



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- 4.2 La place des pronoms doubles
- 4.3 Décrire les moeurs et les pays
- 4.4 La Réunion
- 4.5 Compréhension/ production écrite
- 4.6 Entraînement DELF
- 4.7 Épreuves

TOTAL HOURS :54

Books for Study

1. BAGLIETO, David, GIRARDEAU, Bruno, MISTICHELLI, Marion – *Agenda 1*, Hachette, Paris, 2011
2. POISSON QUINTON, Sylvie, SIREJOLS, Evelyne, *Amical -1*, CLE International, Paris, 20011
3. GIRARDET, Jacky, PECHEUR, Jacques – *Écho A1*, CLE International, Paris, 2010
4. MIQUEL, Claire, *Vite et Bien-1*, CLE International, Paris, 2009
5. MERIEUX , Régine; LOISEAU, Yves, *Connexions-1*, Didier, Paris , 2004
6. CAPELLE Guy; MENAND, Robert *Taxi-1*, Hachette, Paris, 2003

Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

CO1: To acquire basic communication skills in French

CO2: To acquire sufficient competence to appear for the Certificate level language proficiency tests in basic French.



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| Course Code | Course Title | L | T | P | C |
|--|--------------|---|---|---|------------------------|
| 216UEHT02 | English II | 4 | 0 | 0 | 3 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ To develop their critical thinking capabilities focused through the course as an important need ▪ To acquire knowledge in prose, poetry and short stories | | | | | |
| Unit - I Prose | | | | | 12hrs |
| <ol style="list-style-type: none"> 1. The Refugee - K.A. Abbas 2. The Lion and The Lamb - Leonard Clark 3. The Lady or the Tiger? - Frank R. Stockton 4. The Sky is the limit - Kalpana Chawla | | | | | |
| Unit - II Poems | | | | | 10hrs |
| <ol style="list-style-type: none"> 1. The Solitary Reaper - William Wordsworth 2. Gift - Alice Walker 3. O What is that Sound - W. H. Auden 4. Ode to the West Wind - P.B. Shelly | | | | | |
| Unit - III Short Stories | | | | | 12hrs |
| <ol style="list-style-type: none"> 1. The Fortune-Teller - Karel Capek 2. The Postmaster - Rabindranath Tagore 3. The Model Millionaire - Oscar Wilde 4. The Dying Detective - Arthur Canon Doyle | | | | | |
| Unit - IV One-Act Plays | | | | | 10hrs |
| <ol style="list-style-type: none"> 1. The Death Trap - Saki (H.H. Munro) 2. The Dear Departed: A Comedy in ONE-ACT- Stanley Houghton 3. The Sherif's Kitchen - Ronald Gow 4. The Anniversary - Anton Chekkov | | | | | |
| Unit - V Communicative Grammar | | | | | 10hrs |
| Refer to the Text Panorama and Part III from Spring Board by Orient Black Swan Pvt. Ltd | | | | | |
| Watch Your English | | | | | |
| Grammar, Framing Questions, Common Errors, More Grammar, Word Building: Prefixes and Suffixes. | | | | | |
| | | | | | TOTAL HOURS :54 |
| EXPECTED COURSE OUTCOMES: | | | | | |
| Upon completion of the course students will be able to: | | | | | |
| CO1:Apply the useful information on utilizing activity words in sentence development. | | | | | |
| CO2:Apply and practiced the correct knowledge in grammar. | | | | | |
| CO3:Apply and breakdown the correct sort of articulation with respect to discourse sounds and ready to get various kinds of elocutions. | | | | | |
| CO 4: Apply the idea of central rule of checking to take care of the issues on direct, round changes and furthermore for the issues on determinations. | | | | | |
| CO 5: Analyze the given conditions and discovering all the potential courses of action in direct and round request | | | | | |

Course Code
216UEHT02

Course Title
English II

| CO | COURSE OUTCOME | RBT |
|-----|---|-------|
| CO1 | Apply the useful information on utilizing activity words in sentence development. | K1,K2 |
| CO2 | Apply and practiced the correct knowledge in grammar | K3 |
| CO3 | Apply and break down the correct sort of articulation with respect to discourse sounds and ready to get various kinds of elocutions. | K5 |
| CO4 | Apply the idea of central rule of checking to take care of the issues on direct, round changes and furthermore for the issues on determinations. Apply the idea of likelihood, while doing the issues on Leap year and Non-Leap year issues, coins, bones, balls and cards. | K4 |
| CO5 | Analyze the given conditions and discovering all the potential courses of action in direct and round request. Break down the given numbers or letters to discover the concealed relationship and apply that similarity to discover arrangements. Finding the odd ball by watching the standard which makes the others comparable. | K6 |

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|----------------|-----|------------|------------|-----|------------|-----|----------|-----|
| CO1 | - | - | - | - | - | - | - | - |
| CO2 | - | 2 | - | - | - | - | - | - |
| CO3 | - | - | 2 | - | 2 | - | 2 | - |
| CO4 | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | 3 | - |
| AVERAGE | - | 0.4 | 0.4 | - | 0.4 | - | 1 | - |

Since it is mapped with PO2, PO3, PO5 and PO7 this subject is considered for employability



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| Course Code | Course Title | L | T | P | C |
|--|-------------------------------|---|---|---|---|
| 216UPHT03 | Thermal Physics and Acoustics | 6 | 0 | 0 | 5 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ provides the basic idea of thermometry and calorimetry ▪ understand the basic ideology of phase space, microstate, macrostate. ▪ apply the principles of probability in distribution of particles in various systems and to calculate thermodynamic probability. ▪ gives the insight of ultrasonics | | | | | |
| Unit 1 : Thermometry and Calorimetry 18hrs | | | | | |
| Platinum resistance thermometer – Calendar and Griffith’s bridge – Thermistor – Specific heat capacity – Specific heat capacity of solids – Dulong and Petit’s law – Specific heat capacity of liquid – method of mixtures – Barton’s correction – Specific heat capacity of gases – C_p and C_v by Regnault’s and Callendar & Barne’s methods – variation of specific heat capacity of diatomic gases | | | | | |
| Low temperature physics : | | | | | |
| Joule-Kelvin effect – porous plug experiment – liquefaction of gases – Linde’s method of liquefying air | | | | | |
| Unit 2 : Thermodynamics 18hrs | | | | | |
| Thermodynamic equilibrium – zeroth law of thermodynamics – first law of thermodynamics – Reversible and irreversible processes – second law of thermodynamics-Heat engine – Carnot’s engine – Carnot’s theorem – Internal combustion engines – petrol and diesel engines – thermodynamics scale of temperature- Entropy – entropy and available energy – temperature – entropy diagram for Carnot’s cycle - III Law of thermodynamics – Nernst’s heat theorem. | | | | | |
| Unit 3 : Conduction and Radiation 18hrs | | | | | |
| Thermal conductivity – rectilinear flow of heat – thermal conductivity of a good conductor – Forbe’s method – thermal conductivity of a bad conductor – Lee’s disc method – radiation – blackbody radiation – Wien’s law – Stefan’s law – Newton’s law of cooling from Stefan’s law – Solar constant – Pyrometer – Pyroheliometer. | | | | | |
| Unit 4 : Waves and oscillations 18hrs | | | | | |
| Simple harmonic motion - combination of two SHMs in a straight line – at right angles – Lissajous’s figures – free, damped, forced oscillations and resonance – intensity and loudness of sound – intensity level – decibel – noise pollution. | | | | | |
| Unit 5 : Ultrasonics 18hrs | | | | | |
| Ultrasonics – production – piezo electric crystal method – magnetostriction method – applications Acoustics of buildings – reverberation – Absorption coefficient – Sabine’s formula – Acoustics aspects of halls and auditoriums | | | | | |
| TOTAL HOURS :90 | | | | | |



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Books for study

1. Heat and Thermodynamics by D.S.Mathur, 3rd edition Sulthan Chand & Sons, New Delhi (1978).
2. Heat and Thermodynamics by Brijlal and N. Subramanyam, S.Chand & Co, New Delhi (2000).
3. Heat by Narayanamoorthy and KrishnaRao, Triveni Publishers, Madras (1969).
4. Text book of Sound by V.R.Khanna and R.S.Bedi, 1st edition, Kedharnaath Publish & Co, Meerut (1998).
5. Waves and Oscillations by Brijlal and N. Subramanyam, Vikas Publishing house, New Delhi (2001).
6. Text book of Sound by Ghosh, S.Chand & Co, New Delhi (1996).

Books for Reference

1. Heat and Thermodynamics by Zemansky, McGraw – Hill Book Co. Inc., New York.
2. Fundamentals of Physics by Resnick Halliday and Walker, 6th edition, , John Willey and Sons, Asia Pvt.Ltd., Singapore.
3. Fundamentals of Thermodynamics by Carroll M.Leonard, Prentice-Hall of India (P) Ltd., New Delhi (1965).

Expected Course Outcomes:**STUDENTS WILL BE ABLE TO**

CO1: provides the basic idea of thermometry and calorimetry

CO2: study basic ideology of phase space, microstate, macrostate.

CO3: apply the principles of probability in distribution of particles in various systems and to calculate thermodynamic probability

CO4: apply the principles of oscillation

CO5: gives the insight of ultrasonics




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Course Code **Course Title**
216UPHT03 **Thermal Physics and Acoustics**

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Understand the basic idea of thermometry and calorimetry | K2 |
| CO2 | Acquire knowledge in laws of Thermodynamics | K6 |
| CO3 | Apply the concept of conduction and radiation in the experiment | K3 |
| CO 4 | Gain knowledge in the concept of waves and oscillations | K1 |
| CO5 | Gives the insight of ultrasonics | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 3 | 3 | 1 | - | 2 |
| CO2 | 3 | 3 | 3 | 3 | 1 | - | 2 |
| CO3 | 3 | 3 | 3 | 3 | 1 | - | 2 |
| CO4 | 3 | 3 | 3 | 3 | 1 | - | 2 |
| CO5 | 3 | 3 | 3 | 3 | 1 | - | 2 |
| AVG | 3 | 3 | 3 | 3 | 1 | - | 2 |

Since it is mapped with PO7 this subject is considered for employability



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| Course Code | Course Title | L | T | P | C |
|--|--------------------|---|---|---|---|
| 216UPHP01 | Major Practical II | 5 | 0 | 0 | 2 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ provides the basic idea of thermometry and calorimetry ▪ understand the basic ideology of phase space, microstate, macrostate. ▪ apply the principles of probability in distribution of particles in various systems and to calculate thermodynamic probability. | | | | | |
| (Any Seven Experiments) | | | | | |
| <ol style="list-style-type: none"> 1. Surface tension and interfacial surface tension – drop weight method. 2. Coefficient of viscosity of liquid – Graduated burette (radius of capillary tube by Mercury pellet method). 3. Sonometer – Relative Density of a solid and liquid. 4. Specific heat capacity of a liquid – Newton’s law of cooling. 5. Specific heat capacity of liquid – Method of mixtures (Half-time correction). 6. Focal length, Power, R and refractive index of a long focus convex lens. 7. Focal length, Power, R and refractive index of a concave lens. 8. Potentiometer-Calibration of low range voltmeter. <p>Note : Use of Digital balance is permitted</p> | | | | | |
| TOTAL HOURS :72 | | | | | |
| Books for study | | | | | |
| <ol style="list-style-type: none"> 1. Practical Physics and Electronics, C.C. Ouseph, U.J. Rao.V. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | | | | |
| Expected Course Outcomes: | | | | | |
| STUDENTS WILL BE ABLE TO | | | | | |
| CO1: Provide the basic idea of thermometry and calorimetry | | | | | |
| CO2: Understand the basic ideology of phasespace, microstate,macrostate | | | | | |
| CO3: Apply the principles of probability in distribution of particles in various systems and to calculate thermodynamic probability | | | | | |
| CO4:Undersatnding the basics of refractive index of lens | | | | | |
| CO5: Gain practical knowledge by applying the experimental methods to correlate with the physics theory | | | | | |




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Course Code
216UPHP01

Course Title
Major Practical II

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Provide the basic idea of thermometry and calorimetry | K1 |
| CO2 | Understand the basic ideology of phasespace, microstate, macrostate. | K2 |
| CO3 | Apply the principles of probability in distribution of particles in various systems and to calculate thermodynamic probability | K4 |
| CO4 | Undersatnding the basics of refractive index of lens | |
| CO5 | Gain practical knowledge by applying the experimental methods to correlate with the physics theory | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability & skill development & Entrepreneurship



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| Course Code | Course Title | L T P C |
|---|----------------|--------------|
| 216UPHT04 | Mathematics II | 5 1 0 5 |
| Prerequisites :Nil | | |
| Course Objectives: <ul style="list-style-type: none"> ▪ This course introduces the concepts of integration and differential. ▪ To learn the basic need for their major concepts ▪ To train the students in the basic differentiation and integrations | | |
| Unit-I INTEGRAL CALCULUS: Bernoulli's formula. Reduction formulae - $\int_0^{\frac{\pi}{2}} \sin^n x dx$, $\int_0^{\frac{\pi}{2}} \cos^n x dx$ $\int_0^{\frac{\pi}{2}} \sin^m x \cos^n x dx$ (m, n being positive integers), Fourier series for functions in $(\alpha, \alpha + 2\pi)$, Half range sine and cosine series. Chapter 2, Section 2.7 and 2.9 Chapter 4, Section 4.1 to 4.2 | | 18hrs |
| Unit II DIFFERENTIAL EQUATIONS Ordinary Differential Equations: second order non- homogeneous differential equations with constant coefficients of the form $ay'' + by' + cy = X$ where X is of the form $e^{\alpha x} \cos \beta x$ and $e^{\alpha x} \sin \beta x$ Partial Differential Equations: Formation, complete integrals and general integral, four standard types and solving lagrange's linear equation $Pp + Qq = R$ Chapter 5, Section 5.2 Chapter 6, Section 6.1 to 6.4 | | 18hrs |
| Unit-III LAPLACE TRANSFORMS: Laplace transformations of standard functions and simple properties, inverse Laplace transforms, Application to solution of linear differential equations up to 2 nd order-simple problems. Chapter 7, Section 7.1.1 to 7.1.4 and 7.2 to 7.3 | | 18hrs |
| Unit IV VECTOR DIFFERENTIATION Introduction, Scalar point functions, Vector point functions, Vector differential operator Divergence, Curl, Solenoidal, irrotational, identities. Chapter 8, Section 8.1 to 8.4.4 | | 18hrs |
| Unit V VECTOR INTEGRATION Line, surface and volume integrals, Gauss, Stoke's and Green's theorems (without proofs). Simple problems on these. Chapter 8, Section 8.5 to 8.6.3 | | 18hrs |
| TOTAL HOURS 90 | | |
| Book for Study: <ol style="list-style-type: none"> 1. S. Narayanan and T.K. Manickavasagam Pillai Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai. 2. Allied Mathematics by Dr. A. Singaravelu. | | |
| COURSE OUTCOMES On the successful completion of the course, students will be able to CO 1: Solve all type of integrals. CO 2: Get the knowledge to solve ordinary and partial differential equation. CO 3: Solve periodic functions and transform functions. CO 4: Apply the vector operators. CO 5: Evaluate vector operators using various theorem. | | |

Mapping with Programme Outcomes

| CO Number | CO Statement | Knowledge Level |
|-----------|--|---------------------|
| CO1 | Solve all type of integrals. | K1, K3,K5 |
| CO2 | Get the knowledge to solve ordinary and partial differential equation. | K1,K2,K3,K4 K5, |
| CO3 | Solve periodic functions and transform functions. | K1,K2,K3.K4 , K5 |
| CO4 | Apply the vector operators. | K1,K2,K3 |
| CO5 | Evaluate vector operators using various theorem. | K1, K2 , K5 |

Strong – 3; Medium – 2; Low – 1.

Course Outcomes

On the successful completion of the course, students will be able to

| CO's\PO's\PSO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | - | - | 2 | 2 | 2 | - | 1 | 2 | 2 |
| CO2 | 2 | 2 | 2 | - | 2 | 2 | 1 | 1 | - | 2 | 2 |
| CO3 | 2 | 2 | - | - | 2 | 1 | 1 | 2 | - | 2 | 2 |
| CO4 | - | 2 | 2 | - | 1 | - | 2 | - | - | 1 | 1 |
| CO5 | - | 2 | 2 | - | 1 | - | 1 | - | - | 1 | 2 |

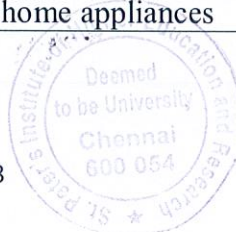


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Syllabus for Non Major Elective II

| Course Code | Course Title | L T P C |
|--|---------------------|----------------|
| 216UPHT06 | Everyday Physics | 2 0 0 2 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ To Study about the physics behind the Home appliances. ▪ To Study the basic principles of submarines and air crafts. ▪ To Learn about the services of domestic appliances. | | |
| Unit 1 | | 7hrs |
| Physics behind Home appliances – Light bulb – Fan – Hair drier – Television – Air Conditioners – microwave ovens – Vacuum cleaners – Dishwasher – Washing machines | | |
| Unit 2 | | 8hrs |
| How things work – Basic principles – Rape recorder – Taps – Lifts – Submarines – Jet planes – Helicopters – Rockets – fax machines – Pagers – Cellular phones | | |
| Unit 3 | | 7hrs |
| Demonstration – making a switch board with multiple points – wiring – one lamp controlled by one switch/Two switches – fixing a fuse – soldering – P.C.B Preparation | | |
| Unit 4 | | 7hrs |
| Study of resistors, chokes, Capacitors and Transformers – multimeter – Basic principles – measurement of resistance, Voltage AC & DC | | |
| Unit 5 | | 7hrs |
| Servicing of domestic appliances – iron box – mixie – grinder – motor – emergency lamp | | |
| Total Hours :36 | | |
| Books for Study | | |
| <ol style="list-style-type: none"> 1. The Learner's series – Everyday science – Published by INFINITY BOOKS, New Delhi 2. The Hindu speaks on Science, Vol I & II, Kasturi Ranga Publishers, Chennai | | |
| Books for Reference | | |
| <ol style="list-style-type: none"> 1. Fundamentals of Physics by D. Halliday, R.Rensick and J. Walker, 6th edition, Wiley, NY (2001). 2. Physics, Vols I, II, III by D.Halliday, R.Resnick and K.S.Krane, 4th Edition, Wiley, New York (1994). 3. The Feymann Lectures on Physics Vols I, II, III by R.P. Feynmann, R.B. Leighton & M. Sands, Narosa, New Delhi (1998). | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1 : To Study about the physics behind the Home appliances.. | | |
| CO2: To Study the basic principles of submarines and aircrafts | | |
| CO3: To Learn about the services of domestic appliances | | |
| CO4: To learn about basics of electrical devices | | |
| CO5: Apply the knowledge about servicing home appliances | | |



Course Code
216UPHT06

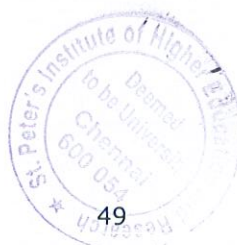
Course Title
Everyday Physics

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | To Study about the physics behind the Home appliances. | K3 |
| CO2 | To Study the basic principles of submarines and aircrafts. | K3 |
| CO3 | To Learn about the services of domestic appliances | K3 |
| CO4 | To learn about basics of electrical devices | |
| CO5 | Apply the knowledge about servicing home appliances. | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 1 | 2 | - | - | 3 |
| CO2 | 3 | 3 | 1 | 2 | - | - | 3 |
| CO3 | 3 | 3 | 1 | 2 | - | - | 3 |
| CO4 | 3 | 3 | 1 | 2 | - | - | 3 |
| CO5 | 3 | 3 | 1 | 2 | - | - | 3 |
| AVG | 3 | 3 | 1 | 2 | - | - | 3 |

Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability skill development & Entrepreneurship



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| Course Code | Course Title | L T P C |
|--|---------------|-----------------------|
| 216UPHT05 | Basic Physics | 2 0 0 2 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVE: | | |
| <ul style="list-style-type: none"> ▪ Will give knowledge about the general parameter like velocity, acceleration. ▪ Will provide the students about the knowledge of heat, sound and optics. ▪ Course provides the basic Knowledge about Geo physics and Medical Physics. ▪ Gives knowledge about communication system. | | |
| Unit 1 : Mechanics | | 7 hrs |
| Force – Weight – Work – Energy – Power – Horsepower – Centrifuge – Washing machine | | |
| Unit 2 : Heat | | 7hrs |
| Variation of boiling point with pressure – Pressure cooker – Refrigerator – Air conditioner – Principle and their capacities – Bernoulli principle – Aero plane | | |
| Unit 3 : Sound and Optics | | 7hrs |
| Sound waves – Doppler effect – Power of lens – Long sight and short sight – X-rays – Ultrasound scan – CT scan – MRI scan Microscope – Telescope – Binocular – Camera | | |
| Unit 4 : GeoPhysics and Medical Physics | | 7hrs |
| Earthquake – Richter scale – thunder and lightning – Lightning arrestors – Cosmic showers | | |
| Unit 5 : Space science and Communication | | 8hrs |
| Newton's law of gravitaion – Weather forecasting and communication satellites – Indian satellites – Electromagnetic spectrum – Radio waves – AM and FM transmission and reception | | |
| | | Total Hours 36 |
| Books for Study | | |
| <ol style="list-style-type: none"> 1. The Learner's series – Everyday science – Published by INFINITY BOOKS, New Delhi 2. The Hindu speaks on Science, Vol I & II, Kasturi & Sons, Chennai | | |
| Books for Reference | | |
| <ol style="list-style-type: none"> 1. Fundamentals of Physics by D. Halliday, R.Rensick and J. Walker, 6th edition, Wiley, NY (2001). 2. Physics, Vols I, II, III by D.Halliday, R.Resnick and K.S.Krane, 4th Edition, Wiley, New York (1994). 3. The Feymann Lectures on Physics Vols I, II, III by R.P. Feynmann, R.B. Leighton & M. Sands, Narosa, New Delhi (1998). | | |
| ExpectedCourseOutcomes: | | |
| STUDENTSWILLBEABLETO | | |
| CO1: Will give knowledge about the general parameter like velocity,acceleration.. | | |
| CO2 : Will provides the students about the knowledge of heat, sound and optics | | |
| CO3 : Course provides the basic Knowledge about Geophysics and Medical Physics.. | | |
| CO4: Gives knowledge about communication system. | | |
| CO5: Learn about space science and communication. | | |

Course Code
216UPHT05

Course Title
Basic Physics

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Will give knowledge about the general parameter like velocity,acceleration. | K2 |
| CO2 | Will provides the students about the knowledge of heat, sound and optics. | K2 |
| CO3 | Course provides the basic Knowledge about Geophysics and Medical Physics. | K4 |
| CO 4 | Gives knowledge about communication system. | K4 |
| CO5 | Learn about space science and communication. | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 1 | 1 | - | - | - | 2 |
| CO2 | 3 | 1 | 1 | - | - | - | 2 |
| CO3 | 3 | 1 | 1 | - | - | - | 2 |
| CO4 | 3 | 1 | 1 | - | - | - | 2 |
| CO5 | 3 | 1 | 1 | - | - | - | 2 |
| AVG | 3 | 1 | 1 | - | - | - | 2 |

Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability & skill development & Entrepreneurship



| Course Code | Course Title | L T P C |
|---|--------------|-----------------------|
| 216UCCT02 | Soft skills | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To enhance through a task based and learner centric syllabus ▪ To carry out all LSRWskills. | | |
| Essentials of Language and Communication – Level – II | | |
| Unit-I | | 12 hrs |
| Speaking Skills Formal and Informal Conversation – Conversation in the work place – Interviews – Public Speech – Lectures. | | |
| Unit – II | | 10hrs |
| Listening Skill Comprehending – Retaining – Responding – Tactics – Barriers to Listening – Overcoming listening barriers – Misconception about listening. | | |
| Unit – III | | 10hrs |
| Reading Skill Acquiring reading – Reading Development – methods teaching – Reading difficulties. | | |
| Unit – IV | | 12hrs |
| Writing skill Note-making – CV's – Report writing, copy writing, Agenda – Minutes – Circular – Essay writing on any current issues – paragraph – Essay writing, Writing Research papers – Dissertation. | | |
| Unit- V | | 10hrs |
| Business Correspondence Meaning of Business correspondence – Importance of Business Correspondence essential qualities of a business letters. Different types of business letters – cover letter, thank you letters, message through email and Fax, Acceptance letters, rejection letters, and withdrawal letters. | | |
| | | Total Hours 54 |
| Books for Study: | | |
| 1. Minippally, Methukutty. M. 2001. Business Communication Strategies. 11 th Reprint. Tata McGraw – Hill. New Delhi. | | |
| 2. SasiKumar. V and P.V. Dharmija. 1993. Spoken English: A Self-Learning Guide Conversation Practice. 34 th reprint. Tata McGraw – Hill. New Delhi. | | |
| 3. Swets, Paul. W. 1983. The Art of Talking So That People Will Listen: Getting Through to Family, Friends and Business Associates. Prentice Hall Press. New York. | | |
| 4. John, Seely The Oxford guide to writing and speaking. Oxford U P, 1998, Delhi. | | |
| 5. The Process of Writing: Planning and Research, Writing, Drafting and Revising. | | |




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Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

CO1: Enhance through at ask based and learner centric syllabus

CO2: Carry out all LSRW skills.

CO3: Gaining the knowledge about writing skills

CO4: Learning about business letters

CO5: Understanding the importance of business correspondence

Course Code
216UCCT02

Course Title
Soft skills

| No. | Course Outcome | RB T |
|------|---|---------|
| CO1 | Enhance through at ask based and learner centric syllabus | K2 |
| CO2 | Carry out all LSRW skills. | K6 |
| CO3 | Gaining the knowledge about writing skills | K3 |
| CO 4 | Learning about business letters. | K1 |
| CO5 | Understanding the importance of business correspondence | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|------------|------|------|------|------|------|------|-----|
| CO1 | - | - | 1 | 2 | - | - | 3 |
| CO2 | - | - | 1 | 2 | - | - | 3 |
| CO3 | - | - | 1 | 2 | - | - | 3 |
| CO4 | - | - | 1 | 2 | - | - | 3 |
| CO5 | - | - | 1 | 2 | - | - | 3 |
| AVG | - | - | 1 | 2 | - | - | 3 |

Since it is mapped with PO4, PO6, PO7, & PO8, this subject is considered for employability & skill development & Entrepreneurship



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III Semester

316UTM01 - TAMIL - III

அலகு : 1 தமிழ் இலக்கிய வரலாறு

அ. பல்லவர் கால பக்தி இலக்கிய வரலாறு

ஆ. பிற்காலச் சோழர் காலப் பேரிலக்கிய வரலாறு

இ. காப்பிய இலக்கிய வரலாறு

அலகு : 2

அ. தேவாரம் - திருநாவுக்கரசர்

ஆ. திருவாசகம் - மாணிக்க வாசகர்

(திருப்பாவை முதல் 10 செய்யுள்கள்)

இ. நாலாயிரத் திவ்ய பிரபந்தம் - ஆண்டாள்

வாரணம் ஆயிரம் தொடங்கி 10 செய்யுள்கள்

அலகு : 3

கம்பராமாயணம்

(முத்த காண்டம் - கும்பகருணன் வதைப்படலம்)

அலகு : 4

பெரிய புராணம்

(காரைக்காலம்மையர் புராணம்)

அலகு : 5

இராமலிங்க அடிகள் - மனுமுறை கண்ட வாசகம்

அலகு : 6 மொழிப் பயிற்சி

1. தனியார் நிறுவனத்துக்கு வேலை வாய்ப்பு வேண்டி விண்ணப்பம் எழுதுதல்

2. ஊராட்சி, பேரூராட்சி, நகராட்சி, மாநகராட்சிக்குத்

அ. தெருக்குழாய் குடிநீர் வேண்டி

ஆ. வீட்டுக்குக் குடிநீர் இணைப்பு வேண்டி

இ. தெருக்குப்பைகளை அப்புறப்படுத்த வேண்டி

ஈ. கொசுத் தொல்லைகளை நீக்க மருந்து தெளிக்க வேண்டி

உ. வெறிநாய்களைக் கட்டுப்படுத்த வேண்டி

ஊ. தெருச்சாலைகளைச் செப்பனிட வேண்டி

எ. இரயில் பாதையின் மேல் மேம்பாலம் கட்ட வேண்டிக் கடிதம் எழுதுதல்




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| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | - | 1 | - | - | - | - | - | - |
| CO2 | - | 2 | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | 1 | - |
| CO4 | - | - | - | - | - | - | 2 | - |
| CO5 | - | - | - | - | - | - | - | 1 |
| AVERAGE | - | 0.6 | - | - | - | - | 0.6 | 0.2 |

Since it is mapped with PO2, PO7 and PO8 this subject is consider for empolyblity and skill development

| CO NO | COURSE OUTCOME | RBT |
|-------|---|-----|
| CO1 | சைவ இலக்கியங்களின் தோற்றம் வளர்ச்சியினை மாணவர்கள் அறிதல். | K2 |
| CO2 | வைணவ இலக்கிய வரலாற்றினை அறிதல் | K2 |
| CO3 | கம்பராமாயணம் போன்ற புராண நூல்களை படித்து கதைகளை அறிய செய்தல். | K1 |
| CO4 | உரைநடை எழுதும் திறன் வளர்த்தல் | K6 |
| CO5 | கடிதங்கள் விண்ணப்பங்கள் போன்றவற்றை பிழையின்றி எழுதும் திறன் வளர்த்தல் | K3 |




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| Course Code | Course Title | L T P C |
|---|--------------|--------------|
| 316UHIT01 | Hindi III | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To acquire basic communication skills in Hindi ▪ To inculcate role play and educational games in order to improve interaction in Hindi | | |
| UNIT I | | 12hrs |
| <ol style="list-style-type: none"> 1. Kabirdas - Saakhi (Dohas from 1 to 10) 2. Literary Trends of Veeragatha Kaal (Aadikaal) 3. Chand Baradai and his Works 4. Vidhyapathi and his Works | | |
| UNIT II | | 10hrs |
| <ol style="list-style-type: none"> 1. Surdas - Bramargeet Saar 2. Literary Trends of Bhakthi Kaal 3. Gyan Margi Shakha 4. Important Poet : 1. Kabirdas | | |
| UNIT III | | 12hrs |
| <ol style="list-style-type: none"> 1. Tulasidas – Vinay ke Pad only 2. Literary Trends of Bhakthi Kaal – Prem Margi Shakha 3. Literary Trends of Bhakthi Kaal - Ram Bhakthi Shakha 4. Important Poets – 1. Joyasi and 2. Tulasidas | | |
| UNIT – IV | | 10hrs |
| <ol style="list-style-type: none"> 1. Meera Bai – Pad only 2. Tiruvalluar (Dharmakaand only) 3. Literary Trends of Bhakthi Kaal – Krishna Bhakthi Shakha 4. Important Poet – Surdas | | |
| UNIT – V | | 10hrs |
| <ol style="list-style-type: none"> 1. Biharilal (Dohas 1 to 5) 2. Literary Trends of Reethikaal 3. Important Poet : Bihari and his works 4. Bhushan and his works and Ghananand and his works | | |
| TOTAL HOURS :54 | | |
| Reference Books : | | |
| <ol style="list-style-type: none"> 1. Hindi Sahithya Ka Itihas, Ramchandra Shukla , Jayabharathi Publications, 217, B, Maya Press Road, Allahabad – 211 003. 2. Hindi Sahithya Yug Aur Pravritthiya, Dr. Sivakumar Varma, Asok Prakashan Nayi Sarak, New Delhi – 6 3. Hindi Sahithya ka Sybodh Itihas, Babu Gulabroy, Lakshmi Narayanan Agarwas Book Publishers seller, Anupama Plaza -1, Block.No.50, Sanjay Place, Agra- 282002. | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: acquire basic communication skills in Hindi | | |
| CO2: inculcate role play and educational games in order to improve interaction in Hindi | | |

| Course Code | Course Title | L T P C |
|---|--------------|---------|
| 316UFRT01 | French III | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To be capable of conversing with reasonable ease with a native speaker on basic aspects of everyday life | | |
| <p><i>Peau d'âne</i> Presentation and study of the text , Oral and Written comprehension Grammar and Activities from workbook . Aller plus loin</p> <p><i>Djeha et l'homme changé en âne</i> Presentation and study of the text . Oral and Written comprehension , Grammar and Activities from workbook , Aller plus loin</p> <p><i>Le violoniste</i> Presentation and study of the text , Oral and Written comprehension ,Grammar and Activities from workbook ,Aller plus loin</p> <p><i>La Loire et ses rives</i> Presentation and study of the text ,Oral and Written comprehension , Grammar and Activities from workbook , Aller plus loin</p> <p><i>Hans et la digue</i> Presentation and study of the text ,Oral and Written comprehension , Grammar and Activities from workbook , Aller plus loin</p> <p><i>Grand poussin</i> Presentation and study of the text , Oral and Written comprehension , Grammar and Activities from workbook , Aller plus loin</p> <p style="text-align: right;">TOTAL HOURS :54</p> <ol style="list-style-type: none"> 1. BAGLIETO, David, GIRARDEAU, Bruno, MISTICHELLI, Marion – <i>Agenda 2</i>, Hachette, Paris, 2011 2. POISSON QUINTON, Sylvie, SIREJOLS, Evelyne, <i>Amical -2</i>, CLE International, Paris, 2011 3. GIRARDET, Jacky, PECHEUR, Jacques – <i>Écho A2</i>, CLE International, Paris, 2010 4. MERIEUX , Régine; LOISEAU, Yves, <i>Connexions-2</i>, Didier, Paris , 2004 MENAND, Robert <i>Taxi-2</i>, Hachette, Paris, 2003 | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: converse with reasonable ease with a native speaker on basic aspects of everyday life | | |

| Course Code | Course Title | L T P C |
|---|--------------|-----------------------|
| 316UEHT02 | English III | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> To introduce to a range of contexts where the language is used to meet a variety of real life communication | | |
| Unit I Prose | | 12hrs |
| <ol style="list-style-type: none"> Dress in Communication - Fusion Music - <i>Pt. Ravi Shankar</i> About "An Inconvenient Truth" - <i>Davis Guggenheim</i> A Speech - N.R. Narayana Murthy A Speech - Barack Obama Unity of Minds - <i>A.P.J. Abdul Kalam</i> | | |
| Unit II Poetry | | 12hrs |
| <ol style="list-style-type: none"> The Justice of Peace - <i>Hillari Bellock</i> A Different History - <i>Sujata Bhatt</i> Digging - <i>Seamus Heaney</i> I Love You Mom - Ozymandias of Egypt - <i>Percy Bysshe Shelly</i> Leave this Chanting and Singing and Telling of Beads - <i>Rabindranath Tagore</i> | | |
| Unit III Short Stories | | 10hrs |
| <ol style="list-style-type: none"> Happy Prince - <i>Oscar Wilde</i> The Story of Stanford - Engine Trouble - <i>R.K. Narayan</i> After Twenty Years - <i>O. Henry</i> Two Gentlemen of Verona - <i>A.J. Cronin</i> The Avenger - <i>Anton Chekhov.</i> | | |
| Unit IV Biographies from Inspiring Lives | | 10hrs |
| <ol style="list-style-type: none"> Madam Curie Mother Teresa Subrahmanyam Chandrasekhar Dr. Amartya Kumar Sen Gertrude Elion Vikram Sarabhai Charles Chaplin Wangari Maathi | | |
| Unit V Grammar | | 10hrs |
| <p>Refer to the exercises given in the text and Part -V from Spring Board by Orient Black Swan Pvt. Ltd Rs.95/-</p> <p>Face-to-Face</p> <p>Preparing for an Interview, Win the Game of Life, The First Written Encounter: Writing Skills.</p> | | |
| Books for Study: | | OTAL HOURS :54 |
| <ol style="list-style-type: none"> Reflections by Foundation Books Inspiring Lives by Maruthi Publications | | |

Course Code
316UEHT02

Course Title
English III

| CO | COURSE OUTCOME | RBT |
|-----|---|-------|
| CO1 | Heighten their awareness of correct usage of English grammar in writing and speaking. | K1,K2 |
| CO2 | Improve their fluency and comprehensibility of different genres through the texts prescribed. | K3 |
| CO3 | Enlarge their vocabulary of literary terms and genres. | K5 |
| CO4 | Strengthen their ability to write essays and summaries in an advanced level. | K4 |
| CO5 | Attain and enhance competence in the four modes of literacy: writing, speaking, reading and listening | K6 |

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|----------------|-----|------------|------------|-----|------------|-----|----------|-----|
| CO1 | - | - | - | - | - | - | - | - |
| CO2 | - | 2 | - | - | - | - | - | - |
| CO3 | - | - | 2 | - | 2 | - | 2 | - |
| CO4 | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | 3 | - |
| AVERAGE | - | 0.4 | 0.4 | - | 0.4 | - | 1 | - |

Since it is mapped with PO2, PO3, PO5 and PO7 this subject is considered for employability



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| Course Code | Course Title | L | T | P | C |
|--|--------------|---|---|---|--------------|
| 316UPHT03 | Optics | 6 | 0 | 0 | 5 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ Understand the physics behind various optical phenomenon. ▪ Understand various natural phenomenon which is happening in their surroundings ▪ Learn about various phenomenon like Interference, Diffraction and Polarization. ▪ Learn the concepts of Diffraction, Polarization and Spectroscopy | | | | | |
| Unit 1 : Geometrical Optics | | | | | 18hrs |
| Spherical aberration in lenses - methods of minimizing spherical aberration - condition for minimum spherical aberration in the case of two lenses separated by a distance - Chromatic aberration in lenses - Condition for achromatism of two thin lenses (in and out of contact) - Dispersion produced by a thin prism - Achromatic prisms - Combination of prisms to produce - Dispersion without deviation - Deviation without dispersion. | | | | | |
| Unit 2 : Interference | | | | | 18hrs |
| Analytical treatment of interference - expression for intensity - condition for maxima and minima in terms of phase and path difference - Airy's disk - determination of diameter of thin wire - test for optical flatness - Haidinger's fringes - Michelson's interferometer - theory - applications - determination of wavelength; thickness of thin transparent material and resolution of interferometer. | | | | | |
| Unit 3 : Diffraction | | | | | 18hrs |
| Fresnel diffraction - diffraction at a circular aperture and narrow wire. Fraunhofer diffraction - single slit - double slit - (simple theory). Plane diffraction grating - missing order - overlapping spectra - maximum number of orders - Determination of wavelengths using grating - normal incidence - oblique incidence (theory). Dispersive power of a grating. Rayleigh's criterion for resolution - limit of resolution of the eye - resolving power of Telescope and microscope - resolving power of prism and grating - Difference between resolving power and Dispersive power. | | | | | |
| Unit 4 : Polarisation | | | | | 18hrs |
| Double refraction - Nicol prisms - polarizer and analyzer - Huygen's explanation of double refraction in uniaxial crystals - Dichroism - polaroids and their uses - Double image polarizing prisms - Quarter wave plate and Halfwave plate - plane, elliptically and circularly polarized light - production and detection - Babinet's Compensator - optical Activity - Fresnel's explanation of optical activity - specific rotatory power - determination using Laurent's half shade polarimeter. | | | | | |
| Unit 5 : Spectroscopy | | | | | 18hrs |
| Introduction to spectroscopy - Electromagnetic spectrum - characterization of electromagnetic radiation - quantization of energy - regions of the spectrum - classification of molecules - microwave spectroscopy - rigid rotator - vibrational spectroscopy - harmonic oscillator - Raman effect - experimental set up - Characteristics of Raman lines - Laser - Ruby laser - He-Ne, CO ₂ laser construction and working - application of laser. | | | | | |



TOTAL HOURS :90**Books for Study :**

1. A Text book of Optics by Subrahmanyam N., Brij Lal and M.N. Avadhanulu, S.Chand & Co., New Delhi(2006).
2. Optics by Khanna D.R. & Gulati H.R., S.Chand & Co., New Delhi (1979).
3. Optics and Spectroscopy by R.Murugesan and Kiruthiga Sivaprasath, S. Chand & Co., New Delhi (2006).
4. Molecular structure and spectroscopy by Aruldas, Prentice Hall of India Pvt. Ltd., New Delhi (2005).

Books for Reference :

1. Fundamentals of Physics, by D.Halliday, R. Resnick and J. Walker, Wiley, 6th Edition, New York (2001).
2. Optics by Ajay Ghatak, Tata McGraw-Hill publishing Co. Ltd., New Delhi(1998).
3. Spectroscopy by Gurdeep Chatwal, Sham Anand, Himalaya Publishing House(1990).

Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

CO1: Understand the physics behind various optical phenomenon

CO2: Understand various natural phenomenon which is happening in their surroundings.

CO3: Explain the spectroscopic aspects of the molecule

CO4: Gaining the knowledge of understanding the property of polarization

CO5: Learn about interference and thickness of thin films



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REGULATIONS 2016

Course Code
316UPHT03

Course Title
Optics

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Understand the physics behind various optical phenomenons. | K2 |
| CO2 | Understand various natural phenomenons which is happening in their surroundings. | K2 |
| CO3 | Explain the spectroscopic aspects of the molecule | K4 |
| CO4 | Gaining the knowledge of understading the property of polarization | |
| CO5 | Learn about interference and thickness of thin films | |

CO –PO MATRICES:

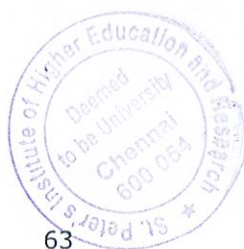
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| AVG | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

Since it is mapped with PO4, PO6 this subject is considered for Entrepreneurship



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| Course Code | Course Title | L | T | P | C |
|--|---------------------|---|---|---|---|
| 316UPHP01 | Major Practical III | 5 | 0 | 0 | 2 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ Study the fundamentals of instruments like Optical Instruments, Thermal conductivity instruments and specific resistance of the given material ▪ Gain practical knowledge by applying the experimental methods to correlate with the physics theory ▪ Apply the analytical technique and graphical analysis to the experimental data. ▪ Use the different measuring devices and meters to record the data with precision. | | | | | |
| (Any Eight Experiments) | | | | | |
| <ol style="list-style-type: none"> 1. Young's modulus - cantilever - depression - (Static method)-(Scale and telescope) 2. Rigidity modulus - Static torsion 3. Compound pendulum - g and k 4. Sonometer - A.C. Frequency - Steel and Brass wires 5. Thermal conductivity of a bad conductor - Lee's disc method 6. Spectrometer - μ of a glass prism - i-d Curve 7. Air wedge - Thickness of a wire 8. m and B_H - deflection magnetometer Tan C position and vibration magnetometer 9. Carey Foster bridge - Temperature coefficient of resistance of a coil | | | | | |
| TOTAL HOURS :72 | | | | | |
| Books for study | | | | | |
| <ol style="list-style-type: none"> 1. Practical Physics and Electronics, C.C. Ouseph, U.J. Rao.V. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | | | | |
| Expected Course Outcomes: | | | | | |
| STUDENTS WILL BE ABLE TO | | | | | |
| CO1: Study the fundamentals of instruments like Thermal conductivity instruments and specific resistance of the given material | | | | | |
| CO2: Analyzing the young modulus of the material. | | | | | |
| CO3: Gain practical knowledge by applying the experimental methods to correlate with the physics theory | | | | | |
| CO4: Apply the analytical technique and graphical analysis to the experimental data. | | | | | |
| CO5: Use the different measuring devices and meters to record the data with precision. | | | | | |



Course Code
316UPHP01

Course Title
Major Practical III

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Study the fundamentals of instruments like Thermal conductivity instruments and specific resistance of the given material | K2 |
| CO2 | Analyzing the young modulus of the material. | K4 |
| CO3 | Gain practical knowledge by applying the experimental methods to correlate with the physics theory | K3 |
| CO4 | Apply the analytical technique and graphical analysis to the experimental data. | K5 |
| CO5 | Use the different measuring devices and meters to record the date with precision. | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO7, PO8 this subject is considered for employability & skill development



| Course Code | Course Title | L T P C |
|--|--------------------|--------------|
| 316UPHT04 | Allied Chemistry I | 6 0 0 5 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To acquire knowledge in industrial and nuclear chemistry ▪ To understand the basics of organic chemistry ▪ To gain knowledge in the field of thermodynamics and chemical kinetics | | |
| Unit 1: NUCLEAR CHEMISTRY | | 18hrs |
| Fundamental particles of nucleus, isobars, isotones and isomers – Differences between chemical reactions; fusion and fission – Radio active series, group displacement law – Mass defect, derivation of $1 \text{amu} = 931 \text{ MeV}$ – nuclear binding energy and calculation – Applications of radio isotopes – carbon dating, and medicinal applications. | | |
| Unit 2: INDUSTRIAL CHEMISTRY | | 18hrs |
| Fuels- Classification-gaseous fuels like water gas, producer gas, liquefied petroleum gas, gobar gas, Compressed natural gas - Fertilizers- Classification – urea ,Ammonium sulphate, superphosphate, Triple super phosphate, potassium nitrate-manufacture and uses - Silicones - Preparation, properties and applications. Hardness of water: temporary and permanent hardness, disadvantages of hard water - Softening of hard water - Zeolite process, demineralization process and reverse osmosis-Purification of water for domestic use: use of chlorine, Ozone and UV light - Definitionand determinations of BOD and COD. | | |
| Unit 3: FUNDAMENTALS OF ORGANIC CHEMISTRY | | 18hrs |
| Classification of organic compounds -Hybridization in methane, ethane, acetylene, benzene - classification of reagents - electrophiles, nucleophiles and free radicals - Classification of reactions addition, substitution, elimination, condensation and polymerisation - Polar Effects - Inductive effect, resonance, hyper-conjugation, steric effect - Keto-enol tautomerism - electrophilic substitution mechanism in benzene (Nitration and Sulphonation) – Heterocyclic compounds - Preparation, properties anduses of furan, Thiophene, pyrrole and pyridine. | | |
| Unit 4: THERMODYNAMICS | | 18hrs |
| Definition of Certain terms - system, surrounding, reversible and irreversible proces - Limitations of I Law Need for II Law - Different Statements of II. Law - Carnot cycle - Efficiency - Carnot Theorem - Thermodynamic Scale Of Temperature - Entropy- Definition Unit and change of entropy for phase transformation 'Free energy nature ofProcess in terms of Free energy and entropy- Statement of Third Law. | | |
| Unit 5: CHEMICAL KINETICS | | 18hrs |
| Rate of chemical reaction- Differential rate expression - order and molecularity - Integrated rate expression for first, second, and zero order reactions - Half-life period—Effect of temperature on rate - Activation energy . Arrhenius equation - Arrhenius reation rate theory - Homogeneous and heterogeneous catalysis. | | |



Photochemistry • Statement of Grothus - Draper Law, Stark-Einstein's Law, Quantum Yield. Hydrogen chlorine reaction (elementary idea only) Photosynthesis, Photsensitisation, Phosphorescence Fluorescence, Chemiluminiscence - Definition with examples.

TOTAL HOURS :90

BOOK FOR REFERENCE:

1. Dr. Veeraiyan V., Textf book of Ancillary Chemistry, Highmount Publishing house,Chenha-14. Edition - 2008. (Both In Tamil and English)
2. Vaithyanathan S. and Others, Textf book of Ancillary Chemistry, Priya Publications,Karur-2. Edition-2006.
3. Soni P.. and Others, Textf book of Organic chemistry, Sultan Chand and Company,New Delhi, Edition - 2006.
4. 8oni P. and Others, Textf book of Inorganic Chemistry, Sultan Chand* and Company,New Delhi, Edition - 2006.
5. Puri B.R., Sharma and Pathania, Text book of Physical Chemistry, Vishal PublishingCo., New Delhi. Edition-2006.
6. Dara S.S., Textf book of Environmental chemistry and Pollution Control.- S.Chandand Co., NewDelhl, Edition 2006.




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Course Code
316UPHT04

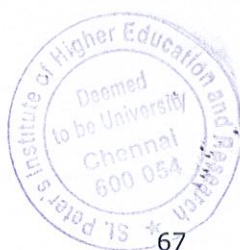
Course Title
Allied Chemistry I


| CO | COURSE OUTCOMES | RBT |
|-----|---|-----------|
| CO1 | Acquire knowledge in Nuclear Chemistry | K1,K2 |
| CO2 | Gain knowledge on Industrial Chemistry involving Fuels, Fertilizers, Silicones and Water technology | K1,K2,K3 |
| CO3 | Understand the basics of Organic Chemistry | K1,K2 |
| CO4 | Gain knowledge in the field of Thermodynamics | K1,K2, K3 |
| CO5 | Understand the concept of Chemical kinetics and Photochemistry | K1,K2 |

MATRICES:

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | - | - | - | - | 2 | - |
| CO2 | 2 | 2 | - | - | - | - | 2 | - |
| CO3 | 2 | 2 | - | - | - | - | 2 | - |
| CO4 | 2 | 2 | - | - | - | - | 2 | - |
| CO5 | 2 | 2 | - | - | - | - | 2 | - |
| AVG | 2 | 2 | - | - | - | - | 2 | - |

Since it is mapped with, PO1, PO2 and PO7 this subject is considered for Employability




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| Course Code | Course Title | L | T | P | C |
|--|------------------------|---|---|---|------------------------|
| 316UPHP02 | Allied Chemistry Lab I | 5 | 0 | 0 | 2 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> To gain knowledge on various types of titrimetric analysis | | | | | |
| Volumetric Analysis | | | | | |
| <ul style="list-style-type: none"> Estimation of sodium hydroxide using Std.sodium carbonate. Estimation of Hydrochloric acid using Std .Oxalic acid. Estimation of Ferrous sulphate using Std Mohr's salt Estimation of oxalic acid using standard Ferrous sul;phate. Estimation of potassium permanganate using Std. Sodium hydroxide. Estimation of Magnesium by EDTA. Estimation mof Ferrous ion using diphenylamine as internal indicator. | | | | | |
| | | | | | TOTAL HOURS :72 |
| COURSE OUTCOMES: | | | | | |
| After the completion of the practical students will be able to | | | | | |
| CO1: Acquire knowledge on neutralization reaction by volumetric analysis. | | | | | |
| CO2: Gain knowledge on redox titration by volumetric estimation. | | | | | |
| CO3: Understand the estimation of potassium permanganate by volumetric analysis. | | | | | |
| CO4: Gain knowledge on the estimation of magnesium in water sample by complex metric titration. | | | | | |
| CO5: Understand the estimation of ferrous iron using diphenylamine as internal indicator | | | | | |
| REFERENCE BOOK | | | | | |
| 1. Venkateswaran V, Veeraswamy R., Kulandivelu A.R.,Basic Principles of Practical Chemistry, 2nd edition, New Delhi, Sultan Chand & Sons,2012 | | | | | |

Course Code: 316UPHP02

Course Name: CHEMISTRY – I ALLIED PRACTICALS

COURSE OUTCOMES

After the completion of the practical students will be able to

| CO | COURSE OUTCOMES | RBT |
|-----|--|-----------|
| CO1 | Acquire knowledge on neutralization reaction by volumetric analysis. | K1,K2,K3 |
| CO2 | Gain knowledge on redox titration by volumetric estimation. | K1,K2,K3 |
| CO3 | Understand the estimation of potassium permanganate by volumetric analysis. | K1,K2,K3 |
| CO4 | Gain knowledge on the estimation of magnesium in water sample by complexometric titration. | K1,K2, K3 |
| CO5 | Understand the estimation of Ferrous iron by dichrometry. | K1,K2 |

CO PO MATRICES:

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | - | - | - | - | - | 2 |
| CO2 | 2 | 2 | - | - | - | - | - | 2 |
| CO3 | 2 | 2 | - | - | - | - | - | 2 |
| CO4 | 2 | 2 | - | - | - | - | - | 2 |
| CO5 | 2 | 2 | - | - | - | - | - | 2 |
| AVERAGE | 2 | 2 | - | - | - | - | - | 2 |

Since it is mapped with, PO1, PO2 and PO8 this subject is considered for Skill development.

B.Sc REGULAR



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Avadi, Chennai-600 084

| Course Code | Course Title | L T P C |
|---|--------------|--------------|
| 316UCCT03 | Soft Skills | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To impart hands on training to students in Microsoft Office essentials like MS Word, MS Excel and MS Access. ▪ To offer at two levels exclusively meant for students who have no computer knowledge. ▪ To design as a practical oriented course and not for chalk and board teaching. | | |
| COMPUTING SKILLS – LEVEL - I | | |
| Unit I | | 12hrs |
| Introduction to computers – classification of computers; Computers inside – Hardware(processing, memory i/o, storage etc), Software (Systems, application); Operating Systems – DOS, LINUX, UNIX, Windows ; Programming – Overview, need and skills; Networking Basics; Virus; Hacking | | |
| Unit II | | 10hrs |
| Word processing - Operating of word documents like open, close, save, print ; Editing Text – tools, formatting , bullets, layout ; Navigating word – Keyword, mouse, document formatting ; paragraph alignment - indentation, headers, footers, numbering; printing – preview, options | | |
| Unit III | | 12hrs |
| File Management – Importance of file management, backing of files, files and folders-editing, deleting, retrieving, renaming, subfolders; Manipulating windows – minimize, maximize; power point basics- terminology- templates, viewing | | |
| Unit IV | | 10hrs |
| Spreadsheets – MS Excel – opening, entering text and data, formatting, navigating; Formulas- entering, handling and copying; charts- creating, formatting and printing, header and footer, centering of data; printing | | |
| Unit V | | 10hrs |
| Networking - Internet explorer; www – working, browsing, searching, saving; bookmark – features, favorite, create, delete ; printing webpage; email – creating, receiving, reading and sending messages | | |
| TOTAL HOURS 54 | | |
| Note – Unit 2 -5 are to be taught as practical with hands on experience | | |
| Books for Study: | | |
| <ol style="list-style-type: none"> 1. Introduction to Computers – Peter Norton, Tata McGraw-Hill, India 2. Microsoft 2003 – Jennifer Ackerman Kettel et al., Tata Mc-Graw Hill, India 3. Working In Microsoft office 2006– Ron Mansfield , Tata Mc-Graw Hill, India | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: identify categories of programs, system software and applications. | | |
| CO2: organize and work with files and folders. | | |
| CO3: describe various types of networks network standards and communication software. | | |

Course Code: 316UCCP03**Course Name: Computing Soft Skills – Level - I**

| CO No. | COURSE OUTCOMES | RBT |
|--------|--|------------|
| CO1 | To identify categories of programs, system software and applications. | K1,K2 |
| CO2 | To organize and work with files and folders. | K2, K3 |
| CO3 | To describe various types of networks network standards and communication software | K2,,K3, K5 |

K1 – Remembering K2 – Understanding K3-Applying K4 – Analyzing K5- Evaluating K6 – Creating

CO PO MATRICES:

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|----------------|----------|----------|----------|----------|----------|----------|----------|----------|
| CO1 | 3 | 3 | 1 | - | - | 2 | 2 | 3 |
| CO2 | 3 | 3 | 1 | - | - | 2 | 2 | 3 |
| CO3 | 3 | 3 | 1 | - | - | 2 | 2 | 3 |
| AVERAGE | 3 | 3 | 1 | - | - | 2 | 2 | 3 |

Since it is mapped with, PO7 & PO8 this subject is considered for Employability & SkillDevelopment



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IV Semester

IV Semester

416UTM01 – TAMIL - IV

அலகு : 1

- தமிழ் இலக்கிய வரலாறு
1. சங்க இலக்கிய வரலாறு
2. அற இலக்கிய வரலாறு

அலகு : 2

- எட்டுத்தொகை
1. நற்றிணை : 10, 110, 129
2. குறுந்தொகை : 8, 25, 32
3. கலித்தொகை : 6, 37, 51
4. அகநானூறு : 7, 122, 155
5. புறநானூறு : 89, 109, 204

அலகு : 3

- பத்துப்பாட்டு
நெடுநல்வாடை

அலகு : 4

- சிலப்பதிகாரம்
மனையறம்படுத்த காதை
மணி மேகலை
விழாவறை காதை

அலகு : 5

- திருக்குறள்
அறத்தாப்பால் : வாழ்க்கைத் துணைநலம், மக்கள் பேறு
பொருட்பால் : கல்வி, கேள்வி
காமத்தாப்பால் : குறிப்பு அறிதல், புணர்ச்சி மகிழ்தல்

அலகு : 6

- மொழிப் பயிற்சி
1. ஆங்கிலத்தில் இருந்து தமிழுக்கு மொழி பெயர்த்தல்
2. தமிழில் இருந்து ஆங்கிலத்துக்கு மொழி பெயர்த்தல்




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| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | - | 2 | - | - | - | - | - | - |
| CO2 | 2 | - | 2 | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | 2 | - |
| CO4 | - | - | - | - | 1 | - | - | - |
| CO5 | - | - | - | - | - | - | - | 2 |
| AVERAGE | 0.4 | 0.4 | 0.4 | - | 0.2 | - | 0.4 | 0.4 |

Since it is mapped with PO1, PO2 , PO3, PO5, PO7 and PO8 this subject is consider for empolyblity and skill development

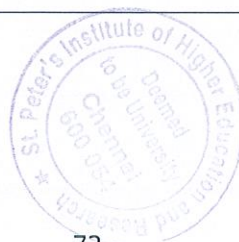
| CO NO | COURSE OUTCOME | RBT |
|-------|--|-----|
| CO1 | சங்க இலக்கியம், அற இலக்கியங்களை அறிந்து கொள்ளல். | K2 |
| CO2 | சங்க இலக்கியப் பாடல்கள் வழி தமிழர்களின் அகம், புறம் வாழ்வினை அறிதல். | K2 |
| CO3 | முல்லைப்பாட்டு உள்ள போர்முறை பாசறை நிகழ்வுகள் மாணவர் அறிதல் | K1 |
| CO4 | காப்பியங்கள் உணர்த்தும் செய்திகளை மாணவர்கள் அறிதல். | K3 |
| CO5 | திருக்குறள் கூறும் ஒழுக்கமுடைமை, வாய்மை, வான்சிறப்பு, கல்வி போன்றவற்றை கற்றுக் கொள்ளல். ஆங்கிலத்தில் இருந்து தமிழில் மொழிப்பெயர்க்கவும் தமிழில் இருந்து ஆங்கிலத்தில் மொழிப்பெயர்க்கவும் அறிந்து கொள்ளல் | K6 |



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| Course Code | Course Title | L T P C |
|---|--------------|--------------|
| 416UHIT01 | Hindi IV | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To acquire basic communication skills in Hindi ▪ To inculcate role play and educational games in order to improve interaction in Hindi | | |
| UNIT I | | 12hrs |
| <ol style="list-style-type: none"> 1. Asha – (Jayashankar Prasad) 2. Tum Logon se Door (Nagarjun) 3. Literary Trends of Chayavaad | | |
| UNIT – II | | 10hrs |
| <ol style="list-style-type: none"> 1. Kavi Aur Kalpana – (Dhramaveer Bhaarathi) 2. Bharat Ki Aarthi - (Shamsher Bahadur Singh) 3. Literary Trends of Pragathivaad | | |
| UNIT – III | | 10hrs |
| <ol style="list-style-type: none"> 1. Varadan Mangoonga Nahi (Siva Mangal Singh Suman) 2. Anevalon Se Ek Savaal (Bharat Bhooshan Agarwal) 3. Literary Trends of Nayee Kavita | | |
| UNIT –IV | | 12hrs |
| <ol style="list-style-type: none"> 1. Literary Trends of Hindi Short Stories 2. Literary Trends of Hindi One Act Plays | | |
| UNIT- V | | 10hrs |
| <ol style="list-style-type: none"> 1. Maithili Saran Gupta, Jayashankar Prasad, Nirala, 2. Mahadevi Varma, Panth, Dinakar, Premchand, 3. Yashpaal Jainendra Kumar, Mohan Rakesh. | | |
| TOTAL HOURS :54 | | |
| Books For Study: | | |
| <ol style="list-style-type: none"> 1. Hindi Sahithya Ka ItihasBy: Ramchandra Shukla , Jayabharathi Publications, 217, B, Maya Press Road, Allahabad – 211 003. 2. Hindi Sahithya Yug Aur Pravritiya By: Dr. Sivakumar Varma, Asok Prakashan Nayi Sarak, New Delhi – 6 3. Hindi Sahithya ka Sybodh ItihasBy : Babu Gulabroy, Lakshmi Narayanan Agarwas Book Publishers seller,Anupama Plaza -1, Block.No.50, Sanjay Place, Agra-282002. | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: acquire basic communication skills in Hindi | | |
| CO2: inculcate role play and educational games in order to improve interaction in Hindi | | |



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| Course Code | Course Title | L T P C |
|--|--------------|--------------|
| 416UFRT01 | French IV | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To acquire basic communication skills in French ▪ To be capable of conversing with reasonable ease with a native speaker on basic aspects of everyday life. | | |
| UNIT I | | 12hrs |
| <i>Le chasseur de phoque et l'homme sirène</i> | | |
| Presentation and study of the text | | |
| Oral and Written comprehension | | |
| Grammar and Activities from workbook | | |
| Aller plus loin | | |
| UNIT – II | | 10hrs |
| <i>Le pave sonnante</i> | | |
| Presentation and study of the text | | |
| Oral and Written comprehension | | |
| Grammar and Activities from workbook | | |
| Aller plus loin | | |
| UNIT – III | | 10hrs |
| <i>La Dent au chat</i> | | |
| Presentation and study of the text | | |
| Oral and Written comprehension | | |
| Grammar and Activities from workbook | | |
| Aller plus loin | | |
| UNIT –IV | | 12hrs |
| <i>Ganesa, le scribe</i> | | |
| Presentation and study of the text | | |
| Oral and Written comprehension | | |
| Grammar and Activities from workbook | | |
| Aller plus loin | | |
| UNIT- V | | 10hrs |
| <i>La Légende de Chirapa</i> | | |
| Presentation and study of the text | | |
| Oral and Written comprehension | | |
| Grammar and Activities from workbook | | |
| Aller plus loin | | |
| <i>Les questions d'enfance</i> | | |
| Presentation and study of the text | | |
| Oral and Written comprehension | | |
| Grammar and Activities from workbook | | |
| Aller plus loin | | |
| Books For Study: | | |


TOTAL HOURS :54

1. BAGLIETO, David, GIRARDEAU, Bruno, MISTICHELLI, Marion – *Agenda 2*, Hachette, Paris, 2011
2. GIRARDET, Jacky, PECHEUR, Jacques – *Écho A2*, CLE International, Paris, 2010
3. DENYER, Monique, GARMENDIA, Augustin, LIONS-OLIVIERI, Marie-Laure – *Version Originale 2*, Editions Maison des Langues, 2009
4. MIQUEL, Claire, *Vite et Bien-2*, CLE International, Paris, 2009

Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

CO1: acquire basic communication skills in French

CO2: To be capable of conversing with reasonable ease with a native speaker on basic aspects of everyday life




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| Course Code | Course Title | L T P C |
|--|--------------|------------------------|
| 416UEHT02 | English IV | 4 0 0 3 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To gain ample practice in writing skills ▪ To write essays and report and differentiate between objective and subjective writing. | | |
| Unit - I Six One-Act Plays | | 11hrs |
| <ol style="list-style-type: none"> 1. The Bishop's Candlesticks - <i>Norman McKinnell</i> 2. The Two Corporals - <i>Val Gielgud</i> 3. Wurzel-Flummery - <i>A.A. Milne</i> 4. Old Man River - <i>Dorothy Deming</i> 5. Hewers of Coal - <i>Joe Corrie</i> 6. Five at "The George" - <i>Stuart Ready</i> | | |
| Unit - II Short Stories | | 11hrs |
| <ol style="list-style-type: none"> 1. Comrades - <i>Nadine Gardiner</i> 2. Games at Twilight - <i>Anita Desai</i> 3. Gateman's Gift - <i>R. K. Narayan</i> 4. Open Window - <i>Munro (Saki)</i> 5. Some Words with a Mummy - <i>Edgar Allan Poe</i> 6. The Ant and the Grasshopper - <i>Somerset Maugham</i> | | |
| Unit - III Prose, Short Stories and Scenes from Shakespeare from Shakespeare: | | 11hrsScenes |
| <ol style="list-style-type: none"> 1. Merchant of Venice - Lines on Quality of Mercy 2. Julius Ceaser - Antony's Funeral Oration 3. Macbeth - Line from Sleep Walking Sign | | |
| Prose: | | |
| <ol style="list-style-type: none"> 1. Little Girls are Wiser than Men - <i>Leo Tolstoy</i> 2. The Last Clock - <i>James Thurber</i> 3. How far is the River - <i>Ruskin Bond</i> | | |
| Unit - IV Writing Skill Exercises | | 11hrs |
| Letter Writing (Formal & Informal)Précis Writing Paraphrasing ComprehensionReport Writing. | | |
| | | TOTAL HOURS :54 |



Expected Course Outcomes:

Students will be able to

CO1: Heighten their awareness of correct usage of English grammar in writing and speaking.

CO2: Improve their fluency and comprehensibility of different genres through the texts prescribed.

CO3: Enlarge their vocabulary of literary terms and genres. CO4: Strengthen their ability to write essays and summaries in an advanced level.

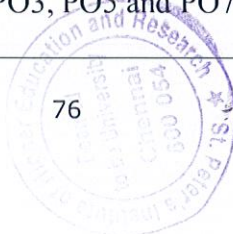
CO5: Attain and enhance competence in the four modes of literacy: writing, Speaking reading and listening.

Course Code **Course Title**
416UEHT02 **English IV**

| CO | COURSE OUTCOME | RBT |
|-----|---|-------|
| CO1 | To comprehend the content and structures of all types of fiction in a better way. | K3 |
| CO2 | Appreciate the linguistics of theatre and short-Fiction alike. | K2 |
| CO3 | Familiarize yourself with the background and the impact of a fictional text on society. | K1,K4 |
| CO4 | Relate the moral, ethical and grammatical aspects of a text with their performance. | K4,K5 |
| CO5 | Communicate very effectively through their writings. | K6 |

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|----------------|-----|------------|------------|-----|------------|-----|----------|-----|
| CO1 | - | - | - | - | - | - | - | - |
| CO2 | - | 2 | - | - | - | - | - | - |
| CO3 | - | - | 2 | - | 2 | - | 2 | - |
| CO4 | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | 3 | - |
| AVERAGE | - | 0.4 | 0.4 | - | 0.4 | - | 1 | - |

Since it is mapped with PO2, PO3, PO5 and PO7 this subject is considered for employability



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| Course Code | Course Title | L | T | P | C |
|--|----------------|---|---|---|------------------------|
| 416UPHT03 | Atomic Physics | 6 | 0 | 0 | 5 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ To know the Discharge Phenomenon through gases ▪ To understand atomic spectra of atom. ▪ To understand the Quantum Numbers ▪ Study the way that light interacts with atoms and hence explain the observed spectrum of hydrogen. ▪ IStudy the principle and production of X-rays | | | | | |
| Unit 1 : Discharge Phenomenon Through Gases | | | | | 18hrs |
| Moving of a charge in transverse electric and magnetic fields - specific charge of an electron - Dunnington's method - magnetron method - positive rays – Aston's , Dempster's mass spectrographs. | | | | | |
| Unit 2 : | | | | | 18hrs |
| Richardson and Compton experiment - Laws of photoelectric emission - Einstein photo electric equation - Millikan's experiment - verification of photoelectric equation - photo electric cells - photo emissive cells - photovoltaic cell - photo conducting cell - photomultiplier. | | | | | |
| Unit 3 : Atomic Structure | | | | | 18hrs |
| Bohr and Sommerfield atom models - Vector atom model - Pauli's exclusion principle - explanation of periodic table - various quantum numbers - angular momentum and magnetic moment - coupling schemes - LS and JJ coupling - special quantisation - Bohr magnetron - Stern and Gerlach experiments. | | | | | |
| Unit 4 : Ionisation Potential and Splitting of Energy Levels | | | | | 18hrs |
| Excitation and ionization potential – Frank and Hertz's experiment - Davis and Goucher's method. Spectral terms and notions - selection rules - intensity rule and interval rule - fine structure of sodium D lines - alkali spectra - fine structure of alkali spectra - spectrum of Helium - Zeeman effect - Larmor's theorem - Debye's explanation of normal Zeeman effect. Anamalous Zeeman effect - theoretical explanation. Lande's 'g' factor and explanation of splitting of D1 and D2 lines of sodium. Paschen-Back effect - Stark effect (qualitative study only). | | | | | |
| Unit 5 : X-Rays | | | | | 18hrs |
| Bragg's law - X-ray spectroscopy - characteristic X-ray spectra - satellite and Auger effect - continuous X-ray spectra - X-ray absorption and fluorescence - Moseley's law - uses of X-rays - Compton effect - experimental verification of Compton effect. | | | | | |
| | | | | | Total Hours- 90 |
| Books for Study | | | | | |
| 1. Modern Physics by R. Murugesan, Kiruthiga Sivaprasath, S. Chand & Co., New Delhi(2008). | | | | | |

2. Modern Physics by D.L.Sehgal, K.L.Chopra and N.K.Sehgal. Sultan Chand & Sons Publication, 7th Edition, New Delhi(1991).
3. Atomic Physics by J.B. Rajam, S. Chand & Co., 20th Edition, New Delhi (2004).
4. Atomic and Nuclear Physics by N. Subrahmanyam and Brij Lal, S. Chand & Co. 5th Edition, New Delhi(2000).

Book for Reference :

1. Modern Physics by J.H. Hamilton and Yang, McGraw-Hill Publication, (1996).
2. Concepts of Modern Physics by A. Beiser, Tata McGraw-Hill, New Delhi(1997).
3. Fundamentals of Physics by D.Halliday, R.Resnick and J. Walker, Wiley, 6th Edition, New York(2001).
4. Modern Physics by Kenneth S.Krane, John Willey & sons, Canada(1998)

Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

CO1: To know the Discharge Phenomenon through gases

CO2: To understand atomic spectra of atom.

CO3: To understand the Quantum Numbers

CO4: Study the way that light interacts with atoms and hence explain the observed spectrum of hydrogen.

CO5: Study the principle and production of X-rays

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Course Code **Course Title**
416UPHT03 **Atomic Physics**

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Understand the main features of the structure of the hydrogen atom and the various contributions to the energy of atomic states of hydrogen. | K2 |
| CO2 | Study the way that light interacts with atoms and hence explain the observed spectrum of hydrogen. | K1 |
| CO3 | Know the quantum mechanical description of two-particle states, including the effect of spin. | K1 |
| CO 4 | Get knowledge on how more complex atoms are built and give rise to the periodic table of the elements. | K1 |
| CO5 | Analyzing the knowledge about X-rays in various aspects | K4 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|------------|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| AVG | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

Since it is mapped with PO4, PO6 this subject is considered for Entrepreneurship



| Course Code | Course Title | L | T | P | C |
|---|--------------------|---|---|---|------------------------|
| 416UPHP01 | Major Practical IV | 5 | 0 | 0 | 2 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ To gain practical knowledge by applying the experimental methods to correlate with the physics theory. ▪ Apply the analytical technique and graphical analysis to the experimental data. ▪ Use the different measuring devices and meters to record the date with precision. | | | | | |
| (Any Eight Experiments) | | | | | |
| <ol style="list-style-type: none"> 1. Young's modulus - cantilever oscillations - (Dynamic method) 2. Melde's string - frequency, Relative Density of a solid and liquid 3. Spectrometer - Grating N and λ - normal incidence method 4. Spectrometer - Grating N and λ - minimum deviation method 5. Potentiometer - Calibration of low range voltmeter 6. Potentiometer - Ammeter calibration. 7. Figure of merit of galvanometer (Mirror Galvanometer Or Table Galvanometer) 8. * C.R.O. Study of wave forms - Lissajou's figures - frequency determination 9. * Study of resistors, Choke, capacitors and transformer 10. * Construction of battery eliminator - various voltages - with filter circuit and IC voltage regulator. 11. * Two transistor Radio receiver * Not for Examination | | | | | |
| | | | | | TOTAL HOURS :72 |
| Books for study | | | | | |
| <ol style="list-style-type: none"> 1. Practical Physics and Electronics, C.C. Ouseph, U.J. Rao. 2. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | | | | |
| Expected Course Outcomes: | | | | | |
| STUDENTS WILL BE ABLE TO | | | | | |
| CO1: Study the fundamentals of instruments like Optical Instruments, Thermal conductivity instruments and specific resistance of the given material | | | | | |
| CO2 : Gain practical knowledge by applying the experimental methods to correlate with the physics theory | | | | | |
| CO3: Apply the analytical technique and graphical analysis to the experimental data. | | | | | |
| CO4: Use the different measuring devices and meters to record the date with precision. | | | | | |
| CO5: To find specific resistance of the given material | | | | | |

Course Code
416UPHP01

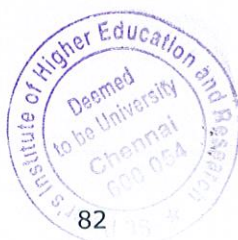
Course Title
Major Practical IV

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Study the fundamental of instruments like Optical Instruments, Thermal conductivity instruments and specific resistance of the given material | K1 |
| CO2 | To find specific resistance of the given material | K5 |
| CO3 | To gain practical knowledge by applying the experimental methods to correlate with the physics theory | K2 |
| CO4 | Apply the analytical technique and graphical analysis to the experimental data. | K3 |
| CO5 | Use the different measuring devices and meters to record the data with precision. | K5 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO4, PO6 this subject is considered for Entrepreneurship



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| Course Code | Course Title | L | T | P | C |
|---|---------------------|---|---|---|--------------|
| 416UPHT04 | Allied Chemistry II | 6 | 0 | 0 | 5 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ To gain knowledge in the basics of coordination chemistry in complex formations. ▪ To understand the analytical skill in the interpretation of biomolecules. ▪ To acquire theoretical knowledge on Phase rule and electrochemical applications. | | | | | |
| Unit1 CO-ORDINATION CHEMISTRY | | | | | 18hrs |
| Definition of terms - Classification of Ligands - Nomenclature - Chelation - EDTA and the application – Wernar's Theory - Effective Atomic Number - Pauling's theory- Postulates - Applications to Ni(CO) ₄ , Ni(CN) ₄ , (CO(CN) ₆) ³⁻ -Merits and Demerits of. Werners and Pauling's theory - Biological Role of haemoglobin and Chlorophyll (elementary idea only)-Applications of co-ordination compounds in qualitative analysis and Quantitative analysis like Separation of. copper and cadmium ions; Nickel and cobalt ion; Identification of metal ions like cu, Fe and Ni. Estimation of Ni using DMG and Al using Oxine. | | | | | |
| Unit 2 BIOMOLECULES | | | | | 18hrs |
| Classifications, preparation and reactions of glucose and fructose. Discussion of open and ring structure of glucose. Mutarotation. Interconversion of glucose to fructose and vice versa - Preparation and properties of sucrose. Properties of starch, cellulose and derivatives of cellulose - Diabetes - causes and control :measures RNA and DNA (elementary idea only) - Amino acids: Classification, preparation and properties of alanine -preparation of dipeptide using Bergman method. | | | | | |
| Unit 3 PHASE DIAGRAM | | | | | 18hrs |
| Phase rule: Definition of terms, application of phase rule to water system - reduced phase rule and its application to Pb-Ag system. Freezing mixture - Completely miscible and partially miscible liquid systems - upper and lower critical solution temperatures | | | | | |
| Unit 4 ELECTROCHEMISTRY | | | | | 18hrs |
| Galvanic cells – emf - standard electrode potential - reference electrodes - electrochemical series and its applications - Determination of pH using electrochemical method - Electroplating process -Nickel and Chrome plating - Different type of cells -primary cell, Secondary cell and fuel cells -Corrosion and methods of prevention, .Conductometric titrations - hydrolysis of salts. Derivation of Kh - Definition of pH and its determination by colorimetric method. Buffer solution -; Henderson's equation. Applications of pH and buffer in biological processes and industries - Corrosion and its prevention. | | | | | |
| Unit 5: ANALYTICAL CHEMISTRY | | | | | 18hrs |
| Introduction to Qualitative and Quantitative Analysis - Principle of volumetric analysis - Separation techniques - extraction - distillation - crystallization— Chromatographic separations - Principles and applications of column, paper, thin layer, gas-liquid and ion-exchange. | | | | | |

TOTAL HOURS :90**Books for Study :**

1. Dr. Veeraiyan V., Text book of Ancillary Chemistry, Highmount Publishing house,Chenna-14. Edition -2060. (Both in Tamil and English)
2. Vaithiyanathan S. and Others, Text book of Ancillary Chemistry, PriyaPublications, Karur-2. Edition -2006.
3. Soni P.L and Others, Text book of Organic chem/sfry, Sultan Chand and Company,New Delhi, Edition-2006.
4. Soni P.L. and Others, Textbook of Inorganic Chemistry, Sultan Chand and Company,New Delhi, Edition -2006.
5. Puri B.R., Sharma and Pathania, text book of Physical Chemistry, Vishal PublishingCo., New Delhi. Edition-2006.
6. Dara S.S., Textf book of Environmental chemistry and Pollution Control.- S.Chandand Co., NewDelhi,Editin

COURSE OUTCOMES

After the completion of the course students will be able to

CO1: Gain knowledge in the basics of Coordination chemistry in complex formations.

CO2: Understand the analytical skills in the interpretation of Biomolecules.

CO3: Acquire theoretical knowledge on Phase rule for the construction of Phase diagram.

CO4: Gain knowledge on Electrochemistry, Cell mechanism, principle and applications

CO5: Acquire Knowledge on Analytical skills in Qualitative and Quantitative Analysis.

REFERENCE BOOKS

1. Dr. Veeraiyan V., Text book of Ancillary Chemistry, High mount Publishing house, Chennai, 2008.
2. Vaithyanathan S. and Others, Text book of Ancillary Chemistry, Priya Publications, Karur, 2006.
3. Soni P. and Others, Text book of Organic chemistry, Sultan Chand and Company, New Delhi, 2004.
4. Soni P. and Others, Text book of Inorganic Chemistry, Sultan Chand and Company, New Delhi, 2004.
5. Puri B.R., Sharma and Pathania, Text book of Physical Chemistry, Vishal Publishing Co., New Delhi. 2002.
6. Dara S.S., Text book of Environmental chemistry and Pollution Control.- S.Chand and Co., NewDelhl, 2006.



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Course Code: 416UPHT04**Course Name: CHEMISTRY – II (ALLIED)****COURSE OUTCOMES**

After the completion of the course students will be able to

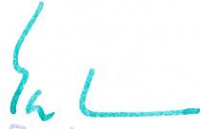
| CO | COURSE OUTCOMES | RBT |
|-----|--|-------------|
| CO1 | Gain knowledge in the basics of Coordination chemistry in complex formations. | K1,K2 |
| CO2 | Understand the analytical skills in the interpretation of Biomolecules. | K1,K2,K3 |
| CO3 | Acquire theoretical knowledge on Phase rule for the construction of Phase diagram. | K1,K2,K3,K4 |
| CO4 | Gain knowledge on Electrochemistry, Cell mechanism, principle and applications | K1,K2,K3 |
| CO5 | Acquire Knowledge on Analytical skills and Chromatographic techniques | K1,K2,K3, |

CO PO MATRICES:

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | - | - | - | - | 2 | - |
| CO2 | 2 | 2 | - | - | - | - | 2 | - |
| CO3 | 2 | 2 | - | - | - | - | 2 | - |
| CO4 | 2 | 2 | - | - | - | - | 2 | - |
| CO5 | 2 | 2 | - | - | - | - | 2 | - |
| AVERAGE | 2 | 2 | - | - | - | - | 2 | - |


Since it is mapped with, PO1, PO2 and PO7 this subject is considered for Employability




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 Chennai-600 099.

| Course Code | Course Title | L | T | P | C |
|---|-------------------------|---|---|---|---|
| 416UPHP02 | Allied Chemistry Lab II | 5 | 0 | 0 | 2 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ Understand the physics behind various optical phenomenon. ▪ Understand various natural phenomenon which is happening in their Surroundings ▪ Learn about various phenomenon like Interference, Diffraction and Polarization. ▪ Learn the concepts of Diffraction, Polarization and Spectroscopy | | | | | |
| TOTAL HOURS :72 | | | | | |
| Books for Study : | | | | | |
| <ol style="list-style-type: none"> 1. A Text book of Optics by Subrahmanyam N., Brij Lal and M.N. Avadhanulu, a. S.Chand & Co., New Delhi(2006). 5. Optics by Khanna D.R. & Gulati H.R., S.Chand & Co., New Delhi (1979). 6. Optics and Spectroscopy by R.Murugesan and Kiruthiga Sivaprasath, S. Chand & Co., New Delhi (2006). 7. Molecular structure and spectroscopy by Aruldhas, Prentice Hall of India Pvt. Ltd., New Delhi (2005). | | | | | |
| Books for Reference : | | | | | |
| <ol style="list-style-type: none"> 4. Fundamentals of Physics, by D.Halliday, R. Resnick and J. Walker, Wiley, 6th Edition, New York (2001). 5. Optics by Ajay Ghatak, Tata McGraw-Hill publishing Co. Ltd., New Delhi(1998). 6. Spectroscopy by Gurdeep Chatwal, Sham Anand, Himalaya Publishing House(1990). | | | | | |
| Expected Course Outcomes: | | | | | |
| STUDENTS WILL BE ABLE TO | | | | | |
| CO1: Understand the physics behind various optical phenomenon. | | | | | |
| CO2: Understand various natural phenomenon which is happening in their Surroundings | | | | | |
| CO3: Learn about various phenomenon like Interference, Diffraction and Polarization. | | | | | |
| CO4: Learn the concepts of Diffraction, Polarization and Spectroscopy | | | | | |




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Course Code: ACYL2608

Course Name: CHEMISTRY – II ALLIED PRACTICALS

COURSE OUTCOMES

After the completion of the practical students will be able to

| CO | COURSE OUTCOMES | RBT |
|-----|--|-----------|
| CO1 | Acquire knowledge on detection of aliphatic and aromatic elements in organic compound. | K1,K2, K3 |
| CO2 | Gain knowledge on saturation and unsaturation in organic compound. | K1,K2, K3 |
| CO3 | Identify the functional groups present in the organic compound. | K1,K2, K3 |
| CO4 | Gain knowledge on the detection of special elements in organic compound. | K1,K2, K3 |
| CO5 | Understand the preparation of derivatives of the organic compound. | K1,K2, K3 |

CO PO MATRICES:

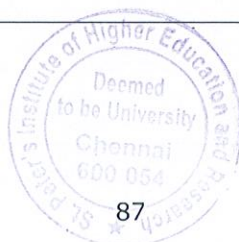
| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 2 | 2 | - | - | - | - | - | 2 |
| CO2 | 2 | 2 | - | - | - | - | - | 2 |
| CO3 | 2 | 2 | - | - | - | - | - | 2 |
| CO4 | 2 | 2 | - | - | - | - | - | 2 |
| CO5 | 2 | 2 | - | - | - | - | - | 2 |
| AVERAGE | 2 | 2 | - | - | - | - | - | 2 |

Since it is mapped with PO1, PO2 and PO8 this subject is considered for Skill development.




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| Course Code | Course Title | L | T | P | C |
|--|-----------------------|---|---|---|-------------|
| 416UEST01 | Environmental Science | 3 | 0 | 0 | 2 |
| Prerequisites :Nil | | | | | |
| Course Objectives: | | | | | |
| <ul style="list-style-type: none"> ▪ Understand the different types of natural resources ▪ Get insight on the eco system ▪ Learn about various types of Pollution and their causes ▪ Learn the concepts of social issues and environmental pollution | | | | | |
| Unit 1 : Multidisciplinary nature of environmental studies | | | | | 4hrs |
| Definition, scope and importance, need for public awareness. | | | | | |
| Unit 2 : Natural Resources : | | | | | 5hrs |
| Renewable and non-renewable resources : | | | | | |
| Natural resources and associated problems. Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources : World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies. Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources., Equitable use of resources for sustainable lifestyles. | | | | | |
| Unit 3 : Ecosystems | | | | | 6hrs |
| Concept of an ecosystem., Structure and function of an ecosystem., Producers, consumers and decomposers, Energy flow in the ecosystem., Ecological succession. Food chains, food webs and ecological pyramids., Introduction, types, characteristic features, structure and function of the following ecosystems :- | | | | | |
| <ul style="list-style-type: none"> (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) | | | | | |
| Unit 4 : Biodiversity and its conservation | | | | | 6hrs |
| Introduction – Definition : genetic, species and ecosystem diversity. Bio geographical classification of India, Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels., India as a mega-diversity nation, Hot-spots of biodiversity., Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts. | | | | | |
| Unit 5 : Environmental Pollution | | | | | 6hrs |
| Definition, Cause, effects and control measures of :- | | | | | |
| <ul style="list-style-type: none"> a. Air pollution | | | | | |



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- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards
 - Solid waste Management : Causes, effects and control measures of urban and industrial wastes.
 - Role of an individual in prevention of pollution.
 - Pollution case studies.
 - Diaster management : floods, earthquake, cyclone and landslides.

Unit 6 : Social Issues and the Environment**4hrs**

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rahabilitation of people; its problems and concerns. Case Studies
- Environmental ethics : Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation.
- Public awareness.

Unit 7 : Human Population and the Environment**5hrs**

- Population growth, variation among nations.
- Population explosion – Family Welfare Programme.
- VII
- Environment and human health.
- Human Rights.
- Value Education.
- HIV/AIDS.
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

Unit 8 : Field Work

Visit to a local area to document environmental assets rivers/forest/grassland/hill/moutain. Visit to a local polluted site – urban / Rural / Industrial / Agricultural Study of common plants, insects, birds.

TOTAL HOURS :36

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Expected Course Outcomes:

Upon completion of the course students will be able to:

CO1: Create public awareness of environment at infant stage.

CO2: Gain knowledge on the structure and functions of different types of ecosystems.

CO3: Understand the importance of Natural resources, Biodiversity, Environmental pollution and Environmental policies

CO4: To analyze the importance of environment by assessing its impact on the Human world.

CO5: To analyze the environment policies and practices.

Course Code **Course Title**
416UEST01 **Environmental Science**

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Create public awareness of environment at infant stage. | K2 |
| CO2 | Gain knowledge on the structure and functions of different types of ecosystems. | K3 |
| CO3 | Understand the importance of Natural resources, Biodiversity, Environmental pollution and Environmental policies | K3 |
| CO4 | To analyze the importance of environment by assessing its impact on the Human world | K1 |
| CO5 | To analyze the environment policies and practices. | K6 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | - | - | - | 3 | - | - | 3 |
| CO2 | - | - | - | 3 | - | - | 3 |
| CO3 | - | - | - | 3 | - | - | 3 |
| CO4 | - | - | - | 3 | - | - | 3 |
| CO5 | - | - | - | 3 | - | - | 3 |
| AVG | - | - | - | 3 | - | - | 3 |

Since it is mapped with PO2, PO3, PO5 and PO7 this subject is considered for employability



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| Course Code | Course Title | L T P C |
|---|--------------|--------------|
| 416UCCT04 | Soft Skills | 4 0 0 3 |
| Prerequisites : Essentials of Microsoft office as given in Level I | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ▪ To impart hands on training to students in Microsoft Office essentials like MSWord, MS Excel and MS Access. ▪ To offer at two levels exclusively meant for students with no computer knowledge. ▪ To design as a practical oriented course and not for chalk and board teaching | | |
| COMPUTING SKILLS – LEVEL II | | |
| Unit I | | 12hrs |
| Word processing - Auto formatting; Paragraph and character styles – creating , modifying and using styles; Templates – modifying, attaching and controlling; Tables and columns - creating, manipulating and formulating; mail merge; labels- creating | | |
| Unit II | | 10hrs |
| Data Management – MS Access - Introduction, concepts and terms; database and tables- creating, data types, editing fields, renaming, resizing of fields, finding, sorting and displaying of data –printing | | |
| Unit III | | 10hrs |
| Spreadsheets – MS Excel – Worksheets – moving, copying, sorting, inserting of cells, rows, columns; Charts – creating, editing, adding, rotating, printing, deleting and controlling; graphics- creating and placing, drawing lines and shapes; using multiple worksheets ; printing | | |
| Unit IV | | 10hrs |
| Presentations – Power point- starting, browsing and saving, creating, editing, formatting of text and paragraphs, inserting tables and charts; Presentation through slides, handouts and printing. | | |
| Unit V | | 12hrs |
| Graphics and Multimedia - Clip art – create and insert; shapes- draw, insert and copy; create a flow | | |
| <i>Note – Unit 1-5 are to be taught as practical with hands on experience</i> | | |
| TOTAL HOURS :54 | | |
| Books for Study : | | |
| <ol style="list-style-type: none"> 1. Introduction to Computers – Peter Norton, Tata McGraw-Hill, India 2. Microsoft 2003 – Jennifer Ackerman Kettel et al., Tata Mc-Graw Hill, India 3. Working In Microsoft office 2006– Ron Mansfield , Tata Mc-Graw Hill, India, | | |

Expected Course Outcomes:

CO1: To understand how Access , Word is used and how to navigate around it
 CO2: To design a database with lookup tables
 CO3: To create a presentations using power point.
 CO4: To create images and multimedia using graphics.

Course Code: **416UCCP04**Course Name: **Computing Soft Skills – LEVEL II**

| CO No. | COURSE OUTCOMES | RBT |
|--------|---|------------|
| CO1 | To understand how Access , Word is used and how to navigate around it | K3,K3,K5 |
| CO2 | To design a database with lookup tables | K2,K4 |
| CO3 | To create a presentations using power point. | K3, K5, K6 |
| CO4 | To create images and multimedia using graphics | K3, K6 |

K1 – Remembering K2 – Understanding K3-Applying K4 – Analyzing
 K5- Evaluating K6 – Creating

CO PO MATRICES:

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| CO1 | 3 | 3 | 1 | - | - | 2 | 2 | 3 |
| CO2 | 3 | 3 | 1 | - | - | 2 | 2 | 3 |
| CO3 | 3 | 3 | 1 | - | - | 2 | 2 | 3 |
| CO4 | 3 | 3 | 1 | - | - | 2 | 2 | 3 |
| AVERAGE | 3 | 3 | 1 | - | - | 2 | 2 | 3 |

Since it is mapped with, PO7 & PO8 this subject is considered for Employability & Skill Development



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Semester V

| Course Code | Course Title | L T P C |
|--|----------------------------------|----------------|
| 516UPHT01 | Electricity and Electromagnetism | 6 0 0 5 |
| Prerequisites :Nil | | |
| Course Objectives: | | |
| <ul style="list-style-type: none"> ➤ To gain firsthand knowledge in Electric field, Magnetic field, and Electromagnetic theory. ➤ To understand the mathematical idea behind the electrostatic field. ➤ To acquire knowledge physics behind the Magneto statistics. ➤ To learn the basics of electromagnetic theory. | | |
| Unit I Chemical Effects of Electric Current | | 18 hrs |
| Faraday's laws of Electrolysis - ionic velocities and mobilities. Calculation and experimental determination of ionic mobilities - transport number. Thermoelectricity-Peltier effect - Experimental determination of Peltier coefficient - Thomson coefficient - experimental determination of Thomson coefficient - application of thermodynamics to a thermocouple and connected relations - thermoelectric diagram and uses. | | |
| Unit II DC Circuits | | 18 hrs |
| Growth and decay of current in a circuit containing resistance and inductance - growth and decay of charge in a circuit containing resistance and capacitor - growth and decay of charge in an LCR circuit - condition for the discharge to be oscillatory - frequency of oscillation - network analysis - Thevenin and Norton's Theorems. | | |
| Unit III AC Circuits | | 18 hrs |
| AC Voltage and current - Power factor and current values in and AC circuit containing LCR circuit - series and Parallel resonant circuits - AC motors - single phase, three phase - star and delta connections - electric fuses - circuit brakers. | | |
| Unit IV Magnetic Effect of Electric Current | | 18 hrs |
| Biot and Savart's law - magnetic field intensity due to a solenoid carrying current - effect of iron core in a solenoid - Helmholtz galvanometer - moving coil ballistic galvanometer – theory - damping correction - determination of the absolute capacity of a condenser using B.G. | | |
| Unit V Electromagnetic Induction and Its Applications | | 18 hrs |
| Faraday's laws of electromagnetic induction - inductor and inductance - determination of self inductance of a coil using Anderson method - mutual inductance - experimental determination of absolute mutual inductance - coefficient of coupling - Earth inductor - uses of earth inductor - measurement of horizontal component of the earth's magnetic | | |




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field - measurement of vertical component of earth's magnetic field - calibration of B.G. - Induction coil and its uses.

TOTAL HOURS 90

Books for Study :

1. Electricity & Magnetism by M.Narayanamurthy & N.Nagarathnam, NPC pub., Revised edition.
2. Electricity and Magnetism by Brijlal and Subrahmanyam; S.Chand & Co., New Delhi, (2000).
3. Electricity & Magnetism by D.Chattopadhyay and P.C. Rakshit, Books and Allied (P) Ltd.(2001).
4. Fundamentals of electricity and magnetism by B.D. Dugal and C.L. Chhabra, Shobanlal Nagin, S.
5. Chand & Co., 5th edition, New Delhi(2005).
6. Electricity and Magnetism by R. Murugesan, S.Chand & Co., New Delhi, (2008).

Books for Reference:

1. Electricity & Magnetism by K.K.Tewari, S.Chand & Co., New Delhi, (2002).
2. Introduction to Electrodynamics by D.J.Griffiths, Printice Hall of India Pvt. Ltd., 3rd Edition, New Delhi (2003).
3. Fundamentals of Physics, D.Halliday, R.Resnick and J.walker, Wiley, 6th Edition, New York (2001).

Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

CO1: Interpret basics of Electric field, Magnetic field, and Electromagnetic theory.

CO2: Acquire the knowledge of Ac & DC circuits

CO3: Acquire an intense knowledge mathematical idea behind the electrostatic field

CO4: Gain cognitive skills in physics behind the Magnetostatics

CO5: Acquire an in depth knowledge in the basics of electromagnetic theory



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Course Code **Course Title**
516UPHT01 **Electricity and Electromagnetism**

| CO No. | Course Outcome | RB T |
|---------------|---|-------------|
| CO1 | Interpret basics of Electric field, Magnetic field, and Electromagnetic theory. | K4 |
| CO2 | Acquire the knowledge of Ac & DC circuits | K1 |
| CO3 | Acquire an intense knowledge mathematical idea behind the electrostatic field | K5 |
| CO 4 | Gain cognitive skills in physics behind the Magnetostatics | K4 |
| CO5 | Acquire an in depth knowledge in the basics of electromagnetic theory | K1 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|------------|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| AVG | 3 | 3 | 3 | 3 | 2 | 2 | 3 |

Since it is mapped with PO7, PO8 this subject is considered for employability & skill development

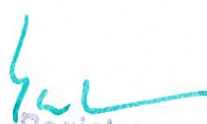


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| Course Code | Course Title | L T P C |
|---|------------------------------|---------------|
| 516UPHT02 | Nuclear and Particle Physics | 6 0 0 5 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ To study the phenomena taking place in the nuclear domain and dimensions of a nucleus. ▪ To know the stability of nucleus and various other properties. ▪ To learn about various types of radiations and their interaction with matter. ▪ To gain Knowledge about various types of nuclear reactions and their energies. ▪ To learn the methods to find the mass and charge of any nucleus by using some instruments. | | |
| Unit 1 : General Properties of Nuclei | | 18 hrs |
| Nuclear size, charge, mass-determination of nuclear radius-mirror nucleus method-mass defect and binding energy-packing fraction - nuclear spin - magnetic dipole moment - electric quadrupole moment-nuclear models-liquid drop model-Weizacker semi empirical mass formula-shell model and magic numbers-collective model-nuclear forces-meson theory of nuclear force (qualitative). | | |
| Unit 2 : Radioactivity | | 18 hrs |
| Natural radioactivity-law of disintegration-half life and mean life period-units of radioactivity-transient and secular equilibrium-radiocarbon dating-age of earth - alpha rays-characteristics-Geiger Nuttal law - α -ray spectra-Gamow's theory of α -decay (qualitative study)-beta rays-characteristics-beta ray spectra-neutrino hypothesis-violation of parity conservation-experimental verification with Co^{60} -gamma rays and internal conversion-nuclear isomerism. | | |
| Unit 3 : Radiation Detectors and Particle Accelerators | | 18 hrs |
| Ionisation chamber-G.M.Counter-quenching and resolving time-scintillation counter-photo multiplier tube – thermoluminescence -thermoluminescence dosimetry (TLD) - Linear accelerator-cyclotron-synchrocyclotron, betatron. | | |
| Unit 4 : Nuclear Reactions | | 18 hrs |
| Conservation laws-nuclear reaction Kinematics-Q-value-threshold energy - artificial radioactivity-radioisotopes and its uses-classification of neutrons-nuclear fission-chain reaction - critical mass and size-nuclear reactor-breeder reactor - transuranic elements-nuclear fusion-thermonuclear reactions-sources of stellar energy. | | |




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Unit 5 : Elementary Particles**18 hrs**

Classification of elementary particles fundamental interaction-elementary particle quantum numbers - isospin and strangeness - conservation laws and symmetry-basic ideas about quark-quark model.

TOTAL HOURS:90**REFERENCE BOOKS**

1. Nuclear Physics by R.R.Roy and B.P.Nigam, New Age International (P) Ltd., New Delhi(2017).
2. Fundamentals of Elementary Particle Physics by Longo, Mc Graw-Hill.
3. Nuclei and Particles by Serge., W.A. Benjamin, USA
4. Elements of Nuclear Physics by ML Pandya and RPS Yadav, Kedarnath Ram Nath, Meerut

COURSE OUTCOMES

Upon completion of this course students will be able to:

CO1: Know the properties of nucleus likes binding energy, magnetic dipole moment and electric quadruple moment

CO2: Understand the concept of radioactivity and decays law

CO3: Know the working of Radiation detectors and particle accelerators

CO4: Gain an extended knowledge about nuclear reactions such as nuclear fission and fusion

CO5: Understand the basic concept of Particle Physics




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Course Code **Course Title**
516UPHT02 **Nuclear and Particle Physics**

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Know the properties of nucleus likes binding energy, magnetic dipole moment and electric quadruple moment | K1 |
| CO2 | Understand the concept of radioactivity and decays law | K2 |
| CO3 | Know the working of Radiation detectors and particle accelerators | K1 |
| CO 4 | Gain an extended knowledge about nuclear reactions such as nuclear fission and fusion | K3 |
| CO5 | Understand the basic concept of Particle Physics | K2 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| AVG | 3 | 3 | 3 | 2 | 2 | 2 | 2 |

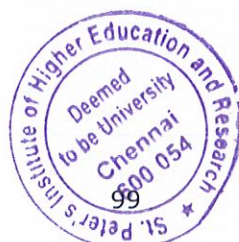
Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability & skill development & Entrepreneurship



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| Course Code | Course Title | L T P C |
|--|---------------------|---------|
| 516UPHT03 | Solid State Physics | 5 0 0 5 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ➤ To recognize and also give the lattice parameter relationships for all seven crystal systems ➤ Given a unit cell and the Miller indices for a plane, to draw the plane for a system ➤ To be able to draw the atomic packing arrangement for a specific crystallographic plane. ➤ To understand the use of X-ray diffraction measurements in determining crystalline structures | | |
| <p>Unit 1 : Crystal Structure 18 hrs Crystal lattice – primitive and unit cell – seven classes of crystal – Bravais Lattice – Miller Indices – Structure of crystals – simple cubic, hexagonal close packed structure, face centred cubic structure, body centred cubic structure – Sodium chloride structure, Zinc Blende structure, Diamond structure.</p> <p>Unit 2 : Defects in Solids 18 hrs X ray diffraction – Bragg’s law in one dimension – Experimental methods – Laue Method, powder crystal method and rotating crystal method. Defects in solids - Point defects - Frenkel and schottky defects - Equilibrium concentrations - Line defects - Edge dislocation and screw dislocation - Surface defects - Grain boundary - Effects of Crystal imperfections.</p> <p>Unit 3: Chemical Bonds and Crystallography 18 hrs Interatomic forces - Different types of chemical bonds - Ionic bond - Cohesive energy of ionic Crystals and Madelung constant - Covalent bond - Metallic bond - Van der Waal's bond - Hydrogen bond. Superconductivity - General properties - Type I and II Superconductors - Meissner effect - BCS theory - applications of super conductors.</p> <p>Unit 4 : Dielectric Properties 18 hrs Dielectric materials - Polarization, susceptibility and dielectric constant - Local field or internal field - Clausius - Mossoti relation - Sources of polarizability - Electronic polarizability - Ionic polarizability - Orientational polarizability - Frequency and temperature effects on polarization - Dielectric breakdown – Properties of different types of insulating materials.</p> <p>Unit 5 : Magnetic Properties 18 hrs Different types of magnetic materials - classical theory of diamagnetism (Langevin theory) - Langevin theory of paramagnetism - Weiss theory of paramagnetism - Heisenberg interpretation on internal field and quantum theory of ferromagnetism - Antiferromagnetism - Hard and soft magnetic materials.</p> | | |




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TOTAL HOURS :90**REFERENCE BOOKS**

1. Materials Science by M.Arumugam, Anuradha Agencies Publishers.(2012)
2. Solid State Physics by R L Singhal, Kedarnath Ram Nath & Co., Meerut (2017)
3. Introduction to Solid State Physics by Kittel, Willey Eastern Ltd(2013).
4. Materials Science and Engineering by V. Raghavan, Prentice Hall of India Private Limited, New Delhi(2014)
5. Solid State Physics by S.O.Pillai, New Age International (P) Ltd.,(2018).
6. Solid State Physics by A. J.Dekker, Macmillan India(2019).
7. Solid State Physics by HC Gupta, Vikas Publishing House Pvt. Ltd., New Delhi (2017).

COURSE OUTCOMES

Upon completion of the practical students will be able to:

CO1: Understand the crystalline and non crystalline material

CO2: Know the principles of structure determination by diffraction

CO3: Understand the principles and techniques of X-ray diffraction

CO4: Know the fundamental principles of superconductors

CO5: Get an extended knowledge about magnetic and dielectric materials


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Course Code **Course Title**
516UPHT03 **Solid State Physics**

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Understand the crystalline and non-crystalline material | K2 |
| CO2 | Know the principles of structure determination by diffraction | K1 |
| CO3 | Understand the principles and techniques of X-ray diffraction | K2 |
| CO 4 | Know the fundamental principles of superconductors | K1 |
| CO5 | Get an extended knowledge about magnetic and dielectric materials | K1 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| AVG | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

Since it is mapped with PO4, PO6 this subject is considered for Entrepreneurship

B.Sc REGULAR



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Syllabus for Elective I

| Course Code | Course Title | L T P C |
|--|---------------------|-----------------------|
| 516UPHT05 | Numerical Methods | 5 1 0 4 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ Develop a greater understanding of the issues involved in the numerical solutions of Algebraic, Transcendental and Differential Equation. ▪ Develop an in-depth understanding in Interpolation and curve fitting. ▪ To learn about the concepts of Numerical Integrations. | | |
| Unit 1 : Simultaneous Linear Algebraic Equations | | 14 hrs |
| Method of triangularisation - Gauss elimination method - Inverse of a matrix - Gauss - Jordan method | | |
| Unit 2 : Numerical Solution of Algebraic, Transcendental and Differential Equation | | 14 hrs |
| Bisection method – Regular falsi method - Newton - Raphson method - - Horner's method - Solution of ordinary differential equation - Euler's method. | | |
| Unit 3 : Interpolation | | 14 hrs |
| Finite differences – operators $\Delta, \nabla, \delta, E, D$ – relation between operators – linear interpolation – interpolation with equal intervals – Newton forward interpolation formula – Newton backward interpolation formula. | | |
| Unit 4 : Curve Fitting | | 15 hrs |
| Principles of least squares - fitting a straight line - linear regression - fitting an exponential curve. | | |
| Unit 5 : Numerical Integration | | 15 hrs |
| Trapezoidal Rule - Simpson's 1/3 rule and 3/8 rule - Applications - Weddle's rule | | |
| | | TOTAL HOURS:72 |
| Books for Study | | |
| <ol style="list-style-type: none"> 1. Numerical methods - M.K.Venkatraman, National Publishing Company, (1990). 2. Numerical methods by V. Rajaraman, Prentice - Hall India Pvt. Ltd., (2003). 3. Numerical methods by P. Kandasamy, K. Thilagavathy and K. Gunavathy, S. Chand & Co. (2002). | | |
| Books for References | | |




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1. Numerical methods for Scientific and Engineering computation by Jain Iyenger and Jain, New Age International (P) Ltd.,(2004).
2. Numerical methods by S.S.Sastry, Prentice Hall of India Pvt. Ltd., New Delhi(2003).

COURSE OUTCOMES

Upon completion of this course students will be able

CO1: Understand the issues involved in the numerical solutions of Algebraic, Transcendental and Differential Equations.

CO2: Be capable of specifying the Interpolation and curve fitting.

CO3: To Understand the concept of the Numerical Integrations Be capable of specifying the

CO4: Interpolation and curve fitting.

CO5: Understand the concept of the Numerical Integrations




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Course Code

516UPHT05

Course Title**Numerical Methods**

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Understand the issues involved in the numerical solutions | K2 |
| CO2 | Analyzing the Algebraic, Transcendental equations | K5 |
| CO3 | Gaining the knowledge of Differential equations | |
| CO4 | Be capable of specifying the Interpolation and curve fitting. | |
| CO5 | Understand the concept of the Numerical Integrations | K2 |

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
|-----|------|------|------|------|------|------|------|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO7, PO8 this subject is considered for employability & skill development


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| Course Code | Course Title | L | T | P | C |
|--|-------------------------|---|---|---|---|
| APHT3607 | Low Temperature Physics | 5 | 1 | 0 | 6 |
| Prerequisites :Nil | | | | | |
| COURSE OBJECTIVES | | | | | |
| <ul style="list-style-type: none"> ➤ To Know the theory behind low temperature physics ➤ To understand the concept of different types of cryogenes. ➤ To Gain knowledge about the magnetic and electrical properties ➤ To Gain an extended knowledge about specific heats and spectral properties | | | | | |
| UNIT I - Production of Low Temperature | | | | | |
| 12 hours | | | | | |
| Introduction - Joule Thomson effect - Regenerative cooling - Vacuum pumps - liquefaction of air - Hydrogen - Helium - Maintenance of low temperature -production of temperature below 1 K - Adiabatic demagnetization - Evaporative cooling of He-3 - Dilution refrigeration - Laser cooling - Nuclear demagnetization. | | | | | |
| UNIT II – Measurement of Low Temperature | | | | | |
| 12 hours | | | | | |
| The gas thermometer and it corrections - Secondary thermometers- resistance thermometers, thermocouples- vapour pressure thermometers- magnetic thermometers. | | | | | |
| UNIT III - Liquid and Solid Cryogenes | | | | | |
| 12 hours | | | | | |
| Liquid Nitrogen - Liquid oxygen - Liquid hydrogen - Liquid He -4 and He -3 - Solid He- 4 and He -3 - Lamda point - Superfluidity - Density - Compressibility factor - viscosity and thermal properties - Velocity of sound in liquid helium. | | | | | |
| UNIT IV - Electrical and Magnetic Properties | | | | | |
| 12 hours | | | | | |
| Experimental observations - Theories of sommerfield and block - Superconductivity - magnetic properties of superconductors - Thermal properties of superconductors - penetration depth and high frequency resistance - Ferromagnetism - Diamagnetism - paramagnetism - Paramagnetic saturation. | | | | | |
| UNIT V – Specific Heats, Spectroscopic and Hyperfine Properties | | | | | |
| 12 hours | | | | | |
| Specific heats - Rotational specific heat of Hydrogen - Einstein's and Debye's theories - Schottky effect - Anomalies in specific heats at low temperature - Infrared- visible spectra - Zeeman spectra at low temperature - Dielectric constant and its measurement - Magnetic susceptibility - NMR and electron paramagnetic resonance at low temperature - Nuclear magnetic properties - Mossbauer effect and other hyperfine properties at low temperature | | | | | |
| TOTAL HOURS:60 | | | | | |




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TEXT BOOKS:

1. Cornelis Jacobus Gorter, D. F. Brewer, Progress in Low Temperature Physics, Elsevier Ltd, 2011.
2. Christian E. and Siegfried H, Low Temperature Physics, Springer, 2005.

REFERENCES

1. Jack Ekin, Experimental Techniques for Low-Temperature Measurements, OUP Oxford, 2006.
2. Charles P. Poole Jr., Horacio A. Farach, Richard J. Creswick and Ruslan Prozorov, Superconductivity Elsevier Ltd, 2007.
3. John Wilks, Properties of Liquid and Solid Helium, Oxford University Press, 1967.
4. Jackson L.C., Low Temperature Physics, Methuen and Company, 1962.
5. Ching Wu Chu and J. Woollam, High Pressure and Low Temperature Physics, Plenum Press, 1978.

COURSE OUTCOMES

Upon completion of the this course students will be able to:

CO1: Know the theory behind low temperature physics

CO2: Understand the concept of different types of cryogens

CO3: Gain knowledge about the magnetic and electrical properties

CO4: Gain an extended knowledge about specific heats and spectral properties

CO5: Learn about the spectroscopy and hyperfine properties



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Course Code **Course Title**
APHT3607 **Low Temperature Physics**

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Know the theory behind low temperature physics | K1 |
| CO2 | Understand the concept of different types of cryogenes | K2 |
| CO3 | Gain knowledge about the magnetic and electrical properties | K1 |
| CO 4 | Gain an extended knowledge about specific heats | K1 |
| CO5 | Learn about the spectroscopy and hyperfine properties | K1 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| AVG | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

Since it is mapped with PO4, PO6 this subject is considered for Entrepreneurship




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| Course Code | Course Title | L | T | P | C |
|---|--------------|---|---|---|------------------------|
| 516UPHP01 | Practical V | 0 | 0 | 5 | 2 |
| Prerequisites : Nil | | | | | |
| COURSE OBJECTIVES | | | | | |
| <ul style="list-style-type: none"> ▪ To study the basic properties of Instruments, specific resistance of the given material. ▪ To gain practical knowledge by applying the experimental methods to correlate with the physics theory. ▪ Know to apply the analytical technique and graphical analysis to the experimental data. | | | | | |
| LIST OF EXPERIMENTS (Any eight experiments) | | | | | |
| <ol style="list-style-type: none"> 1. Young's modulus - Non uniform Bending - Koenig's method. 2. Kundt's Tube – Determination of velocity of sound in solid - Young's modulus. 3. Spectrometer - Small angled prism - Normal incidence and emergence refractive index of the material of prism. 4. Newton's rings - R_1, R_2 and μ of convex lens. 5. Field along axis of a circular coil - Deflection magnetometer - B_H and M. 6. Potentiometer - Calibration of high range voltmeter 7. Potentiometer - Emf of a thermo couple. 8. B.G - Comparison of mutual inductances 9. B.G - Absolute mutual inductance 10. B.G - Self inductance - Anderson method. | | | | | |
| | | | | | TOTAL HOURS :72 |
| Books for Study: | | | | | |
| <ol style="list-style-type: none"> 1. Practical Physics and Electronics, C.C. Ouseph, U.J. Rao. 2. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | | | | |
| COURSE OUTCOMES | | | | | |
| Upon completion of the practicals students will be able to: | | | | | |
| CO1: To demonstrate the basic properties of Instruments specific resistance of the given material. | | | | | |
| CO2: Learning the knowledge about Young 's modulus | | | | | |
| CO3: Apply the analytical technique and graphical analysis to the experimental data. | | | | | |
| CO4: Gain practical knowledge by applying the experimental methods to correlate with the physics theory. | | | | | |
| CO5: Use the different measuring devices and meters to record the date with precision | | | | | |




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Course Code Course Title
516UPHP01 Practical V

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | To demonstrate the basic properties of Instruments specific resistance of the given material. | K1 |
| CO2 | Learning the knowledge about Young 's modulus | K1 |
| CO3 | Apply the analytical technique and graphical analysis to the experimental data. | K3 |
| CO 4 | Gain practical knowledge by applying the experimental methods to correlate with the physics theory | K1 |
| CO5 | Use the different measuring devices and meters to record the date with precision. | K5 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|------------|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability & skill development & Entrepreneurshi



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| Course Code | Course Title | L | T | P | C |
|---|--------------|---|---|---|------------------------|
| 516UPHP02 | Practical VI | 0 | 0 | 5 | 2 |
| Prerequisites :Nil | | | | | |
| COURSE OBJECTIVES | | | | | |
| <ul style="list-style-type: none"> ▪ To study the basics of Electronics. ▪ To gain practical knowledge by applying the experimental methods to correlate with the physics theory. ▪ Know to apply the analytical technique and graphical analysis to the experimental data. | | | | | |
| LIST OF EXPERIMENTS (Any eight experiments) | | | | | |
| <ol style="list-style-type: none"> 1. A.C. Circuit – LCR – Series resonance 2. Bridge rectifier - Zener regulated power supply - 9V characteristics. 3. R-C Coupled Single Stage Amplifier - Frequency Response 4. Transistor - Phase Shift Oscillator 5. FET characteristics 6. UJT characteristics 7. SCR characteristics 8. NAND / NOR as universal gates. 9. 4 bit ripple counter using 7473/7476 10. Decode counter using 7490 | | | | | |
| | | | | | TOTAL HOURS :72 |
| BOOKS For Study: | | | | | |
| <ol style="list-style-type: none"> 1. Practical Physics and Electronics, C.C. Ouseph, U.J. Rao. 2. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | | | | |
| Expected Course Outcomes: | | | | | |
| STUDENTS WILL BE ABLE TO | | | | | |
| CO1: To study the basics of Electronics using the universal gates. | | | | | |
| CO2: Understand the concept of Transistor characteristics | | | | | |
| CO3: Apply the analytical technique and graphical analysis to the experimental data. | | | | | |
| CO4: Gain practical knowledge by applying the experimental methods to correlate with the physics theory. | | | | | |
| CO5: Use the different measuring devices and meters to record the date with precision. | | | | | |



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Course Code
516UPHP02

Course Title
Practical VI

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | To study the basics of Electronics using the universal gates. | K1 |
| CO2 | Understand the concept of Transistor characteristics. | K1 |
| CO3 | Apply the analytical technique and graphical analysis to the experimental data. | K3 |
| CO 4 | Gain practical knowledge by applying the experimental methods to correlate with the physics theory | K1 |
| CO5 | Use the different measuring devices and meters to record the data with precision. | K5 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|------------|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |




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| Course Code | Course Title | L T P C |
|---|---------------|---------|
| 516UPHP03 | Practical VII | 0 0 4 2 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ To study the basics of Microprocessor. ▪ To gain practical knowledge by applying the experimental methods to correlate with the physics theory. ▪ Know to apply the analytical technique and graphical analysis to the experimental data. | | |
| (Any Seven Experiments) | | |
| <ol style="list-style-type: none"> 1. Microprocessor – 8085 – 8 bit Addition 2. Microprocessor – 8085 – 8 bit Subtraction 3. Microprocessor – 8085 – 8 bit Multiplication 4. Microprocessor – 8085 – 8 bit Division 5. Microprocessor – 8085 – Addition of N Number of single byte numbers 6. Microprocessor – 8085 – Sorting of given set of numbers in ascending order 7. Microprocessor – 8085 – Sorting of given set of numbers in descending order 8. Microprocessor – 8085 – Finding the largest no. in a given set of numbers. 9. Microprocessor – 8085 – Finding the smallest no. in a given set of numbers. | | |
| TOTAL HOURS:72 | | |
| Books For Study: | | |
| <ol style="list-style-type: none"> 1. Practical Physics and Electronics, C.C. Ouseph, U.J. Rao. 2. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | |
| Expected Course Outcomes: | | |
| STUDENTS WILL BE ABLE TO | | |
| CO1: Apply the basics of Microprocessors and to write programs. | | |
| CO2: Design circuits using 555 timer. | | |
| CO3: Instructing the programming techniques in machine language. | | |
| CO4: Apply the analytical technique and graphical analysis to the experimental data. | | |
| CO5: Use the different measuring devices and meters to record the data with precision | | |




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Course Code
516UPHP03

Course Title
Practical VII

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Apply the basics of Microprocessors and to write programs | K3 |
| CO2 | Design circuits using 555 timer | K6 |
| CO3 | Instructing the programming techniques in machine language. | K5 |
| CO4 | Apply the analytical technique and graphical analysis to the experimental data | K3 |
| CO5 | Use the different measuring devices and meters to record the data with precision | K1 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |



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| Course Code | Course Title | L T P C |
|--|-----------------|-------------|
| 516UVET01 | Value Education | 3 0 0 2 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ To get Knowledge of the values inculcated through education ▪ To understand the ethical or moral values, doctrinal or ideological values, social values and aesthetic values ▪ Know to apply to help and solve common human problems. | | |
| Unit I | | 7hrs |
| Value education-its purpose and significance in the present world – Value system – The role of culture and civilization-Holistic living – Balancing the outer and inner – Body, Mind and Intellectual level- Duties and responsibilities. | | |
| Unit II | | 7hrs |
| Salient values for life- Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness, Self esteem and self confidence, punctuality – Time, task and resource management – Problem solving and decision making skills- Interpersonal and Intra personal relationship – Team work – Positive and creative thinking. | | |
| Unit III | | 7hrs |
| Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and non-violence – Dr. A P J Kalam's ten points for enlightened citizenship – Social Values and Welfare of the citizen – The role of media in value building. | | |
| Unit IV | | 7hrs |
| Environment and Ecological balance – interdependence of all beings – living and non-living. The binding of man and nature – Environment conservation and enrichment. | | |
| Unit V | | 8hrs |
| Social Evils – Corruption, Cyber crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – untouchability – female infanticide – atrocities against women-How to tackle them. | | |
| Books for Study: | | |
| 1. M.G.Chitakra: Education and Human Values, A.P.H.Publishing Corporation, New Delhi, 2003 | | |
| TOTAL HOURS:36 | | |

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COURSE OUTCOMES:

Upon completion of the practical's students will be able to:

CO1: Get Knowledge of the values inculcated through education.

CO2: Understand the ethical or moral values, doctrinal or ideological values, social values and aesthetic values.

CO3: Know to apply to help and solve common human problems.

CO4: Developing the awareness about Human rights.

CO5: Developing the knowledge about cybercrime, terrorism etc and how to tackle them

Course Code
516UVET01

Course Title
Value Education

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Get Knowledge of the values inculcated through education. | K1 |
| CO2 | Understand the ethical or moral values, doctrinal or ideological values, social values and aesthetic values. | K2 |
| CO3 | Know to apply to help and solve common human problems. | K3 |
| CO4 | Developing the awareness about Human rights | K1 |
| CO5 | Developing the knowledge about cybercrime, terrorism etc and how to tackle them. | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | - | - | 1 | 2 | - | - | 3 |
| CO2 | - | - | 1 | 2 | - | - | 3 |
| CO3 | - | - | 1 | 2 | - | - | 3 |
| CO4 | - | - | 1 | 2 | - | - | 3 |
| CO5 | - | - | 1 | 2 | - | - | 3 |
| AVG | - | - | 1 | 2 | - | - | 3 |

Since it is mapped with PO4, PO6, PO7, &PO8, this subject is considered for employability & skill development & Entrepreneurship



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SEMESTER VI

| Course Code | Course Title | L T P C |
|--|----------------------------------|----------------|
| 616UPHT01 | Relativity and Quantum mechanics | 5 1 0 5 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ To study the basic principles of quantum mechanics. ▪ To explain the operator formulation of quantum mechanics. ▪ To learn the concept of wave function. ▪ To understand the Schrodinger equation and their applications. ▪ To study role of uncertainty in quantum physics. | | |
| Unit 1 : Relativity | | 18 hrs |
| Frames of reference - Galilean transformation - Michelson - Morley experiment - Postulates of special theory of relativity - Lorentz transformation - length Contraction - time dilation - Relativity of simultaneity - addition of velocities - variation of mass with velocity – Mass energy relation - Elementary ideas of general relativity. | | |
| Unit 2 : Wave Nature of Matter | | 18 hrs |
| Phase and group velocity - wave packet - expression of De Brogile's wave length - Davisson and Germer's experiment - G.P.Thompson's experiment - Electron microscope - Heisenberg's uncertainty principle and its consequences. | | |
| Unit 3 : Schrodinger Equation | | 18 hrs |
| Inadequacy of classical mechanics - Basic postulates of quantum mechanics - Schrodinger equation - Properties of wave function - Probability interpretation of wave function - linear operators - self adjoint operators - expectation value – eigen values and eigen functions - commutativity and compatibility. | | |
| Unit 4 : Angular Momentum in Quantum Mechanics | | 18 hrs |
| Orbital angular momentum operators and their commutation relations - separation of three dimensional Schrodinger equation into radial and angular parts - Elementary ideas of spin angular momentum of an electron - Pauli matrices. | | |
| Unit 5 : Solutions of Schrodinger Equation | | 18 hrs |
| Free particle solution - Particle in a box - Potential well of finite depth (one dimension) - linear harmonic oscillator - rigid rotator and hydrogen atom. | | |
| TOTAL HOURS :90 | | |
| Books for Study | | |
| 1.A Text book of Quantum mechanics by P.M.Mathews and S.Venkatesan, Tata McGraw - Hill, New Delhi(2005). | | |
| 2.Quantum Mechanics by V.K.Thankappan, New Age International (P) Ltd. Publishers, New Delhi(2003). | | |
| 3.Quantum mechanics by K.K.Chopra and G.C. Agrawal, Krishna Prakasam Media (P) Ltd., Meerut First Edition(1998). | | |
| Modern Physics by R. Murugesan and Kiruthiga Sivaprasath, S. Chand & Co.,(2008). | | |




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COURSE OUTCOMES

Upon completion of the this course students will be able to

CO1: Pinpoint the historical aspects of development of quantum mechanics

CO2: Understand and explain the differences between classical and quantum mechanics.

CO3: Understand the idea of wave function

CO4: Gain an extended knowledge about the uncertainty relations

CO5: Solve Schrodinger equation for simple potentials.

Course Code

616UPH01

Course Title

Relativity and Quantum mechanics

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Pinpoint the historical aspects of development of quantum mechanics | K1 |
| CO2 | Understand and explain the differences between classical and quantum mechanics. | K2 |
| CO3 | Understand the idea of wave function | K2 |
| CO 4 | Gain an extended knowledge about the uncertainty relations | K1 |
| CO5 | Solve Schrodinger equation for simple potentials. | K5 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| AVG | 3 | 3 | 2 | 2 | 2 | 2 | 2 |


Since it is mapped with PO4, PO6 this subject is considered for Entrepreneurship



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| Course Code | Course Title | L | T | P | C |
|--|---------------------------------|---|---|---|-----------------------|
| 616UPHT02 | Mathematical Methods in Physics | 5 | 1 | 0 | 5 |
| Prerequisites :Nil | | | | | |
| COURSE OBJECTIVES | | | | | |
| <ul style="list-style-type: none"> To introduce students to methods of mathematical physics To develop required mathematical skills to solve problems in quantum mechanics, electrodynamics and other fields of theoretical physics To prelude to basic theoretical studies in classical mechanics To develop a working knowledge of statistical mechanics | | | | | |
| Unit 1 : Matrices and Special Functions | | | | | 18 hrs |
| Characteristic equation of a matrix - Eigenvalues and Eigenvectors - Hermitian and Unitary matrices - Properties of their eigenvalues and eigenvectors - Diagonalisation of matrices. Special functions - Gamma and Beta functions - Series solutions of Legendre, Bessel and Hermite equations - Orthogonality properties of Legendre and Hermite Polynomials and Bessel functions. | | | | | |
| Unit 2 : Elementary Complex Analysis | | | | | 18 hrs |
| Functions of a Complex variable - Continuity and differentiability - single and multivalued functions - Analytic function - Cauchy - Riemann conditions (necessity and sufficiency). Cauchy - Riemann Conditions in the Polar (r,θ) coordinates. | | | | | |
| Unit 3 : Vector Analysis | | | | | 18 hrs |
| Scalar and Vector fields - Gradient, Divergence and Curl - Equations of motion in the vector notation - equations of motion (components) in cartesian coordinates and spherical polar coordinates - equation of motion in the polar coordinates. | | | | | |
| Unit 4 : Classical Mechanics | | | | | 18 hrs |
| Generalised coordinates - configuration space - Lagrange's equation - simple applications : to find equations of motion given a lagrangian; central potential and conservation of angular momentum - Hamilton function and Hamilton's equations - harmonic oscillator. | | | | | |
| Unit 5 : Statistical Physics | | | | | 18 hrs |
| Quantum statistics of identical particles - Maxwell - Boltzmann, Bose - Einstein and Fermi Dirac statistics - Derivation of Planck's radiation formula from Bose - Einstein statistics-Degenerate Fermi gas. | | | | | |
| | | | | | TOTAL HOURS:90 |
| Books for Study | | | | | |
| 1.Mathematical Physics by Sathya Prakash, Sultan Chand and Sons, New Delhi (1996) | | | | | |
| 2.Classical Mechanics by J.C. Upadhyaya, Himalaya Publishing House, Mumbai(2003). | | | | | |
| 3.Introduction to Statistical Mechanics by S.K. Sinha Narosa Publication(2007). | | | | | |
| 4.Heat Thermodynamics and Statistical Physics by Brijlal N.Subrahmanyam, P.S. Hemne S.Chand & Co., New Delhi.(2007) | | | | | |




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Expected Course Outcomes:**STUDENTS WILL BE ABLE TO**

CO1: Understand basic theory of vector and tensor analysis.

CO2: Understand the theoretical background of classical mechanics

CO3: Understand the theory of statistical mechanics

CO4: Explore various applications related to mathematical methods

CO5: Getting the knowledge about Statistical mechanics

Course Code
616UPHT02**Course Title**
Mathematical Methods in Physics

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Understand basic theory of vector and tensor analysis. | K2 |
| CO2 | Understand the theoretical background of classical mechanics | K6 |
| CO3 | Understand the theory of statistical mechanics | K3 |
| CO 4 | Explore various applications related to mathematical methods | K1 |
| CO5 | Getting the knowledge about Statistical mechanics. | K1 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 3 | 3 | 3 | 1 | 1 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 1 | 1 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 1 | 1 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 1 | 1 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 1 | 1 | 3 |
| AVG | 3 | 3 | 3 | 3 | 1 | 1 | 3 |

Since it is mapped with PO4, PO6, PO7 & PO8, this subject is considered for employability & skill development & Entrepreneurship



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| Course Code | Course Title | L | T | P | C |
|---|----------------|---|---|---|---|
| 616UPHP01 | Practical VIII | 0 | 0 | 5 | 2 |
| Prerequisites :Nil | | | | | |
| COURSE OBJECTIVES | | | | | |
| <ul style="list-style-type: none"> ▪ To study the basis of Optical Instruments and B.G. ▪ To gain practical knowledge by applying the experimental methods to correlate with the physics theory. ▪ To Apply the analytical technique and graphical analysis to the experimental data. | | | | | |
| Any Seven Experiments | | | | | |
| <ol style="list-style-type: none"> 1. Spectrometer - (i - i') curve - refractive index. 2. Spectrometer - Cauchy's constant. 3. Newton's rings - Refractive index of liquid. 4. Field along axis of a circular coil - vibration magnetic needle - B_H. 5. Potentiometer - Temp coeff. of resistance of a thermistor 6. B.G - Comparison of EMFs 7. B.G -Figure of merit (quantity of charge) 8. B.G - Comparison of capacitances 9. B.G - Internal resistance of a cell 10. B.G - High Resistance by leakage 11. B.G - Absolute capacitance | | | | | |
| TOTAL HOURS:72 | | | | | |
| Books for Study | | | | | |
| <ol style="list-style-type: none"> 1. Practical Physics and Electronics, C.C. Ouseph, U.J. Rao. 2. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | | | | |



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COURSE OUTCOMES

Upon completion of this course students will be able to:

CO1: Learn about spectrometer for finding refractive index

CO2: Understand the basis of Optical Instruments and B.G.

CO3: Gain practical knowledge by applying the experimental methods to correlate with the physics theory.

CO4: Apply the analytical technique and graphical analysis to the experimental data

CO5: Use the different measuring devices and meters to record the data with precision.

Course Code
616UPHP01

Course Title
Practical VIII

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Learn about spectrometer for finding refractive index | K2 |
| CO2 | Understand the basis of Optical Instruments and B.G. | K6 |
| CO3 | Gain practical knowledge by applying the experimental methods to correlate with the physics theory | |
| CO4 | Apply the analytical technique and graphical analysis to the experimental data | |
| CO5 | Use the different measuring devices and meters to record the data with precision | K3 |

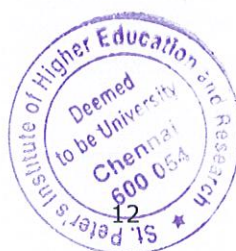
CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 |
|-----|------|------|------|------|------|------|------|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |



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| Course Code | Course Title | L | T | P | C |
|--|--------------|---|---|---|---|
| 616UPHP02 | Practical IX | 0 | 0 | 5 | 2 |
| Prerequisites :Nil | | | | | |
| COURSE OBJECTIVES | | | | | |
| <ul style="list-style-type: none"> ▪ To study the basics of Electronics ▪ To gain practical knowledge by applying the experimental methods to correlate with the physics theory. ▪ Apply the analytical technique and graphical analysis to the experimental data. | | | | | |
| List of Experiments (Any Seven Experiments) | | | | | |
| <ol style="list-style-type: none"> 1. A.C. Circuit – LCR – Parallel resonance 2. R-C Coupled Amplifier with feedback. 3. Emitter follower 4. Transistor - Wien's Bridge Oscillator 5. FET amplifier 6. UJT Relaxation oscillator 7. Transistor - Astable multivibrator 8. Transistor - Bistable multivibrator 9. Half Adder – Full adder – Ex-OR(7486) 10. Half Subtractor – Full subtractor – Ex - OR(7486) 11. 4 bit ripple counter using 7473/7476 12. 4 bit shift register using 7473/7476 | | | | | |
| TOTAL HOURS:72 | | | | | |
| Books for Study: | | | | | |
| 1.Practical Physics and Electronics, C.C. Ouseph, U.J. Rao. Vijayendran, S. Vishwanathan Publishers Pvt Ltd. (2011) | | | | | |




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Expected Course Outcomes:**STUDENTS WILL BE ABLE TO**

CO1: Learn the basis of Electronics and working of electronic circuits

CO2: Gain practical knowledge by applying the experimental methods to correlate with the physics theory.

CO3: Learn the basic and universal logic gates

CO4: Apply the analytical technique and graphical analysis to the experimental data

CO5: Use the different measuring devices and meters to record the data with precision

Course Code
616UPHP02**Course Title**
Practical IX

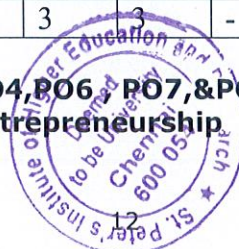
| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Learn the basis of Electronics and working of electronic circuits | K2 |
| CO2 | Gain practical knowledge by applying the experimental methods to correlate with the physics theory | K5 |
| CO3 | Learn the basic and universal logic gates | K3 |
| CO 4 | Apply the analytical technique and graphical analysis to the experimental data | K3 |
| CO5 | Use the different measuring devices and meters to record the data with precision | K1 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO4, PO6, PO7, & PO8, this subject is considered for employability & skill development & Entrepreneurship.

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| Course Code | Course Title | L | T | P | C |
|--|--------------|---|---|---|---|
| 616UPHP03 | Practical X | 0 | 0 | 5 | 2 |
| Prerequisites :Nil | | | | | |
| COURSE OBJECTIVES | | | | | |
| <ul style="list-style-type: none"> ▪ To study the basics of Inverting Amplifier. ▪ To gain practical knowledge by applying the experimental methods to correlate with the physics theory. ▪ To gain insight on how to apply the analytical technique and graphical analysis to the experimental data | | | | | |
| List of Experiments (Any Seven Experiments) | | | | | |
| <ol style="list-style-type: none"> 1. Op amp 741 - Inverting , Non - Inverting amplifier, unity follower. 2. Op amp 741 - Summing and difference amplifier 3. Op amp 741 – Differentiator, integrator 4. OP amp 741 – Solving simultaneous equations 5. Op amp 741 – Wein’s Bridge oscillator 6. Op amp 741 - Phase Shift oscillator 7.555 - Timer - Schmitt Trigger 8.555 - Timer - Astable operation 9.555 - Timer - Monostable 10. D/A Converter – 4 bit, binary weighted resistor method | | | | | |
| TOTAL HOURS:72 | | | | | |
| Books for Study: | | | | | |
| <ol style="list-style-type: none"> 1.Practical Physics by D.Chattopadhyay, P.C.Rakshit, New Central Book Agency (p) Ltd. Kolkata (2007). 2. Practical Physic sand Electronics by C.C.Ouseph, U.J.RaoandVijayendran,S. Viswanathan(Printers&Publishers)Pvt.,Ltd(2007).PracticalP hysicsbyCLArora,S.Chand&Co.,NewDelhi(2008) | | | | | |




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Expected Course Outcomes:**STUDENTS WILL BE ABLE TO**

CO1: Learn the basis of Electronics using OP-AMP

CO2: Gain practical knowledge by applying the experimental methods to correlate with the physics theory.

CO3: Learn the basic 555 timer

CO4: Apply the analytical technique and graphical analysis to the experimental data

CO5: Use the different measuring devices and meters to record the data with precision

Course Code**Course Title****616UPHP03****Practical X**

| CO No. | Course Outcome | RB T |
|--------|--|---------|
| CO1 | Learn the basis of Electronics using OP-AMP | K2 |
| CO2 | Gain practical knowledge by applying the experimental methods to correlate with the physics theory | K5 |
| CO3 | Learn the basic 555 timer | K3 |
| CO 4 | Apply the analytical technique and graphical analysis to the experimental data | K3 |
| CO5 | Use the different measuring devices and meters to record the data with precision | K1 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO2 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO3 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO4 | 3 | 2 | 3 | 3 | - | - | 2 |
| CO5 | 3 | 2 | 3 | 3 | - | - | 2 |
| AVG | 3 | 2 | 3 | 3 | - | - | 2 |

Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability & skill development & Entrepreneurship

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Elective II & III

| Course Code | Course Title | L T P C |
|---|-----------------------------|---------------|
| 616UPHT06 | Microprocessor Fundamentals | 5 0 0 4 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ To provide knowledge of architecture of Microprocessor and Interfacing Devices ▪ To have an insight on the Programming Techniques ▪ To study the interfacing memory of 8085 ▪ To gain knowledge on the interrupts of 8085 | | |
| Unit 1 : Architecture | | 15 hrs |
| Architecture of 8085 – registers, flags, ALU, address and data bus, demultiplexing address/data bus – control and status signals – control bus, Programmer’s model of 8085 – Pin out diagram – Functions of different pins. | | |
| Unit 2 : Programming Techniques | | 15 hrs |
| Instruction set of 8085 – data transfer, arithmetic, logic, branching and machine control group of instructions – addressing modes – register indirect, direct, immediate and implied addressing modes. Assembly language & machine language – programming techniques: addition, subtraction, multiplication, division, ascending, descending order, largest and smallest (single byte) | | |
| UNIT 3 : Interfacing memory to 8085 | | 15 hrs |
| Memory interfacing – Interfacing 2kx8 ROM and RAM, Timing diagram of 8085 (MOV Rd, Rs – MVI Rd,data(8)) . | | |
| Unit 4 : Interfacing I/O Ports to 8085 | | 15 hrs |
| Interfacing input port and output port to 8085 – Programmable peripheral interface 8255 – flashing LEDs. | | |
| Unit 5 : Interrupts | | 12 hrs |
| Interrupts in 8085 - hardware and software interrupts – RIM, SIM instructions – priorities-simple polled and interrupt controlled data transfer. | | |
| TOTAL HOURS :72 | | |
| Books for Study: | | |
| 1.Microprocessor Architecture programming and application with 8085 / 8080A. R.S.Gaonkar, Wiley Eastern Ltd.(2019). | | |
| 2.Fundamental of microprocessor 8085 by V. Vijayendran, S.Viswanathan Publishers, Chennai(2003) | | |
| 3.Fundamentals of Microprocessors and microcomputers by B.Ram - Dhanpat RAI publication | | |



Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

CO1: Gain knowledge on the architecture of Microprocessor and Interfacing Devices.

CO2: Instructing the programming techniques in machine language.

CO3: Write programs using the basics of 8085.

CO4: Understand the interfacing memory of 8085.

CO5: Gain knowledge on the interrupts of 8085

Course Code

6T6UP1T06

Course Title**Microprocessor Fundamentals**

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Gain knowledge on the architecture of Microprocessor and Interfacing Devices | K1 |
| CO2 | Instructing the programming techniques in machine language. | K5 |
| CO3 | Write programs using the basics of 8085 | K5 |
| CO 4 | Understand the interfacing memory of 8085 | K2 |
| CO5 | Gain knowledge on the interrupts of 8085 | K1 |

CO –PO MATRICES:

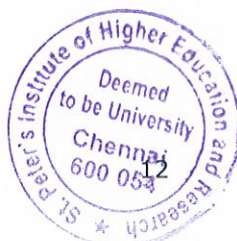
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|------------|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 2 | 2 | - | - | 1 |
| CO2 | 3 | 2 | 2 | 2 | - | - | 1 |
| CO3 | 3 | 2 | 2 | 2 | - | - | 1 |
| CO4 | 3 | 2 | 2 | 2 | - | - | 1 |
| CO5 | 3 | 2 | 2 | 2 | - | - | 1 |
| AVG | 3 | 2 | 2 | 2 | - | - | 1 |

Since it is mapped with PO7, PO8 this subject is considered for employability & skill development


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| Course Code | Course Title | L | T | P | C |
|---|------------------------|---|---|---|------------------------|
| 616UPHT07 | Integrated Electronics | 5 | 0 | 0 | 4 |
| Prerequisites :Nil | | | | | |
| COURSE OBJECTIVES | | | | | |
| <ul style="list-style-type: none"> ▪ To provide knowledge of Interfacing Electronics circuits and its applications. ▪ To understand the Structural analysis about the e component. ▪ To acquire Knowledge about ICs, resistance, inductor and capacitor. | | | | | |
| Unit I Fundamental Digital Electronics | | | | | 15hrs |
| Number systems – binary – hexadecimal – Binary addition – subtraction (1's and 2's compliment method) – multiplication - division - BCD – Conversion – simplification of logic circuits - using (i) Boolean algebra, (ii) Karnaugh map – Demorgan's theorems - NAND and NOR as universal building blocks. | | | | | |
| Unit II Combinational Logic Circuits | | | | | 15hrs |
| Half adder, full adder, half subtractor and full subtractor – 4 bit adder/subtractor - decoder, encoder - multiplexer - demultiplexer | | | | | |
| Unit III Sequential Logic Circuits | | | | | 15hrs |
| R.S flip flop, D flip flop and JK flip flops - JK Master Slave flip flop - synchronous and ripple counters - BCD counter – Up/Down counters - shift registers - serial and parallel registers - ring and twisted ring counter. | | | | | |
| Unit IV OP-AMP Basic Applications | | | | | 15hrs |
| Characteristics parameters – differential gain – CMRR – Slew rate – bandwidth - applications – inverter, non-inverter, integrator, differentiator, summing, difference and averaging amplifier - solving simultaneous equations - comparator - square wave generator - Wien's bridge oscillator - Schmitt trigger | | | | | |
| Unit V Timer, DAC/ADC | | | | | 12hrs |
| Timer 555 - Internal block diagram and working - astable multivibrator - schmitt trigger. D/A converter - binary weighted method - A/D converter - successive approximation method. | | | | | |
| | | | | | TOTAL HOURS :72 |
| Books for Study | | | | | |
| 1.Digital Principles and Application by Malvino Leach, Tata McGraw Hill, 4th Edition(1992). | | | | | |
| 2.Digital Fundamentals by Thomas L. Floyd, Universal Book Stall, New Delhi(1998). | | | | | |
| 3.Introduction to Integrated Electronics by V.Vijayendran, S. Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai(2005). | | | | | |
| OP - AMPs and Linear Integrated Circuits by Ramakant A. Gayakwad, Prentice Hall of India(1994). | | | | | |



COURSE OUTCOMES

Upon completion of this course students will be able to:

CO1: Acquire basic knowledge of Interfacing Electronics devices

CO2: To understand the Structural analysis about the component

CO3: To acquire Knowledge about ICs, resistance, inductor and capacitor.

CO4: Learn about the basis application of OP-AMP

CO5: Gaining knowledge of DAC/ADC converter

Course Code
616UPHT07

Course Title
Integrated Electronics

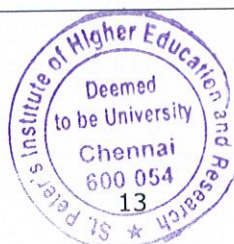
| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Acquire basic knowledge of Interfacing Electronics devices | K3 |
| CO2 | To understand the Structural analysis about the component | K2 |
| CO3 | To acquire Knowledge about ICs, resistance, inductor and capacitor. | K3 |
| CO4 | Learn about the basis application of OP-AMP | |
| CO5 | Gaining knowledge of DAC/ADC converter | |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 1 | 1 | 3 | - | 1 |
| CO2 | 3 | 2 | 1 | 1 | 3 | - | 1 |
| CO3 | 3 | 2 | 1 | 1 | 3 | - | 1 |
| CO4 | 3 | 2 | 1 | 1 | 3 | - | 1 |
| CO5 | 3 | 2 | 1 | 1 | 3 | - | 1 |
| AVG | 3 | 2 | 1 | 1 | 3 | - | 1 |

Since it is mapped with PO7, PO8 this subject is considered for employability & skill development

| Course Code | Course Title | L T P C |
|---|----------------|---------------|
| 616UPHT06 | Energy Physics | 5 1 0 4 |
| Prerequisites : Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ To have an insight on the various renewable energy resources available at a location and assessment of its potential, using tools and techniques ▪ To learn the Solar energy radiation, its interactions, measurement and estimation ▪ To acquire knowledge in Geothermal, wave, tidal resources and site selection | | |
| Unit I Introduction to energy sources: | | 15hrs |
| Energy sources and their availability – prospects of renewable energy sources. | | |
| Solar radiation and its measurements: Solar constant – solar radiation at the Earth's surface – solar radiation Geometry – solar radiation measurements – solar radiation data – estimation of average solar radiation – solar radiation of tilted surfaces. | | |
| Unit II Solar cells: | | 15hrs |
| Solar cells for direct conversion of solar energy to electric powers – Solar cell parameter – Solar cell electrical characteristics – Efficiency – Single crystal silicon solar cells – Polycrystalline silicon solar cells – cadmium sulphide solar cells. | | |
| Unit III Applications of solar energy: | | 15 hrs |
| Solar water heating – space heating and space cooling – solar photo voltaics – agricultural and industrial process heat – solar distillation – solar pumping – solar furnace – solar cooking – solar green house. | | |
| Unit IV Wind Energy: | | 15 hrs |
| Base principles of wind energy conversion wind data and energy estimation – Base components of wind energy conversion systems (WECS) types of wind machines – Generating systems – schemes for electric generation – generator control – load control–applications of wind energy. | | |
| Unit V Energy from Biomass: | | 12 hrs |
| Biomass conversion Technologies – wet and Dry process – Photosynthesis. | | |
| Biogas generation: Introduction – basic process and energetic – Advantages of anaerobic digestion – factors affecting bio digestion and generation of gas. | | |
| Classification of Biogas plants: Continuous and batch type – the done and drum types of Bio gas plants – biogas from wastes fuel properties of biogas utilization of biogas. | | |
| TOTAL HOURS:72 | | |
| Books for study and Reference | | |
| 1.Kreith and Kreider, Principles of solar Engineering, 2nd Edition, 2008, Mc Graw Hill Pub., | | |
| 2.A.B.Meinel and A.P.Meinel, Applied Solar Energy, 1976, Addison Wesley Education Publishers, India. | | |
| 3.M.P.Agarwal, Solar Energy, S.Chand & Co., 1983. | | |
| 4.S.P.Sukhatme, Solar Energy, Tata McGraw Hill Publications, 1984. | | |
| G.D.Rai, Non-conventional Energy sources, Khauna Publications, Delhi, 2004. | | |



Expected Course Outcomes:

At the end of the course, the students will be able to

CO1: Learn the various renewable energy resources available at a location and assessment of its potential, using tools and techniques.

CO2: Understand the concepts of solar photovoltaic (SPV).

CO3: Know photo thermal application of solar energy

CO4: Understand the principles of wind energy

CO5: Learn the various energy from Biomass.

Course Code
616UPHT06

Course Title
Energy Physics

| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Learn the various renewable energy resources available at a location and assessment of its potential, using tools and techniques. | K1 |
| CO2 | Understand the concepts of solar photovoltaic (SPV). | K2 |
| CO3 | Know photo thermal application of solar energy | K1 |
| CO4 | Understand the principles of wind energy | K2 |
| CO5 | Learn the various energy from Biomass | K1 |

CO -PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | - | - | - | 3 | 3 |
| CO2 | 3 | 2 | - | - | - | 3 | 3 |
| CO3 | 3 | 2 | - | - | - | 3 | 3 |
| CO4 | 3 | 2 | - | - | - | 3 | 3 |
| CO5 | 3 | 2 | - | - | - | 3 | 3 |
| AVG | 3 | 2 | - | - | - | 3 | 3 |

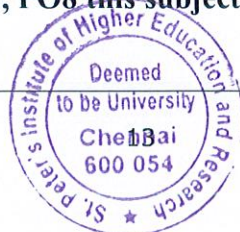
Since it is mapped with PO7, PO8 this subject is considered for employability & skill development



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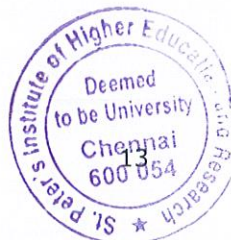
| Course Code 616UEAT01 | Course Title Extension Activity | L T P C 0 0 0 1 | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---------------------------|--------------------|---------------------|------|-----------|---|------|------|--|------------|---|---|---|---|---|---|---|------------|---|---|---|---|---|---|---|
| Prerequisites :Nil | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COURSE OBJECTIVES | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> ▪ To enrol for NSS /NCC/ NSO (Sports & Games) Rotract/ Youth Red cross or any other service organizations ▪ To go for Literacy and population Education Field Work shall be compulsory components in the above extension service activities. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>All the Students shall have to enrol for NSS /NCC/ NSO (Sports & Games) Rotract/ Youth Red cross or any other service organizations in the college and shall have to put in Complusory minimum attendance of 40 hours which shall be duly certified by the Principal of the college before 31st March in a year. If a student LACKS 40 HOURS ATTENDANCE in the First year, he/she shall have to compensate the same during the subsequent years.</p> <p>Students those who complete minimum attendance of 40 hours in One year will get HALF A CREDIT and those who complete the attendance of 80 or more hours in Two Years will ONE CREDIT.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COURSE OUTCOMES | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Upon completion of this course students will be able to:</p> <p>CO1: To enrol for NSS /NCC/ NSO (Sports & Games) Rotract/ Youth Red cross or any other service organizations s</p> <p>CO2: To go for Literacy and population Education Field Work shall be compulsory components in the above extension service activities.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table style="width:100%; border: none;"> <tr> <td style="width:33%;">Course Code</td> <td style="width:33%;">Course Title</td> <td style="width:33%;"></td> </tr> <tr> <td style="text-align: center;">616UEAT01</td> <td style="text-align: center;">Extension Activity</td> <td></td> </tr> </table> | | | Course Code | Course Title | | 616UEAT01 | Extension Activity | | | | | | | | | | | | | | | | | | | |
| Course Code | Course Title | | | | | | | | | | | | | | | | | | | | | | | | | |
| 616UEAT01 | Extension Activity | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">CO No.</th> <th style="width:70%;">Course Outcome</th> <th style="width:20%;">RB T</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">CO1</td> <td>Learn the various renewable energy resources available at a location and assessment of its potential, using tools and techniques.</td> <td style="text-align: center;">K1</td> </tr> <tr> <td style="text-align: center;">CO2</td> <td>Understand the concepts of solar photovoltaic (SPV).</td> <td style="text-align: center;">K2</td> </tr> </tbody> </table> | | | CO No. | Course Outcome | RB T | CO1 | Learn the various renewable energy resources available at a location and assessment of its potential, using tools and techniques. | K1 | CO2 | Understand the concepts of solar photovoltaic (SPV). | K2 | | | | | | | | | | | | | | | |
| CO No. | Course Outcome | RB T | | | | | | | | | | | | | | | | | | | | | | | | |
| CO1 | Learn the various renewable energy resources available at a location and assessment of its potential, using tools and techniques. | K1 | | | | | | | | | | | | | | | | | | | | | | | | |
| CO2 | Understand the concepts of solar photovoltaic (SPV). | K2 | | | | | | | | | | | | | | | | | | | | | | | | |
| CO –PO MATRICES: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;"></th> <th style="width:10%;">PO 1</th> <th style="width:10%;">PO 2</th> <th style="width:10%;">PO 3</th> <th style="width:10%;">PO 4</th> <th style="width:10%;">PO 5</th> <th style="width:10%;">PO 6</th> <th style="width:10%;">PO7</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">CO1</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td style="text-align: center;">3</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">CO2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td style="text-align: center;">3</td> <td style="text-align: center;">3</td> </tr> </tbody> </table> | | | | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 | CO1 | 3 | 2 | - | - | - | 3 | 3 | CO2 | 3 | 2 | - | - | - | 3 | 3 |
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 | | | | | | | | | | | | | | | | | | | |
| CO1 | 3 | 2 | - | - | - | 3 | 3 | | | | | | | | | | | | | | | | | | | |
| CO2 | 3 | 2 | - | - | - | 3 | 3 | | | | | | | | | | | | | | | | | | | |
| <p>Since it is mapped with PO7, PO8 this subject is considered for employability & skill development</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |



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INTER-DISCIPLINARY COURSE

| Course Code | Course Title | L T P C |
|---|---------------------------------------|----------------|
| 616UEAT01 | Non Destructive testing and Materials | 5 0 0 4 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ To study and understand the various Non Destructive Evaluation ▪ To explore the Testing methods, theory and their industrial applications | | |
| UNIT I OVERVIEW OF NDT NDT: | | 10hrs |
| Versus Mechanical testing, Overview of the Non Destructive Testing Methods for the detection of manufacturing defects as well as material characterisation. Relative merits and limitations, Various physical characteristics of materials and their applications in NDT., Visual inspection – Unaided and aided. | | |
| UNIT II SURFACE NDE METHODS: | | 12hrs |
| Liquid Penetrant Testing - Principles, types and properties of liquid penetrants, developers, advantages and limitations of various methods, Testing Procedure, Interpretation of results. Magnetic Particle Testing- Theory of magnetism, inspection materials Magnetisation methods, Interpretation and evaluation of test indications, Principles and methods of demagnetization, Residual magnetism. | | |
| UNIT III THERMOGRAPHY AND EDDY CURRENT TESTING (ET): | | 10hr |
| Thermography- Principles, Contact and non contact inspection methods, Techniques for applying liquid crystals, Advantages and limitation - infrared radiation and infrared detectors, Instrumentations and methods, applications. Eddy Current Testing- Generation of eddy currents, Properties of eddy currents, Eddy current sensing elements, Probes, Instrumentation, Types of arrangement, Applications, advantages, Limitations, Interpretation/Evaluation. | | |
| UNIT IV ULTRASONIC TESTING (UT) & ACOUSTIC EMISSION (AE): | | 12 hrs |
| Ultrasonic Testing-Principle, Transducers, transmission and pulse-echo method, straight beam and angle beam, instrumentation, data representation, A/Scan, B-scan, C-scan. Phased Array Ultrasound, Time of Flight Diffraction. Acoustic Emission Technique –Principle, AE parameters, Applications | | |
| UNIT V RADIOGRAPHY (RT): | | 10hrs |
| Principle, interaction of X-Ray with matter, imaging, film and film less techniques, types and use of filters and screens, geometric factors, Inverse square, law, characteristics of films - graininess, density, speed, contrast, characteristic curves, Penetrameters, Exposure charts, Radiographic equivalence. Fluoroscopy- Xero-Radiography, Computed Radiography, Computed Tomography | | |
| TOTAL HOURS 54 | | |
| Books For Study: | | |
| 1. Baldev Raj, T.Jayakumar, M.Thavasimuthu “Practical Non-Destructive Testing”, Narosa Publishing House, 2009. | | |
| 2. Ravi Prakash, “Non-Destructive Testing Techniques”, 1st revised edition, New Age International Publishers, 2010 | | |



Expected Course Outcomes:**STUDENTS WILL BE ABLE TO**

CO1: Use the various Non-Destructive Testing and Testing methods

CO2: Understand for defects and characterization of industrial components and any other service organizations

CO3: Gaining the knowledge of ultrasonics waves and acoustics.

CO4: Learnig about therrmography and eddy currents

CO5: Understand the concept of Radiography.

Course Code
616UEAT01**Course Title**
Non Destructive testing and Materials

| CO No. | Course Outcome | RB T |
|--------|--|------|
| CO1 | Use the various Non-Destructive Testing and Testing methods | K1 |
| CO2 | Understand for defects and characterization of industrial components and any other service organizations | K2 |
| CO3 | Gaining the knowledge of ultrasonics waves and acoustics. | K1 |
| CO4 | Learnig about therrmography and eddy currents | K2 |
| CO5 | Understand the concept of Radiography. | K2 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO3 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO5 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| AVG | 3 | 2 | 1 | 2 | 1 | 1 | 2 |

Since it is mapped with PO4,PO6 , PO7,&PO8, this subject is considered for employability & skill development & Entrepreneurship



| Course Code | Course Title | L T P C |
|--|-----------------------------|--------------|
| 616UEAT01 | Acoustics and Noise control | 5 0 0 4 |
| Prerequisites :Nil | | |
| COURSE OBJECTIVES | | |
| <ul style="list-style-type: none"> ▪ To understand the general classification of the processes by which sound is produced, frequency, wavelength and speed of sound: Doppler effect; ▪ To acquire knowledge on measurement of sound and possible measurement uncertainties; ▪ To explore the frequency analysis and classification of sound, including digital Fourier techniques; ▪ To understand the physical principles underlying the propagation of sound waves in fluids and solids; | | |
| UNIT I Sound: | | 12hrs |
| <p>Concepts of source, pathway and receiver and power and sound power level sound intensity sound intensity level sound pressure, rms and peak values and sound pressure level. addition and averaging of the levels. Relationship between sound pressure and sound intensity at a location in a free field. Equations to predict the sound pressure level (and sound intensity level) due to point, line and plane sources under free field conditions. Façade effect. Source directivity, directivity index, directivity factor. Indices of time-varying sound. Physical principles of the propagation of a travelling compression wave: frequency, wavelength, speed (including effects of temperature). Principle of superposition of waves, interference, beats, standing waves (and standing wave ratio). Principle of active noise control. Doppler effect.</p> | | |
| UNIT II Sound propagation within and between spaces: | | 12hrs |
| <p>Reverberation time, its measurement, prediction and control. Sabine equation. Diffuse sound fields, energy density, room constant, reverberant sound pressure level and its measurement, prediction and control. Sound intensity at the boundary of a diffuse field. Total sound pressure level in an enclosed space due to a directional source. Room radius. Sound transmission through single-leaf, homogeneous partitions; transmission coefficient, sound reduction index, mass law, coincidence effect. Composite (but single-leaf) partitions, effects of holes and gaps and flanking. Level difference, Standardized level difference. Sound transmission between enclosed spaces. Sound transmission between an enclosed space and free field conditions; and vice versa. Impact noise: impact sound pressure level; standardized impact sound pressure level.</p> | | |
| UNIT-III Vibration: | | 15hrs |
| <p>For simple harmonic motion: displacement, velocity, acceleration and their relationships; the relationship between rms and peak values. Displacement level, velocity level, acceleration level; reference quantities Power radiated from a vibrating plate. Equation of motion for the free vibration of a single-degree of freedom mass on a spring., Equation for the natural frequency of a single-degree of freedom mass on a spring. Effect of damping on the motion. Under-, over- and critically-damped oscillations. Equation of motion for the forced vibration of a single-degree of freedom mass on a spring. Response of the system as a function of the forcing frequency, including the effect of damping on the motion. Vibration isolation: transmissibility, resonance, damping. Predicting transmissibility for zero damping</p> | | |
| UNIT-IV Human response to sound and vibration; and psychoacoustics | | 15hrs |
| <p>Human auditory system: Range of audible sound pressure levels and frequencies, infra sound ultra sound. Pitch Loudness: Equal loudness contours and loudness level, Loudness calculations, Masking, Frequency weightings. Hearing disorders: Effects of age, health and noise exposure on hearing acuity. Individual noise susceptibility. Audiometry: Basic procedures of manual and automatic audiometry; audiograms. Assessment of noise dose, hearing protectors and their use. Regulatory issues: Effects</p> | | |

of noise and vibration on humans and human activity. Indices and methods of assessment of noise and vibration exposures.

TOTAL HOURS 54

Books For Study:

1. Fundamentals of Acoustics, 4th Edition Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens, James V. Sanders.
2. Fundamentals of Acoustics, 4th Edition, The Physics of Vibrations and Waves, 6th Edition

Expected Course Outcomes:

STUDENTS WILL BE ABLE TO

- CO1: Describe, quantify, predict, measure and analyse noise and vibration signals
CO2: Describe the physiological and subjective responses of humans exposed to Noise and vibration, quantify the exposure and assess the response
CO3: Apply engineering and other methods for controlling exposure to noise and vibration
CO4: Use legislation, statutory regulations, standards and codes of practice relating to the assessment and control of noise and vibration
CO5: Analyze the concept of human response sound and vibration




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Course Code
616UEAT01

Course Title
Acoustics and Noise control

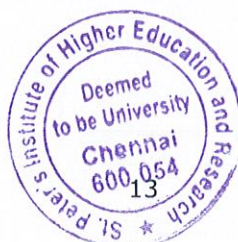
| CO No. | Course Outcome | RB T |
|--------|---|------|
| CO1 | Describe, quantify, predict, measure and analyse noise and vibration signals | K1 |
| CO2 | Describe the physiological and subjective responses of humans exposed to Noise and vibration, quantify the exposure and assess the response | K2 |
| CO3 | Apply engineering and other methods for controlling exposure to noise and vibration | K1 |
| CO4 | Use legislation, statutory regulations, standards and codes of practice relating to the assessment and control of noise and vibration | K2 |
| CO5 | Analyze the concept of human response sound and vibration. | K2 |

CO –PO MATRICES:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO7 |
|-----|------|------|------|------|------|------|-----|
| CO1 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO2 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO3 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO4 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO5 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |
| AVG | 3 | 2 | 1 | 2 | 1 | 1 | 2 |


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