

DEPARTMENT OF PHYSICS

SHIFT I

COURSE HANDOUT

ACADEMIC YEAR – 2021-2022

B.Sc Physics

Preamble

Physics is one of the basic and fundamental sciences. The curriculum for the graduate programme in Physics is revised as per the UGC guidelines on Learning Outcome based Course Framework. The learner- centric courses let the student progressively develop a deeper understanding of various aspects of Physics.

The new curriculum offers courses in the core areas of Mechanics, Acoustics, optics and spectroscopy, Atomic physics etc. The courses will train students with sound theoretical and experimental knowledge that suits the need of academics and industry .In addition to the theoretical course work, students also learn physics laboratory methods for different branches of physics, specialized measurement techniques, analysis of observational data, including error estimation.Students will have deeper understanding of laws of nature through the subjects like classical mechanics, quantum mechanics, statistical physics etc. Students' ability of problem solving will be enhanced. Students can apply principles in physics to real life problems. Subjects like Integrated electronics and Microprocessors will enhance the logical skills as well as employability skills. Numerical methods and Mathematical Physics provide analytical thinking and provides a better platform for higher level physics and research.

The restructured courses with well defined objectives and learning outcomes, provides guidance to prospective students in choosing the elective courses to broaden their skills in the field of physics and interdisciplinary areas.The elective modules of the framework offer students choice to gain knowledge and expertise in specialized domains of Physics like Astrophysics, Medical Physics, etc.

Programme Learning Outcome

Nature and Extent of the Programme

The main objective of science education has evolved to concern the education of future citizens being able to contribute to the growth of global issues. Physics is a unique training that provides a basis of key skills, develops innovative ways of tackling problems, addresses fundamental needs of industry and contributes to economic development.

Physics is the most fundamental of the experimental sciences, as it seeks to explain the universe itself from the very smallest particles—currently accepted as quarks, which may be truly fundamental—to the vast distances between galaxies. Classical physics, built upon the great pillars of Newtonian mechanics, electromagnetism and thermodynamics, went a long way in deepening our understanding of the universe. Maxwell's theory of electromagnetism described the behaviour of electric charge and unified light and electricity, while thermodynamics described the relation between energy transferred due to temperature difference and work and described how all-natural processes increase disorder in the universe. However, experimental discoveries dating from the end of the 19th century eventually led to the demise of the classical picture of the universe as being knowable and predictable. Newtonian mechanics failed when applied to the atom and has been superseded by quantum mechanics and general relativity. However, observations remain essential to the very core of physics. The body of scientific knowledge has grown in size and complexity, and the tools and skills of theoretical and experimental physicists have become so specialized that the students need to be highly proficient in both areas. This is very critical in developing a scientific temperament and urge to innovate, create and discover in Physics.

The Degree Programme in physics course allows students to develop traditional practical skills and techniques and increase their abilities in the use of mathematics, which is the language of physics. It also allows students to develop interpersonal and digital communication skills which are essential in modern scientific endeavour and are important life-enhancing, transferable skills in their own right.

Aim of the Programme:

This Programme enables the students to develop scientific temper, observation skills, problem solving and critical thinking skills. It empowers them with knowledge leading to higher learning in applied sciences. It fosters research attitude among the students and helps them serve for the betterment of the society.

Graduate attributes:

After the completion of B.Sc Physics Programme, students will be able to

- ❖ Acquire a thorough understanding of physical phenomena, identify the principles and basic concepts in physics.
- ❖ Tests the validity of Physical theories in a Scientific Method.
- ❖ Use a methodical approach to compare the implications of a theory with the conclusions drawn from its related experiments.
- ❖ Use Observations to test the validity of a theory in a logical, unbiased and repeatable way.
- ❖ Apply Numerical methods and mathematical approach involved in Physics leading to research.
- ❖ Employ critical thinking and efficient problem solving skills in all the basic areas of Physics

ASSESSMENT NORMS

THEORY:

Internal Exams: CIA I and CIA II	Assignments/Seminars	Model examination	Attendance
CIA I -25 marks CIA II – 25 marks Best of this converted to 10 marks	Important topics are selected and assigned. Five marks is allotted.	Model examination is conducted for 75 marks and is converted to 5 marks.	Attendance is calculated out of 90 working days for each semester. Five marks is allotted.
		Total	25 marks

PRACTICALS:

Experiments completed	Internal marks obtained for each experiment	Model practical examination	Attendance
Number of experiments completed - 15 marks is allotted.	In observation, for each experiment 10 marks are awarded for completed experiment and is converted for 10 .	Best out of two model practical examination each conducted for 60 marks is converted to 10 marks.	Attendance is calculated out of 180 working days for semester. Five marks is allotted.
		Total	40 marks

DEPARTMENT OF PHYSICS

S.No.	NAME	DESIGNATION	DEGREE
1.	Dr. N. Mahalakshmi	Assistant Professor	M.Sc., M.Phil., Ph.D.
2.	Dr. A. Suvitha	Assistant Professor	M.Sc., M.Phil., Ph.D.
3.	Dr. M. Jayanthi	Assistant Professor	M.Sc., M.Phil., Ph.D.
4.	Dr. V. Shreevidhya Suresh	Assistant Professor	M.Sc., M.Phil., Ph.D.
5.	Ms. M. Sheeba Gnana Selvi	Assistant Professor	M.Sc., M.Phil.,
6.	Ms. B. Gayatri	Assistant Professor	M.Sc., M.Phil., SET.

I YEAR
I SEMESTER

**சென்னைப் பல்கலைக்கழகப் பொதுத்தமிழ் (2020 ஆம் ஆண்டு முதல்)
நோக்கும் கற்றல் பயன்பாடும்
அண்ணா ஆதர்ஷ் மகளிர் கல்லூரி, சென்னை
தமிழ்த்துறை
முதலாமாண்டு (2020 -2021)
பொதுத் தமிழ் - முதல் பருவம்**

பாடத்திட்டத்தின் நோக்கம்:

காலந்தோறும் தமிழ் அடைந்துள்ள வளர்ச்சியும் பரந்து விரிந்து கிடக்கும் அதன் ஆழ அகலத்தையும் ஒரு பருந்து பார்வையில் நோக்கும் வகையில் பொதுத்தமிழ் பாடப்பகுதி கட்டமைக்கப்பட்டுள்ளது.

முதல் பருவத்தில் 19 ஆம் நூற்றாண்டு கவிதை முதல் உரைநடை, நாடகம் போன்றவை இடம்பெற்றுள்ளன. தமிழ் மக்களின் வாய்மொழி இலக்கியங்களில் சிலபகுதிகளும் பாடமாக வைக்கப்பட்டுள்ளன. இந்த இலக்கியங்கள் சார்ந்த வரலாற்றுப் பின்புலமும் பாடமாக அமைந்துள்ளன. மொழிப்பயிற்சியும் இடம்பெற்றுள்ளது.

மாணவர்களுக்குப் படிப்பின் ஆர்வத்தைத் தூண்டும் வகையில் கவிதைகள், சிறுகதை, உரைநடை, நாடகம் போன்ற எளிமையான பகுதிகள் அமைக்கப்பட்டுள்ளன. இலக்கிய வாசிப்பின் ஆர்வத்தை ஊக்குவித்தல். தற்கால தமிழ் இலக்கியத்தின் ஆளுமைகளை மாணவர்கள் புரிந்துகொள்ள வைத்தல். தமிழ் இலக்கிய வரலாற்றில் தற்கால படைப்பாளர்களையும் படைப்புகளையும் அறிமுகப்படுத்தித் தமிழ் இலக்கியப் பாரம்பரியத்தைப் புரிய வைத்தல்.

மாணவர்கள் தமிழ் மொழியில் எழுதும் போது பிழையின்றி எழுதுவதற்குரிய இலக்கண விதிமுறைகளைப் புரியவைத்தல். தமிழ் மொழியின் கடினமான சொற்களுக்கூரிய பொருளைத் தெரிந்துகொள்ளும் வகையில் அகராதியைப் பயன்படுத்துவதற்குரிய அடிப்படையைக் கற்றுதருதலே நோக்கமாகும்.

பாடத்திட்டம்

பாடப்பகுப்பு

- I. இலக்கியம்
- II. அதைச் சார்ந்த தமிழிலக்கிய வரலாறு
- III. மொழிப் பயிற்சி

அலகு - I : மரபுக்கவிதை, புதுக்கவிதை

1. பாரதியார் - பாரத சமுதாயம்.
2. பாரதிதாசன் - ஒற்றுமைப்பாட்டு
3. கவிமணி தேசிக விநாயகம் பிள்ளை - உடல் நலம் பேணல்
4. நாமக்கல் கவிஞர் வெ. இராமலிங்கம்பிள்ளை - தமிழன் இதயம்
5. கவிஞர் கண்ணதாசன் - குடும்பம் ஒரு கதம்பம்
6. பட்டுக்கோட்டை அ. கல்யாண சுந்தரம் - வருங்காலம் உண்டு
7. தமிழ் ஒளி - வழிப்பயணம்

புதுக்கவிதை

1. கவிஞர் ந. பிச்சமுர்த்தி - காதல்
2. கவிஞர் அப்துல் ரகுமான் - பித்தன்
3. கவிஞர் மு.மேத்தா - காதலர் பாதை, ஒரு கடிதம் அனாதையாகிவிட்டது, நிழல்கள்
4. கவிஞர் இன்குலாப் - ஒவ்வொரு புல்லையும் பெயர் சொல்லி அழைப்பேன்
5. கவிஞர் தமிழன்பன் - சொல்லில் உயர்வு தமிழ்ச்சொல்லே
6. கவிஞர் வைரமுத்து - விதைச்சோளம்
7. கவிஞர் அ.சங்கரி - இன்று நான் பெரிய பெண்

அலகு - 2 : நாட்டுப்புற இலக்கியம்

1. ஏற்றப்பாட்டு
2. தெம்மாங்கு
3. அம்பா பாடல்கள்
4. விளையாட்டுப் பாடல்கள்
5. நடவுப் பாடல்கள்

அலகு 3 : சிறுகதைகள்

1. கு.ப.ரா - கனகாம்பரம்
2. கு.அழகிரிசாமி - குமாரபுரம் ஸ்டேஷன்
3. தமிழ்ச்செல்வன் - வெயிலோடு போய்
4. தோப்பில் முகமது மீரான் - வட்டக்கண்ணாடி
5. அம்பை - பிளாஸ்டிக் டப்பாவில் பராசக்தி முதலியோர்

உரைநடை

1.இரா.பி.சேதுப்பிள்ளை - வண்மையும் வறுமையும்

அலகு 4 - நாடகம்

நா.முத்துசாமி - நாற்காலிக்காரர்

அலகு -5 தமிழிலக்கிய வரலாறு

1. மரபுக் கவிதை - இருபதாம் நூற்றாண்டு கவிஞர்கள்
2. புதுக்கவிதை - தோற்றம் - வளர்ச்சி -வரலாறு
3. நாட்டுப்புறப் பாடல்கள், கதைகள், கதைப்பாடல்கள், பழமொழிகள், விடுகதைகள் - வரலாறு
4. சிறுகதை, உரைநடை வரலாறு
5. நாடகம் - வரலாறு

அலகு -6 மொழிப் பயிற்சி -

1. வாக்கிய வகை(தொடர் வாக்கியம், தனி வாக்கியம், கூட்டு வாக்கியம்)
2. இரு வழக்குகள் (பேச்சு, எழுத்து)
3. எழுவாய், பயனிலை, செயப்படுபொருள்
4. ஒருமை, பன்மை மயக்கம்
5. திணை, பால், எண், இட வேறுபாடு
6. நால்வகைச் சொற்கள் (பெயர், வினை, இட, உரி)
7. அகரவரிசைப் படுத்துதல்

கற்றலும் பயன்பாடும்:

தமிழ் மொழியின் சிறப்பையும் தேவையையும் உணர்தல். தமிழ் மொழியின் இலக்கிய வளங்களின் மதிப்பைப் புரிதல். தமிழ் இலக்கிய வாசிப்பின் வழி சமூக விழிப்புணர்வைத் தூண்டுதல். தமிழ் இலக்கிய வளங்களின் வாயிலாகத் தமிழ்ப்பண்பாட்டை அடுத்த தலைமுறைக்குக் கொண்டுசெல்லுதல். தமிழ் இலக்கியங்களின் எளிமையைக் கூறுதல். ஒவ்வொருவருக்கும் மொழிவளத்தின் தேவையை வலியுறுத்துதல். மாணவர்கள் பிழையின்றி எழுத மொழிப்பயிற்சி உதவுகிறது. இப்பாடத்திட்டம் மாணவர்கள் தங்கள் படைப்புகளை உருவாக்குவதற்கும் பயன்படுகிறது. போட்டித்தேர்வுகளை எதிர்கொள்ளுவதற்குரிய வகையில் இலக்கிய வரலாற்றுப்பகுதி மிகுந்த பயனுடையதாய் உள்ளது.

FOUNDATION COURSE IN HINDI

I YEAR – I SEMESTER

PAPER – I - PROSE, FUNCTIONAL HINDI & LETTER WRITING

COURSE OBJECTIVES:

The objectives of the course is to sensitize the students -

1. To the aesthetic and cultural aspects of literary appreciation and analysis.
2. To introduce modern Hindi Prose to the students and to understand the cultural, social and moral values of modern Hindi Prose.
3. To familiarize Official correspondence , General letter correspondence and technical words.
4. To motivate to demonstrate human value in different life situations

UNIT-I

Sabhyata ka Rahasya, Personal Applications, Leave Letters, Government Order, Administrative Terminology Hindi to English (25 Words)

UNIT - II

Mitrata, Letter to the Editor, Opening an A/C, Demi Official Letter, Administrative Terminology English to Hindi (25 Words)

UNIT-III

Yuvavon Se, Application for Withdrawal, Circular, Memo
Administrative Terminology Hindi to English (25 Words)

UNIT-IV

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

UNIT-V

Yougyata aur Vyavasay ka Chunav, Complaints, Ordering for Books, Notification
Official Noting Hindi to English (25 words)

UNIT-VI

Enquiry, Resolution, Notice, Official Noting English to Hindi (25 words)

COURSE OUTCOMES:

1. Understanding the concept and importance of functional Hindi
2. Understanding various forms of functional Hindi and its usage according to its area of application
3. Knowledge about good civilization qualities and culture.
4. Knowledge about the importance of human values.

Communicative English

OBJECTIVES:

To give English language skill practice to students to , enhance their English proficiency.

To expose students to native speakers' spoken language to enable students to recognize native speakers' accent and language usage.

To simulate real life situations in the classroom to practice real English dialogues and speeches to gain English language fluency.

LEARNING OUTCOMES:

The course seeks to develop the students' abilities in grammar, oral skills, reading, writing and study skills.

Students will heighten their awareness of correct usage of English grammar in writing and speaking.

Students will improve their speaking ability in English both in terms of fluency and comprehensibility

Unit I (20 hours)

Listening and Speaking :

Introducing self and others, Listening for specific information, Pronunciation (without phonetic symbols), Essentials of pronunciation , American and British pronunciation

Reading and Writing

Reading short articles – newspaper reports / fact based articles, Skimming and scanning, Diction and tone, Identifying topic sentences, Reading aloud: Reading an article/report, Journal (Diary)
Writing

Study Skills - 1

Using dictionaries, encyclopaedias, thesaurus

Grammar in Context: **Naming and Describing** : Nouns & Pronouns, Adjectives

Unit II (20 hours)

Listening and Speaking

Listening with a Purpose, Effective Listening, Tonal Variation, Listening for Information, Asking for Information, Giving Information

Reading and Writing

Strategies of Reading: Skimming and Scanning, Types of Reading : Extensive and Intensive Reading: Reading a prose passage, Reading a poem, Reading a short story

Paragraphs: Structure and Types:

What is a Paragraph? Paragraph structure, Topic Sentence, Unity, Coherence, Connections between Ideas: Using Transitional words and expressions, Types of Paragraphs

Study Skills II:

Using the Internet as a Resource: Online search, Know the keyword, Refine your search,

Guidelines for using the Resources, e-learning resources of Government of India, Terms to know

Grammar in Context

Involving Action-I: Verbs, Concord

Unit III (16 hours)

Listening and Speaking: Giving and following instructions, Asking for and giving directions, Continuing discussions , with connecting ideas

Reading and writing: Reading feature articles , (from newspapers and magazines), Reading to identify point of view and perspective (opinion pieces, editorials etc.), Descriptive writing – writing a short descriptive essay of two to three paragraphs.

Grammar in Context: Involving Action – II: Verbals - Gerund, Participle, Infinitive Modals.

Unit IV (16 hours)

Listening and Speaking: Giving and responding to opinions

Reading and writing: Note taking, Narrative writing – writing narrative essays of two to three paragraphs

Grammar in Context: **Tense:** Present, Past, Future

Unit V (18 hours)

Listening and Speaking: Participating in a Group Discussion

Reading and writing: Reading diagrammatic information– interpretations maps, graphs and pie charts, Writing short essays using the language of comparison and contrast

Grammar in Context: Voice (showing the relationship between Tense and Voice)

PZ1SA PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES I

OBJECTIVES:

- To develop the language skills of students by offering adequate practice in professional contexts.
- To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
- To focus on developing students' knowledge of domain specific registers and the required language skills.
- To develop strategic competence that will help in efficient communication
- To sharpen students' critical thinking skills and make students culturally aware of the target situation.

LEARNING OUTCOMES:

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

SYLLABUS

UNIT 1: COMMUNICATION

Listening: Listening to audio text and answering questions

- Listening to Instructions

Speaking: Pair work and small group work.

Reading: Comprehension passages –Differentiate between facts and opinion

Writing: Developing a story with pictures.

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 2: DESCRIPTION

Listening: Listening to process description.-Drawing a flow chart.

Speaking: Role play (formal context)

Reading: Skimming/Scanning-

Reading passages on products, equipment and gadgets.

Writing: Process Description –Compare and Contrast

Paragraph-Sentence Definition and Extended definition-

Free Writing.

Vocabulary: Register specific -Incorporated into the LSRW tasks.

UNIT 3: NEGOTIATION STRATEGIES

Listening: Listening to interviews of specialists / Inventors in fields
(Subject specific)

Speaking: Brainstorming. (Mind mapping).

Small group discussions (Subject- Specific)

Reading: Longer Reading text.

Writing: Essay Writing (250 words)

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 4: PRESENTATION SKILLS

Listening: Listening to lectures.

Speaking: Short talks.

Reading: Reading Comprehension passages

Writing: Writing Recommendations

Interpreting Visuals inputs

Vocabulary: Register specific - Incorporated into the LSRW tasks

UNIT 5: CRITICAL THINKING SKILLS

Listening: Listening comprehension- Listening for information.

Speaking: Making presentations (with PPT- practice).

Reading: Comprehension passages –Note making.

Comprehension: Motivational article on Professional
Competence,

Professional Ethics and Life Skills)

Writing: Problem and Solution essay– Creative writing –Summary
writing

Vocabulary: Register specific - Incorporated into the LSRW tasks

Core Paper – I - PROPERTIES OF MATTER AND SOUND

Learning Objectives:

- students will learn and understand the properties of materials
- To understand the acoustic aspects of buildings
- To acquire basic knowledge of oscillation and sound energy

Learning outcomes

- Study the elastic behaviour and identify the materials based on the moduli of elasticity.
- Understand the principles of elasticity through the experimental study of Young Modulus and Rigidity Modulus.
- To know the different methods of producing ultrasonic waves and its applications, the concepts of acoustic comfort and better understanding of the theories used in building acoustics

Lecture: 60 Hours Credits:5

Unit I: ELASTICITY

Hooke's Law – Stress–Strain diagram –Elastic constants –Poisson's ratio – Relation between elastic constants and Poisson's ratio – Work done in stretching and twisting a wire – Twisting couple on a cylinder – Torsional pendulum (with and without masses)

Unit II: BENDING OF BEAMS

Cantilever– Expression for Bending moment – Expression for depression at the loaded end of the cantilever–Oscillations of a cantilever – 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 III : FLUID DYNAMICS

Surface tension:-: Definition – molecular forces– Excess pressure over curved surface – Application to spherical and cylindrical drops and bubbles-Variation of surface tension with temperature —Jaegar's method.

Viscosity:-Definition-Streamline and turbulent motion – Rate of flow of liquid in a capillary tube-Poiseuille's formula –corrections-Terminal velocity and Stoke's formula– Variation of viscosity of a liquid with temperature

Unit IV: WAVES AND OSCILLATIONS

Simple Harmonic Motion – Differential equation of SHM – Graphical representation of SHM – Composition of two S.H.M in a straight line-at right angles-Lissajous's figures-Free, Damped, Forced vibrations - Resonance and Sharpness of resonance.Laws of transverse vibration of strings- Sonometer-Determination of AC frequency using sonometer - Determination of frequency using Melde's apparatus.

Unit V: ACOUSTICS OF BUILDINGS AND ULTRASONICS

Intensity of sound – Decibel – Loudness of sound –Reverberation – Sabine's reverberation formula – Acoustic intensity – Factors affecting the acoustics of Buildings. Ultrasonic waves – production of ultrasonic waves – Piezoelectric crystal method –Magnetostriction effect – Application of ultrasonic wave

ALLIED MATHEMATICS PAPERS FOR OTHER BRANCHES OF B.Sc. DEGREE COURSES

**SYLLABUS
Semester I - Mathematics –I (SM3AA)**

COURSE OBJECTIVES:

1. To enable students to learn basic concepts of Algebra and Numerical methods.
2. To enable students to understand Matrices and Theory of equations.
3. To learn circular, hyperbolic and inverse hyperbolic functions and to understand differential calculus and its applications.

Unit 1

Algebra And Numerical Methods:

Algebra: Summation of series - simple problems.

Numerical Methods: Operators E, Δ, ∇ , 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.

Unit 2

Matrices: 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.

Unit 3

Theory Of Equations: 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-simple problems.

Chapter 3, Section 3.1 to 3.4.1(omit section 3.2.1)

Unit 4

Trigonometry: 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 .

Chapter 6, Section 6.1 to 6.3.

Unit 5

Differential Calculus: 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- Simple problems

Chapter 1, Section 1.1 to 1.3.1 and 1.4.3.

COURSE OUTCOMES:

1. Student gain knowledge to find the summation of series and to solve problems in Numerical methods.
2. Student will be able to find the Eigen values, Eigen vectors, apply Cayley Hamilton theorem to find inverse of a Matrix, Powers of a Matrix and to solve polynomial equations.
3. Student will be able to evaluate circular, Hyperbolic, inverse hyperbolic functions and to find higher derivatives of functions and its applications.

UG – NON-MAJOR ELECTIVE COURSE
OFFERED IN THE DEPARTMENT OF MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021
NME-I: FUNCTIONAL MATHEMATICS-I

SUB. CODE: SM5AA SEM: I YEAR/CLASS: I/ I B.Sc PHYSICS

COURSE OBJECTIVE:

1. To enhance problem solving skills
2. To improve basic mathematical skills
3. To help students prepare for competitive exams.

UNIT I

Ratio and Proportion

UNIT II

Percentages

UNIT III

Profit and Loss,

UNIT IV

Simple Interest and Compound interest

UNIT V

Solutions of Simultaneous equations, Problems on Ages and Numbers.

COURSE OUTCOME:

1. Students learn to solve problems on ratio, percentage.
2. To do problems on profit and loss, simple and compound interest.
3. To solve problems on numbers and problems on age.

Reference:

Quantitative Aptitude- R.S. Agarwal

சென்னைப் பல்கலைக்கழகம்
சிறப்புத்தமிழ் - நோக்கும் கற்றல் பயன்பாடும்
அண்ணா ஆதர்ஷ் மகளிர் கல்லூரி, சென்னை
தமிழ்த்துறை
முதலாமாண்டு (2020 -2021)
சிறப்புத் தமிழ் - முதல்பருவம்

பாடத்திட்டத்தின் நோக்கம் (Objective)

இப்பாடத்திட்டம் பள்ளிகளில் ஒரு சில வகுப்புகளில் தமிழைப் படித்து தமிழ் மொழியை முழுமையாக அறிந்து கொள்ளாத கல்லூரிகளில் பிற மொழி கற்பவர்களுக்காக வடிவமைக்கப்படுகிறது. இங்கு தமிழ் இலக்கியப்பகுதியும், தமிழிலக்கிய வரலாற்றுப்பகுதியும், மொழிப்பயிற்சியும் பாடமாக அமைகிறது. தமிழ் இலக்கிய இன்பத்தை உணரும் நோக்கிலும் இலக்கிய வளத்தை உணரும் நோக்கிலும் பாடத்திட்டம் உள்ளது.

பாடத்திட்டம் (SYLLABUS)

பாடப்பகுப்பு

- I.இலக்கியம்
- II.அதைச் சார்ந்த தமிழிலக்கிய வரலாறு
- III.மொழிப் பயிற்சி

அலகு -1

நாட்டுப் புறப்பாடல்: 1. பஞ்சம். 2. மானம் விடிவதெப்போ?

அலகு -2

புனை கதை: -1."கட்டை விரல்"-சி.என்.அண்ணாதுரை

அலகு -3

புதுக்கவிதை: -1. ஆடிக்காற்றே -சிற்பி, 2. கடமையைச் செய்-மீரா, 3. இழந்தவர்கள்-அப்துல் ரகுமான்

அலகு - 4.

மொழித்திறன்:-1. கலைச்சொல்லாக்கம், 2. பொருந்திய சொல் தருதல், 3. பிழை நீக்கி எழுதுதல்

பாடத்திட்டத்தின் பயன்கள் (Subject Outcome)

இப்பாடத்தைப் படிப்பதால் தமிழ் மொழியின் இலக்கியஇன்பம், சொல் வளம், புது கலைச்சொல் படைத்தல் போன்றவற்றை உணர உதவுகிறது.

சென்னைப் பல்கலைக்கழகம்
அடிப்படைத்தமிழ் - நோக்கும் கற்றல் பயன்பாடும்
அண்ணா ஆதர்ஷ் மகளிர் கல்லூரி, சென்னை
தமிழ்த்துறை
முதலாமாண்டு (2020 -2021)
அடிப்படைத் தமிழ் - முதல் பருவம்

பாடத்திட்டத்தின் நோக்கம் (Objective)

தமிழ்மொழியைப் பேசவும் எழுதவும் படிக்கவும் தெரியாத மாணவர்கள் அடிப்படைத்தமிழ் பாடம் படித்துப் பயன்பெறும் நோக்கில் பாடத்திட்டம் அமைகிறது. அண்டை மாநிலங்களிலிருந்தும் பிற நாடுகளிலிருந்தும் இளங்கலை, இளம் அறிவியல் பட்டம் பெறும் மாணவர்கள் தமிழ் நாட்டின் மாநில மொழியைப் பேசவும் எழுதவும் துணைபுரியும் வகையில் பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது.

இம்மாணவர்கள் முதற்பருவத்தில் தமிழ் மொழியின் எழுத்துக்களை எழுதவும் படிக்கவும் பயிற்சி அளிக்கப்படுகிறது. மேலும் தமிழ் மொழியின் சொல் வகை, தொடரமைப்பு, தமிழில் எண்ணுப்பெயர்கள், உடல் உறுப்புகள், அன்றாட வாழ்விற்குத் தேவையான பொருள்களை அறிந்துகொள்ள வைப்பதே இதன் நோக்கமாகும்.

பாடத்திட்டம் - முதல் பருவம் (SYLLABUS)

அலகு - 1.

எழுத்துகள்

1. உயிர் எழுத்து, ஆய்த எழுத்து, 2. மெய் எழுத்து, 3. உயிர் மெய் எழுத்து

அலகு - 2

சொற்கள்

1. பெயர்ச்சொல், 2. வினை சொல், 3. இடை சொல், 4. உரிச் சொல்

அலகு -3.

தொடரமைப்பு

1. எழுவாய், 2. பயனிலை, 3. செயப்படுப் பொருள்

அலகு -4.

பிழை நீக்கம்

1. ஒற்றுப் பிழை, 2. எழுத்துப் பிழை, 3. தொடர்ப்பிழை,

அலகு - 5

எண்கள், உறவுப் பெயர்கள், வாழ் இடங்களும், பொருள்களும்

அலகு - 6

அறிமுகம்

1. விழாக்கள், 2. இயற்கை, 3. உணவு முறைகள்-சுவை-காய்கள்-பழங்கள் போன்றன.

பாடத்திட்டத்தின் பயன்கள் (Subject Outcome)

இந்தப் பாடத்தினால் வேற்றுப்புல மாணவர்கள் தமிழகத்தில் பாமர மக்களிடமும் தமிழில் பேச முடியும். தமிழ் மொழியிலுள்ள சிறு சிறு படைப்புகளைப் பார்த்து இலக்கிய இன்பம் பெறமுடியும். தமிழகத்திலுள்ள சுற்றுலாத்தலங்களுக்கு வழிகாட்டி இன்றிப்போய் வருதல்.

II YEAR
III SEMESTER

**சென்னைப் பல்கலைக்கழகப் பொதுத்தமிழ்
நோக்கும் கற்றல் பயன்பாடும்
அண்ணா ஆதர்ஷ் மகளிர் கல்லூரி, சென்னை
தமிழ்த்துறை
இரண்டாமாண்டு (2020 -2021)
பொதுத் தமிழ் - மூன்றாம் பருவம்**

பாடத்திட்டத்தின் நோக்கம்

காலந்தோறும் தமிழ் அடைந்துள்ள வளர்ச்சியும் பரந்து விரிந்து கிடக்கும் அதன் ஆழ அகலத்தையும் ஒரு பருந்து பார்வையில் நோக்கும் வகையில் பொதுத்தமிழ் பாடப்பகுதி கட்டமைக்கப்பட்டுள்ளது.

மூன்றாம் பருவத்தில் சைவம், வைணவம் சார்ந்த இலக்கியங்கள் இடம்பெற்றுள்ளன. சோழமன்னின் நீதியை விளக்கும் உரைநடை அமைந்துள்ளது. இந்த இலக்கியங்கள் சார்ந்த வரலாறும் பாடமாக அமைந்துள்ளன. மொழிப்பயிற்சியும் இடம்பெற்றுள்ளது. அறிவியலுக்கும் ஆன்மிகத்துக்கும் அன்றாட வாழ்வியலுக்கும் உள்ள தொடர்பினைப் புரிய வைத்தலே நோக்கமாகும்.

பாடத்திட்டம்

பாடப்பகுப்பு

- I. இலக்கியம்
- II. அதைச் சார்ந்த தமிழிலக்கிய வரலாறு
- III. மொழிப்பயிற்சி

அலகு - 1

அ, தேவாரம் - திருநாவுக்கரசர் (நமச்சிவாயப் பதிகம்)

ஆ, திருவாசகம் - மாணிக்கவாசகர்

(திருவெம்பாவை முதல் 10 செய்யுள்கள்)

இ, நாலாயிரத்திவ்யபிரபந்தம் - ஆண்டாள்

(நாச்சியார் திருமொழி - வாரணம் ஆயிரம் தொடங்கி ... 10 செய்யுள்கள்)

அலகு - 2

கம்பராமாயணம் - கம்பர்

கும்பகருணன் வதைப்படலம்

அலகு - 3

பெரியபுராணம் -சேக்கிழார்

காரைக்கால் அம்மையார் புராணம்

அலகு -4

உரைநடை

மனுமுறைகண்ட வாசகம் - இராமலிங்க அடிகளார்

II அலகு - 5 தமிழிலக்கியவரலாறு

அ, பல்லவர் கால பக்தி இலக்கியங்கள்

ஆ, பிற்காலச் சோழர்கால பேரிலக்கியங்கள்

இ, காப்பிய இலக்கிய வரலாறு

அலகு - 6

மொழிப்பயிற்சி

1. தனியார் நிறுவனத்துக்கு வேலைவாய்ப்பு வேண்டி விண்ணப்பம் எழுதுதல்,

2. ஊராட்சி, பேரூராட்சி, நகராட்சி, மாநகராட்சிக்கு,

அ) தெருக்குழாய் குடிநீர் இணைப்பு வேண்டி

ஆ) வீட்டுக்குக் குடிநீர் இணைப்பு வேண்டி

இ) தெருக்குப்பைகளை அப்புறப்படுத்த வேண்டி

ஈ) கொசுத்தொல்லையை நீக்க மருந்து தெளிக்க வேண்டி

உ) வெறிநாய்களைக் கட்டுப்படுத்த வேண்டி

ஊ) தெருச்சாலைகளைச் செப்பனிட வேண்டி

எ) இரயில் பாதையின் மேல்மேம்பாலம் கட்டவேண்டி விண்ணப்பம் எழுதுதல்.

பாடத்திட்டத்தின் பயன்கள்

இறைபக்தியின் இன்றியமையாமை உணர்த்துதல். சமய சான்றோர்கள் தமிழ் மொழிக்கு ஆற்றியுள்ள பங்களிப்புகள் அறிந்து கொள்ளுதல். நாயன்மார்களும் ஆழ்வார்களும் தங்கள் புலமையினால் பாசுரங்களைப் படைத்ததோடு நில்லாமல் இசையோடு இசைத்துள்ளமையால் இசையின் தொன்மையினை அறிதல். பக்தி இலக்கிய ஓதலின் வழி இறைச்சிந்தனையை மேம்படுத்துதல். மேலும் தமிழ் இலக்கிய வரலாற்றுப்பகுதி போட்டித்தேர்வுக்கு உறுதுணையாக விளங்குதல் ஆகியவையே பயன் ஆகும்.

FOUNDATION COURSE IN HINDI

The objectives of the course is to

1. Describe the beginning stage of Hindi literature in the development of Hindi language.
2. Describe the influence of Mughal dynasty on Indian culture and the poetic skill of Indian poets.
3. Understand the importance of Bhakthikaal in bringing the unity in diversity.

Paper III Ancient Poetry and Introduction to Hindi Literature (Upto ReetiKaal)

UNIT –I

Kabirdas - Saakhi (Dohas from 1 to 10), Literary Trends of Veeragatha Kaal (Aadikaal), Chand Baradai and his Works, Vidhyapathi and his works

UNIT - II

Surdas - Bramargeet Saar, Literary Trends of Bhakthi Kaal, Gyan Margi Shakha, Important Poet : 1. Kabirdas

UNIT - III

Tulasidas – Vinay ke Pad only, Literary Trends of Bhakthi Kaal – Prem Margi Shakha, Literary Trends of Bhakthi Kaal - Ram Bhakthi Shakha, Important Poets – 1. Joyasi and 2. Tulasidas

UNIT - IV

Meera Bai – Pad only, Tiruvalluar (Dharmakaand only), Literary Trends of Bhakthi Kaal – Krishna Bhakthi Shakha, Important Poet – Surdas

UNIT - V

Biharilal (Dohas 1 to 5), Literary Trends of Reethikaal, Important Poet : Bihari and his works, Bhushan and his works and Ghananand and his works

COURSE OUTCOMES:

1. Understanding the role played by the poets of Bhakthi cult in literature and society.
2. Describing the Ram leela and Krishna leela poetry by Thulsidas, Surdas and Meerabai respectively by relating it with philosophy of life.
3. Knowledge about the influence of Rama Bhakthi and Krishna Bhakthi in Indian Religion and literature.

Foundation Course: Paper III-French III

Title of the Paper: Translation, Comprehension and Grammar- I

Objectives

In teaching French we aim to

- provide the learners with a basic knowledge of grammar and gradually give them an insight into the culture and literature of France
- enable them to comprehend the nuances of the language so they are better equipped to express themselves in French
- discover another world , another people , another way of life .
- make them more accepting of people who differ from them

Syllabus :

Grammar components :

- Les pronoms relatifs
- Le passé composé
- L'imparfait
- Le plus-que-parfait
- Le subjonctif
- Le conditionnel
- La comparaison

Texts :

- Les feuilles mortes
- Le vrai père
- Nos études
- Demain des l'aube
- Par une journée d'été
- Une visite inattendue
- L'hiver
- Le librairie

Outcome :

Learners are able

- to comprehend and express themselves well
- to have an interest to look into another world
- to improve communication skills
- to perform well in the University Exams

LZ13B - LANGUAGE THROUGH LITERATURE – I

Subject: Language through Literature - I

Subject Code: LZ13B

Class: II B.Sc.

Semester: ODD (III)

Hours: 60

COURSEOBJECTIVES:

- **To use literature as a medium to teach/learn grammar, reading, spelling, vocabulary, writing mechanics, creative writing and thinking skills**
- **To strengthen contextual understanding of the language through texts relevant to specific disciplines and offer scope for imaginative involvement and self-expression**
- **To stimulate interest in acquiring twentyfirst century skills**
- **To engage in self-assessment activities for self-development**

To help absorb the values, ethics and attitudes of life and culture expressed in literature

SYLLABUS:

THEME	TEXT	ENGLISH LANGUAGE SKILLS
Ethics	1.1 Humanities vs Sciences <i>S. Radhakrishnan</i>	Vocabulary skills <ul style="list-style-type: none"> • Etymology • Etymological derivation of words Grammar skills <ul style="list-style-type: none"> • Tenses • The simple present vs the present continuous tense • The simple past vs present perfect tense
	Worksheet 1.1	

Learning	1.2 Wings of Fire (AnExtract) <i>A.P. J.Abdul Kalam</i>	Vocabulary skills <input type="checkbox"/> One-word substitutes/meanings of expressions
	Worksheet 1.2	Grammar skills <input type="checkbox"/> Combining sentences
Society	1.3 On the Rule of the Road <i>A.G.Gardiner</i>	Vocabulary skills • Some literary devices • Word association
	Worksheet 1.3	Grammar skills • Error identification • Types of questions: Wh-andYes/No

UNIT2:POETRY[12Hours]		
THEME	TEXT	ENGLISHLANGUAGESKILLS
Human Values	2.1 Leisure <i>W.H. Davies</i>	Vocabulary skills • Content words and function words • Compound words
	Worksheet2.1	Grammar skills • Punctuation • Use of punctuation marks • Conversion of sentences ▪ Active and passive voice ▪ Reported speech
Science	2.2 The Secret of the Machines <i>Rudyard Kipling</i>	Vocabulary skills • Commonly confused words • Prefixes and suffixes • Negative prefixes
	Worksheet2.2	

		<p>Grammar skills</p> <ul style="list-style-type: none"> • Conversion of word class
Environment	<p>2.3</p> <p>Water <i>Ralph Waldo Emerson</i></p>	<p>Vocabulary skills</p> <ul style="list-style-type: none"> • Homophones • Homonyms • Homographs
	<p>Worksheet2.3</p>	<p>Grammar skills</p> <ul style="list-style-type: none"> • Gerunds • Participles
Sports	<p>2.4</p> <p>Casey at the Bat <i>Ernest Lawrence Thayer</i></p>	<p>Vocabulary skills</p> <ul style="list-style-type: none"> • Completing words
	<p>Worksheet2.4</p>	<p>Grammar skills</p> <ul style="list-style-type: none"> • Phrasal verbs
Satire	<p>2.5</p> <p>Very Indian Poem in Indian English <i>Nissim Ezekiel</i></p>	<p>Vocabulary skills</p> <ul style="list-style-type: none"> <input type="checkbox"/> Metonymy
	<p>Worksheet2.5</p>	<p>Grammar skills</p> <ul style="list-style-type: none"> <input type="checkbox"/> Integrated grammar activities <input type="checkbox"/> Cloze test

UNIT3: SHORTSTORIES[15Hours]

THEME	TEXT	ENGLISH LANGUAGE SKILLS
Attitude	3.1 Witches'Loaves <i>O.Henry</i>	Pronunciation <ul style="list-style-type: none"> • Tongue twisters • Pronouncing words of foreign origin • Using adictionary to understand pronunciation
	Worksheet3.1	
Fantasy	3.2 The Country of the Blind <i>H.G.Wells</i>	Writing skills <ul style="list-style-type: none"> • Descriptive writing • Narrative writing • Writing long essays
	Worksheet3.2	
Humour	3.3 The Boy Who Broke the Bank <i>Ruskin Bond</i>	Writing skills <ul style="list-style-type: none"> • Converting a story into a play
	Worksheet3.3	
Social Justice	3.4 The Squirrel <i>Ambai</i>	Writing skills <ul style="list-style-type: none"> • Filling forms • Letter writing
	Worksheet3.4	

UNIT4:NON-FICTION[14Hours]		
THEME	TEXT	ENGLISHLANGUAGESKILLS
Artificial Intelligence	4.1 A Land Literature: The Muse in the Machine <i>John Thornhill</i>	Writing skills <ul style="list-style-type: none"> • Writing blogs • Creating vlogs
	Worksheet4.1	
Social Media	4.2 Facebook Is Making Us Miserable <i>Daniel Gulati</i>	Writing skills <ul style="list-style-type: none"> • Writing emails
	Worksheet4.2	
Culture	4.3 One World One Culture <i>Kenneth J. Pakenham, JoMcEntire, JessicaWilliams</i>	Writing skills <ul style="list-style-type: none"> • Résumés • Cover letters • Format of a cover letter Speaking skills <ul style="list-style-type: none"> • Introduction to job interviews
	Worksheet4.3	
Food and Nutrition	4.4 Portion Size is the Trick!!! <i>Ranjani Raman</i>	Writing skills <ul style="list-style-type: none"> • Argumentative essays
	Worksheet4.4	

UNIT5: SCENESFROMSHAKESPEARE[14Hours]		
THEME	TEXT	ENGLISHLANGUAGESKILLS
Human Nature	5.1 The Merchant of Venice[ActIV,SceneI;Lines170–419]	Writing skills <ul style="list-style-type: none"> • Recreating a court scene • Role play
	Worksheet5.1	
	5.2 Henry IV Part I[ActII,Scene4]	Writing skills <ul style="list-style-type: none"> • Creating a webpage
Worksheet5.2		
Formative Assessment [5Hours]		Unit-end Assessment Tasks I-V

LEARNINGOUTCOMES:

After completing the course, the students will be able to

- Reveal the extent of enhancement of their vocabulary and use them appropriately to communicate in contexts
- become aware of commonly occurring errors and avoid committing them in language use
- rewrite words and sentences by changing their forms and use them appropriately
- show improvement in their pronunciation
- attempt different kinds of writing – essays, emails, blogs, letters etc
- prepare resumes to face interviews
- convert short stories into plays or skit
- role play the scenes and make a dramatic presentation of the scenes
- create a webpage for themselves and others show their awareness of contemporary issues and themes that are socially relevant by reading texts of different literary genres

SEMESTER - III

CORE PAPER IV

MATHEMATICAL METHODS IN PHYSICS

Course Objective:

To make students understand the important and essential topics under the mathematical methods in physics for solving advanced problems in theoretical physics which is research oriented.

Learning Outcomes :

Upon completion of the course, the student should be able:

- To implement the advanced techniques in mathematical methods and theories on various mathematical and physics problems.
- To develop the skill of problem-solving ability.
- Use Matrices to solve simultaneous equations
- To ease problem solving in quantum mechanicals using special functions and polynomials.
- Apply Fourier series to simple circuits.
- To understand electromagnetic theory with Vector Calculus

Lecture: 60 Hours

Tutorial: 15 Hours

Credits:4

UNIT I: VECTOR CALCULUS (12 Hours)

Scalar and Vector Fields - Gradient of a Scalar function - Divergence of a Vector function - Curl - Line Integral, Surface Integral and Volume Integral (Simple Problems) - Gauss Divergence Theorem - Stoke's

Theorem and Green's Theorem (Statement and Proof)- Spherical Polar Coordinates - Expressions for Gradient, Divergence, Curl and Laplacian Operator in Cartesian and Spherical Polar Coordinates.

UNIT II: SPECIAL FUNCTIONS (12 Hours)

Special Functions - Beta and Gamma Functions - Definitions - Symmetry Property of Beta function - Evaluation of Integrals using Beta function - Transformation of Beta function - Evaluation of Gamma Function - The value of $\Gamma_{1/2}$ - Transformations of Gamma function (Other forms) - Relation between Beta and Gamma functions - Simple Problems in beta and gamma functions - Series Solutions for Bessel, Legendre and Hermite Differential Equations.

UNIT III: MATRICES (12Hours)

Special Types of Matrices - Symmetric and Skew-symmetric Matrices -Hermitian and Skew-Hermitian Matrices - Orthogonal Matrices - Unitary Matrices -Properties - Characteristics Equation - Determination of Eigen values and Eigen vectors - Properties - Statement and Proof of Cayley - Hamilton Theorem - Simple Problems - Inverse of Matrix by CH Theorem - Diagonalization of 2x2 Real Symmetric Matrices.

UNIT IV: COMPLEX VARIABLES (12 Hours)

Basics of Complex Numbers and their Graphical Representation - Euler's Formula, De-Moivre's Theorem - Functions of Complex Variables - Limit, Continuity and Differentiability - Analytic Function - Definition - Cauchy-Riemann Conditions - Examples of Analytic Functions (Analyticity) - Cauchy-Riemann Conditions in Polar Form

UNIT V: FOURIER SERIES (12 Hours)

Fourier Series in the interval $(-\pi$ to $\pi)$ - Definition – Dirichlet's Conditions (Statement Only) - Determination of Fourier Coefficients - Even and Odd Functions and their Fourier expansions. Sine and Cosine Periodic Functions - Simple Problems in Fourier Series in the interval $(-\pi$ to $\pi)$ - Applications of Fourier series - Half Wave Rectifier and Saw Tooth Wave.

ALLIED CHEMISTRY – I (60 Hours) 4 Credits

(For Maths and Physics Students)

Subject Code: TBTAC

LEARNING OBJECTIVES

- Learning fundamentals of organic chemistry such as types of reagents and types of reactions and polar effects
- Learning the basics of physical chemistry such as thermodynamics, kinetics and photochemistry
- Introduction to fundamental concepts of Nuclear Chemistry and application of radioisotopes
- Learning about water technology, day to day applications of fuels, fertilizers and polymers.
-

Unit I: NUCLEAR CHEMISTRY

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 in medicine.

Unit II: INDUSTRIAL CHEMISTRY

Fuels- Classification-gaseous fuels like water gas, producer gas, liquefied petroleum gas, gobar gas, compressed natural gas - Fertilizers- Classification – urea ,Ammoniumsulphate, 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 –definition and determinations of BOD and COD.

Polymers: General method of preparation and properties of the following: PVC, Polyethylene, Teflon, Bakelite, Nylon 6 and Nylon 6, 6.

Unit III: FUNDAMENTALS OF ORGANIC CHEMISTRY

Classification of organic compounds -.Hybridization in methane, ethane, acetylene, benzene - classification of reagents - electrophiles, nucleophiles and free radicals - Classification of reactions- addition, substitution, elimination and polymerisation - Polar Effects - Inductive effect, resonance, hyper-conjugation, steric effect - Keto-enol tautomerism - electrophilic substitution mechanism in benzene (nitration and sulphonation) – Aromaticity – Huckel's rule and application to Benzene, Naphthalene, Anthracene and Phenanthrene.

Unit IV: THERMODYNAMICS

Definition of certain terms - system, surrounding, reversible and irreversible processes - 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 of process in terms of free energy and entropy-Statement of Third Law.

Unit V: CHEMICAL KINETICS AND PHOTOCHEMISTRY

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 reaction rate theory – Homogeneous and Hetrogeneous Catalysis Photochemistry Statement of Grotthus - Draper Law, Stark-Einstein's Law, Quantum Yield.Hydrogen chlorine reaction (elementary idea only) Photosynthesis, Photsensitisation, Phosphorescence Fluorescence, Chemiluminiscence - Definition with examples

BOOKS FOR REFERENCE

1. Gopalan R. and Sundaram S., Allied Chemistry, Sultan Chand & Sons Publishers, New Delhi 2nded.
2. Soni P.L. and Mohan Katyal, Text Book of Inorganic Chemistry, Sultan Chand and Company Pvt. Ltd, New Delhi, 20th ed.
3. Bahl B.S. and AunBahl, A text book of Organic Chemistry 21st ed., S.Chand and Company Pvt. Ltd
4. Puri B.R., Sharma L.R and Pathania M.S, Text book of Physical Chemistry, Vishal Publishing Co., New Delhi, 2010
5. Jainudeen M.D, Text book of Chemical Kinetics and Photochemistry.
6. Dara S.S., Text book of Environmental chemistry and Pollution Control, S.Chand andCo., NewDelhi, 2006
7. Billmayer F.W, Text book of Polimer science, Wiley India Pvt. Ltd., 3rd Edition, 2007
8. Gowrikar V.R, Viswanathan N.V and Sreedhar J, Polimer science, New Age, International publication, New Delhi, Reprint ed. 2005

LEARNING OUTCOMES

- Learnt about basic concepts of organic chemistry and how electron displacement affects reactivity
- Introduced to fundamental concepts of thermodynamics and chemical kinetics
- Introduced to nuclear chemistry concepts and got to know various applications of radioisotopes such as treatment of cancer. Learnt about radiocarbon dating to determine age of natural specimens
- Learnt about purification of water and gained insight into reverse osmosis process. The chapter helped to understand which is the best fuel for domestic and industrial purposes.
- Gained insight into various photophysical processes such as phosphorescence, fluorescence.

**TSSEC - ESSENTIALS OF SPOKEN &
PRESENTATION SKILL - LEVEL I**

Subject: Essentials of Spoken & Presentation Skill - level
I

Subject Code: TSSEC

Class: II B.Sc.

Semester: ODD (III)

Hours: 30

- **LEARNING OBJECTIVES:**

Courses on Soft skills are intended to improve the communication skills enrich personality development, Computing skills, Quantitative aptitude and knowledge of Foreign language of the students. These courses are intended to enhance the employability of the students.

- **SYLLABUS:**

UNIT- I: Communication Skills for effective Business
Presentation:

1. Perfecting oral skills
2. Aural skills
3. Reading skills

UNIT- II: Non Verbal Communication:

1. Cultural codes for effective Business Presentation
2. Business Etiquettes

UNIT- III: Formal and Informal Conversation:

1. Introducing
2. Opening & Closing speeches
3. Inviting
4. Thanking
5. Apologizing
6. Expressing anger
7. Resolving conflict
8. Giving and taking information

UNIT- IV: Etiquettes for Public Speaking

1. Extempore
2. Lectures
3. Interviews
4. Group discussion
5. Telephone conversation
6. Business meetings

UNIT- V: Etiquettes for Business Presentation:

1. Team Presentation

2. Individual presentation

LEARNING OUTCOME:

The courses will help to bridge the gap between the skill requirements of the employer or industry and the competency of the students.

III YEARS

V SEMESTER

ELECTRICITY AND ELECTROMAGNETISM

Course Objective:

To give the students a firm understanding of the basics of Electricity and Magnetism.

To familiarize the fundamentals of electromagnetic theory and applications of electromagnetic Induction

To familiarize the Maxwell's equations and its wide application

Learning Outcomes:

Demonstrate Gauss law, Coulomb's law for the electric field and apply it to systems of point charges as well as line, surface and volume distribution of charges

Understand the principle of capacitors and dielectric properties

Explain Faraday and Lenz's laws to articulate the relation between electric and magnetic fields

Lecture: 60 Hours

Tutorial: 15 Hours

Credits:4

Unit 1 : Chemical Effects of Electric Current:

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 2 : DC Circuits:

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 3: AC Circuits:

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 breakers.

Unit 4 : Magnetic Effect of Electric Current:

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 5 : Electromagnetic Induction and Its Applications:

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

NUCLEAR PHYSICS AND PARTICLE PHYSICS

Course Objective:

To study the basic structure of nucleus and nuclear models
To analyse the radioactivity of nuclear substances and radiation hazard
To introduce the concept of elementary particles.

Learning outcomes:

On completion of the course the students will be able to
Describe the nuclear models
Understand the half life and mean life of radioactive substances and the mechanism of radiation
Appreciate the production of nuclear energy through nuclear fission

Lecture:60 Hours

Tutorial:15 Hours

Credits:4

Unit 1 : General Properties of Nuclei

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

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

Ionisation chamber-G.M.Counter-quenching and resolving time-scintillation counter-photo multiplier tube – thermoluminescence -thermoluminescence dosimetry (TLD) - Linear accelerator-cyclotron-synchrotron, betatron.

Unit 4 : Nuclear Reactions

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.

Unit 5 : Elementary Particles

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

SOLID STATE PHYSICS

Course Objectives:

To understand the fundamental concepts of crystal structure.

To acquire knowledge on the basics of magnetic phenomena on materials and various types of magnetization.

To learn the properties of superconducting materials.

Learning Outcomes:

Helps as pre-requisite for understanding materials science, nano science, etc.

Gives relationship between structure and properties of the solid state systems.

To understand the importance of superconducting materials in engineering applications.

Lecture:60Hours

Tutorial:15Hours

Credits:4

Unit 1 : Crystal Structure

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.

Unit 2 : Defects in Solids

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.

Unit 3: Chemical Bonds and Crystallography

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.

Unit 4 : Dielectric Properties

Dielectric materials - Polarization, susceptibility and dielectric constant - Local field or internal field - Clausius - Mossotti 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.

Unit 5 : Magnetic Properties

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.

BASIC ELECTRONICS

Course Objectives:

To study the characteristics and application of various semiconductor devices.

To study the basics of electronic Instrumentation.

To study the special semiconductor devices

Learning Outcomes:

Handle basic electronic devices like diode and transistor and Construct amplifiers of different specification

Apply Barkhausen criteria to oscillators

Get an idea about Instrumentation

Lectures: 60 Hours

Tutorial: 15 Hours

Credit:4

Unit 1 : Semiconductor

Bandgap - forbidden energy gap - valence and conduction bands, pure semiconductor - Law of mass action, Impurity in semiconductors - energy band diagram and fermi level - PN junction barrier voltage across the junction.

Unit 2 : Transistor Amplifier

Transistor – different modes of operations – CB mode & CE mode - Two port representation of a transistor - h parameter - AC equivalent circuit using h parameters - analysis of an amplifier using h parameters common emitter only - expression for current gain, voltage gain, input impedance, output impedance and power gain - RC coupled amplifier - frequency response - analysis of low, mid and high frequency regions - classification of amplifiers - class A power amplifier – push pull, class B power amplifier - emitter follower.

Unit 3 : Feedback oscillators

Feedback in amplifiers - effect of negative feedback - concept of feedback – Barkhuesen condition - oscillators - phase shift and Wien's bridge oscillators - expression for frequency of oscillation and condition for oscillation in each case.

Unit 4 : Wave shaping circuits and multivibrators

Clipping and clamping circuits - biased clipper - integrating and differentiating circuits - RC time constant - Multivibrators - astable, monostable and bistable multivibrator - using transistors.

Unit 5 : Special semiconductor devices and applications

Field effect transistor (FET) - characteristics - FET amplifier - Unijunction transistor (UJT) - characteristics - saw tooth generator - VVR action - relaxation oscillator - frequency of oscillation - SCR characteristics - SCR as a switch - SCR rectifier.

ELECTIVE 1

NUMERICAL METHODS

Course Objectives:

To study the computational techniques involved in different mathematical manipulation.

Learning Outcomes:

On completion of the course the students will be able to

- Solve simultaneous equations using method of triangularisation
- Find the inverse of a matrix using Gauss Jordan Method
- Solve Algebraic, Transcendental and Differential Equation using different methods
- To fit a curve for the given data using principles of least squares
- Integrate the functions using different rules like Simpsons 1/3 rule

Lecture:60 Hours

Tutorial:15 Hours

Credits:5

Unit 1 : Simultaneous Linear Algebraic Equations

Method of triangularisation - Gauss elimination method - Inverse of a matrix - Gauss - Jordan method

Unit 2 : Numerical Solution of Algebraic, Transcendental and Differential Equation

Bisection method – Regula falsi method - Newton - Raphson method - - Horner's method - Solution of ordinary differential equation - Euler's method.

Unit 3 : Interpolation

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

Principles of least squares - fitting a straight line - linear regression - fitting an exponential curve.

Unit 5 : Numerical Integration

Trapezoidal Rule - Simpson's 1/3 rule and 3/8 rule - Applications - Weddle's rule

Syllabus: Value education

Unit I: 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.

UnitII:

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.

UnitIII:

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.

UnitIV:

Environment and Ecological balance interdependence of all beings living and non-living. The binding of man and nature Environment conservation and enrichment.

UnitV:

Social Evils Corruption, Cyber crime, Terrorism Alcoholism, Drug addiction Dowry Domestic violence untouchability female infanticide atrocities against women-How to tackle them

I YEAR

II SEMESTER

**சென்னைப் பல்கலைக்கழகப் பொதுத்தமிழ் (2020 ஆம் ஆண்டு முதல்)
நோக்கும் கற்றல் பயன்பாடும்
அண்ணா ஆதர்ஷ் மகளிர் கல்லூரி, சென்னை
தமிழ்த்துறை
முதலாமாண்டு (2020 -2021)
பொதுத் தமிழ் - இரண்டாம் பருவம்**

பாடத்திட்டத்தின் நோக்கம்

காலந்தோறும் தமிழ் அடைந்துள்ள வளர்ச்சியும் பரந்து விரிந்து கிடக்கும் அதன் ஆழ அகலத்தையும் ஒரு பருந்து பார்வையில் நோக்கும் வகையில் பொதுத்தமிழ் பாடப்பகுதி கட்டமைக்கப்பட்டுள்ளது.

பழந்தமிழ் இலக்கியங்கள் வழி அறம், பொருள், இன்பம் ஆகியவற்றைப் போதித்தல். பழந்தமிழ் இலக்கியங்களின் பா செறிவையும் சொல் வளங்களையும் உணர வைத்தல். பழந்தமிழ் சொற்களின் அருமையைப் புரியவைத்து மொழி கலப்பின்றிப் பேசுவதன் அவசியத்தை வலியுறுத்தல். பழந்தமிழ் மக்களின் வாழ்வியலை எடுத்துரைத்தல். ஆகியவை இப்பாடத்திட்டத்தின் நோக்கமாகும்.

பாடத்திட்டம்

பாடப்பகுப்பு

- I. இலக்கியம்
- II. அதைச் சார்ந்த தமிழிலக்கிய வரலாறு
- III. மொழிப்பயிற்சி

அலகு 1

1. நற்றிணை - 87, 88
2. குறுந்தொகை - 46, 88, 89
3. கலித்தொகை - II ஆம் பாடல் - “அரிதாய அறன் எய்தி..

அலகு 2

1. அகநானூறு - 86 ஆம் பாடல் (உழுந்து தலைபெய்த)
2. ஐங்குறுநூறு - கிள்ளைப்பத்து
3. பரிபாடல் - செவ்வேள் 5, கடுவன் இளவெயினார் (I முதல் 10 வரிகள் - வெற்றி வேல்)

அலகு 3

1. புறநானூறு - 182, 192

2. பதிற்றுப்பத்து -காக்கைப்பாடியார், நச்செள்ளையார் பாடல் (56, 57)

அலகு 4

1. பத்துப்பாட்டு - முல்லைப்பாட்டு

அலகு 5

1. திருக்குறள் - பொருட்பால் - 3 அதிகாரம் (காலமறிதல், சுற்றந்தழால், கண்ணோட்டம்)

2. நாலடியார் - ஈகை (முதல் 5 பாடல்கள்)

II தமிழிலக்கிய வரலாறு

1. முச்சங்க வரலாறு, பதினெண்மேற்கணக்கு நூல்கள் (எட்டுத்தொகை, பத்துப்பாட்டு)

2. பதினெண்கீழ்க்கணக்கு நூல்கள்

III மொழிப்பயிற்சி

1. இலக்கணக் குறிப்பு (வேற்றுமைத் தொகை, உவமைத் தொகை, பண்புத் தொகை, உம்மைத் தொகை, அன்மொழித் தொகை....வடிவம்) (பத்தியிலிருந்து இலக்கணக் குறிப்புகளைக் கண்டறிதல்)

2. ஒற்று மிகும் மிகா இடங்கள்

3. மரபுத் தொடர்கள் (தமிழ் மரபுத் தொடர்களைக் கண்டறிதல்)

பாடத்திட்டத்தின் பயன்கள்

பழந்தமிழ் இலக்கியங்களின் நுட்பமும் செறிவையும் உணர்தல். சங்க இலக்கியங்களைப் படிப்பதன் வாயிலாக அக்கால மக்களின் அகவுணர்வுகளையும் அக ஒழுக்கங்களையும் பண்பாட்டையும் உணர்ந்து கொள்ளுதல். பழந்தமிழ் இலக்கிய வாசிப்பின் வழி இயற்கையின் உன்னத மகத்துவத்தைப் புரியவைத்தல். தமிழ் இலக்கிய வளங்களின் வாயிலாகத் தமிழ்ப்பண்பாட்டை அடுத்த தலைமுறைக்குக் கொண்டுசெல்லுதல். தமிழ் இலக்கியங்களின் செறிவைக் கூறுதல். ஒவ்வொருவருக்கும் மொழிவளத்தின் தேவையை வலியுறுத்துதல். போன்றவை தலையாய பயன்களாக அமைந்துள்ளன. மேலும், மாணவர்கள் பிழையின்றி எழுத மொழிப்பயிற்சி உதவுகிறது. இப்பாடத்திட்டம் மாணவர்கள் தங்கள் நடிப்பு திறனை வளர்த்துக்கொள்ள பயன்படுகிறது. போட்டித்தேர்வுகளை எதிர்கொள்வதற்குத் தமிழ் இலக்கிய வரலாற்றுப்பகுதி மிகுந்த பயனுடையதாய் அமைகிறது.

HINDI
I YEAR II SEMESTER

COURSE OBJECTIVES:

The objectives of the course is

- 1. To appreciate and analyse the dramatic elements in Hindi literature.**
- 2. To understand the distinct features Hindi short stories and One Act Play.**
- 3. To understand the importance and process of translation and the qualities of translators.**
- 4. To understand the importance of vocabularies.**

PAPER – II – ONE ACT PLAY, SHORT STORY & TRANSLATION

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

1. Laksmi ka Swagat
2. Mithayeewala
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIT-III

1. Basant Ritu ka Natak
2. Seb Aur Dev
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIT-IV

1. Bahut Bada Sawal
2. Vivah ki Teen Kathayen
3. Practice of Annotation Writing
4. Practice of Summary and Literary evaluation Writing

UNIT-V

1. Translation Practice. (English to Hindi)

COURSE OUTCOMES:

- 1. Understand the role of Hindi short stories and One Act Play in the development of the society.**
- 2. Knowledge about the importance of cultural, social and moral responsibility of human beings.**
- 3. Enculcating the habit of book reading to gain knowledge of vocabularies.**
Understanding the importance of art of translation

SEMESTER II - COMMUNICATIVE ENGLISH

LEARNING OBJECTIVES: LEARNING OBJECTIVES:

- To give English language skill practice to students to enhance their English proficiency.
- To expose students to native speakers' spoken language to enable students to recognize native speakers' accent and language usage.
- To simulate real life situations in the classroom to practice real English dialogues and speeches to gain English language fluency.

LEARNING OUTCOMES:

- The course seeks to develop the students' abilities in grammar, oral skills, reading, writing and study skills
- Students will heighten their awareness of correct usage of English grammar in writing and speaking
- Students will improve their speaking ability in English both in terms of fluency and comprehensibility

Unit I

(18 hours)

Listening and Speaking : Listening and responding to complaints (formal situation)

Listening to problems and offering solutions (informal)

Reading and writing: Reading aloud (brief motivational anecdotes), Writing a paragraph on a proverbial expression/motivational idea.

Word Power/Vocabulary: Synonyms & Antonyms

Grammar in Context: Adverbs Prepositions.

Unit II

(20 hours)

Listening and Speaking: Listening to famous speeches and poems, Making short speeches-

Formal: welcome speech and vote of thanks.

Informal occasions- Farewell party, graduation speech

Reading and Writing: Writing opinion pieces (could be on travel, food, film / book reviews or on any contemporary topic)

Reading poetry: Reading aloud: (Intonation and Voice Modulation), Identifying and using figures of speech - simile, metaphor, personification etc.

Word Power : Idioms & Phrases

Grammar in Context Conjunctions and Interjections.

Unit III

(18 hours)

Listening and Speaking :Listening to Ted talks, Making short presentations – Formal presentation with PPT, analytical presentation of graphs and reports of multiple kinds
Interactions during and after the presentations

Reading and writing: Writing emails of complaint, Reading aloud famous speeches

Word Power: One Word Substitution

Grammar in Context: Sentence Patterns.

Unit IV

(16 hours)

Listening and Speaking: Participating in a meeting: face to face and online, Listening with courtesy and adding ideas and giving opinions during the ,meeting and making concluding remarks.

Reading and Writing: Reading visual texts – advertisements, Preparing first drafts of short assignments

Word Power: Denotation and Connotation

Grammar in Context: Sentence Types.

Unit V

Listening and Speaking: Informal interview for feature writing, Listening and responding to questions at a formal interview

Reading and Writing: Writing letters of application, Readers' Theatre (Script Reading),
Dramatizing everyday situations/social issues through skits. (writing scripts and performing)

Word Power: Collocation

Grammar in Context: Working With Clauses.

PZ1SC - PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES

Semester-II

Objectives:

The Professional Communication Skills Course is intended to help Learners in Arts and Science colleges,

Develop their competence in the use of English with particular reference to the workplace situation.

Enhance the creativity of the students, which will enable them to think of innovative ways to solve issues in the workplace.

Develop their competence and competitiveness and thereby improve their employability skills.

Help students with a research bent of mind develop their skills in writing reports and research proposals.

Learning Outcomes:

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

Attend interviews with boldness and confidence.

Adapt easily into the workplace context, having become communicatively competent.

Apply to the Research & Development organisations/ sections in companies and offices with winning proposals.

Syllabus

Unit 1- Communicative Competence

Listening – Listening to two talks/lectures by specialists on selected subject specific topics - (TED Talks) and answering comprehension exercises (inferential questions)

Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions)

Reading: Two subject-based reading texts followed by comprehension activities/exercises

Writing: Summary writing based on the reading passages.

Unit 2 - Persuasive Communication

Listening: listening to a product launch- sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just-A Minute Activities

Reading: reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing- writing an argumentative /persuasive essay.

Unit 3- Digital Competence

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (using video conferencing skills)

Creating Vlogs (How to become a vlogger and use vlogging to nurture interests – subject related)

Reading: Selected sample of Web Page (subject area) Writing: Creating Web Pages

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life.

The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area

Unit 4 - Creativity and Imagination

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. <https://www.youtube.com/watch?v=tpvicScuDy0>)

Speaking: Making oral presentations through short films – subject based Reading : Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based)

- Creating blogs, flyers and brochures (subject based)
- Poster making – writing slogans/captions (subject based)

Unit 5- Workplace Communication & Basics of Academic Writing

Speaking: Short academic presentation using PowerPoint

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting. Writing an introduction, paraphrasing

Punctuation (period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis)

Capitalization (use of upper case).

THERMAL PHYSICS

Course Objective:

Students will understand the various thermo dynamical concepts

Will learn principles and to solve problems.

Will learn the thermodynamical laws and theories of Gases are thought.

Learning Outcome:

Upon completion of the course students will be able to:

Acquire knowledge of Heat and different measurement techniques in calorimetry.

Use thermodynamic terminology correctly

Learn the basic aspects of kinetic theory of gases and the mean free path of molecular collision

Lecture: 60 Hours

Credits:4

UNIT I :KINETIC THEORY OF GASES AND MEAN FREE PATH

Review of results of kinetic theory of gases: (Pressure exerted by gas -rms, average and most probable speed-Equipartition Theorem – Heat capacities) - Distribution of molecular velocities in a perfect gas-Distribution of molecular speeds-Mean free path (Zeroth and First order)

UNIT II: TRANSPORT PHENOMENA AND REAL GASES

Transport phenomena- Viscosity (Zeroth order approximation)- Effects of Temperature and Pressure on viscosity- Thermal Conductivity- Diffusion – Real gases -Deviations from Perfect gas behaviour- Regnault's Experiment – Vander Waals' equation of state – Discussion of Vander Waals' equation – Joule Experiment – Porous Plug experiment – Joule –Thomson Coefficient for Vander Waals' gas

UNIT III: THERMOMETRY AND CALORIMETRY

Platinum resistance thermometer – Callendar 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 – Cp and Cv by Regnault's and Callendar & Barne's methods – Variation of Specific Heat Capacity of Diatomic Gases

UNIT IV: FIRST AND SECOND LAW OF THERMODYNAMICS

Thermodynamic system, surroundings, boundaries-State of system and Thermodynamic variables – Thermodynamic equilibrium- Processes- The Zeroth law and concept of temperature- origin of the first law- Internal energy-Basic thermal, mechanical and diffusive interactions-the first law-applications of first law(heat capacities of gas, adiabatic equation of state and lapse rate)- Enthalpy- Second law –Origin of second law - Heat engines –The Carnot cycle- Carnot cycle as refrigerator –Kelvin, Planck and Clausius statements-Carnot's theorem

UNIT V: ENTROPY AND THERMODYNAMIC RELATIONS

Entropy- Entropy change in reversible processes – Reversible heat transfer- Clausius inequality -Entropy change in irreversible process-the principle of increase of entropy- Joule's expansion-the entropy form of first law- Entropy of an Ideal gas- Entropy of mixing - Unavailable energy: Thermal death of universe - Physical concept of entropy- Maxwell relations- Thermodynamic relations involving heat capacities- TdS equations.

ALLIED MATHEMATICS

SYLLABUS

COURSE OBJECTIVES:

Enable the students to know Integration using Recurrence relation and Fourier series for circular functions.

To understand Differential equations, Laplace transforms and its applications

To know the derivatives in Vector and Vector integration.

Unit 1

Integral Calculus: Bernoulli formula – Reduction formulae $\int_0^{\pi/2} \sin^n x \, dx$, $\int_0^{\pi/2} \cos^n x \, dx$, $\int_0^{\pi/2} \sin^m x \cos^n x \, dx$ (m, n being positive integers), Fourier series for functions in $(0, 2\pi)$, $(-\pi, \pi)$.

Chapter 2: Section 2.7 & 2.9, Chapter 4: Section 4.1.

Unit 2

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 $e^{ax} \cos \beta x$ and $e^{ax} \sin \beta x$ -Related problems only.

Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving Lagrange's linear equation $Pp + Qq = R$.

Chapter 5: Section 5.2.1, Chapter 6: Section 6.1 to 6.4

Unit 3:

Laplace Transforms: Laplace transformations of standard functions and simple properties, inverse Laplace transforms, Application to solution of linear differential equations up to second order- simple problems.

Chapter 7: Section 7.1.1 to 7.1.4 & 7.2 to 7.3

Unit 4:

Vector Differentiation: Introduction, Scalar point functions, Vector point functions, Vector differential operator Gradient, Divergence, Curl, Solenoidal, irrotational, identities.

Chapter 8, Section 8.1 to 8.4.4

Unit 5:

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.

COURSE OUTCOMES:

1. Students will be able to apply reduction formulae to evaluate integrals and to find Fourier series of a given periodic function.
2. Student will be able to solve differential equations and to apply Laplace transform to solve differential and integral equations.
3. To find derivatives of vector functions and to evaluate Line, surface and Volume integrals using Greens, Stokes & Gauss divergence theorem and verifying the same.

Content and treatment as in

Allied Mathematics, Volume I and II, P. Duraipandian and S. Udayabaskaran, S. Chand Publications.

UG – NON-MAJOR ELECTIVE COURSE
OFFERED IN THE DEPARTMENT OF MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021

NME-II: FUNCTIONAL MATHEMATICS-II

SUB. CODE: SM5AB

SEM: II

YEAR/CLASS: I/ I B.Sc PHYSICS

COURSE OBJECTIVE:

1. To enhance problem solving skills
2. To improve basic mathematical skills
3. To help students prepare for competitive exams.

UNIT I

Time and work – Pipes and cisterns- Problem

UNIT II

Time and Distance, Relative speeds- Problems on Races, Boats and Trains.

UNIT III

Mensuration – Problems.

UNIT IV

Polygons – Interior angles- Number of diagonals- Regular Polygons- Problems

UNIT V

Stocks and Shares – Problems

COURSE OUTCOME:

1. Students learn to solve problems on time and work, distance and speed.
2. To do problems on trains, races, pipes and cisterns and mensuration.
3. To solve problems on stocks and shares, polygons.

சென்னைப் பல்கலைக்கழகம்
அடிப்படைத்தமிழ் - நோக்கும் சுற்றல் பயன்பாடும்
அண்ணா ஆதர்ஷ் மகளிர் கல்லூரி, சென்னை
தமிழ்த்துறை
முதலாமாண்டு (2020 -2021)
அடிப்படைத் தமிழ் - இரண்டாம்பருவம்

பாடத்திட்டத்தின் நோக்கம் (Objective)

தமிழ்மொழியைப் பேசவும் எழுதவும் படிக்கவும் தெரியாத மாணவர்கள் அடிப்படைத்தமிழ் பாடம் படித்துப் பயன்பெறும் நோக்கில் பாடத்திட்டம் அமைகிறது. அண்டை மாநிலங்களிலிருந்தும் பிற நாடுகளிலிருந்தும் இளங்கலை, இளம் அறிவியல் பட்டம் பெறும் மாணவர்கள் தமிழ் நாட்டின் மாநில மொழியைப் பேசவும் எழுதவும் துணைபுரியும் வகையில் பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது.

இம்மாணவர்கள் இரண்டாம் பருவத்தில் தமிழ் மொழியிலுள்ள சிறு சிறு இலக்கியப்பகுதிகளைப் படிப்பர். சிறு கதைகள், சுற்றுலாத்தலங்கள், தமிழ் இலக்கியங்களின் வரலாறு ஆகியவற்றைப் புரிந்துகொள்ளும் நோக்கில் பாடத்திட்டம் அமைகிறது.

பாடத்திட்டம் (SYLLABUS)

அலகு -1.

நீதி நூல்கள்

1. ஆத்திச் சூடி(1-12), 2. கொன்றை வேந்தன்(1-8),
3. திருக்குறள்(5)

1. அகர முதல (1), 2. செயற்கரிய (26), 3. மனத்துக்கண் (34), 4. கற்க கசடறக்..... (391), 5. எப்பொருள் (423).

அலகு - 2.

நீதிக் கதைகள்

1. பீர்பால் கதை, 2. பரமார்த்த குரு கதை

அலகு - 3.

அறிமுகம்

அ. தமிழ் இலக்கிய வரலாறு - இலக்கியங்கள் புலவர்கள்

ஆ.தமிழக வரலாறு - வரலாற்றுச்

சின்னங்கள்- சுற்றுலாத்தலங்கள்- அலுவலகப் பெயர்கள்

இ.பழமொழிகள்.

பாடத்திட்டத்தின் பயன்கள் (Subject Outcome)

தமிழ் இலக்கியத்தின் சிறப்பினையும் தமிழ் மொழியின் சிறப்பினையும் மொழிவளத்தையும் அறிந்து கொள்ள உதவுகிறது. தமிழக மக்களின் பண்பாட்டுக்கூறுகளை உணர்ந்து கொள்ளுதல்.

சென்னைப் பல்கலைக்கழகம்
சிறப்புத்தமிழ் - நோக்கும் கற்றல் பயன்பாடும்
அண்ணா ஆதர்ஷ் மகளிர் கல்லூரி, சென்னை
தமிழ்த்துறை

முதலாமாண்டு (2020 -2021)

சிறப்புத் தமிழ் - இரண்டாம்பருவம்

பாடத்திட்டத்தின் நோக்கம் (Objective)

இப்பாடத்திட்டம் பள்ளிகளில் சில வகுப்புகள் வரையில் மட்டுமே தமிழைப் படித்துக் கல்லூரிகளில் பிற மொழி கற்பவர்களுக்காக வடிவமைக்கப்படுகிறது. இங்கு தொடக்க கால செய்யுள் முதல் தற்கால புதுக்கவிதை வரை உள்ள ஒருசில பகுதிகள் அமைந்துள்ளன. அனைத்துக் கால இலக்கியங்களின் தன்மையை உணர்ந்துகொள்ளுதல். தமிழ் இலக்கியப்பகுதியும், தமிழிலக்கிய வரலாற்றுப்பகுதியும், மொழிப்பயிற்சியும் பாடமாக அமைகிறது.

பாடப்பகுப்பு

I.இலக்கியம்

II.அதைச் சார்ந்த தமிழிலக்கிய வரலாறு

III.மொழிப் பயிற்சி

அலகு - 1

கட்டுரை

1. பெண்ணின் பெருமை-திரு.வி.க

அலகு -2.

செய்யுள்

1. புறநானூறு - அ. கெடுகசிந்தை-ஓக்கூர் மாசாத்தியார்,

ஆ. ஈன்று புறந்தருதல் - பொன்முடியார், இ. யாதும் ஊரே -

கனியன்பூங்குன்றனார்

ஈ. திருக்குறள் - வான் சிறப்பு முழுமையும்

உ. சிலப்பதிகாரம் - மங்கல வாழ்த்துப் பாடல்

ஊ. திருவாசகம் - வேண்டத்தக்கது

எ. திருவாய்மொழி - உயர்வற

ஏ. இரட்சண்ய யாத்ரிகம் (சிலுவைப்பாடு)-பாடல்எண்-1,3,4

ஐ. சீறாப்புராணம் - வானவர்க்கும்

ஓ. பாரதியார்- நல்லதோர்வீணை

அலகு -3.

இலக்கிய வரலாறு

பாடம் தழுவிய இலக்கிய வரலாறு

அலகு -4.

மொழிபெயர்ப்பு

ஆங்கிலப் பகுதியைத் தமிழாக்கம் செய்தல்

பாடத்திட்டத்தின் பயன்கள் (Subject Outcome)

தமிழ் மொழி, தமிழ் இலக்கியத்தின் தொன்மையை அறிதல்.

தமிழ் மக்களின் பண்பாட்டைக் கால வாரியாக உணர்ந்து கொள்ளுதல்.

மொழிபெயர்ப்புத்துறையிலும் செயலாற்ற முடியும்

**II YEAR
IV SEMESTER**

**சென்னைப் பல்கலைக்கழகப் பொதுத்தமிழ்
நோக்கும் கற்றல் பயன்பாடும்
அண்ணா ஆதர்ஷ் மகளிர் கல்லூரி, சென்னை
தமிழ்த்துறை
இரண்டாமாண்டு (2020 -2021)
பொதுத் தமிழ் - நான்காம் பருவம்**

பாடத்திட்டத்தின் நோக்கம்

காலந்தோறும் தமிழ் அடைந்துள்ள வளர்ச்சியும் பரந்து விரிந்து கிடக்கும் அதன் ஆழ அகலத்தையும் ஒரு பருந்து பார்வையில் நோக்கும் வகையில் பொதுத்தமிழ் பாடப்பகுதி கட்டமைக்கப்பட்டுள்ளது.

நான்காம் பருவத்தில் சங்க இலக்கியம், நீதி இலக்கியம், இரட்டை காப்பியம் ஆகிய இலக்கியங்கள் இடம்பெற்றுள்ளன. இந்த இலக்கியங்கள் சார்ந்த வரலாறும் பாடமாக அமைந்துள்ளன. மொழிப்பயிற்சியும் இடம்பெற்றுள்ளது. இந்த இலக்கியங்களின் வாயிலாக பழந்தமிழ் மக்களின் சமூக நிலை, பண்பாடு, வீரம் போன்ற செய்திகளை அறிந்துகொள்ளுதல். அன்றைய செய்யுள்களின் யாப்பு கட்டமைப்பினை உணரவைத்தல். பழந்தமிழ் இலக்கியங்களின் செழுமையையும் அறக்கோட்பாடுகளையும் எடுத்துரைத்தல்.

பாடத்திட்டம்

பாடப்பகுப்பு

- I. இலக்கியம்
- II. அதைச் சார்ந்த தமிழிலக்கிய வரலாறு
- III. மொழிப்பயிற்சி

அலகு - I

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 - 2

பத்துப்பாட்டு - நெடுநல்வாடை முழுவதும்

அலகு - 3

சிலப்பதிகாரம் - மனையறம் படுத்த காதை

மணிமேகலை - விழாவறை காதை

அலகு - 4

திருக்குறள்

அறத்துப்பால் - வாழ்க்கைத்துணை நலம், மக்கட்பேறு

பொருட்பால் - கல்வி, கேள்வி

காமத்துப்பால் - குறிப்பறிதல், புணர்ச்சிமகிழ்தல்

அலகு - 5

தமிழ் இலக்கிய வரலாறு

1. சங்க இலக்கிய வரலாறு

2. அற இலக்கிய வரலாறு

அலகு - 6

மொழிப்பயிற்சி

1. ஆங்கிலத்திலிருந்து தமிழுக்கு மொழிபெயர்த்தல்

2. தமிழிலிருந்து ஆங்கிலத்திற்கு மொழி பெயர்த்தல்.

பாடத்திட்டத்தின் பயன்கள்

சங்க இலக்கிய செய்யுள்களின் நுட்பத்தையும் புலமையையும் வலியுறுத்துதல். அக்கால மக்களின் வாழ்க்கை நிலை உணர வைத்தல். பழந்தமிழர்களின் பண்பாட்டை தக்க வைத்துக்கொள்வதின் தேவை. மொழி வளம் பாதுகாப்பின் அவசியம். போட்டித்தேர்வுகளுக்கும் பயன்படும்.

FOUNDATION COURSE IN HINDI
COURSE OBJECTIVES AND COURSE OUTCOMES

COURSE OBJECTIVES:

Gain awareness about the social, cultural and literary situations during the Aadhunic Kaal .

Gain awareness on the importance of literature in addressing contemporary issues such as an environmental concerns, gender issues, social problems, thereby giving effective solution to such problems.

Acquire a comprehensive knowledge of historical, literary and theoretical aspects of Hindi literature, and all the genres of literature leading to the understanding of literary movements from times immemorial.

UNIT -I

1. Asha – (Jayashankar Prasad)
2. Tum Logon se Door (Nagarjun)
3. Literary Trends of Chayavaad

UNIT - II

1. Kavi Aur Kalpana – (Dhramaveer Bhaarathi)
2. Bharat Ki Aarathi - (Shamsher Bahadhur Singh)
3. Literary Trends of Pragathivaad

UNIT - III

1. Varadan Mangoonga Nahi (Siva Mangal Singh Suman)
2. Anevalon Se Ek Savaal (Bharat Bhooshan Agarwal)
3. Literary Trends of Nayee Kavita

UNIT –IV

1. Literary Trends of Hindi Short Stories
2. Literary trends of Hindi One Act Plays

UNIT- V

1. Maithili Saran Gupta, Jayashankar Prasad, Nirala,
2. Mahadevi Varma, Panth, Dinakar, Premchand,
3. Yashpaal Jainendra Kumar, Mohan Rakesh,

COURSE OUTCOMES:

Analysing the development of Khadiboli Hindi

Knowledge about the reason of emergence of Aadhunik Kaal in Hindi Iiterature.

Knowledge about the literary trends of Aadhunik Kaal.

Foundation Course: Paper IV-French IV

Objectives

In teaching French we aim to

- provide the learners with a basic knowledge of grammar and gradually give them an insight into the culture and literature of France
- enable them to comprehend the nuances of the language so they are better equipped to express themselves in French
- discover another world , another people , another way of life .
- make them more accepting of people who differ from them

Syllabus

Grammar components:

- Le passé simple
- Temps du passé - Emplois (le passé composé, l'imparfait, le passé simple, le plus-que-parfait)
- L'expression de la cause
- L'expression de la conséquence
- L'expression du but
- L'expression de la concession
- L'expression de la condition et de l'hypothèse

Outcome :

Learners are able

- to comprehend and express themselves well
- to have an interest to look into another world
- to improve communication skills
- to perform well in the University Exams

LZ14B - LANGUAGE THROUGH LITERATURE –II

Subject: Language through Literature - II

Subject Code: LZ14B

Class: II B.Sc.

Semester: EVEN (IV)

Hours: 60

COURSE OBJECTIVE:

- To use literature as a medium to teach/learn grammar, reading, spelling, vocabulary, writing mechanics, creative writing and thinking skills
- To strengthen contextual understanding of the language through texts relevant to specific disciplines and offer scope for imaginative involvement and self-expression
- To stimulate interest in acquiring twenty first century skills
- To engage in self-assessment activities for self-development

To help absorb the values, ethics and attitudes of life and culture expressed in literature

SYLLABUS:

UNIT 1 : History Makers			
THEME	TEXTS	WRITING SKILLS	
	1.1 My Experience with ALS By Stephen Hawking	➤ Gathering details and information – Brainstorming ➤ Listing events and experiences ➤ Creating Mind Map	

		<ul style="list-style-type: none"> ➤ Pre-Writing, Writing and Rewriting/ Revising 	
	1.2 Vikram Sarabhai	<p>Writing</p> <p>Autobiographical and Memoirs</p> <p>(Writing about one's own personality)</p> <ul style="list-style-type: none"> ➤ Biographical, personalities 	

UNIT 2 : Self Help Essays			
THEME	TEXTS	Writing about Life experiences and events (Writing based on facts)	
	2.1 Attitude by Margaret Atwood	<ul style="list-style-type: none"> ➤ Journal Writing ➤ Social events ➤ Festivals ➤ Sports <ul style="list-style-type: none"> ○ 	
	2.2 Creativity By Edward de Bono.	<ul style="list-style-type: none"> ➤ Travel writing , ➤ Preparing Itineraries ➤ Natural calamities, ➤ Environment 	
UNIT 3 : Contemporary Writings from India			

THEME	TEXTS	Critical / Analytical Writing	
	<p>3.1 The Future of jobs By Amitabh Kant</p>	<ul style="list-style-type: none"> ➤ Reading and analysing Media reports ➤ Social Media Posts and comments 	
	<p>3.2 Education and the English Language By Shashi Tharoor</p>	<ul style="list-style-type: none"> ➤ Film review ➤ Writing opinions ➤ Appraisal 	

Unit 4: Regional Indian Literature in Translation

THEME	TEXTS	ENGLISH LANGUAGE SKILLS Critical / Analytical Writing	
	<p>POETRY</p> <p>4.1 Those who have lost the Nectar by O N V Kurup</p> <p>(Translated from Malayalam by S. Velayudhan)</p>	<ul style="list-style-type: none"> ➤ Translation ➤ Short poems – acrostics etc ➤ Critique/ Culture study 	
	<p>4.2 “Some People Laugh, Some People Cry” by Sri Srinivasa Rao</p> <p>(Translated from Telugu by V. Narayana Rao and A. K. Ramanujam)</p>	<ul style="list-style-type: none"> ➤ Fill in the story , ➤ expanding stories, ➤ rewriting tales ➤ Comic strips and cartoons 	
	<p>4. 3</p> <p>The Rogue by Atulananda Goswami.</p> <p>(Translated from Assamese by the author)</p>		
	<p>SHORT STORY</p>		

	4.4 The Holy Panchayat by Premchand (Translated from Hindi by Reshme Sehgal)		
	4.5 The Card-Sharper's Daughter by V. M. Basheer (Translated from Malayalam by K. M. Sheriff)		
UNIT 5 : Fiction			
THEME	TEXTS	Writing about Life experiences and events (Writing based on facts)	
	The White Tiger By Aravind Adiga Harper Collins Publishers	<ul style="list-style-type: none"> ➤ Creative writing ➤ Critical thinking 	

LEARNING OUTCOMES:

After completing the course, the students will be able to

- Reveal the extent of enhancement of their vocabulary and use them appropriately to communicate in contexts
- become aware of commonly occurring errors and avoid committing them in language use
- rewrite words and sentences by changing their forms and use them appropriately
- show improvement in their pronunciation
- attempt different kinds of writing – essays, emails, blogs, letters etc
- prepare resumes to face interviews
- convert short stories into plays or skit
- role play the scenes and make a dramatic presentation of the scenes
- create a webpage for themselves and others

Show their awareness of contemporary issues and themes that are socially relevant by reading texts of different literary genres

SEMESTER - IV

CORE PAPER V

MECHANICS

Course Objective:

To make the students understand the basic principles of mechanics and enable them to analyze and solve problems

Learning Outcomes:

At the end of the course the student will be able to

- Understand the Newton's law of motion
- Know the motion of a particle in a Gravitational, electric and magnetic fields
- Acquire knowledge on the conservation law
- Gain knowledge on the basics of dynamics of linear and rotational motion.
- Realize the basic principles behind planetary motion
- Understand the space - time concept through relativity

Lecture: 60 Hours

Tutorial: 15 Hours

Credits:4

UNIT I: NEWTON'S LAWS OF MOTION(12 Hours)

Newton's Laws of Motion- Forces and Equations of Motion- Motion of a Particle in a Uniform Gravitational Field- Newtonian law of Universal Gravitation-Examples-Electric and Magnetic Forces on a Charged Particle-The Magnetic Field and Lorentz Force-Examples- Motion of Charged Particle in a Uniform Electric and Magnetic Field-Conservation of Momentum-Contact Forces: Friction- Problems

UNIT II : CONSERVATION LAWS(12 Hours)

Definition of concepts-Conservation of Energy-Work-Kinetic and Potential energy- Examples-Conservative Forces-Potential Energy and Conservation of Energy in Gravitational and Electric field- Examples.

Conservation of Linear and Angular Momentum: Internal forces and Momentum conservation-Center of mass- Examples- General Elastic Collision of Particles of Different Masses- System with Variable Mass-Examples- Conservation of Angular Momentum-Torque due to Internal Forces-Torque due to Gravity- Angular momentum about Center Of Mass- Proton scattering by heavy nucleus.

UNIT III: HARMONIC OSCILLATOR AND INVERSE SQUARE LAW OF FORCE

(12 Hours)

Mass on spring-Simple Pendulum (Force, energy and torque method)-Compound Pendulum-LC circuit- Motion of systems displaced from position of stable equilibrium-Average kinetic energy and potential energy.

Inverse Square Law of Forces and Static Equilibrium- Orbits: Equation and Eccentricity-Circular orbit-Kepler's laws- Examples

UNIT IV: ELEMENTARY RIGID BODY DYNAMICS (12 Hours)

The Equation of Motion-Angular Momentum and Kinetic Energy-Moment of inertia-Parallel Axis Theorem- Perpendicular Axis Theorem- Examples-Rotation about fixed axis: Time Dependence of Motion- Examples- Rolling without slipping (three methods)-Torque about Center of Mass-Examples.

UNIT V: SPECIAL RELATIVITY (12 Hours)

Constancy of Speed of light-Michelson-Morley Experiment-Invariance of 'c' - Basic assumptions- Lorentz Transformation- Length Contraction-Examples- Time Dilation of Moving Clocks-Examples-Velocity Transformation- Velocity Addition-Variation of Mass with Velocity-Aberration of light-Longitudinal Doppler Effect

ALLIED CHEMISTRY – II (60 Hours) 4 Credits

(For Maths and Physics Students)

SUBJECT CODE: TBTAD

LEARNING OBJECTIVES

- Learning basic concepts of electrochemistry
- Learning fundamentals of coordination chemistry as well as application of coordination complexes in qualitative analysis
- Introduction to biomolecules such as carbohydrates and amino acids
- Introduction to analytical techniques

Unit I: COORDINATION CHEMISTRY

Definition of terms - Classification of Ligands - Nomenclature - Chelation - EDTA and its application – Werner's Theory - Effective Atomic Number - Pauling's theory- Postulates – Hybridisation, Geometry and magnetic properties of $[\text{Ni}(\text{CN})_4]^{2-}$, $[\text{NiCl}_4]^{2-}$, $[\text{Fe}(\text{CN})_6]^{4-}$, $[\text{Co}(\text{NH}_3)_6]^{3+}$ and $[\text{CoF}_6]^{3-}$ - Biological Role of haemoglobin and Chlorophyll (elementary idea only) - Applications of coordination compounds in qualitative analysis like separation of copper and cadmium ions; Nickel and cobalt ion; Identification of metal ions like Cu, Fe and Ni.

Unit II: BIOMOLECULES

Classification, preparation and reactions of glucose and fructose. Discussion of open chain structure. Interconversion of glucose to fructose and vice versa - Preparation and properties of sucrose. Structure 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 III: PHASE DIAGRAM

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 IV: ELECTROCHEMISTRY

Galvanic cells – emf - standard electrode potential - reference electrodes (hydrogen and calomel electrode only) -electrochemical series and its applications - Electroplating process - Nickel and Chrome plating - Different type of cells - primary cell, Secondary cell and fuel cells – elementary idea only, Corrosion and methods of prevention, .Conductometric titrations - hydrolysis of salts. Derivation of K_h - Definition of pH and its determination by using glass electrodes. Buffer solution - Henderson's equation. Applications of pH and buffer in biological processes and industries.

Unit V: ANALYTICAL CHEMISTRY

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.

BOOKS FOR REFERENCE

1. Gopalan R. and Sundaram S., Allied Chemistry, Sultan Chand & Sons Publishers, New Delhi 2nd ed
2. Soni P.L. and Mohan Katyal, Text Book of Inorganic Chemistry, Sultan Chand and Company Pvt. Ltd, New Delhi, 20th ed.
3. Bahl B.S. and AunBahl, A text book of Organic Chemistry 21st ed., S.Chand and Company Pvt. Ltd
4. Puri B.R., Sharma L.R and Pathania M.S, Text book of Physical Chemistry, Vishal Publishing Co., New Delhi, 2010
5. Jainudeen M.D, Text book of Chemical Kinetics and Photochemistry.
6. Dara S.S., Text book of Environmental chemistry and Pollution Control, S.Chand andCo., NewDelhi, 2006
7. Gopalan R., Subramanian P.S. and Rangarajan K, Elements of analytical chemistry, Sultan chand&Sons Publishers, New Delhi, 1991.

LEARNING OUTCOMES

- Learnt definitions of ligands, coordination number; hybridisation and geometry of coordination complexes. Gained elementary idea about naturally occurring complexes such as haemoglobin and chlorophyll
- Introduced to biomolecules such as carbohydrates (glucose, starch and cellulose) and amino acids (alanine)
- Learnt about batteries, electrochemical cells, electrodes and EMF
- Learnt principles of volumetric analysis, separation and purification techniques such as chromatography. Learnt about separation and identification of aminoacids through thin layer chromatography

ENVIRONMENTAL STUDIES PROGRAMME

ABILITY ENHANCEMENT COMPULSORY COURSES

(AECC- Environmental Studies)

Syllabus with effect from the academic year 2018-2019

(i.e. for batch of candidates admitted to the course from the academic year 2017-18) Credits:

2

II Year / III/IV Sem.

Unit 1: Introduction to Environmental Studies

- Multidisciplinary nature of environmental studies;
- Scope and importance; concept of sustainability and sustainable development.

Unit 2 : Ecosystem (2 lectures)

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem:
Food chains, food webs and ecological succession, Case studies of the following ecosystem:
 - a) Forest ecosystem
 - b) Grassland ecosystem
 - c) Desert ecosystem
 - d) Aquatic ecosystem (ponds, stream, lakes, rivers, ocean, estuaries)

Unit 3: Natural Resources : Renewable and Non – renewable Resources (6 lectures)

- Land resources and land use change: Land degradation, soil erosion and desertification.
- Deforestation : Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water : Use and over –exploitation of surface and ground water, floods, droughts, conflicts over water (international and inter-state).
- Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and Conservation (8 lectures)

- Levels of biological diversity: genetics, species and ecosystem diversity, Biogeographic zones of India: Biodiversity patterns and global biodiversity hot spots
- India as a mega- biodiversity nation, Endangered and endemic species of India.
- Threats to biodiversity: Habitat loss, poaching of wildlife, man- wildlife conflicts, biological invasions; Conservations of biodiversity: In-situ and Ex-situ Conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 5: Environmental Pollution (8 lectures)

- Environmental pollution: types, causes, effects and controls: Air, Water, soil and noise Pollution.
- Nuclear hazards and human health risks

Unit 6: Environmental Policies & Practices (8 lecturers)

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act, Air (Prevention & Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human Wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment (7 lectures)

- Human population growth, impacts on environment, human health and welfare.
- Resettlement and rehabilitation of projects affected persons; case studies.
- Disaster management: floods, earthquake, cyclone and landslides.
- Environmental movements : Chipko, Silent Valley, Bishnois of Rajasthan.
- Environmental ethics : Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies(e.g. CNG Vehicles in Delhi)

Unit 8 : Field Work (6 lectures)

- Visit to an area to document environmental assets: river / forest/ flora/ fauna etc.
- Visit to a local polluted site – Urban / Rural/ Industrial/ Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystem- pond, river, Delhi Ridge etc.

(Equal to 5 Lectures)

Suggested Readings:

1. Carson , R. 2002.Silent Spring, Houghton Mifflin Harcourt.
2. Gadgil , M.,& Guha, R. 1993.This Fissured Land: An Ecological History of India. Univ.of California Press.
3. Glesson, B. and Low, N.(eds.)1999. Global Ethics and Environment, London, Routledge.
4. Gleick,P.H.1993.Water Crisis. Pacific Institute for Studies in Dev.,Environment & Security. Stockholm Env.Institute, Oxford Univ.Press.
5. Groom, Martha J., Gary K.Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates,2006.
6. Grumbine,R.Edward, and Pandit,M.K2013.Threats from India's Himalayas dams .Science,339:36-37
7. McCully,P.1996.Rivers no more :the environmental effects of dams(pp.29-64).Zed books.
8. McNeill,John R.2000.Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum,E.P.,Odum, H.T.& Andrees,J.1971.Fundamental of Ecology. Philadelphia Saunders.
10. Pepper,I.L.,Gerba,C.P & Brusseau,M.L.2011.Environmental and Pollution Science.

Academic Press.

11. Rao,M.N.& Datta,A.K1987.Waste Water Treatment. Oxford and IBH Publishing Co.Pvt.Ltd.
12. Raven,P.H.,Hassenzahl,D.M & Berg,L.R.2012 Environment.8th edition. John Willey& sons.

TSSSED - ESSENTIALS OF SPOKEN & PRESENTATION SKILL - LEVEL II

Subject: Essentials of Spoken & Presentation Skill - level I

Subject Code: TSSSED

Class: II B.Sc.

Semester: EVEN (IV)

Hours: 30

LEARNING OBJECTIVES:

The main objectives of this course are

- to help the students understand the role of kinesics and other paralinguistic elements in enriching their presentation skills
- to improve their skills in teamwork and group discussions
- to equip them with skills needed to face interviews and make effective presentations

SYLLABUS:

UNIT 1:

- Body Language - Kinesics
- Proxemics
- Para linguistic
- Chronemics
- Nuances of Speech Delivery
- Personality Development: Building self-esteem

UNIT II:

- Team work and participating in group discussions
- Team building and Team work
- Team briefing
- Role of Team leader
- Conflict resolution
- Methodology of Group discussions
- Role Functions in Group Discussion
- Types of Non-functional behaviour
- Improving group performance
- Participating in Mock group discussions

UNIT III:

- Interviews
- Types of Interviews
- preparing for interviews

- facing interviews
- reviewing performance
- participating in mock interviews

UNIT IV:

- Business Presentations
- Preparing successful presentations
- thinking about audience
- making effective use of visual aid
- Delivering presentation
- using prompts
- dealing with questions and interruptions
- Mock presentations

LEARNING OUTCOME:

After completing this course the students would have

- learnt the importance of paralinguistic elements in enhancing their presentation
 - learnt to work as a team, conduct and participate in group discussions
- face interviews and face presentations effectively.

III YEAR
VI SEMESTER

SEMESTER - VI

CORE PAPER 11 - RELATIVITY AND QUANTUM MECHANICS

Lecture:60 Hours

Tutorial:15 Hours

Credits:4

CourseObjective:

- To introduce to the undergraduate students the development and formulation of Relativity and Quantum Mechanics
- Understand the wave nature of the matters around them.
- Its underlying Mathematical and Physical principles through exactly solvable problems and concepts.

Learning Outcomes:

On completion of the course the students will be able to

- Know the concepts of relativity and its associated concepts
- Know the inadequacies of classical mechanics in explaining microscopic phenomena
- Introduce with the concept of matter waves and their existence proved by experimental procedure and uncertainty principle in physical measurements

Unit 1 : Relativity

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

Phase and group velocity - wave packet - expression of De Broglie'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

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 - eigenvalues and eigenfunctions - commutativity and compatibility.

Unit 4 : Angular Momentum in Quantum Mechanics

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

Free particle solution - Particle in a box - Potential well of finite depth (one dimension) - linear harmonic oscillator - rigid rotator and hydrogen atom.

CORE PAPER 12 - MATHEMATICAL METHODS IN PHYSICS

Course Objective :

- To familiarize students with essential mathematical methods for solving advanced problems in theoretical physics.
- Develop the skill of problem-solving ability.
- Understand electromagnetic theory with Vector Calculus

Learning Outcomes :

Upon completion of the course, the student should be able:

- To use advanced mathematical methods and theories on various mathematical and physics problems.
- Use Matrices to solve simultaneous equations
- Solve quantum mechanical problems using special functions and polynomials.

Unit 1 : Matrices and Special Functions

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

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

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

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

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.

SEMESTER – VI ELECTIVE 2

INTEGRATED ELECTRONICS

Lecture:60Hours

Tutorial:15 Hours

Credits:5

Course Objectives:

- To study the different number systems associated with digital computation
- To introduce the counters and registers.
- To have in-depth knowledge in arithmetic operations of an operational amplifier.

Learning Outcomes:

On completion of the course the students will have:

- Through knowledge on different number systems
- The skill to simplify the logics using Karnaugh map and Boolean algebra
- Detailed knowledge in storing and retrieving a data through mux and demux

Unit 1 : Fundamental Digital Electronics

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 2 : Combinational Logic Circuits

Half adder, full adder, half subtractor and full subtractor – 4 bit adder/subtractor - decoder, encoder - multiplexer - demultiplexer.

Unit 3 : Sequential Logic Circuits

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 4 : OP-AMP Basic Applications

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 5 : Timer, DAC/ADC

Timer 555 - Internal block diagram and working - astable multivibrator - schmitt trigger.
D/A converter - binary weighted method - A/D converter - successive approximation method.

ELECTIVE 3

MICROPROCESSOR FUNDAMENTALS

Lecture:60Hours

Tutorial:15 Hours

Credits:5

Course Objective:

- To study the architecture of the microprocessor 8085
- To understand the Interfacing of memory & various I/O devices with 8085 microprocessor
- To understand the concepts of interrupts and microcontrollers

Learning Outcome :

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

- Describe the general architecture of a microcomputer system and architecture & organization of 8085 Microprocessor and understand the difference between 8085 and advanced microprocessor
- Understand and classify the instruction set of 8085 microprocessor and distinguish the use of different instructions and apply it in assembly language programming.
- Understand the architecture and operation of Programmable Interface Devices and realize the programming & interfacing of it with 8085 microprocessor.

Unit 1 : Architecture

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

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

Memory interfacing – Interfacing 2kx8 ROM and RAM, Timing diagram of 8085 (MOV R_d, R_s – MVI R_d,data(8)) .

Unit 4 : Interfacing I/O Ports to 8085

Interfacing input port and output port to 8085 – Programmable peripheral interface 8255 – flashing LEDs.

Unit 5 : Interrupts

Interrupts in 8085 - hardware and software interrupts – RIM, SIM instructions – priorities – simple polled and interrupt controlled data transfer.

PRACTICALS
AT THE END OF EVEN SEMESTER
ALL THREE YEARS

Core Paper III

Practical - I

(At the end of the Second semester - Any Fifteen Experiments) Credits:4

1. Young's modulus – Non-uniform Bending – Pin and microscope.
2. Young's modulus – Uniform Bending – Scale and Telescope
3. Rigidity modulus – Torsional pendulum (without symmetrical masses)
4. Rigidity modulus and Moment of Inertia – Torsional pendulum (With symmetric masses)
5. Surface Tension and Interfacial Surface Tension – Drop Weight Method
6. Coefficient of Viscosity of Liquid – Graduated Burette (radius of capillary tube by Mercury pellet method).
7. Sonometer–Frequency of Tuning Fork
8. Sonometer – Relative Density of a Solid and Liquid
9. Specific heat capacity of liquid–Method of Mixtures (Half-time correction).
10. Comparison of Viscosities of two Liquids–Burette Method
11. Focal length, Power, R and Refractive Index of a long Focus Convex Lens
12. Focal length, Power, R and Refractive Index of a Concave Lens
13. P.O. Box – Temperature coefficient of resistance
14. Spectrometer – Refractive index of a Glass Prism
15. Spectrometer – Hollow Prism- Refractive index of a liquid.
16. Newton's law of cooling-Specific heat Capacity of the Liquid
17. Carey Foster's Bridge-Resistance and Specific Resistance
18. Potentiometer – Calibration of a Low Range Voltmeter
19. Deflection magnetometer – Tan A Position

CORE PAPER VI

Practical - II

(At the end of Fourth semester - Any Fifteen Experiments) Credits:4

1. Young's Modulus-Cantilever-Depression-(Static method-Scale and Telescope).
2. Young's Modulus –Uniform bending – Pin &Microscope.
3. Rigidity Modulus-Static Torsion (Scale and Telescope)
4. Compound Pendulum-g and k
5. Sonometer-A.C. Frequency-Steel and Brass wires.
6. Melde's string- Frequency, Relative Density of a solid and liquid.
7. Thermal conductivity o f a bad conductor-Lee's disc method.
8. Spectrometer-Grating N and λ -minimum deviation method.
9. Spectrometer- μ of a glass prism -i-d Curve
10. Airwedge-Thickness of a wire.
11. Deflection Magnetometer – Tan B position
12. m and BH -Deflection Magnetometer-Tan C position and vibration magnetometer
13. Carey Foster Bridge - Temperature coefficient of resistance of a coil.
14. Potentiometer – Specific resistance of the given wire.
15. Potentiometer-Ammeter calibration.
16. Potentiometer- Emf of thermocouple.
17. Figure of merit of galvanometer (Mirror or Table Galvanometer).
18. Surface tension – Capillary rise method.
19. Specific heat of capacity – Joule's calorimeter.

Core paper 13 - Practical – III (At the end of sixth semester – Any Fifteen Experiments)

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. Spectrometer - (i - i') curve - refractive index.1
5. Spectrometer - Cauchy's constant.
6. Newton's rings - R1, R2 and μ of convex lens.
7. Spectrometer – Grating N and λ - Normal incidence method
8. Field along axis of a circular coil - Deflection magnetometer - BH and M.
9. Field along axis of a circular coil - vibration magnetic needle - BH.
10. Potentiometer - Calibration of high range voltmeter
11. Potentiometer - Temp coeff. of resistance of a thermistor
12. Potentiometer - Emf of a thermo couple.
13. Thermo emf - Mirror galvanometer (or) spot galvanometer
14. B.G - Figure of merit (quantity of charge)
15. B.G - Internal resistance of a cell
16. B.G - High Resistance by leakage
17. B.G - Absolute capacitance
18. B.G - Comparison of mutual inductances
19. B.G - Absolute mutual inductance
20. B.G - Self inductance - Anderson method

Core paper 14 - Practical – IV (At the end of sixth semester – Any Fifteen Experiments)

1. A.C. Circuit – LCR – Series resonance.
2. A.C. Circuit – LCR – Parallel resonance.
3. Bridge rectifier - Zener regulated power supply - 9V characteristics.
4. RC Coupled single stage amplifier – Frequency Response
5. RC Coupled amplifier with feedback
6. Emitter follower..
7. Transistor – Phase shift oscillator.

8. Transistor – Wien’s bridge oscillator
9. FET characteristics.
10. FET amplifier.
11. UJT characteristics
12. UJT as Relaxation oscillator.
13. SCR characteristics
- 14.. Transistor – Astable multivibrator.
15. Transistor – Bistable multivibrator.
16. NAND and NOR as universal gates
17. Half Adder & Full adder (using basic logic gates and Ex-OR gate or NAND gates only).
18. Half Subtractor & Full subtractor (using basic logic gates and Ex-OR gate or NAND gates only).
19. 4 Bit ripple Counter using 7473/ 7476
20. 4 Bit Shift Register using 7473/7476
21. Decode Counter using 7490

**Core Paper 15 Practical – V (Applied Electronics)
(At the end of Sixth Semester - Any Fifteen Experiments) Credits:2**

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 – Sorting of given set of numbers in ascending order
6. Microprocessor – 8085 – Sorting of given set of numbers in descending order
7. Microprocessor – 8085 – Finding the largest no. in a given set of numbers.
8. Microprocessor– 8085 – Finding the smallest no. in a given set of numbers.
9. Microprocessor – 8085 – Addition of N Number of single byte numbers
10. Op amp 741 - Inverting, Non - Inverting amplifier, unity follower.
11. Op amp 741 - Summing and difference amplifier
12. Op amp 741 – Differentiator, integrator
13. OP amp 741 – Solving simultaneous equations
14. Op amp 741 – Wien’s Bridge oscillator
15. OP amp 741 – Phase Shift oscillator.
16. 555 - Timer - Schmitt Trigger

17. 555 - Timer - Astable operation

18. 555 - Timer - Monostable operation

19. D/A Converter – 4 bit, binary weighted resistor method



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