DEPARTMENT OF PHYSICS

PRIST

Declared Under Section 3 of UGC Act, 1956

Thanjavur, Tamilnadu, India

B.Sc., PHYSICS
REGULATION – 2020

PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

SCHOOL OF ARTS AND SCIENCE
B.Sc., PHYSICS - REGULATION 2020

COURSE STRUCTURE

Course Code	Course Title	L	T	P	C
	SEMESTER I				
THEORY					
20110AEC11 20111AEC11 20132AEC11 20135AEC11	Tamil-I Advanced English-I Hindi-I French-I	4	0	0	2
20111AEC12	English-I	4	0	0	2
20113AEC13	Properties of Matter	5	1	0	4
20112AEC15A	Calculus and Fourier series	4	-	0	4
20112AEC16A	Algebra and Trigonometry	4	-	0	3
PRACTICAL					
20113SEC14L	Properties of Matter Lab	0	0	3	2
Total		**21**	**1**	**3**	**17**
AUDIT COURSE					
201ACLSICN	Indian Constitution	-	-	-	2
201ACLSUHV	Universal Human Values	-	-	-	2

SEMESTER II

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC21 20111AEC21 20132AEC21 20135AEC21	Tamil-II Advanced English-II Hindi-II French-II	4	0	0	2
20111AEC22	English-II	4	0	0	2
20113AEC23	Mechanics And special theory of Relativity	6	1	0	4
20112AEC25A	ODE,PDE and Laplace Transform	5	0	0	4
20112AEC26A	Analytical Geometry in Vector Calculus	4	0	0	3
PRACTICAL					
20113SEC24L	Mechanics Lab	0	0	3	2
RESEARCH SKILL BASED COURSE					
20113RLC27	Research Led Seminar	-	-	-	1
Total		**23**	**1**	**3**	**18**
AUDIT COURSE					
201ACLSCOS	Communication Skills	-	-	-	2
201ACSSBBE	Basic Behavioral Etiquette	-	-	-	2

SEMESTER III

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC31 20111AEC31 20132AEC31 20135AEC31	Tamil-III Advanced English-III Hindi-III French-III	4	0	0	2
20111AEC32	English-III	4	0	0	2
20113AEC33	Heat and Thermodynamics	5	0	0	4
20114AEC35	Chemistry-I	6	0	0	5
PRACTICAL					
20113SEC34L	Heat and Thermodynamics lab	0	0	3	2
20114SEC36L	Volumetric Analysis lab- I	0	0	3	2
RESEARCH SKILL BASED COURSE					
20113RMC37	Research Methodology	2	0	0	2
TOTAL		**21**	**0**	**6**	**19**
AUDIT COURSE					
201ACLSOAN	Office Automation	-	-	-	2

SEMESTER IV

Course Code	Course Title	L	T	P	C
THEORY					
20110AEC41 20111AEC41 20132AEC41 20135AEC41	Tamil-IV Advanced English-IV Hindi-IV French-IV	4	0	0	2
20111AEC42	English-IV	4	0	0	2
20113AEC43	Optics	5	0	0	4
20114AEC45	Chemistry-II	6	0	0	5
201ENVTSTU	Environmental Studies	2	0	0	2
PRACTICAL					
20113SEC44L	Optics Lab	0	0	3	2
20114SEC46L	Volumetric Analysis Lab -II	0	0	3	2
TOTAL		**21**	**0**	**3**	**19**
AUDIT COURSE					
201ACLSLMS	Leadership and Management Skills	-	-	-	2
201ACSSAQA	General Aptitude and Quantitative Ability	-	-	-	2

SEMESTER V

Course Code	Course Title	L	T	P	C
THEORY					
20113AEC51	Electricity and Magnetism	5	0	0	4
20113AEC52	Atomic Physics	4	1	0	3
20113AEC53	Basic Electronics	4	1	0	4
20113DSC56_	Discipline Specific Elective – I	5	0	0	3
RESEARCH SKILL BASED COURSE					
20113BRC57	Participation in Bounded research	-	-	-	1
PRACTICAL					
20113SEC54L	Electricity and Magnetism Lab	0	0	3	2
20113SEC55L	Basic Electronics Lab	0	0	3	2
TOTAL		**18**	**2**	**6**	**19**
AUDIT COURSE					
201ACLSPSL	Professional Skills	-	-	-	2

SEMESTER VI

Course Code	Course Title	L	T	P	C
THEORY					
20113AEC61	Digital Electronics & Microprocessor	4	1	0	4
20113AEC62	Elements of Theoretical Physics	5	0	0	5
20113DSC65_	Discipline Specific Elective –II	5	0	0	3
201__OEC	Open Elective Course	4	0	0	2
PRACTICAL					
20113SEC63L	Digital Electronics Lab	0	0	3	2
20113SEC64L	Microprocessor Lab	0	0	3	2
20113PRW66	Project Work	-	-	-	4
20113PEE	Programme Exit Examination	-	-	-	1
TOTAL		**18**	**1**	**6**	**23**
AUDIT COURSE					
201ACSSIST	Interview Skills Training and Mock Test	-	-	-	2
201ACLSCET	Community Engagement	-	-	-	1
TOTAL CREDITS					**115**
Total Credits – Audit Courses					**19**

Discipline Specific Electives

Semester	Discipline Specific Elective Courses -I
V	a) 20113DSC56A- Energy Physics b) 20113DSC56B- Laser Physics

Semester	Discipline Specific Elective Courses - II
VI	a) 20113DSC65A- Material Physics b) 20113DSC65B- Communication Physics

Open Elective Course

Semester	General Elective Courses
VI	a) 201TNOEC-Tamil IlakkiyaVaralaru b) 201ENOEC-Journalism c) 201MAOEC-Development of Mathematical Skills d) 201CEOEC-Food and Adulteration e) 201MBOEC-Wildlife Conservation f) 201CSOEC-E-Learning g) 201CAOEC-Web Technology h) 201CMOEC-Banking Service

Credit Distribution

Sem	AEC	SEC	DSC	OEC	Research	NON CGP	Total
I	15	2	-	-	-	-	17
II	15	2	-	-	1	-	18
III	13	4	-	-	2	-	19
IV	13	4	-	-	-	2	19
V	11	4	3	-	1	-	19
VI	9	4	3	2	4	1	23
Total	**76**	**20**	**6**	**2**	**8**	**3**	**115**

Course Code	TAMIL PAPER-1	L	T	P	C
20110AEC11		4	0	0	2

பிரிஸ்ட் நிகர்நிலைப் பல்கலைக்கழகம் வல்லம், தஞ்சாவூர்

பாட குறியீடு : தமிழ் முதல் பருவம்

முதலாம் ஆண்டு

இக்கால இலக்கியம் - செய்யுள், சிறுகதை , நாடகம், இலக்கிய வரலாறு

அலகு : 1.செய்யுள்

தாயுமானவ சுவாமிகள் - ஆதார புவனம் - சிதம்பர ரகசியம் - 40 அடிகள்

இராமலிங்க அடிகள் - திருவருட்பா - கருணை விண்ணப்பம் - 40 அடிகள்

கவிமணி தேசிக விநாயகம் பிள்ளை - மலரும் மாலையும் - 52 அடிகள்

பாரதியார் - புதுமைப்பெண்- 40 அடிகள்

பாரதிதாசன் - பாரதிதாசன் கவிதைகள் ,தமிழ் இனிமை , தமிழ் உணவு

அலகு : 2. செய்யுள்

நாமக்கல் கவிஞர் - தமிழ் தேன் - தமிழ் வளர்க்க சபதம் செய்வோம் , 40 அடிகள்

ந.பிச்சமூர்த்தி - வழித்துணை - கவிதை கருடன் , 42 அடிகள்

சுரதா - தேன்மழை, கைப்பை , 22 அடிகள்

கண்ணதாசன் - இலக்கியம் , ஒரு பானையின் கதை , 54 அடிகள்

அப்துல் ரகுமான் - சொந்த சிறகுகள், குப்பையை கிளறும் சிறகுகள், 80 அடிகள்

அலகு : 3. சிறுகதை

சு.சமுத்திரம் - வேரில் பழுத்த பலா

அலகு : 4. நாடகம்

கு. வெ. பாலசுப்பிரமணியன் , கௌதம புத்தர் (உரைநடை நாடகம்)

அலகு : 5. இலக்கிய வரலாறு

சிறுகதை , புதினம், நாடகம் உரைநடை , கவிதை , புதுக்கவிதை

COURSE CODE	COURSE TITLE	L	T	P	C
20111AEC11	Advanced English-I	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the glossary terms, figures of speech
- To enhance vocabulary
- To learn how to edit and proof read
- To know the comparison and contrast and cause and effect forms
- To understand the impact of the speeches of famous people

Outcome:

- Develop vocabulary
- Learn to edit and do proof reading
- Read and comprehend literature

UNIT –I

Glossary of grammar terms

Figures of speech

UNIT – II

Foreign words and phrases

British and American Vocabulary

UNIT – III

Comparison and contrast

Cause and effect

UNIT – IV

Editing

Proof reading

UNIT – V

Speeches of famous people:

Mahatma Gandhi-Abraham Lincoln-Swami Vivekananda-John F. Kennedy

Reference book:

Author	Title of the book	Edition / Year	Publisher
Wren and Martin	English Grammar	2009	S.Chand& Company Ltd
Meenakshi Raman &Sangeetha Sharma	Technical Communication	Second Edition 2011	Oxford University Press
Sudhir Kumar Sharma	The World's Great Speeches	-	Galaxy Publishers

Course Code	English-I	L	T	P	C
20111AEC12		4	0	0	2

Aim:

- To acquaint with learning English through literature

Objective:

- To improve English delightfully through simple poems, essays
- To throw light on fiction
- To read and comprehend literature

Outcome:

- Read and comprehend literature
- Appreciate the different types of poetry and prose

UNIT –I

Because I could not Stop for Death -Emily Dickinson
Stopping by Woods on a Snowy Evening -Robert Frost

UNIT – II

Enterprise -Nissim Ezekiel
Love poem for a wife -A.KRamanujam

UNIT –III

The Art of Reading - Lin Yutang
An Eco-Feminist Vision -ArunaGnanadason

UNIT –IV

The Merchant of Death -Nanda Kishore Mishra & John Kennet
She Spoke for all Nature -Young world 'The Hindu'

UNIT –V

Oliver Twist -Charles Dickens

Text book:

Author	Title of the book	Edition / Year	Publisher
S.Murugesan/Dr.K.Chellappan	The Art of Reading/ Experiencing Poetry	Reprint 2004	Emerald Publishers

CourseCode	Core Paper - I	L	T	P	C
20113AEC13	Properties Of Matter	5	1	0	4

Aim:

The course presents an introduction to the physics of the objects whose sizes span from atomic dimensions to macroscopic, human scale dimensions, and beyond: atoms, molecules, gases, liquids, and solids. The aim is to show how the properties of macroscopic bodies can be derived from the knowledge that matter is made up from atoms.

Objectives:

Recognize the difference between physical and chemical properties
Distinguish between extensive and intensive properties

UNIT – I Elasticity:

Stress – Strain – Hooke's law – Relation between elastic constants – poisson's Ratio – Expression for poisson's ratio in terms of elastic constants – work done in twisting – Torsional pendulum – determination of rigidity modulus – Young's modulus – determination – uniform – non-uniform bending.

UNIT – II Surface Tension:

Definition, Explanation of surface tension– Surface energy and surface tension – Pressure difference across a liquid surface – Excess of pressure inside a soap bubble – Angle of contact – Measurement of angle of contact – Experimental determination of surface tension by Jaegars method - Capillary rise method – Surface tension and vapour pressure over a liquid surface – Effect of Evaporation and condensation.

UNIT – III Viscosity:

Definition – flow of liquid through a capillary tube – Stokes Law – Poiseuille's method for coefficient of viscosity – conception of poiseuille'sequation-Ostwald's viscometer – viscosity of highly viscous liquids – Stokes method – variation of viscosity of a liquid with temperature – viscosity of Gases and kinetic energy.

UNIT – IV Diffusion – Osmosis:

Osmosis and osmotic pressure – Laws of osmotic pressure – Experimental determination of osmotic pressure – Preffer method – Berkley method – Elevation of Boiling point and Depression of freezing point – Diffusion – Fick's law – Experimental measurement of Diffusivity – Graham's Laws of Diffusion of Gases – Effusion, Transpiration and Transfusion.

UNIT - V Gravitation:

Newton's Law – Kepler's Law –Deductions of Newton's law from Kepler's Law – Law of Gravitation– Gravitational potential: Potential energy – Gravitation Potential and Field at a point due to spherical shell, solid sphere, Hollow sphere – Satellites – Stationary satellite – Escape velocity – Rocket – Jet plane.

Learning outcomes:

On completion successful students will be able to demonstrate an understanding of:

1. The relationships between physics on the atomic scale and the properties of matter.
2. The roles played by microscopic states of system, their numbers and their accessibility.
3. Techniques for finding appropriate averages to predict macroscopic behavior.
4. How these techniques are applied to the calculation of the properties of matter.

Reference:

1. Properties of matter – Subramaniaiyer and Jeyaraman.
2. Elements of properties of matter – D.S. Mathur, S Chand and Co.,
3. Properties of Matter – Brijlal and Subramaniam, S. Chand and Co.,

Course.Code	PROPERTIES OF MATTER LAB	L	T	P	C
20113SEC14L		0	0	3	2

List of Experiments

1. Young's modulus – uniform bending – pin and microscope.
2. Young's modulus – non uniform bending – scale and telescope.
3. Static torsion – Rigidity modulus.
4. Torsion pendulum – Rigidity modulus.
5. Cantilever depression – scale and telescope method.
6. Surface tension – capillary rise method.
7. Viscosity – capillary flow method.
8. Newton's ring –determination of R.
9. Compound pendulum.
10. Long focus convex lens – f, R, u determination.

Course Code	Allied Paper - I Calculus and Fourier Series	L	T	P	C
20112AEC15A		4	0	0	4

Aim and objectives:

This paper aims at enabling the students to know various concepts and principles of differential and integral calculus. Sound Knowledge of calculus is essential for the students of mathematics for thebetter perceptions of the subject and its development

Unit – I

Leibnitz theorem (Proof not needed) and its applications – curvature and radius of curvature in Cartesian only (Proof not needed) – total differential coefficient (Proof not needed) – Jacobians of two & three variables – Simple problems in all these.

Unit – II

Reduction formula (when n is a +ve integer) for (i)

i. $\int_a^b e^{ax}x^n dx$

ii. $\int_a sin^n x\ dx$

iii. $\int_a cos^n x\ dx$

iv. $\int_0^x e^{ax}x^n dx$

v. $\int_0 sin^n x\ dx$

vi. without proof $\int_0 sin^n x\, cos^n x\, dx$ and illustrations

Unit – III

Beta and Gamma functions

Unit – IV

Evaluation of double and triple integrals in simple cases – changing the order and evaluating of the double integration (Cartesian only)

Unit – V

Definition of Fourier series – Finding Fourier coefficients for a given periodic function with period 2π and with period $2l$ – use of odd and even functions in evaluating Fourier coefficients – half range sine and cosine series.

Outcomes:

- Calculate definite integral values using Beta and Gamma Functions
- Develop the skill of evaluating Laplace and inverse Laplace transform to solve Linear systems under initial and boundary conditions

Text Books

Calculus – T.K.M. Pillai

Trigonometry & Fourier Series – T.K.M. Pillai.

Course Code	Allied Paper - II Algebra and Trigonometry	L	T	P	C
20112AEC16A		4	0	0	3

Aim and Objectives:

This paper emphasizes general techniques of problemsolving and explores the creation of mathematical patters. It aims at introducing a course that initiates thestudents into the world of Discrete Mathematics.

Unit – I

Binomial, Exponential & Logarithmic series (Formulae only) – Summation

Unit – II

Nonsingular, symmetric, skew symmetric, orthogonal, Hermitian, skew Hermitian and unitary matrices – Characteristics equation, Eigen values, Eigen vector – Cayley Hamilton's theorem (proof not needed) Simple application only.

Unit – III

Expansion of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$and $\sin^n\theta$, $\cos^n\theta$, $\sin^n\theta\cos^m$(m &n being a positive integer) – Expansion of in a series of sines and cosines of multiples of θ (θ – given in radius) Expansion of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in terms of powers of θ (only problems in all the above)

Unit – IV

Euler's formula for $e^{i\theta}$ – definition of hyperbolic functions – formulae involving hyperbolic functions – relation between hyperbolic and circular function – expansion of sinhx, coshx, tanhx in power of x.

Unit – V

Expansion of inverse hyperbolic function – sinh-1x, cosh-1x and tanh-1x - Separation of real and imaginary parts of sin(x+iy), cos(x+iy), tan(x+iy), sinh(x+iy), cosh(x+iy), tanh(x+iy)

Outcomes:

The topic like Mathematical Logic, Set Theory, Relations, Functions, Mathematical Induction, Recursive relations and Matrices.

Text Books:

T.K.M. Pillai, T.Natarajan, K.S. Ganapathi, **Algebra, Vol I**. S.ViswanathanPvt.Ltd., Chennai – 2004

S.Narayanan,T.K.M.Pillai, **Trigonometry,** S.ViswanathanPvt.Ltd. & Vijay Nicole imprint Pvt. Ltd. 2004

Course Code	Indian constitution	L	T	P	C
201ACLSICN		0	0	0	2

Aim and Objectives:

1. To make the students understand about the Democratic Rule and Parliamentarian Administration.
2. To appreciate the salient features of the Indian Constitution.
3. To know the fundamental Rights and Constitutional Remedies.
4. To make familiar with powers and positions of the Union Executive, Union Parliament and the Supreme Court.
5. To exercise the adult franchise of voting and appreciate the Electoral system of Indian Democracy.

UNIT I: THE MAKING OF INDIANCONSTITUTION

The Constituent Assembly Organization Character – Work – Salient features of the constitution – Written and Detailed Constitution – Socialism – Secularism – Democracy and Republic.

UNIT II: FUNDAMENTAL RIGHTS AND FUNDAMENTAL DUTIES OF THE CITIZENS

Right of Equality – Right of Freedom – Right against Exploitation – Right to Freedom of Religion – Cultural and Educational Rights – Right to Constitutional Remedies – Fundamental Duties .

UNIT III: DIRECTIVE PRINCIPLES OF STATE POLICY

Socialism Principles – Gandhian Principles – Liberal and General Principles – Differences between Fundamental Rights and Directive principles.

UNIT IV: THE UNION EXECUTIVE, UNIONPARLIAMENT AND SUPREME COURT

Powers and positions of the President – Qualification Method of Election of President and vice president – Prime Minister RajyaSabha- LokSabha – The Supreme Court – High Court – Functions and position of Supreme court and High Court.

UNIT V: STATE COUNCIL – ELECTION SYSTEM AND PARTLIAMENTARY DEMOCRACY IN INDIA

State council of Ministers – Chief Minister – Election system in India- Main features – Election Commission - Features of Indian Democracy.

Outcomes

Democratic values and citizenship Training are gained.

1. Awareness on Fundamental Rights are established.
2. The functions of union Government and State Governments are learnt.
3. The power and functions of the Judiciary learnt thoroughly.
4. Appreciation of Democratic parliamentary Rule is learnt.

REFERENCES:

1. Palekar S.A. Indian Constitution Government and polities, ABD Publications, India.
2. AiyerAlladi, Krishnaswami, Constitution and fundamental rights 2055.
3. Markandan K.C. Directive Principles in the Indian Constitution 2066.
4. KashyapSubash C Our Parliament, National Book, Trust New Delhi 2089.

Course Code	Course Title	L	T	P	C
201ACLSUHV	**Universal Human Values**	-	-	-	2

Aim:

Thiscourseaimsatmakinglearnersconsciousaboutuniversalhumanvaluesinanintegral manner, without ignoring other aspects that are needed for learner's personalitydevelopment.

Course Objectives :

Thepresentcoursedealswithmeaning, purpose andrelevanceofuniversalhumanvaluesandhow to inculcate and practice them consciously to be a good human being and realiseone'spotentials.

Course Outcomes :

By the end of the course the learners will be able to:

1. Know about universalhuman values and understandtheimportanceofvaluesinindividual, social circles, career path, and nationallife.
2. Learnfromcasestudiesoflivesofgreatandsuccessfulpeoplewhofollowedandpractised human values and achieved self-actualisation.
3. Become conscious practitioners of humanvalues.
4. Realisetheirpotentialashumanbeingsandconductthemselvesproperlyintheway softhe world.

Unit I

- Introduction:Whatislove?Formsoflove—forself,parents,family,friend,spouse, community, nation, humanity and other beings, both for living and non-living
- Love and compassion and inter-relatedness
- Love, compassion, empathy, sympathy andnon-violence
- Individuals who are remembered in history for practicing compassion andlove.
- Narratives and anecdotes from history, literature including localfolklore
- Practicing love and compassion: What will learners learn gain if they practice love and compassion? What will learners lose if they don't practice love and compassion?
- Sharing learner's individual and/or groupexperience(s)
- SimulatedSituations
- Case studies

Unit II

- Introduction: What is truth? Universal truth, truth as value, truth as fact(veracity, sincerity, honesty among others)
- Individuals who are remembered in history for practicing this value

- Narratives and anecdotes from history, literature including local folklore
- Practicing Truth: What will learners learn/gain if they practice truth? What will learners lose if they don't practice it?
- Learners' individual and/or groupexperience(s)
- Simulatedsituations
- Case studies

Unit III

- Introduction:What is non-violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non-violence
- Ahimsa as non-violence andnon-killing
- Individuals and organisations that are known for their commitment tonon-violence
- Narrativesandanecdotesaboutnon-violencefromhistory,andliteratureincluding local folklore
- Practicing non-violence: What will learners learn/gain if they practice non-violence? What will learners lose if they don't practiceit?
- Sharing learner's individual and/or group experience(s) aboutnon-violence
- Simulatedsituations
- Case studies

Unit IV

- Introduction: What isrighteousness?
- Righteousness and *dharma*, Righteousness andPropriety
- Individuals who are remembered in history for practicingrighteousness
- Narratives and anecdotes from history, literature including localfolklore
- Practicingrighteousness:Whatwilllearnerslearn/gainiftheypracticerighteousness? What will learners lose if they don't practiceit?
- Sharing learners' individual and/or groupexperience(s)
- Simulatedsituations
- Case studies

Unit V

- Introduction: What is peace? Its need, relation with harmony andbalance
- Individuals and organisations that are known for their commitment topeace
- Narratives and Anecdotes about peace from history, and literature includinglocal folklore
- Practicing peace: What will learners learn/gain if they practice peace? What will learners lose if they don't practiceit?
- Sharing learner's individual and/or group experience(s) aboutpeace
- Simulated situations
- Case studies

Unit VI

- Introduction: What is service? Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings—living and non-living, persons in distress or disaster.
- Individuals who are remembered in history for practicing thisvalue.
- Narratives and anecdotes dealing with instances of service from history,literature

including local folklore

- Practicingservice:Whatwilllearnerslearn/gaingainiftheypracticeservice?Wha t will learners lose if they don't practiceit?
- Sharing learners' individual and/or group experience(s) regardingservice
- Simulatedsituations
- Case studies

Unit VII

- Introduction: What is renunciation? Renunciation and sacrifice. Self-restrain and

Ways of overcoming greed. Renunciation with action as true renunciation

- Individuals who are remembered in history for practicing thisvalue.
- Narrativesandanecdotesfromhistoryandliterature,includinglocalfolkloreabout individuals who are remembered for their sacrifice andrenunciation.
- Practicing renunciation and sacrifice: What will learners learn/gain if they practice Renunciation and sacrifice? What will learners lose if they don't practice it?
- Sharing learners' individual and/or groupexperience(s)
- Simulatedsituations
- Case studies

Course.Code	TAMIL PAPER-II	L	T	P	C
20110AEC21		4	0	0	2

பிரிஸ்ட் நிகர்நிலைப் பல்கலைக்கழகம் வல்லம், தஞ்சாவூர்

பாட குறியீடு : தமிழ் இரண்டாம் பருவம்

முதலாம் ஆண்டு

செய்யுள் , பக்தி இலக்கியம், சிற்றிலக்கியம் , இலக்கிய வரலாறு

அலகு : 1. செய்யுள்:

1. திருஞானசம்பந்தர் தேவாரம் - கோளறு பதிகம்

2. திருநாவுக்கரசர் தேவாரம் - தனிக் குறுந்தொகை

3. சுந்தரர் தேவாரம் - திருநொடித் தான் மலை

4. மாணிக்கவாசகர் - திருவாசகம் - திருப்பொன் னூசல்

அலகு : 2 . செய்யுள் :

5. குலசேகராழ்வார் - பெருமாள் திருமொழி

6. நம்மாழ்வார் திருவாய் மொழி - இரண்டாம் பத்து - வைகுந்த உபதேசம்

7. ஆண்டாள் - நாச்சியார் திருமொழி - திருமணக்கனவை உரைத்தல்

8. திருமங்கை ஆழ்வார் - சிறிய திருமடல்

அலகு : 3 . செய்யுள் :

9 . திருமூலர் - மூன்றாம் திருமுறை

10 . குமரகுருபரர் - மீனாட்சியம்மைப் பிள்ளை - தமிழ் வருகைப் பருவம்

11 . திரிகூடராசப்பக்கவிராயர் - குற்றாலக்குறவஞ்சி - குறத்தி நாட்டு வளம் கூறுதல்

12 . வீரமாமுனிவர் - திருக்காவலூர்க் கலம்பகம்

அலகு : 4 . புதினம்

13 . கு.வெ. பாலசுப்ரமணியன் - காவலாப்

அலகு : 5 . இலக்கிய வரலாறு

14 . சைவ வைணவ இலக்கியங்கள் , சிற்றிலக்கியங்கள் , (பள்ளு - பிள்ளைத்தமிழ் , - பரணி)

Course Code	Course Title	L	T	P	C
20111AEC21	Advanced English-II	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To understand the format of e-mail, fax and memos
- To write itinerary, checklist, invitation, circular, instruction, recommendations
- To understand the impact of the biographies of famous people

Outcome:

- Develop technological skill
- Able to write in a variety of formats
- Read biographies and develop personality

UNIT –I
E-mail
Fax
Memos
UNIT – II
Itinerary
Checklist
UNIT – III
Invitation
Circular
UNIT – IV
Instruction
Recommendations
UNIT – V
Biographies of famous people:
Mother Teresa-Madam Curie-Charles Chaplin-Vikram Sarabhai

Text Book

Author	Title of the book	Edition / Year	Publisher
Meenakshi Raman &Sangeetha Sharma	Technical Communication	2011	Oxford University Press
Rajendra Pal &J.S.Korlahalli	Business Communication	2015	Sultan

Course Code	English Paper -II	L	T	P	C
20111AEC22		4	0	0	2

Aim:

- To acquaint learners with different trends of writing

Objective:

- To acquire language skills through literature
- To enable the students to appreciate literature
- To develop the conversational skills through one act plays

Outcome:

- Appreciate different forms of literature
- Acquire language skills through literature
- Broaden the horizon of knowledge

UNIT – I

Ecology -A.K. Ramanujan
Gift -Alice Walker
The First Meeting -Sujata Bhatt

UNIT –II

Fueled -Marcie Hans
Asleep -Ernst Jandl
Buying and selling -Khalil Gibran

UNIT –III

The End of living and The Beginning of Survival - Chief Seattle
My Wood - E.M.Forster
The Meeting of Races - Rabindranath Tagore

UNIT – IV

The Refugee -K.A. Abbas
I Have a Dream -Martin Luther king
Those People Next Door -A.G. Gardiner

UNIT – V

Marriage is a private Affair -Chinua Achebe
The Fortune Teller -Karel Capek
Proposal -Anton Chekov

Text book:

Author	Title of the book	Edition / Year	Publisher
GowriSivaraman	Gathered Wisdom	Reprint 2010	Emerald Publishers

ourseCode	Core Paper - II Mechanics and Special Theory of Relativity	L	T	P	C
20113AEC23		6	1	0	4

Aim:

- To deepen understanding of Mechanics.
- To Prepare students for courses in quantum field theory and gauge theory

Objectives:

Find the unitary transformations linked to symmetry operations.
Apply time-dependent perturbation theory to variety of problems.

Unit I :Dynamics projectile , impulse, impact

Projectile - range of horizontal and inclined plane – Impulse – Impact – Impulsive force – Laws of impact – Impact of a smooth sphere on a smooth horizontal plane – Direct and oblique impacts – Loss in kinetic energy – Motion of two interacting bodies – reduced mass.

Unit II: Dynamics of Rigid bodies

Kinetic energy of rotation - Theory of compound pendulum - Equivalent simple pendulum – Reversibility of centers of oscillation and suspension - Determination of 'g' and radius of gyration of a bar pendulum-period of oscillation of a Bifilar pendulum with Parallel threads.

Center of mass - velocity and acceleration of center mass - system of variable mass-equation for a rocket – Conservation of linear and angular momentum.

Unit III: Center of Gravity and states of equlibrium:

Center of gravity of simple bodies – Center of gravity of solid hemisphere, hemispherical bowl, and right solid cone – stable, Unstable and neutral equilibrium of a rigid body supported about an axis.

Unit IV: Center of Pressure:

Center of pressure of vertical rectangular Lamina – Vertical triangular lamina – Vertical circular lamina – Atmospheric Pressure – Variation of atmospheric pressure with altitude – Hydro dynamics – stream line flow of an ideal fluid – equation of continuity of flow – Bernoulli's theorem and its applications to liquids.

Unit V: Special theory of relativity:

Frame of reference – Newton's relativity – Inertial frame of reference – Galilean transformations – Transformation of position , velocity and acceleration – time dilation & length contraction – Lorentz Transformations – Mass –Energy relation– variation of mass with velocity.

Learning Outcomes:

Derive a mathematical description of quantum motion in electromagnetic fields.
Apply the relativistic wave equations to simple single-particle problems.

Books for Study:

1. Mechanics – Part I and II – NarayanaMoorthy
2. Mechanics – D.S. Mathur
3. Mechanics – Brij.Lal and N. Subramaniyam

Course Code	Core Practical – II Mechanics Lab	L	T	P	C
20113SEC24L		0	0	3	2

List of Experiments

1. Characteristics of junction diode.
2. Characteristics of Zener diode.
3. Potentiometer – low range voltmeter calibration.
4. Potentiometer – specific resistance.
5. Transistor characteristics –CE configuration.
6. Spectrometer - μ of a solid prism.
7. Air wedge – thickness of a wire.
8. Specific heat capacity of liquid – Newton's law of cooling.
9. Thermal conductivity of a bad conductor- lee's disc.
10. Carey fosters bridge – specific resistance measurement.

Course Code	Allied Paper - III ODE, PDE And Laplace Transform	L	T	P	C
20112AEC25A		5	0	0	4

Aim:

Introduce the Concepts of laplace and fourier transforms

Objectives:

Find the Fourier series representation of a function of one variable
Find the solution of the wave,diffusion and Laplaceequations using the Fourier series.

UNIT I:

Ordinary differential equations of first order but of higher degree- Equations solvable for x and y – solvable for dy/dx, clairaut's form (simple case only)- homogeneous linear differential equation(Variable coefficients), variation of parameter.

UNIT II:

Formation of partial differential equation by eliminating constants and by eliminating of arbitrary functions- definition of general, particular and complete solution – singular integral(Geometrical meaning not required) solution of first order equations in the slandered forms f(p,q=0, f(x,p,q)=0, f(z,p,q)=0 f1(x,p=f_2(y,p) z=(x,p+yq=f(p,q).

UNIT III:

Lagrange's method for solving $P_p + Q_q = R$ where p,q,r functions of X, Y, Z- (geometrical meaning is not needed)- (only problem in all the above- No proof needed for any formula) Cherpit's method The four standard forms.

UNIT IV:

Laplace Transforms- Definitions-

L(e^{at}) L(cosat), L(sinat), L(t^n) where n is a positive integer – Basic theorem in Laplace transform (Statement only) L (e^{-st}cosbt), L(e^{-st}sinbt), L[e^{-st} f(t)]-L[F(t), L[f(t)], L[f'(t)]

UNIT V:

Inverse Laplace transform related to the above standard forms- solving second order ODE with constant coefficients using Laplace transforms and simultaneous equation, variable coefficients. Fourier series: Periodic functions — Dirichlet conditions (Without Proof) Odd and Even functions change of interval — Half range series.

Outcomes:

Solve an initialvalueproblemfor an nth order or ordinarydifferentialequationusing the Laplacetransform.

Solve a Cauchy problem for the wave ordiffusionequationsusing the Laplace,

Text Books

Differential Equations - S. Narayanan

Differential Calculus T.K.M Pillai &S.Naranyanan

Differential Calculus - M.L.Khanna

Course Code	Allied Paper - IV	L	T	P	C
20112AEC26A	Analytical Geometry inVector Calculus	4	0	0	3

Aim and Objective:

The course is designed to lay a strong foundation of Geometry and Vector Calculus.

UNIT – I

Vector differentiation – velocity & acceleration vectors- Gradient of a vector directional derivative - unit normal vector- tangent plane

Unit- II

Divergence- Curl – Solenoidal&Irrotational vector- Double operators – Properties connecting grad, div & curl of a vector.

Unit –III

Vector integration –Line integrals – Conservative force field – Scalar field- Scalar potential- work done by d Force- Surface integrals – Volume integrals.

Unit –IV

Gauss divergence theorem ,Stoke's theorem (statement, application & verification only)

Unit –V

Equation of sphere – Tangent plane – plane section of a sphere – Finding the centre& radius of the circle of integration – sphere through the circle of integration (only problem in all above)

Outcomes:

- Vector calculus plays an important role in deferential geometry and in the
- study of partial deferential equations. It is used extensively in physics and
- engineering, especially in the description of electromagnetic ends, gravitational elysian uid dynamics.

Text Book

Analytical Geometry (3D) & Vector calculus, T.K. Manickavasagem Pillai, , New Gamma Publishing House, 2091

Course Code	Course Title	L	T	P	C
201ACLSCOS	Communication Skills	-	-	-	2

Aim:

Course Objectives :

This course has been developed with the following objectives:

1. Identify common communication problems that may be holding learnersback
2. Identify what their non-verbal messages are communicating toothers
3. Understand role of communication in teaching-learningprocess
4. Learning to communicate through the digitalmedia
5. Understand the importance of empatheticlistening
6. Explore communication beyondlanguage.

Course Outcome :

By the end of this program participants should have a clear understanding of what good communication skills are and what they can do to improve their abilities.

Unit I

- Techniques of effective listening
- Listening and comprehension
- Probing questions
- Barriers to listening

Unit II

- Pronunciation
- Enunciation
- Vocabulary
- Fluency
- Common Errors

Unit III

- Techniques of effective reading
- Gathering ideas and information from a given text
    i. Identify the main claim of the text
    ii. Identify the purpose of the text
    iii. Identify the context of the text
    iv. Identify the concepts mentioned
- Evaluating these ideas and information
    i. Identify the arguments employed in the text
    ii. Identify the theories employed or assumed in the text
- Interpret the text
    i. To understand what a text says

ii. To understand what a text does
iii. To understand what a text means

Unit IV

- Clearly state the claims
- Avoid ambiguity, vagueness, unwanted generalisations and over simplification of

issues

- Provide back ground information
- Effectively argue the claim
- Provide evidence for the claims
- Use examples to explain concepts
- Follow convention
- Be properly sequenced
- Use proper sign posting techniques
- Be well structured
  i. Well-knit logical sequence
  ii. Narrative sequence
  iii. Category groupings
- Different modes of Writing -
  i. E-mails
  ii. Proposal writing for Higher Studies
  iii. Recording the proceedings of meetings
  iv. Any other mode of writing relevant for learners

Unit V

- Role of Digital literacy in professional life
- Trends and opportunities in using digital technology in workplace
- Internet Basics
- Introduction to MS Office tools
  i. Paint
  ii. Office
  iii. Excel
  iv. Power point

Unit VI

- Introduction to social media websites
- Advantages of social media
- Ethics and etiquettes of social media
- How to use Google search better
- Effective ways of using Social Media
- Introduction to DigitalMarketing

Unit VII

- Meaning of non-verbal communication
- Introduction to modes of non-verbal communication
- Breaking the misbeliefs
- Open and Closed Body language
- Eye Contact and Facial Expression
- Hand Gestures
- Do's and Don'ts
- Learning from experts
- Activities-Based Learning

Reference:

1. Sen Madhucchanda (2010), *An Introduction to Critical Thinking*, Pearson,Delhi
2. Silvia P. J. (2007), *How to Read a Lot*, American Psychological Association, Washington DC

Course Code	TAMIL PAPER-III	L	T	P	C
20110AEC31		4	0	0	2

பிரிஸ்ட் நிகர்நிலைப் பல்கலைக்கழகம் - வல்லம், தஞ்சாவூர்

பாட குறியீடு :

தமிழ் மூன்றாம் பருவம்

இரண்டாம் ஆண்டு

செய்யுள் , காப்பியங்கள் இலக்கிய வரலாறு

செய்யுள்

அலகு : 1

1. சிலப்பதிகாரம் - மனையறம் படுத்த காதை
2. மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை
3. சீவக சிந்தாமணி - விமலையார் இலம்பகம்

அலகு :2

4. பெரியபுராணம்- இளையான் குடிமாற நாயனார் புராணம்
5. கம்பராமாயணம் - கைகேயி சூழ்வினைப் படலம்

அலகு :3

6. சீறாப்புராணம் - நபி அவதாரப் படலம் - 24 வரிகள்
7. தேம்பாவணி - வாமன் ஆட்சி படலம் - முதல் 5 பாடல்கள்

அலகு :4

8. நளவெண்பா - சுயம்வர காண்டம் (20 - 51)

அலகு . 5 : இலக்கிய வரலாறு

9. காப்பியங்கள் , ஐஞ்சிறு காப்பியங்கள் , புராணங்கள் , இதிகாசங்கள்

Course Code	Course Title	L	T	P	C
20111AEC31	Advanced English-III	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the organs of speech and the description and classification of speech sounds
- To understand consonant cluster, syllable, word accent and intonation.
- To know how to interpret graphics
- To write slogans and advertisements

Outcome:

- Understand phonetics
- Develop writing skill
- Able to develop creative writing

UNIT –I

The organs of speech
Classification of speech sounds
Vowels and Diphthongs

UNIT –II

Consonants
Consonant cluster

UNIT – III

Syllable
Word accent
Intonation

UNIT – IV

Idiom
Interpretation of graphics

UNIT – V

Slogan writing
Writing advertisement

Reference books:

Author	Title of the book	Edition / Year	Publisher
T.B. Balasubramaniyan	A text book of Phonetics for Indian Students	Reprint 2008	Macmillian
Meenakshi Sharma &Sangeetha Sharma	Technical Communication	2011	Oxford University Press

Course Code	English Paper -III	L	T	P	C
20111AEC32		4	0	0	2

Aim:

- To acquaint with learning English through literature

Objective:

- To sensitize language use through prescribed text
- To develop the conversational skills through one act plays

Outcome:

- Appreciate different types of prose
- Develop the conversational skills through one act plays
- Enhance the skill of making grammatically correct sentences.

UNIT – 1

The Doctor's World - R.K. Narayan
The Postmaster - Rabindranath Tagore
Princess September - E.Somerest Maugham

UNIT – II

The Price of Flowers -Prabhat Kumar Mukhopadhyay
The Open Window -Saki
The Model Millionaire -Oscar Wilde

UNIT –III

My Brother My Brother - Norah Burke
Uneasy Home Coming - Will F. Jenkins
Resignation - Premchand

UNIT –IV

The Referee -W.H. Andrews & Geoffrey Dreamer
The Case of the Stolen Diamonds -Farrell Mitchell

UNIT – V

The Dear Departed -Stanley Houghton
The Princess and the Wood Cutter -Alan Alexander Milne

Text book:

Author	Title of the book	Edition / Year	Publisher
SteuartH.King	Nine Short Stories	Reprint 2001	Blackie Books
T.Prabhakar	One – Act Play		Emerald

Course Code	Core Paper - III Heat and Thermodynamics	L	T	P	C
20113AEC33		5	0	0	4

Aim:

To develop the ideas of classical thermodynamics
To deepen the appreciation of the link between the microscopic properties of individual atoms or
other particles and the macroscopic properties of many-body systems formed from them
To demonstrate the power of statistical methods in physics

Objectives:

Demonstrate an understanding of the first and second laws of thermodynamics, and of the concept of entropy.
Explain and derive the fundamental thermodynamic relation.

Unit – I: Thermodynamics

Transport Phenomenon – Viscosity- Thermal conductivity – Difffusion – Experimental confirmation of kinetic theory – Zeroth law of thermodynamics – First law of thermodynamics – Heat engines – Reversible and irreversible process – Carnot's theorem – Second law of thermodynamics – Entropy – Change of entropy in reversible and irreversible processes.

Unit – II: Low Temperature

Joule – Thomson's effect – Porus plug experiment – Liquefaction of gases – Adiabatic expansion process – adiabatic demagnetization – practical application of low temperature – Refrigerating mechanism – Electrolux refrigeration – Air conditioning machines.

Unit – III: Radiation

Radiation – Stefan's law – Boltzmann law – Black body – Rayleigh radiation – Rayleigh-Jeans law – Stefan fourth power law – Pyrometry – Solar constant – Sources of solar energy .

Unit – IV: Specific Heat

Specific heat of solids – Dulong and Petit's law – Einstein's theory of specific heat – Debye's theory – Specific heat of gases – Variations of specific heat of Diatomic gases – Quantization of various contributions to energy of a diatomic molecules.

Unit – V: Statistical Physics:

Quantum statistics of identical particles – M.B statistics – Ideal gas - B.E statistics – Specific heat - F.D. Statistics – Richardson equation –Comparison of M.B,B.E and F.D statistics.

Learning Outcomes:

Use the formalism of thermodynamics, including the thermodynamic potentials and Maxwell's relations, and apply these tools to simple systems in thermal equilibrium.

Explain the basic concepts of statistical mechanics, including the derivation of the general formula for entropy in terms of the ensemble partition function.

Explain the statistical origin of the second law of thermodynamics; and

Construct a partition function for a system in thermal equilibrium and use it to obtain thermodynamic quantities of interest.

Books for Reference:

1) Heat and Thermodynamics – J.B. Rajam and C.L. Arora.
2) Thermodynamics and Statistical Physics – Sharma and Sarkan.
3) Heat and Thermodynamics – Brijlal and Subramanian.
4) Statistical Mechanics – Satyaprakash and C. Agarwal.

Course Code	Core Practical – III	L	T	P	C
20113SEC34L	Heat and Thermodynamics Lab	0	0	3	2

List of Experiments

1) Sonometer – Verification of laws.
2) Stokes method – Viscosity of highly viscous liquid.
3) P.O. Box – Temperature coefficient.
4) Potentiometer – Calibration of high range voltmeter.
5) Spectrometer – I-d curve.
6) Joule's calorimeter – Specific heat capacity.
7) Study of logic gates – discrete components.
8) Potentiometer – Calibration of ammeter.
9) Spectrometer – Grating – normal incidence method.
10) Emissive power of a surface – Spherical calorimeter.

Course Code	Allied Paper -II	L	T	P	C
20114AEC35	Inorganic, Organic and Physical Chemistry- I	6	0	0	5

UNIT- I : Polar effect:

Inductive effect +I and – I groups, relative strength of – foamic , acetic and propionic acids – acetic and chloroacetic acids – ammonia and methyl amine. Resonance – resonating structure of benzene, butadiene and COOH groups – conditions – applications (resonance energy and stability). Acidic & basic properties of phenol &aniline. Hyper conjugation.- consequence of hyper conjucation. Steric effects –Steric accelerated reaction and steric inhibited reaction.

UNIT –II : Industrial chemistry

Fuel gases – Watergas, products gas, L.P.G gas, Gober gas and natural gas. Fertilizers – NPK and mixed fertilizers, micronutrients, and their role in plant life and biofertilizers, soap and detergents an elementary idea about preparation cleaning action of soup detergents.

UNIT III : Aromatic compounds :

structure, stability, resonance and aromaticity of benzene. Substitution reactions, Nitration, Halogenation and Alkylation Naphthalene Isolation, Synthesis, properties, and structural elucidation and uses .Organic compounds: Benzoin, Perkin, Cannizaro, Claisenreactions.Chemotherapy: Definition and uses of Antibiotic, Analgesic Antibactria, Antiviral, Antidiabetic, Antihypertensive, Antiseptic and disinfectant, Antimalarial- Anaesthetics – local and general.

UNIT –IV :Energetic:

Review first law of thermodynamic state and path functions need for the second law Carnot cycle and thermodynamic scale of temperature spontaneous and non spontaneous process and Third law.

UNIT – V : Chemical kinetics:

Order of reactions and their determinations. Activation energy, effect of temperature on reaction rate. Catalysis Types, mechanism of catalytic reactions, industrial applications.

References:

1. R.D.Madan, J.S.Tiwari and G.L.Mudhara, A Text Book of First Year B.Sc. Chemistry, S . hand & Co.
2. G.S. Manku, Theoretical Principles of Inorganic chemistry, Tata McgrawHill,New Delhi.
3. Paula YaukanisBruice – Organic chemistry, prentice Hall.
4. J.D.Lee, concise inorganic chemistry, 5th Edition, Blackwell Science Ltd, Oxford, 2002.
5. B.S.Bahl and ArunBahl, Advanced Organic chemistry, S.Chand and Co., NewDelhi
6. B.R.Puri and Sharma, principles of physical chemistry.
7. K.S.Tiwari, N.K.Vishnoi and S. N. Mehrotra,A Text book of Organic chemistry, Vikas publishing House Pvt. Ltd., NewDelhi, 2004.

Course ode	Volumetric Analysis Lab- I	L	T	P	C
20114AEC36L		0	0	3	2

1. Strong acid vs Strong base.
2. Weak acid vs Strong base
3. Estimation of ferrous sulphate.
4. Estimation of oxalic acid.
5. Estimation of copper.
6. Estimation of potassium dichromate
7. Estimation of potassium permanganate

Course ode	Research Methodology	L	T	P	C
20113RMC37		2	0	0	2

UNIT I: Introduction to Research Methodology

Meaning of research – Objectives of research – Types of research – Significance of research – Research approaches

UNIT II: Research Methods

Research methods versus methodology – Research and scientific method – Criteria of good research – Problems encountered by researchers in India.

UNIT III: Literature Survey

Articles – Thesis – Journals – Patents – Primary sources of journals and patents – Secondary sources – Listing of titles – Abstracts – Reviews – General treatises – Monographs.

UNIT IV: Database Survey

Database search – NIST – MSDS – PubMed – Scopus – Science citation index – Information about a specific search.

UNIT V: Laboratory Safety

General guidelines. Hygiene – Eye, foot, skin and hand protection – Safety rules -Equipment protection – Respiratory protective equipment – safety equipment – Leakingcompressed gas cylinders – electrical safety. Fire – fire extinguishers.

References:

1. C. R. Kothari, Research Methodology, New Age International Publishers. New Delhi, 2004.

2. R.A Day and A.L. Underwood, Quantitative analysis, Prentice Hall, 2099.

3. D.G Peters, J.M. Hayes and G.M. Hefige, A brief introduction to Modern chemical analysis.

4. R. Gopalan, Thesis writing, Vijay Nicole Imprints Private Ltd., 2005.

5. R.Gopalan, P. S. Subramanian and K. Rengarajan, Elements of Analytical Chemistry,

Sultan Chand and Sons, New Delhi, 2005.

6. E. Balagurusamy, Numerical methods, Tata McGraw-Hill

7. S.S. Sastry, Introductory Methods of Numerical analysis, PHI, N.Delhi

Course Code	Course Title	L	T	P	C
201ACLSOAN	OFFICE AUTOMATION	-	-	-	2

Aim:

Course Objectives :

To provide an in-depth training in use of office automation, internet and internet tools. The course also helps the candidates to get acquainted with IT.

Course Outcomes:

After completion of the course, students would be able to documents, spreadsheets, make small presentations and would be acquainted with internet.

UNIT I

Knowing the basics of Computers

UNIT II

Word Processing (MS word)

UNIT III

Spread Sheet (MS XL)

UNIT IV

Presentation (MS Power Point)

UNIT V

Communicating with Internet

Reference:

1. Fundamentals of computers - V.Rajaraman - Prentice- Hall of india

2. Microsoft Office 2007 Bible - John Walkenbach,HerbTyson,FaitheWempen,caryN.Prague,MichaelR.groh,PeterG.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.

3. Introduction to Information Technology - Alexis Leon, Mathews Leon, and Leena Leon, Vijay Nicole Imprints Pvt. Ltd., 2013.

4. Computer Fundamentals - P. K. Sinha Publisher: BPB Publications

5. https://en.wikipedia.org

6. https://wiki.openoffice.org/wiki/Documentation

7. http://windows.microsoft.com/en-in/windows/windows-basics-all-topics

Course Code	TAMIL PAPER-IV	L	T	P	C
20110AEC41		4	0	0	2

பிரிவு: இயற்கலைப் பல்கலைக்கழகம்- வல்லம், தஞ்சாவூர்

பட. குறியீடு :தமிழ்.

நான்காம் பருவம் இரண்டாம் ஆண்டு

செய்யுள் , சங்க இலக்கியம், அற இலக்கியம் , செய்யுளி , இலக்கிய வரலாறு

அலகு . 1 : பண்டைய இலக்கியம் - நற்றிணை;

1. நெய்தல் - தோழி கூற்று - பாடல் எண் . 11

2. குறிஞ்சி - தலைவி கூற்று - பாடல் எண். 64

3. முல்லை - தலைவன் கூற்று - பாடல் எண்.142

4. பாலை - நற்றாய் கூற்று - பாடல் எண். 29

5. மருதம் - தலைவி கூற்று - பாடல் எண் . 70

பண்டைய இலக்கியம் குறுந்தொகை

1 . குறிஞ்சி - தோழி கூற்று - பாடல் எண் .1

2. முல்லை - செவிலித்தாய் கூற்று - பாடல் எண்.167

3. மருதம் - தலைவி கூற்று - பாடல் எண். 181

4. நெய்தல் - தலைவி கூற்று - பாடல் எண் . 290

5. பாலை - தலைவன் கூற்று - பாடல் எண் . 347

பண்டைய இலக்கியம் ஐங்குறுநூறு

1. மருதம் - கள்வன் பத்து - முதல் இரண்டு பாடல்கள்

2. நெய்தல் - தோழிகூற்றுப் பத்து - முதல் இரண்டு பாடல்கள்

3. குறிஞ்சி - குன்றக் குரவன் பத்து - முதல் இரண்டு பாடல்கள்

4. பாலை - இளவேனிற் பத்து - முதல் இரண்டு பாடல்கள்

5. முல்லை - பாசறைப் பத்து - முதல் இரண்டு பாடல்கள்

அலகு . 2 : கலித்தொகை

1 . பாலை - பாடல் எண். 2

2. குறிஞ்சி - பாடல் எண் . 37

அகநானூறு

1 . பாலை - பாடல் எண். 5

2. மருதம் - பாடல் எண். 6

புறநானூறு

பாடல் எண் : 6 ,121, 41, 153 ,172 191, 223, 246, 284, 358.

பதிற்றுப்பத்து

இரண்டாம் பத்து பாடல் எண் . 4 (நிலம் நீர் வளி விசும்பு)

அலகு .3:

1 . பட்டினப்பாலை - முதல் 105 வரிகள்

2. திருக்குறள் - 1.மருந்து 2.ஊக்கமுடைமை 3.உழவு

அலகு . 4 : செம்மொழி வரலாறு :

(மொழி - விளக்கம் , மொழிக்குடும்பங்கள், உலகச் செம்மொழிகள் , இந்தியச் செம்மொழிகள் , செம்மொழித் தகுதிகள் , வரையறைகள், வாழும் தமிழ் செம்மொழி , தொன்மை , தமிழின் சிறப்புகள், தமிழ் செம்மொழி நூல்கள்)

அலகு . 5 : இலக்கிய வரலாறு

சங்க இலக்கியங்கள் , பதினெண் கீழ்க்கணக்கு நூல்கள்.

Course Code	Course Title	L	T	P	C
20111AEC41	Advanced English-IV	4	0	0	2

Aim:

- To improve the knowledge of English

Objective:

- To familiarize with the objectives and types of interview
- To know the types of questions and answering techniques
- To prepare reviews and proposals
- To learn the grammatical forms
- To understand the meaning of a poem and write the content
- To write for and against a topic
- To draw a flowchart
- To write definitions

Outcome:

- Develop writing skill
- Comprehend and describe poems
- Learn interviewing skills

UNIT –I

Interviews

Objectives, types, ten success factors, ten failure factors - Planning and preparation – Presentation– Type of questions – Answering techniques.

UNIT – II

Flowchart

Proposals

UNIT – III

Discourse markers

Review

UNIT IV

Grammatical forms

Paraphrasing

UNIT –V

Definition

Writing for and against a topic.

Reference books:

Author	Title of the book	Edition / Year	Publisher
Rajendra Pal & J.S Korlahalli	Essentials of Business Communication	2015	Sultan Chand & Sons
Meenakshi Raman &Sangeetha Sharma	Technical Communication	2011	Oxford University Press
Wren & Martin	English Grammar & Composition	2009	S.Chand

Course Code	English Paper -IV	L	T	P	C
20111AEC42		4	0	0	2

Aim:

- To learn English through literature

Objective:

- To explore learners to the standard literary texts
- To impart wisdom through morally sound poems and essays
- To introduce Shakespeare to non-literature students

Outcome:

- Improve their ability to read and understand them
- Know the genius of Shakespeare
- Express one's views in writing

UNIT –I

My Last Duchess -Robert Browning
The Toys -Coventry Patmore
I, too -Langston Hughes

UNIT –II

How to be a Doctor -Stephen Leacock
My Visions for India -A.P.J. Abdul Kalam
Woman, not the weaker sex -M.K. Gandhi

UNIT –III

The Best Investment I ever made-A.J.Cronin
The Verger -W.S Maugham
A Willing Slave -R.K.Narayan

UNIT –IV

Macbeth
As You Like It

UNIT –V

Henry IV
Tempest

Text book:

Author	Title of the book	Edition / Year	Publisher
Devaraj	English for Enrichment	2012	Emerald Publishers
Board of Editors	Selected Scenes from Shakespeare Book I & II	2012	Emerald Publishers

Sub. Code	Core Paper - IV Optics	L	T	P	C
20113AEC43		5	0	0	4

Aim:

To introduce geometric optics and the use of ray diagrams using lenses and mirrors.

To understand how simple optical instruments work.

Objectives:

Produce ray diagrams to predict the position and size of the image produced by simple lenses. Measure the focal length of a simple convex lens by producing an image of a distant object. Calculate the focal length of a simple lens by making measurements of image and object distance and using the lens equation.

Unit – I: Geometrical Optics

Thick lens – Principal foci and principal points – Thick lens formulae – Power of a thick lens – Nodal points – Optical centre of a lens.

Chromatic, chromatic combination of lenses,Aberrations: Spherical aberration – Methods of reducing spherical aberration – Coma – Aplanaticsurface – Astigmatism – Curvature of the field.

Unit – II: Optical Instruments

Kellnar's eyepiece – Ramsden's eyepiece – Huygen's eyepiece. Rayleigh's criterion, Resolving power of Optical Instruments: Resolving power – Resolving power of Telescope, Microscope, Prism and Grating.

Unit – III: Interference

Colours of thin films – Air wedge – Newton's rings – Brewster's fringes – Michelson Interferometer and its applications – Fabry-Perrot Interferometer – Interference filter – Stationary waves in light – Colour photography – Holography.

Unit – IV: Diffraction

Fresnel's diffraction – Diffraction at a circular aperture, straight edge – Fraunhofer diffraction at a single slit – Double slit – Diffraction pattern – Transmission grating with theory – Experimental determination of wavelength – Oblique incidence.

Unit – V: Polarization and Fibre optics

Nicol prism – Nicol prism as an analyzer and polarizer – Huygen's explanation of double refraction in Uniaxial crystal – Elliptically and circularly polarized light – Production and detection – quarter wave plate and half wave plate – Basic ideas of optical fibre – Numerical aperture – Stepped and graded index fibres – Fibre optic communication (Block diagram only).

Learning Outcomes:

Generate ray diagrams to predict the position and size of images in optical systems.

Understand and use the mathematical formulae to predict the position and size of images produced by simple lenses.

Measure the focal length of lenses and mirrors using various methods.

Understand the origin of spherical aberration in lenses.

Books for study:

1) Text Book of Optics – Brijlal and Subramaniam , S. Chand & Co.,
2) Optics by Khanna and Gulati.
3) Fibre Optic Communicaion systems – SubirkumarSsarkar, S.Chand& Co.,

Sub. Code	Core Practical– IV Optics Lab	L	T	P	C
20113SEC44L		0	0	3	2

List of Experiments

1) CRO – Study of waveforms – Lissajous figures – determination.
2) Potentiometer – Temperature coefficient of resistance.
3) FET Characteristics.
4) Field along the axis of a coil – determination of magnetic moment.
5) Spectrometer – Grating – Minimum deviation method.
6) Potentiometer – EMF of a thermocouple.
7) Spectrometer - i-i' curve.
8) Koenig's method – Uniform bending – Young's modulus.
9) Cauchy's Constant determination.
10) IC Regulated power supply.

Course Code	Allied Paper-II Inorganic,Organic and Physical Chemistry- II	L	T	P	C
20114AEC45		6	0	0	5

UNIT – I : Amino acids and proteins

Amino acids- Classification based on structure and essential and non - essentialamino acids – preparation and properties – peptides – (elementary treatment) proteins – Classification, based on physical properties and functions. Structure of proteins – primary and secondary (elementary treatment)

UNIT – II: Coordination chemistry

Nomenclature of mononuclear complexes – Werner Sidgwick, and Pauling's theories – Chelation and its industrial importance to EDTA. Biological role of hemoglobin and chlorophyll Metallic bond Electron gas, Pauling and band theories. Semiconductors intrinsic, n- type and p-type.

UNIT –III: Synthetic polymers:

Teflon, Alkyl and epoxy resins, poly esters – General treatment only. Heterocyclic compounds – Furan, Thiophene, pyrrole and pyridine – preparation and properties of pyridine and pyrrole – Quinoline and isoquinoline.
Stereoisomerism – lactic and tartaric acid – racemic mixture and resolution. Geometrical keto – enol tautomerism Meaning of E, Z, R, S, D, L, meso, (+), (-) in stereochemistry.

UNIT- IV : Electrochemistry:

Specific and equivalent conductivities – their determination – Oswald's dilution law, Kohlrausch law.P_H and Buffer: Importance of pH and buffers in living systems – P_H determination by colorimetric and electrometric methods.

UNIT –V : Surface chemistry:

Emulsion, gels preparation, properties and applications. Electrophoresis, Chromatography – Column, paper and thin layer chromatography.

References:

1. S.S.Dara – A Text Book of Environmental chemistry and pollution control- Chand and Co.
2. D.N.Bajpai – Advanced physical chemistry – Chand and Co.
3. Bruce H.Mahan, University chemistry – Narosa publishers, New Delhi, 2089.
4. R.T.Morrison and R.N.Boyd, organic chemistry, 6th Edition.
5. I.L.Finar, organic chemistry, Volume I
6. R.D.Madan, Advanced Inorganic chemistry.
7. Puri and Sharma, Text book of Physical chemistry.

Course code	Allied-II Practical-II Volumetric Analysis Lab- II	L	T	P	C
20114SEC46L		0	0	3	2

I - A study of the reactions of the following organic compounds:

a. Carbohydrate,
b. Amide,
c. Aldehyde,
d. Ketone,
e. Acid,
f. Phenol.

The students may be trained to perform the specific reactions like tests for elements (nitrogen only) aliphatic or aromatic saturated or unsaturated and functional group present and record their observations.

II - Preparation (Single stage) involving

a. Nitration,
b. Hydrolysis
c. Bromination.

Course Code	Environmental Studies	L	T	P	C
201ENVTSTU		2	0	0	2

Aim:

Provide MESM students the opportunity to formulate learning outcomes for their degree program through interaction with URI faculty and staff involved in the six different MESM advising tracks as well with URI faculty and staff working in environmental science and management.

Objectives

The fundamental objective of the course is to introduce new Master of Environmental Science and Management (MESM) students to the opportunities and structure of the degree program. Specifically, the course will:

UNIT–I

The Multidisciplinary Nature of Environmental Studies – Definition, Scope and Importance - Need for public awareness - **Natural Resources: Renewable and Non-Renewable Resources**- Forest resources - Water resources - Mineral resources - Food resources - Energy resources - Land resources.

UNIT-II

Ecosystems- Concept of an ecosystem - Structure and function of an ecosystem - Producers, consumers and decomposers - Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids - Types of ecosystem - Forest ecosystem - Grassland ecosystem - Desert ecosystem - Aquatic ecosystems.

UNIT-III

Biodiversity and its Conservation– Definition - Genetic, species and ecosystem diversity - Biogeographical classification of India - Values of biodiversity - Biodiversity at global, National and local levels - India as a mega - diversity nation - Hot-spots of biodiversity - Threats to biodiversity - Endangered and endemic species of India - Conversation of biodiversity.

UNIT-IV

Environmental Pollution– Definition - Air pollution - Water pollution - Soil pollution - Marine pollution - Noise pollution - Thermal pollution - Nuclear hazards - Solid waste Management - Role of an individual in prevention of pollution - Disaster management.

UNIT-V

Social Issues and the Environment- From Unsustainable to Sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, watershed management - Environmental ethics - Climate change green house effect and global warming - Ozone depletion - Waste land reclamation - Consumerism and waste products - Environmental Legislation - Issues involved in enforcement of environmental legislation - Public awareness - **Human Population and the Environment**.

Learning outcomes:

Provide MESM graduate students the opportunity to identify and develop professional internships (EVS 597) through interactions with professionals representing environmental agencies, nongovernmental organizations, or private firms.

TEXT BOOK:

1. "ENVIRONMENTAL STUDIES", K.Kumarasamy, A.Alagappa Moses, M.Vasanthy.

Course Code	Course Title	L	T	P	C
201ACLSLMS	Leadership and Management Skills	-	-	-	2

Aim:

The aim of the course cultivatingandnurturingtheinnateleadershipskillsofthe youthsothattheymaytransformthesechallengesintoopportunitiesandbecometorchbearersof the future by developing creativesolutions.

Course Objective:

The Module is designed to**:**

- Help students to develop essential skills to influence and motivateothers
- Inculcate emotional and social intelligence and integrative thinking for effective leadership
- Create and maintain an effective and motivated team to work for thesociety
- Nurture a creative and entrepreneurialmindset
- Make students understand the personal values and apply ethical principles inprofessional
  and social contexts.

Course Outcomes :

Upon completion of the course students will be able to:

1. Examine various leadership models and understand/assess their skills, strengthsand
   abilities that affect their own leadership style and can create their leadership vision
2. Learnanddemonstrateasetofpracticalskillssuchastimemanagement,selfmanagement,
   handling conflicts, team leadership, etc.
3. Understand the basics of entrepreneurship and develop businessplans
4. Apply the design thinking approach forleadership
5. Appreciate the importance of ethics and moral values for making of a balanced personality.

UNIT I-LeadershipSkills

a. **Understanding Leadership and itsImportance**
   - What isleadership?
   - Why Leadershiprequired?
   - Whom do you consider as an idealleader?

b. **Traits and Models ofLeadership**
   - Are leaders born ormade?
   - Key characteristics of an effectiveleader
   - Leadership styles
   - Perspectives of differentleaders

c. **Basic LeadershipSkills**

- Motivation
- Teamwork
- Negotiation
- Networking

UNIT II -Managerial Skills

a. **Basic ManagerialSkills**

- Planning for effectivemanagement
- How to organiseteams?
- Recruiting and retainingtalent
- Delegation oftasks
- Learn tocoordinate
- Conflictmanagement

b. **Self ManagementSkills**

- Understanding selfconcept
- Developingself-awareness
- Self-examination
- Self-regulation

UNIT III -EntrepreneurialSkills

a. **Basics ofEntrepreneurship**

- Meaning ofentrepreneurship
- Classification and types ofentrepreneurship
- Traits and competencies ofentrepreneur

b. **Creating BusinessPlan**

- Problem identification and ideageneration
- Ideavalidation
- Pitchmaking

UNIT IV - Innovative Leadership andDesignThinking

a. **Innovative Leadership**

- Concept of emotional and socialintelligence
- Synthesis of human and artificialintelligence
- Why does culture matter for today's globalleaders

b. **DesignThinking**

- What is designthinking?
- Key elements of designthinking:
  - Discovery
  - Interpretation
  - Ideation
  - Experimentation
  - Evolution.

- How to transform challenges intoopportunities?
- How to develop human-centric solutions for creating socialgood?

UNIT V- EthicsandIntegrity

a. Learning throughBiographies

- What makes an individualgreat?
- Understanding the persona of a leader for deriving holisticinspiration
- Drawing insights forleadership
- How leaders sail through difficultsituations?

b. Ethics andConduct

- Importance ofethics
- Ethical decisionmaking
- Personal and professional moral codes ofconduct
- Creating a harmoniouslife

Bibliography and Suggested Readings :

Books

- Ashokan, M. S. (2015). *Karmayogi: A Bbiography of E. Sreedharan*. Penguin,UK.
- Brown, T. (2012). *Change by Design.* HarperBusiness
- Elkington, J., &Hartigan, P. (2008). *The Power of Unreasonable People: How Social Entrepreneurs Create Markets that Change the World.* Harvard Business Press.
- Goleman D. (1995). *Emotional Intelligence.* Bloomsbury Publishing India PrivateLimited
- Kalam A. A. (2003). *Ignited Minds: Unleashing the Power within India*. Penguin BooksIndia
- Kelly T., Kelly D. (2014). *Creative Confidence: Unleashing the Creative Potential WithinUsAll.* WilliamCollins
- KurienV., & Salve G. (2012). *I Too Had a Dream*. Roli Books PrivateLimited
- Livermore D. A. (2010). *Leading with cultural intelligence: The New Secret to Success.* New York: American ManagementAssociation
- McCormackM.H.(1986).*WhatTheyDon'tTeachYouatHarvardBusinessSchool:NotesFromA Street-Smart Executive*. RHUS
- OToole J. (2019) *The Enlightened Capitalists: Cautionary Tales of Business Pioneers Who Tried to Do Well by Doing Good.*Harpercollins
- Sinek S. (2009). *Start with Why: How Great Leaders Inspire Everyone to Take Action*.Penguin
- Sternberg R. J., Sternberg R. J., &BaltesP. B. (Eds.). (2004). *International Handbook of Intelligence*. Cambridge UniversityPress.

E-Resources

- Fries,K.(2019).8EssentialQualitiesThatDefineGreatLeadership.*Forbes.*Retrieved2019- 02-15 from https://www.forbes.com/sites/kimberlyfries/2018/02/08/8-essential-qualities-that-define-great-leadership/#452ecc963b63.
- HowtoBuildYourCreativeConfidence,TedTalkbyDavidKelly-https://www.ted.com/talks/david_kelley_how_to_build_your_creative_confidence
- India's Hidden Hot Beds of Invention Ted Talk by Anil Gupta - https://www.ted.com/ talks/anil_gupta_india_s_hidden_hotbeds_of_invention
- Knowledge@Wharton Interviews Former Indian President APJ Abdul Kalam - . "A Leader Should Know How to Manage Failure" https://www.youtube.com/ watch?v=laGZaS4sdeU
- Martin, R. (2007). How Successful Leaders Think. *Harvard Business Review, 85*(6):60.
- NPTEL Course on Leadership -https://nptel.ac.in/courses/122105021/9

Course Code	Core Paper - V Electricity And Magnetism	L	T	P	C
20113AEC51		5	0	0	4

Aim:

To develop a basic understanding of electric and magnetic fields in free space using the integral forms of Maxwell's laws.

Objectives:

Describe the electric field and potential, and related concepts, for stationary charges.
Calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential.

Unit – I: Electrostatics

Coulomb's law – electrical images – Electric intensity and potential due to an earthed conducting sphere , Different case, applying the principle of electrical images – Electrometers: quadrant electrometers.

Unit – II: Magnetic Properties of Materials

Definitions – IH and BH curves for a magnetic material, Magnetometer method, Ballistic galvanometer method – Hysterisis –coercivity –retentivity – loss of energy per cycle – Difference in the magnetic properties of iron and steel – Magnetic circuit – Magnetic circuit of an iron ring with small air gap.

Unit – III: Chemical effects of electric current

Faraday's law's of electrolysis – Ionic velocities and Mobilities – Calculation and experimental determination of ionic mobilities – Transport numbers.

Thermo electricity – Peltier coefficient – Thomson coefficient – Application of thermodynamics to a thermocouple and Relation between Peltier and Thomson coefficients – Thermo electric diagrams – Uses.

Unit – IV: LCR Circuits

Determination of Self inductance by Rayleigh method – 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 – Application of electromagnetic induction – Flux meter.

Unit – V:

AC Bridges: Owen's bridge – Anderson's bridge – Electromagnetic theory – Maxwell's equations – derivation – Propagation of energy – poynting vector.

Learning Outcomes:

Describe the magnetic field for steady currents and moving charges.
Calculate magnetic properties of simple current distributions using Biot-Savart andAmpere's laws.
Describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws.
Describe the basic physical content of Maxwell's laws in integral form.

Books for Reference:

1) Electricity and Magnetism – Brijlal&Subramaniam.
2) A text book of Electricity & Magnetism – K.K. Tiwal

Course Code	Core Paper - VI	L	T	P	C
20113AEC52	Atomic Physics	4	1	0	3

Aim:

This course will introduce students to the fundamentals of atomic physics and rudimentary nuclear physics. It aims to provide a coherent and concise coverage of traditional atomic and physics.

Objectives:

Important topics of current research interest will be also discussed, such as laser cooling and trapping which plays an important role in the realization of Bose-Einstein condensate in atomic vapors.

Unit – I: Positive ray analysis

Properties – e/m of positive rays: Thomson' parabola method – Aston and Bain bridges – Determination of critical potential – Franck and Hertz's experiment.

Unit – II: Photo Electricity

Photo electric emission – laws – Lenard's experiment – Richardson and Compton experiments – Einstein's photoelectric equation – Experimental verification of Einstein's photoelectric equation by Millikan's experiment.

Unit – III: Vector atom model

Various quantum numers, L-S and j-j couplings – Pauli's exclusion principle – electronic configuration of elements and periodic classification – Magnetic dipole moment of electron due to orbital and spin motion – Bohr magneton Stern and Gerlach experiment.

Unit – IV: Fine structure of special Lines

Special terms and notations – Selection rules – Intensity rule and interval rule – Fine structure of sodium D lines – Alkali spectra – Fine structure in Alkali spectra.

Spectrum of Helium – Zeeman effect – Larmor's theorem – Debyes quantum mechanical explanation of the normal Zeeman effect – Anamolous Zeeman effect – (Qualitative study Only).

Unit – V: X – Rays:

X – Rays – Bragg's law – Bragg's, X-Ray spectrometer – Origin and analysis of continuous X – ray spectrum and characteristic X – ray spectrum – Moseley's law and its importance – Compton effect – derivation of expression for change in wavelength – its experimental verification.

Learning Outcomes:

Explain how light interacting with atom; the working principle of laser trapping and cooling
Recognize the general features of atomic/nuclear spectroscopy

Books for Reference:

1) Modern Physics by R. Murugeshan.
2) Modern Physics by J.B. Rajam
3) Atomic and Nuclear Physics – N. Subramaniam and Brijlal.

Course Code	Core Paper - VII	L	T	P	C
20113AEC53	Basic Electronics	4	1	0	4

Aim:

Electronic systems are built with components like resistance, capacitance, diodes,Transistors, etc. The intention of the course is to create awareness about the principle .

Objectives:

Working of the commonly used components in electronic systems. Upon completion of the Course the student is expected to be able to identify, use and check various electronic components.

Unit – I: Semiconductors

Introduction – Pure semiconductor – Impurity semiconductor – Fermi level in semiconductor – Hall effect – Junction diodes – PN Junction – Biased PN Junction – Volt Ampere characteristic of a PN Junction – Zener diode – Tunnel diode.

Unit – II: Transistors

Junction Transistor – Transistor construction – Modes of operation of a transistor – α and β of a transistor – Relation – static characteristic in CB and CE modes – Transistor amplifier – Transistor Biasing.

Unit – III: Special Semiconductor Devices

Field effect transistor – FET parameters – Comparison between FET and Transistor – SCR – UJT.

Unit – IV: Amplifiers

Voltage and Power amplifiers: R-C coupled Transistor amplifier – Power amplifier – Class A, Class B and Class C power amplifier – Push pull amplifier – Effect of negative feedback.

Unit – V: Oscillators

Types of Oscillators – Concept of feedback oscillator – Hartley – Colpitts - Phase shift oscillator –Tuned collector oscillator – Wien-Bridge oscillator.

Learning Outcomes:

Students will be able to explain basic circuit concepts and responses.

Will be able to do linear modeling of passive elements and sources.

Will be able to use analytical techniques in resistive circuits energized by direct current

voltage and current sources.

Books for Reference:

1) Principles of Electronics – V.K. Metha
2) A text book of Applied Electronics – R.S. Sedha

Course Code	Core Practical – V	L	T	P	C
20113SEC54L	ELECTRICITY AND MAGNETISM LAB	0	0	3	2

1. To study the resonance in series and parallel LCR cicuits for different resistances and calculate Q-value.

2. To determine the given inductance by Anderson's bridge.

3. Verify laws of electromagnetic induction.

4. To study the induced emf as function of velocity.

5. To study the Characteristics of a Series RC Circuit.

6. To study the a series LCR circuit and determine its (a) Resonant Frequency, (b) Quality Factor

7. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor Q

8.Measurement of field strength B and its variation in a Solenoid (Determine dB/dx).

9. Deflection magneto meter – TAN A position

10. Field along the axis of the circular coil- Determination of M

11. Meter Bridge.

12. Post office box.

Course Code	Core Practical – VI	L	T	P	C
20113SEC55L	Basic Electronics Lab	0	0	3	2

List of Experiments

1) M and H – Absolute determination using deflection and vibration magnetometer.
2) Zener regulated power supply – percentage of Regulation.
3) Logic gates, IC- Version.
4) Universality of NOR gates.
5) Verification of Logical Expressions
6) Hartley oscillator – Transistor.
7) Universality of NAND gates.
8) Operational Amplifier – Adder and Subtractor.

Course Code	Discipline Specific Elective -I	L	T	P	C
20113DSC56A	Energy Physics	5	0	0	4

Aim:

To understand the physical background and mechanisms associated with power generation and related issues.

Objectives:

Understand the forms of energy, its production, transport and storage
Understand basic nuclear physics and interactions with matter

Unit – I: Non- Renewable energy sources

World Energy Futures – Energy Sources and their Availability – Coal – Oil – Natural gas – merits and demerits.

Unit – II: Renewable Energy Sources

Solar energy – nature of solar radiation – solar constant – Determination of Solar constant – Solar water heaters – Solar cooling – Solar ponds – Solar cookers – Water desalination.

Unit – III: Other renewable energy sources

Bio mass energy – gobar gas plants – geothermal energy – wind energy – Wind mill – Types of Wind mills – ocean thermal energy conversion (OTEC) – Energy from waves and tides.

Unit – IV: Energy Storage

Energy storage systems – Mechanical Energy storage – Compressed Air storage – Electrical storage – Thermal energy storage.

Unit – V: Impacts of Non-conventional energy

Energy consumption in domestic, Industrial- Transportation and Agricultural sectors – Energy options for the developing countries – Impacts due to non conventional energy sources – global warming. and its impacts.

Learning Outcomes:

Understand the conditions necessary for sustainable chain reactions in fissile material
Understand the design criteria for the control of a nuclear reactor
Understand the principles of nuclear fusion useful in power generation and stellar fusion
Understand physical ideas and issues associated with renewable forms of energy

Books for Reference:

1) Solar energy utilization – G.D. Rai.
2) Solar energy – S.P. Sukhatme

Course Code	Discipline Specific Elective -I	L	T	P	C
20113DSC56B	Laser Physics	5	0	0	4

Objective:
To introduce the physical and engineering principles of laser operation and their applications.

UNIT- I: Fundamentals of LASER

Spontaneous emission – Stimulated emission – Meta stable state –Population inversion – Pumping – Laser Characteristics

UNIT II Production of LASER

Helium – Neon Laser – Ruby Laser – CO2 Laser – Semiconductor Laser

UNIT III Industrial Applications of LASER

Laser cutting – Welding – Drilling – Hologram – Recording andReconstruction of hologram.

UNIT IV Lasers in Medicine

Lasers in Surgery – Lasers in ophthalmology – Lasers in cancer treatment

UNIT V Lasers in Communication

Optic fibre communication – Total internal reflection – Block diagram of fibre optic communication system – Advantages of fibre optic communication.

Books for study:

1. N. Avadhanulu , An introduction to LASERS, S. Chand & Company,2001.

Books for References:

1. William T. Silfvast, Laser fundamentals, University Press, Published in South Asia by Foundation books, New Delhi, 2098.
2. K. Thyagarajan and A.K. Ghatak, LASER Theory and Application, Mc Millan, India Ltd, 2084

Course Code	Course Title	L	T	P	C
201ACLSPSL	Professional Skills	-	-	-	2

Aim:

Course Objectives :

The Objectives of the course are to help students/candidates:

1. Acquire career skills and fully pursue to partake in a successful careerpath
2. Prepare good resume, prepare for interviews and groupdiscussions
3. Explore desired career opportunities in the employment market in consideration ofan individual SWOT.

Course Outcomes :

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

1. Preparetheirresumeinanappropriatetemplatewithoutgrammaticalandothererrorsandusing proper syntax
2. Participate in a simulatedinterview
3. Actively participate in group discussions towards gainfulemployment
4. Capture a self - interview simulation video regarding the job roleconcerned
5. Enlist the common errors generally made by candidates in aninterview
6. Perform appropriately and effectively in groupdiscussions
7. Explore sources (online/offline) of careeropportunities
8. Identify career opportunities in consideration of their own potential andaspirations
9. Usethenecessarycomponentsrequiredtoprepareforacareerinanidentifiedoccupation (as a case study).

Unit I:ResumeSkills

Resume Skills : Preparation andPresentation

- Introduction of resume and itsimportance
- Difference between a CV, Resume and Biodata
- Essential components of a goodresume

ii. **Resume skills : commonerrors**

- Common errors people generally make in preparing theirresume
- Prepare a good resume of her/his considering all essentialcomponents

Unit II: InterviewSkills

i. **Interview Skills : Preparation andPresentation**

- Meaning and types of interview (F2F, telephonic, video,etc.)
- Dress Code, Background Research, Do's andDon'ts
- Situation,Task,ApproachandResponse(STARApproach)forfacingan interview
- Interview procedure (opening, listening skills, closure,etc.)
- Importantquestionsgenerallyaskedinajobinterview(openandclosed ended questions)

ii. **Interview Skills :Simulation**

- Observation of exemplaryinterviews
- Comment critically on simulatedinterviews

iii. **Interview Skills : CommonErrors**

- Discuss the common errors generally candidates make ininterview
- Demonstrate an idealinterview

Unit III: GroupDiscussionSkills

Meaning and methods of GroupDiscussion

- Procedure of GroupDiscussion
- Group Discussion-Simulation
- Group Discussion - CommonErrors

Unit IV: ExploringCareer Opportunities

Knowing yourself – personalcharacteristics

- Knowledge about the world of work, requirements of jobs includingself-employment.
- Sources of careerinformation
- Preparing for a career based on their potentials and availability ofopportunities

Course Code	Core Paper - VIII Digital Electronics And Microprocessors	L	T	P	C
20113AEC61		4	1	0	4

Aim:

To achieve a basic understanding of logic systems and to use this understanding in simple circuit designs.

Objectives:

To show familiarity with basic logic gates, Boolean algebra and binary numbers.
To understand how particular logical functions may be implemented and to design systems
To implement simple truth tables.
To understand how binary addition may be implemented using logic gates.

Unit – I: Number systems and codes

Decimal, Binary, Octal and Hexa decimal systems – Conversion from one to another – Binary addition, subtraction, multiplication, division, complements – Codes: BCD, Weighted, excess three, Gray code.

Unit – II: Boolean Algebra

Fundamental concepts of Boolean algebra – Basic gates and universal gates – De margon's theorem: Simplification of expressions – Karnaugh map, Sop - Pas.

Unit – III: Logic Design

Half adder – Full adder, Subtractors, Multiplexers, Demultiplexer, Flip-Flops: R-S Flip Flops, J-K Flip Flop, D-Flip Flop, T-Flip Flop, Master Slave – Shift Registers – Counters – BCD – Up - Down.

Unit – IV: Memory elements

Memory cell - RAM – types – ROM: ROM, PROM, EPROM, EEPROM – Magnetic Disk Memories – Magnetic tapes – Compact disc.

Unit – V: Micro processor

Organization of 8085 – working – Machine language – Assembly language – Addressing mode, Instruction set – Programming for 8 – bit addition , subtraction, Finding a Largest number in an array – Finding a smallest number in an array.

Learning Outcomes:

understand latches and simple memory devices.
appreciate the progression from latches to flip-flops and understand the operation of the J-K flip-flop.
be able to use and predict the behaviour of simple circuits involving J-K flip-flops.
understand excitation tables and be able to use them to design simple cyclic circuits.

Books for Reference:

1) Digital Principles and application – Albert Paul Malvino and Donald Leach.
2) Digital Design – M. Morris Mano.
3) Fundamentals of Microprocessors and Microcomputers – B.Ram.

ourse Code	Core Paper - IX ELEMENTS OF THEORETICAL PHYSICS	L	T	P	C
20113AEC62		5	0	0	5

Aim:

To learn about the fundamentals of classical formalism

To learn about introduction to quantum mechanics, fundamentals of relativity and astrophysics

Unit I Lagrangian formalism.

Mechanics for a system of particle – Constraints – Generalized Co-ordinates – Transformation equations – Configuration space – Principle of virtue work – D' Alemibert's principle – Applications of Lanrange's equations – Atwood's machine – Simple pendulum.

Unit II Hamiltonian formalism

Phase space – Generalized momentum – Cyclic co-ordinates –Conservation theorem for generalized momentum – Conservation theorem for energy

Unit III Dual Nature of Matter

De Broglie concept of matter waves – de Broglie wavelength – Wave velocity and group velocity for the de Broglic waves – Experimental study of matter waves – Davison and Germer experiment – G.P. Thomon's experiment for verifying de Broglie relation – Heisenberg's uncertainty Principle – Electron microscope – Gamma ray microscope.

Unit IV Schrödinger's wave Mechanics

Basic postulates of wave Mechanics – Development of Schrödinger wave equation – Time independent and dependent forms of equations – Properties of wave function – Orthogonal and normalized wave function Eigen function and eigen values – Applications of Schrödinger equation – particle in a box- Linear harmonic oscillator – The barrier penetration problem.

Unit V Photo electric and Compton effects

Photo electric effect – Lenard, Richardson and Compton experiments – laws of photoelectric emission – Einstein's photoelectric equation – Millikan's experiment- Determination of planck's constant – photo emissive cell – photo – voltaic cell – photo conductive cell – photo multiplier – Compton effect – Theory – Experimental Verification.

Learning Outcomes:

Books for Reference:

BOOKS FOR STUDY

1. Mechanics and Mathematical Physics – R. Murugesan – S. Chand publications , Edn.2008
2. Modern Physics – R. Murugesan and KiruthigaSivaprasath – S. Chand Publications – Multicolor edition – 2008.

UNIT BOOK CHAPTER/ SECTIONS

I 1 6.1 6.2 6.3 6.6 6.7 6.10
II 1 10.1 - 10.7
III 2 11.1 11.2 11.3 11.4
IV 2 11.8, 11.10
V 2 1.14, 1.4, 1.8, 1.7, 1.9

BOOK FOR REFERENCE

1.Modern Physics – Arthur Beiser – Tata Mc Graw Hill Publications(2098).
2.Astrophysics of the Solar System- K.D.Abhyankar, University Press (India) Private Limited (2012)

Course Code	Core Practical – VI	L	T	P	C
20113SEC63L	Digital Electronics Lab	0	0	3	2

List of Experiments

1. Verification and interpretation of truth table for AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates
2. Construction of half and full adder using XOR and NAND gates and verification of its operation
3. To Study and Verify Half and Full Subtractor
4. Realization of logic functions with the help of Universal Gates (NAND, NOR)
5. Construction of a NOR gate latch and verification of its operation
6. Verify the truth table of RS, JK, T and D flip-flops using NAND and NOR gates
7. Design and Verify the 4-Bit Serial In - Parallel Out Shift Registers
8. Implementation and verification of decoder or de-multiplexer and encoder using logic gates
9. Implementation of 4x1 multiplexer and 1x4 demultiplexer using logic gates
10. Design and verify the 4- Bit Synchronous or Asynchronous Counter using JK Flip Flop
11. Verify Binary to Gray and Gray to Binary conversion using NAND gates only
12. Verify the truth table of one bit and two bit comparator using logic gates

Course Code	Core Practical – VI	L	T	P	C
20113SEC64L	MICROPROCESSOR LAB	0	0	3	2

1) 8-bit addition and subtraction using microprocessor 8085.
2) 8-bit multiplication and division using microprocessor 8085.
3) Conversion from decimal to hexadecimal system using microprocessor 8085.
4) 16 – bit addition using microprocessor 8085.
5) Write a program using 8085 Microprocessor for Decimal, Hexadecimal addition and subtraction of two Numbers.
6) Write a program using 8085 Microprocessor for addition and subtraction of two BCD numbers.
7) To perform multiplication and division of two 8 bit numbers using 8085.
8) To find the largest and smallest number in an array of data using 8085 instruction set.
9) To write a program to arrange an array of data in ascending and descending order.
10) To write a program to initiate 8251 and to check the transmission and reception of character.
11) To interface 8253 programmable interval timer to 8085 and verify the operation of 8253 in six different modes.
12). To interface DAC with 8085 to demonstrate the generation of square, saw tooth and triangular wave.
13) 10. Serial communication between two 8085 through RS-232 C port

Course Code	Discipline Specific Elective -II Material Physics	L	T	P	C
20113DSC65A		5	0	0	4

Aim

The subject-specific aims of a degree in materials science are to understand the structure, properties, processing and performance of the principal classes of materials, and to understand and exploit the relationships between these four aspects of materials.

Objectives:

To understand the design, selection and processing of materials for a wide range of applications in engineering and elsewhere.

Unit – I: Crystallographic fundamentals

Crystal lattice – Primitive and Unit cell – Seven classes of crystals – Bravais lattice – Miller Indices – Structure of crystals – Simple cubic, Hexagonal close packed structure, Face centered cubic structure, Body centered cubic structure – Sodium chloride structure – Zinc Blende structure – Diamond Structure.

Unit – II: Crystallography

Diffraction of X-Rays by Crystals – Bragg's law in one dimension – Experimental method in X-Ray diffraction – Laue method, Rotating crystal method – Powder Photograph method – Laue's equations.

Unit – III: Magnetism

Different types of magnetic materials – Classical theory of diamagnetism (Langevin's Theory) – Langevin's theory of paramagnetism – Weiss theory of paramagnetism – Qualitative explanation of Heisenberg's interpretation of internal field and quantum theory of ferromagnetism.

Unit – IV: Dielectrics

Fundamental Definitions – Dielectrics – Different types of electric polarization – Frequency and Temperature effects on polarization – Dielectric loss – Local field on internal field – Clausius Mossotti Relation – Determination of Dielectric constant.

Unit – V : Modern materials and new materials

Polymers – Ceramics – Super strong materials – Cermets – Electrets – Metallic glasses – Optical materials – Acoustic materials – Bio materials – Nuclear materials.

LearningOutcomes:

To understand how and why the properties of materials are controlled by structure and bonding at the atomic-scale, and by features at the microstructural and macroscopic levels.
To understand how and why the structure and composition of a material may be controlled by processing.

Books for Study:

Material Science – M. Arumugam.

Course Code	Discipline Specific Elective -II Communication Physics	L	T	P	C
20113DSC65B		5	0	0	4

Objective: To promote scientific temper among students and update the basic functioning of various communication systems.

UNIT- I : Radio transmission and reception

Transmitter-modulation-need for modulation- types of modulation amplitude, frequency and phase modulation- modulation factor-sideband frequencies in AM wave-limitations of amplitude modulation - frequency modulation-block diagram of AM and FM Transmitter. Receiver- demodulation-AM & FM radio receivers-super heterodyne radio receiver.

UNIT -II : Fiber Optic Communication

Introduction –structure of optical fiber –total internal reflection in optical fiber – principal and propagation of light in optical fiber - acceptance angle - numerical aperture – types of optical fibers based on material – number of modes – refractive index profile - fiber optical communication system (block diagram) - fiber optic sensors – Temperature sensor – fiber optic endoscope.

UNIT- III: Radar Communication

Basic radar system -Radar range –Antenna scanning – Pulsed radar system – A Scope- Plan position indicator- Tracking radar- Moving target indicator- Doppler effect-MTI Principle- CW Doppler Radar- Frequency modulator CW Radar.

UNIT- IV: Satellite Communication

Introduction – history of satellites – satellite communication system – satellite orbits – classification of satellites – types of satellites – basic components of satellite communication – constructional features of satellites- multiple access – communication package – antenna-power source – satellite foot points- satellite communication in India.

UNIT- V: Mobile Communication

GSM – mobile services- concept of cell – system architecture – radio interface – logical channels and frame hierarchy – protocols – localization and calling – Handover-facsimile (FAX) – application – VSAT (very small aperture terminals) – Modem – IPTV (internet protocol television) – Wi-Fi - 3G (Basic ideas only).

Books for Study:

1. Metha V.K., Principles of Electronics, S. Chand & Company Ltd., 2013
2. Anokh Singh and Chopra A.K., Principles of communication Engineering, S. Chand & Company PVT. Ltd., 2013.
3. Mani I. P., A text book of Engineering Physics, Dhanam Publications, Chennai42, 2014.

Books for Reference:

1. PoornimaThangam I, Satellite communication, Charulatha Publications, 2012.
2. Dennis Roddy and John Coolen, Electronic Communication, PHI, 2090.
3. William C.Y. lee, Cellular telecommunication (second edition), Tata Mcgraw hill, 2091.

Course Code	General Elective Journalism	L	T	P	C
201ENOEC		4	0	0	2

Aim :

- To acquaint with the basic knowledge of journalism so that it may enthuse the students to become journalists.

Objective:

- To instill in the minds of students the different aspects of journalism
- To understand the different kinds of news
- To learn the qualities and duties of a reporter, editor and sub editor
- To familiarize with the style and features of the different sections in a newspaper

Outcome:

- Become a journalist

UNIT- I

Journalism – Definition, Qualities of a journalist, Forms of journalism, Role and elements

UNIT- II

News – Definition, Kinds, Elements, Sources

UNIT- III

Reporters

UNIT- IV

The Editor and the Sub Editor

UNIT –V

Language of Journalism, Style
Qualities of a Writer
Writing a News story, Opinion Pieces, Reviews, Headlines, Editorials

References:-

Journalism -Susan
Professional Journalism - John Hogenberg
News Writing and Reporting - M.James Neal (Surjeet Publication)
Professional Journalism -M.V Komath
The Journalist's Handbook -M.V Komath
Mass Communication & Journalism - D.S Mehta

Course code	General Elective	L	T	P	C
201MAOEC	Development of Mathematics Skills	4	0	0	2

Aim:

- To understand theconcepts from the five branches of mathematics

Objectives

- Knowledge and understanding are fundamental to study mathematics and form the base from which to explore concepts and develop problem-solving skills. Through knowledge and understanding students develop mathematical reasoning to make deductions and solve problems.
- To develop student's ability to apply both conventional and creative techniques to the solution of mathematical problems

Outcomes

- Know and demonstrate understanding of the concepts from the five branches of mathematics (Operations Research, Set Theory, Statistics, Matrices and Business mathematics)
- Use appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts
- Select and apply general rules correctly to solve problems including those in real-life contexts.

Unit I

Simple interest and compound interest

Unit II

Sinking fund – discounting – trade discount – quantity discount – cash discount

Unit III

Set theory – Series

Unit IV

Matrices – Determinants

Unit V

Assignment problems

References

P.A.Navanitham, Business Mathematics & Statistics

KantiSwarup, P.K.Gupta and Manmohan, "Operations Research"

Course Code	General Elective Food And Adulteration	L	T	P	C
201CEOEC		4	0	0	2

Aim: To introduce students to food safety and standardization act and quality control of foods.

Objectives:

1. To educate about common food adulterants and their detection.
2. To impart knowledge in the legislatory aspects of adulteration.
3. To educate about standards and composition of foods and role of consumer.

Unit-I Introduction to Food Chemistry

Introduction to Food Chemistry- Water (Structure of water and ice, Physical constants of water, Types of water, Water activity) Composition of Food- Carbohydrates, Proteins, Lipids, Vitamins & Minerals.

Unit- II Food Pigments

Introduction- classification, types of food pigments- chlorophyll, carotenoids, anthocyanins, flavanoids.

Unit – III Food Preservation

Introduction - Importance, principle and Types.

High and low temperatures preservation - Pasteurization - Sterilization- Canning- Freezing- Refrigeration.

Unit – IV Food Additives

Introduction- antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents, bleaching and maturing agent, sweeteners, humectants and anti -caking agents, coloring and flavoring substance.

Unit-V Food Adulteration

Types of adulterants- intentional and incidental adulterants, methods of detection. Detection of common food adulterants in Spices , Grains, Coffee , Tea, Oil fats , Food colours and Milk. Health hazards and risks.

References:

1. The Food Safety and Standard ACT, 2006 – Seth &Capoor
2. Hand book of Food Adulteration and Safety Laws – Sumeet Malik
3. Food Science – B.Srilakshmi

Course Code	Course Title	L	T	P	C
201CMOEC	Banking Service	4	0	0	2

Aim:

- To provide the bank is financial institution which is involved in borrowing and lending money.

Objective:

- To provide a lending money to firms, customers and home buyers.
- To provide keep money for customers
- To provide offering financial advice and related financial services, such as insurance.

Outcome:

- To help to gather knowledge on banking and financial system in India
- To provide knowledge about commercial banks and its products
- To create awareness about modern banking services like e-banking-banking and internet banking, ATM System
- To introduce recent trends in banking system
- To make the student understand the basic concept of banking and financial institutions and expose various types of risk based by banks

UNIT – I

Commercial Banking – An Overview: Banking-Classification- Banking system- Universal Banking- Commercial Banking- functions – Role of Banks in Economic Development

UNIT – II

E-banking –An Overview: Meaning-Service-E-banking and Financial Services –Benefits-Internet Banking –Internet Banking Vs Traditional Banking –Mechanics of Internet Banking-Services

UNIT – III

Mobile Banking and Telephone Banking –An Overview: Meaning-Features- Registration-Services –Security Issues –Banking Facilities- Telephone Banking System – Drawbacks- Call Centers

Unit – IV

ATM and Electronic Money: Concept of ATM-Features-Functions-Strategic importance of ATM- Electronic Money – Categories –Merits – E-Money and Monetary Policy-Policy Issues for the RBI

Unit-V

EFT System and INFINET: Meaning- Steps in EFT- RBI Guidelines-EFT Systems Vs Traditional System - ECS-Features-Factors- Benefits –Handicaps -Applications

References Books

1. Banking theory law and Practice
2. Banking Theory law and practice -Santhanam
3. Banking Awareness - N.K.Gupta
4. Management of Banking and financial Services-Padmalatha suresh, Justinpaul .

Course Code	Course Title	L	T	P	C
201MBOEC	**Wildlife Conservation**	4	0	0	2

Aim:

To enable the students understand the need of conservation of wildlife in India.

Objectives:

- Maintenance of rare species in protected areas such as national parks, sanctuaries etc., Establishment of specific biosphere reserves for endangered plants and animals.
- Protection of wild life through legislation such as banning hunting etc.,
- Imposing specific restrictions on export of endangered plants and animals or their products.

Course Outcome:

- Protection of natural habitats of organisms through controlled exploitation.
- Educating the public about the need to protect the environment
- Long range goal for preserve the wild life for welfare of future generations
- Conservation and Maintenance of endangered plants in wild life

Unit I:

Wildlife Management: Basic concepts and principles - Wildlife management before and after implementation of Wild Life (Protection) Act, 1972 – IUCN – CITES – NBA – IBA –
Evaluation of Wildlife habitat**:** Define habitat – Forest habitat types - basic survey techniques of habitats – Vegetative analyses – Point centered quadrat, Quadrat, strip transect – Habitat manipulation: Food, Water, shade, impact and removal of invasive alien species.

Unit II:

Introduction to conservation biology, the origin of conservation biology, ethical and economical values of conservation biology, definition of biodiversity, types of biodiversity, threats to biodiversity. Scopes and importance of conservation methods – *In-situ* and *Ex-situ* conservation approaches of Indian animals. Captive breeding (Lion-tailed macaque, white tiger and vultures) and reintroduction (Tiger, rhinoceros, gaur).

Unit III:

Biodiversity: Definition and importance - Biodiversity hotspots in India: Western Ghats, Eastern Himalayas. Mega diversity nations – an introduction. Landscape approach and people participation in biodiversity conservation.

Unit IV:

Role of Government and Non-Government organizations in conservation.– **Government** - Wildlife Institute of India, Ministry of Environment and Forests (MoEF),

National Biodiversity Authority (NBA), Zoological Survey of India (ZSI), Botanical Survey of India (BSI), Salim Ali Centre for Ornithology and NaturalHistory(SACON),CentreforEcologicalSciences(CES).**NGOs**.– BombayNaturalHistorySociety (BNHS), World Wide Fund for Nature (WWF), Wildlife Trust of India (WTI), Nilgiri Wildlife and Environment Association (NWEA), Wildlife Conservation Society(WCS).

Unit V:

Conservation Biology Tools - Biological Parks, Zoological Parks, Forest Research Institute, AgriculturalResearchInstitutions,GenePools,CryopreservationCentres,InterpretationCentr esandroleof Field Biologists.

References Books

1. Anon, 1992. Conservation on biological diversity. Text and annexure –WWF-India.
2. Gaughley, G. and A. Gunn. 1995. Conservation Biology in Theory and practice. BlackwellPublishers.
3. Dobson, A.P. 1996. Conservation and biodiversity scientific American Library, New Yark, USA.
4. John M. Fryxell, Anthony R.E. Sinclair and Graeme Caughley. 2014. Wild life Ecology, Conservation and Management. 3rd Ed. Wiley BlackwellPublishers.

Course Code	General Elective	L	T	P	C
201CAOEC	Web Technology	4	0	0	2

Aim:

- To equip the students with basic programming skill in Web Designing

Objective:

- To understand and practice mark up languages
- To learn Style Sheet and Frames

Outcomes:

- Explore markup languages features and create interactive web pages using them
- Learn and design Client side validation using scripting languages

UNIT I

Introduction to the Internet – Internet Technologies – Internet browsers.

UNIT II

Introduction to HTML – Head and body sections – Designing the body section.

UNIT III

Ordered and unordered lists – Table handling.

UNIT IV

DHTML and Style Sheet – Frames.

UNIT V

A web page design project – Forms.

Text Book

World Wide Web design with HTML – C. Xavier – Tata McGraw – Hill – 2000.

Reference Book

Principles of web design – Joel Sklar – Vikas publishing house 2001.

Course Code	Course Title	L	T	P	C
201CSOEC	**E-Learning**	4	0	0	2

Aim

- To know about the basics in e-learning

Objectives

- Learn the basics of E-Learning concepts.
- Learn the content development techniques.

Outcomes

- Develop e – learning application on their own.
- Ability to develop contents for e-learning.
- To perform course management using tools.

UNIT I INTRODUCTION

Introduction – Training and Learning, Understanding elearning, components and models of e- learning, Advocacy of e-learning – benefits, learning styles, criteria for choosing, - Applications of E-learning.

UNIT II CONCEPTS and DESIGN

E-Learning Strategy, the essential elements of elearning strategy, Quality assuring e-learning, suppliers and resources, virtual learning environments, authoring tools, e-assessment, Learning Design Issues – purpose, general principles, designing live e-learning, designing self managed learning.

UNIT III APPLICATIONS

Moodle 2.0 E-Learning Course Development – Features, Architecture, Installation and Configuring Site.

UNIT IV COURSE MANAGEMENT

Creating – Categories, Courses, Adding Static Course Material – Links, Pages, Moodle HTML Editor, Media Files, Interacting with Lessons and Assignments – Evaluating Students – Quizzes and Feedback.

UNIT V ENHANCEMENT

Adding Social Activities - Chat, Forum, Ratings, Blocks – Types, Activities, Courses, HTML, Online Users – Features for Teachers.

Reference Books:

1. Delivering E-Learning: A complete Strategy for Design, Application and Assessment,

Kenneth Fee, Kogan page, 2009.

2. Designing Successful e-Learning, Michael Allen, Pfeiffer Publication, 2007.

3. Moodle 2.0 E-learning Course Development, William Rice, PACKT, 2011.

4. Moodle 2.0 First Look, Mary Cooch, 2010.

Research Integrated Curriculum

The relationship between teacher and learner is completely different in higher education from what it is in school. At the higher level, the teacher is not there for the sake of the student, both have their justification in the service of scholarship. For the students who are the professionals of the future, developing the ability to investigate problems, make judgments on the basis of sound evidences, take decisions on a rational basis and understand what they are doing and why is vital. Research and inquiry is not just for those who choose to pursue an academic career. It is central to professional life in the twenty-first century.

It is observedthat the modern world is characterized by heightened levels of complexity and uncertainty. Fluidity, fuzziness, instability, fragility, unpredictability, indeterminacy, turbulence, changeability, contestability: these are some of the terms that mark out the world of the twenty-first century. Teaching and research is correlated when they are co-related. Growing out of the research on teaching- research relations, the following framework has been developed and widely adopted to help individual staff, course teams and whole institutions analyse their curricula and consider ways of strengthening students understanding of and through research. Curricula can be:

Research – Led: Learning about current research in the discipline

Here the curriculum focus is to ensure that what students learn clearly reflects current and ongoing research in their discipline. This may include research done by staff teaching them.

Research – Oriented: Developing research skills and techniques

Here the focus is on developing student's knowledge of and ability to carry out the research methodologies and methods appropriate to their discipline(s)

Research – Based: Undertaking research and inquiry

Here the curriculum focus is on ensuring that as much as possible the student learns in research and or inquiry mode (i.e. the students become producers of knowledge not just consumers). The strongest curricula form of this is in those special undergraduate programmes for selected students, but such research and inquiry may also be mainstreamed for all or many students.

Research- Tutored: engaging in research discussions

Here the focus is on students and staff critically discussing ongoing research in the discipline.

All four ways of engaging students with research and inquiry are valid and valuable and curricula can and should contain elements of them.

Moreover, the student participation in research may be classified as,

Level 1: Prescribed Research
Level 2: Bounded Research
Level 3: Scaffolded Research
Level 4: Self actuated Research
Level 5: Open Research

Taking into consideration the above mentioned facts in respect of integrating research into the B.Sc (Physics)curriculum, the following Research Skill Based Courses are introduced in the B.Sc (Physics)curriculum.

Semester	RSB Courses	Credits
II	Research Led Seminar	1
III	Research Methodology	3
V	Participation in Bounded Research	2
VI	Project Work	4

Blueprint for assessment of student's performance in Research Led Seminar Course

- **Internal Assessment: 40 Marks**
  - Seminar Report (UG)/Concept Note(PG) : 5 X 4= 20 Marks
  - Seminar Review Presentation : 10 Marks
  - Literature Survey : 10 Marks
- **Semester Examination : 60 Marks**

(Essay type Questions set by the concerned resource persons)

Blueprint for assessment of student's performance in Research Methodology Courses

Continuous Internal Assessment: 20 Marks

- Research Tools(Lab) : 10 Marks
- Tutorial: 10 Marks

Model Paper Writing: 40 Marks

- Abstract: 5 Marks
- Introduction: 10 Marks
- Discussion: 10 Marks
- Review of Literature: 5 Marks
- Presentation: 10 Marks

Semester Examination: 40 Marks

Total: 100 Marks

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