SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

(AFFILIATED TO MADURAI KAMARAJ UNIVERSITY, MADURAI
RE-ACCREDITED WITH 'A' GRADE (THIRD CYCLE) BY NAAC WITH CGPA 3.11)

Programme Scheme, Scheme of Examination and Syllabi

(From 2021-2022 Batch onwards)

Department of Physics

UG Programme

Approved in the Academic Council – XIII held on 11/08/2021

Curriculum Design and Development Cell

Annexure M

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Curriculum Design and Development Cell

HOD	Dean of Pure Science	Dean of Academic Affairs	Principal

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
MEMBERS OF BOARD OF STUDIES

S.No.	Board Members	Name and Designation
1.	Chairman of the Board	**Dr. C.R. Kumaran** Head & Assistant Professor of Physics Sri Kaliswari College (Autonomous), Sivakasi.
2.	University Nominee	**Dr. Sujin P. Jose** Assistant Professor Department of Computational Physics Madurai Kamaraj University, Madurai -625 021.
3.	Academic Expert 1.	**Dr. N. Prithivikumaran,** Head & Associate Professor, Department of Physics, V.H.N. Senthikumara Nadar College (Autonomous), Virudhunagar-626 001.
4.	Academic Expert 2.	**Dr. M. Sivakumar,** Associate Professor, Department of Physics, Alagappa University, Karaikudi – 630 003.
5.	Industrialist	**Mr. J. Senthil Ananda Prakash** B.E. (ECE) Prakash Motors, 1582, PKN road, Sivakasi.
6.	Alumna	**Dr. A. Mathi Vathani** Assistant Professor of Physics, V.H.N. Senthikumara Nadar College (Autonomous), Virudhunagar – 626 001.
Members		
7.	Mrs. R. Chitra	Assistant Professor of Physics
8.	Mrs. R. Bapitha	Assistant Professor of Physics
9.	Dr. S. Karthickprabhu	Assistant Professor of Physics
10.	Dr. S. Abarna	Assistant Professor of Physics

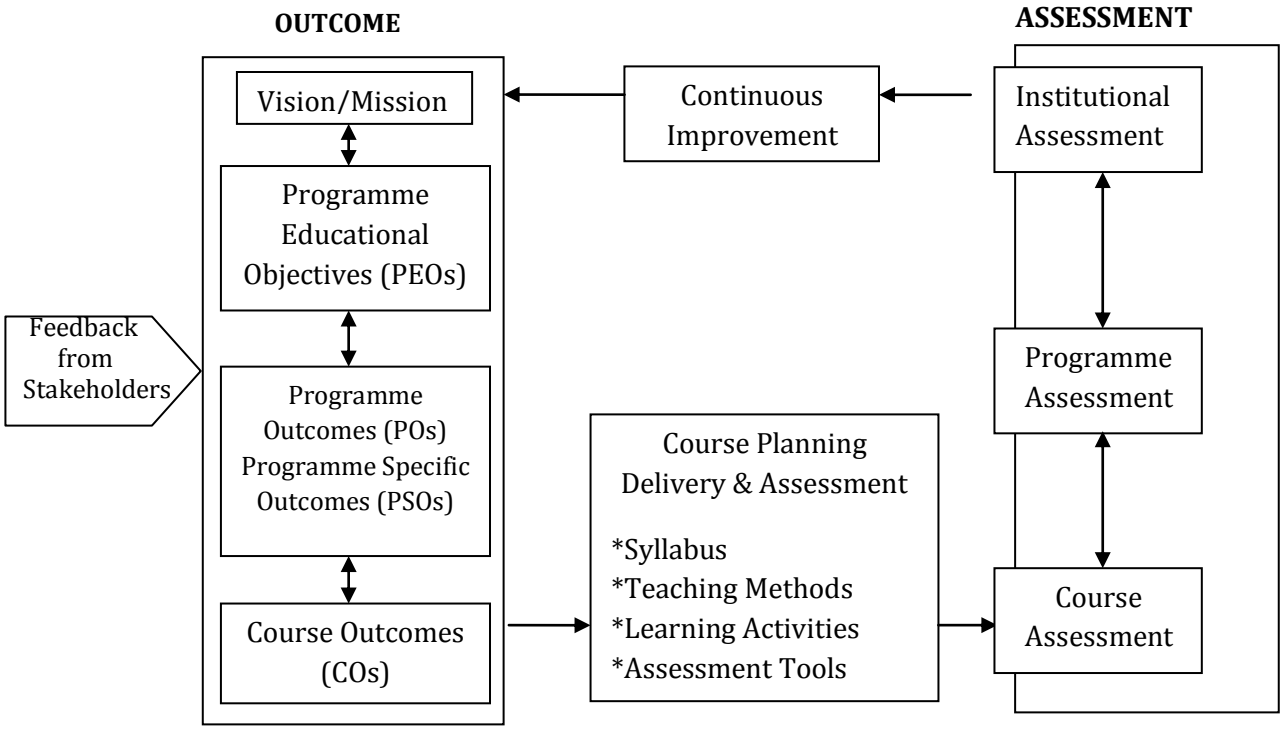
SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade (CGPA 3.11) by NAAC)
DEPARTMENT OF PHYSICS
UG Programme - B.Sc. Physics
GUIDELINES FOR OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

INTRODUCTION

Sri Kaliswari College in its pursuit of imparting quality education has marked a remarkable growth in terms of academic excellence, infrastructure, student strength, ICT facilities, library and placement records since its establishment in 2000-2001.This institution constitutes an academic community that is committed to encourage the student community to experience and share knowledge, identify their potential, enhance the employability skills and enable them to pursue their goals. After the conferment of autonomous status in the year 2012, the college has so far gone for revision of the syllabi three times and is continually updating the syllabi to meet the needs and demands of the student community.

The institution in its success journey of imparting quality education has Re-Accredited with A grade with CGPA (3.11) in its third cycle of accreditation by NAAC. As an added feather to its cap, the institution has taken a giant leap to embrace the Outcome-Based Education system to enable the student community to develop their knowledge, skill and attitude simultaneously through a focussed learning and help the graduates to compete with their global counterparts and prepare them for life.

I. OUTCOME-BASED EDUCATION (OBE) FRAMEWORK



II. VISION OF THE INSTITUTION

- To impart quality higher education to produce highly talented youth capable of developing the nation

III. MISSION OF THE INSTITUTION

- Ensuring quality in all aspects of the activities
- Developing the latent skills of the rural youth
- Providing value - based education to instill courage and confidence
- Nurturing the entrepreneurial skills of the rural youth
- Creating competency to meet global challenges
- Imbibing social awareness and social responsibilities

IV. VISION OF THE DEPARTMENT

- To provide an ambient environment for teaching and research in physics with focus on achieving academic and professional excellence.

V. MISSION OF THE DEPARTMENT

- To impart knowledge in theoretical as well as experimental physics
- To provide a conducive environment for the students to develop scientific insights and practical skills and apply them to real world problems
- To bridge the gap between curriculum based learning and career readiness

VI. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The Graduates will

PEO1: apply one's disciplinary knowledge and transferable skills to new/unfamiliar contexts, to identify and analyse problems and issues and solve complex problems with well-defined solutions.

PEO2: obtain ability to use modern instrumentation and laboratory techniques to design and perform experiments in all the fields of Physics.

PEO3: analyse complex technical information in all areas of Physics and construct logical arguments using correct technical language related to physics.

PEO4: work effectively in diverse teams in classroom, laboratory, industry and field-based situations and exhibit leadership quality in multidisciplinary learning environment with professional ethics.

PEO5: demonstrate investigative skills, including skills of independent investigation of physics-related issues and problems and engage in research and development, teaching and pursue higher education and become a lifelong learner.

VII. PROGRAMME OUTCOMES (POs)

PO1: Disciplinary Knowledge

Acquire comprehensive and scientific knowledge in the field of Science.

PO2: Critical Thinking, Problem Solving and Analytical Reasoning

Develop students' ability of critical observation and capacity to apply the principles/facts of science to identify, analyse, evaluate and solve problems in order to draw realistic conclusions.

PO3: Scientific Reasoning and Research Related Skills

Capability to involve in planning and conducting experiments, analyze the scientific research field, interpret and draw conclusions from experiments and investigate practically.

PO4: Communication Skills and Digital Literacy

Communicate effectively and articulate clearly the scientific ideas in written and oral form and make use of appropriate software for scientific computations and gain ICT skills to disseminate knowledge.

PO5: Ethics, Values and Multicultural Competence

Embrace moral and ethical values and apply it with a sense of responsibility in the workplace and community and adopt objective, unbiased and truthful actions in all aspects of work.

PO6: Team Work, Leadership and Employability Skills

Work effectively and respectfully in groups with enhanced inter-personal skills and exhibit qualities associated with leadership to build a team and achieve the vision and show proficiency in professional, employability and soft skills required for placements and higher educations.

PO7: Self-directed and Life-long Learning

Recognize the need and have the ability to engage in independent learning and be self-motivated and acquire knowledge through lifelong learning in the broadest context of technological change.

VIII. PROGRAMME SPECIFIC OUTCOMES (PSOs) – B.Sc. PHYSICS

On the successful completion of B.Sc. Physics, the students will

PSO1: identify key concepts, principles and fundamental laws that are central to the field of Physics, its different learning areas and applications, and its linkages with related disciplinary areas/subjects.

PSO2: acquire the ability to use critical thinking, analytical reasoning skills to identify and tackle Physics related problems and apply appropriate physical principles and methodologies to solve a wide range of problems associated with Physics.

PSO3: demonstrate the application of physics principles, concepts and laws in physics-related experiments or investigations, analyse and interpret information collected using appropriate methods.

PSO4: plan and execute experiments through careful observations, precise measurements, analyse interpretations and communicate effectively both in oral and written form on science topics or scientific reports and projects and use ICT in variety of learning situations.

PSO5: embrace ethical practices in all work and respond to social, environmental, and moral issues and practise tolerance and respect differences

PSO6: develop the ability to work collaboratively and effectively with others and be a team leader, respecting individual roles and responsibilities and acquire required skills for placements and higher education.

PSO7: recognize the need and have the ability to engage in independent, lifelong learning in the broadest context of technological change.

IX. PO-PSO Mapping Matrix – B.Sc. Physics

PO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
PO1	✓						
PO2		✓					
PO3			✓				
PO4				✓			
PO5					✓		
PO6						✓	
PO7							✓

X. PO-PEO Mapping Matrix – B.Sc. Physics

PO / PEO	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	✓				
PO2	✓	✓	✓		✓
PO3		✓			
PO4			✓		
PO5				✓	
PO6				✓	
PO7					✓

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
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DEPARTMENT OF PHYSICS
UG Programme - B.Sc. Physics

REGULATIONS

Duration of the Programme **:** Three years (equivalent to six semesters)

Eligibility

Candidate should have passed the Higher Secondary Examinations conducted by the Board of Higher Secondary Education, Government of Tamil Nadu or any other examination accepted by the Syndicate of the Madurai Kamaraj University, Madurai as its equivalent.

Medium of Instruction : English

Age Limit

Maximum age limit : 21 Years

Age Relaxation

SC/ SCA/ST/BC/BCM/MBC/DNC & Women : 3 years age relaxation
Differently-Abled Students : 5 years age relaxation

Transitory Permission

Students joined from 2021 - 2024 may be permitted to write their examinations in this pattern up to April 2029.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme - B.Sc. Physics
SCHEME OF EXAMINATION

For UG Programme, the internal and external marks are distributed as follows:

For all Theory Courses : Internal Marks: 40; External Marks: 60

For all Practical Courses, Project and Internship : Internal Marks: 50; External Marks: 50

Internal Mark Distribution for Theory Courses

Assessment Type	Marks	Scheme of Assessment
Internal Test	15 marks	Two Internal Tests and 1 Model Exam will be conducted and average of the best two will be considered
Written Assignment	5 marks	One Written Assignment will be given
E-Assignment/ Case Studies/ Reviews/ Field Assignments/ Poster Presentations/ Portfolios	5 marks	Any one of the Assignments will be given
Quiz	5 marks	One Quiz Test will be conducted
Viva/ Oral Exam/ Group Discussion/ Role Play	10 marks	Test will be conducted in any one of the Oral Mode

Internal Mark Distribution for Practical Courses

Assessment Type	Marks	Scheme of Assessment
Lab work Assessment	40 marks	Two Internal Tests will be conducted and the average of the two will be considered (10) + Assessment will be done during every practical class (30)
Record Notebook	5 marks	Based on Submission of Record Notebook
Viva –Voce / Lab Quiz	5 marks	Two Lab Quiz Tests/viva-voce will be conducted and the average of the two will be considered

External Mark Distribution for Practical Courses

Assessment Type	Marks	Scheme of Assessment
Lab work/Program Execution	40 marks	End result of the Practical
Viva –Voce	10 marks	Oral Mode Test

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme - B.Sc. Physics
QUESTION PAPER PATTERN

Internal Test – 30 Marks – 1 hr Duration

S.No	Type of Questions	Marks
1.	Objectives type Questions: Multiple Choice – 4 questions Answer in a Word/Sentence – 4 questions	 04 04
2.	Short Answer–3 questions –either or type	3x4=12
3.	Long Answer–1 question – either or type	1x10=10

Summative Examinations – 60 Marks -3 hrs Duration

S.No	Type of Questions	Marks
1.	Objective type Questions: Multiple Choice – 5 questions Answer in a Word/Sentence – 5 questions	 05 05
2.	Short Answer 5 questions – either or type	5x4=20
3.	Long Answer 3 questions – either or type	3x10=30

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme - B.Sc. Physics

Attainment of Course outcomes

Attainment of Course outcomes is computed using Direct and Indirect assessment methods. Direct Method of Assessment is based on performance of the students in the Continuous Internal Assessment Tests, Summative Examinations and supporting activities such as Seminar, Assignment, Case study, Group Discussion, Quiz, etc., and Indirect Method of Assessment is based on periodical feedback from the students at the end of each course.

Weightage of Direct and Indirect Assessment in computation of attainment of each course is 70% for Direct Assessment and 30% for Indirect Assessment.

Direct Assessment of Course outcome attainment

i) Rubrics:

Internal Assessment contributes 60% and Summative Examinations Assessment contributes 40% to the Direct Assessment of a course outcome for Theory Courses. For the Practical Courses, Internal Assessment contributes 70% and Summative Examinations Assessment contributes 30% to the Direct Assessment of a course outcome.

ii) Setting of Target:

50% of the maximum mark is set as target of Internal Assessment tools and the average mark of the class is set as target of Summative Examinations Assessment.

Formula for calculating percentage attainment of each course outcome

Based on the result of Summative Examinations and Internal Assessment tools, the number of students scoring more than the target is found out.

For each Internal Assessment Tools,

$$\text{Percentage attainment of each course outcome} = \frac{\text{No. of. Students who scored more than the target in the concerned course outcome}}{\text{Total Number of Students}} \times 100$$

Percentage attainment of each Course outcome for Internal Assessment tools = Average of percentage attainment of all Internal Assessment tools

For Summative Examinations,

$$\text{Percentage attainment of each Course outcome} = \frac{\text{No. of. Students who scored more than the target in the concerned co}}{\text{Total Number of Students}} \times 100$$

Formula for calculating Attainment Percentage of Course outcome of a course

Percentage Attainment of Course outcome for Internal Assessment tools	=	Average of percentage attainment of all COs
Percentage Attainment of Course outcome for Summative Examinations	=	Average of percentage attainment of all COs

Final Direct Assessment of Course outcome Attainment

For Theory Courses

Percentage Attainment of Course outcome through Direct Assessment	=	(0.6 x percentage attainment of CO for internal assessment tool) + (0.4 x percentage attainment of CO for summative examinations)

For Practical Courses

Percentage Attainment of Course outcome through Direct Assessment	=	0.7 x percentage attainment of CO for Internal Assessment tools + 0.3 x percentage attainment of CO for Summative Examinations

Indirect Assessment of CO Attainment

The course outcome feedback is conducted at the end of every semester by distributing structured feedback questionnaire to the students. The analysis of this feedback questionnaire is done on the following score. The feedback forms will be sorted with various scores and feedbacks with a score more than 5.5 are considered as satisfactory level for calculations for indirect attainment.

A : 10-8.5 **B :** 8.4-7.0 **C :** 6.9-5.5 **D :** 5.4-4.0 **E :** 3.9-0

$$\text{Percentage attainment for each CO} = \frac{\text{Satisfaction Number}}{\text{Response Received}} \times 100$$

Percentage Attainment of CO of a course = Average of percentage attainment of all COs

Final Assessment of CO attainment

Average course attainment = 0.7 x Direct assessment of CO attainment + 0.3 x Indirect assessment of CO attainment

Expected Level of Attainment for each of the Course Outcomes

CO	Level of Attainment
Above 70%	Excellent
60 -70 %	Very good
50-60 %	Good
40 – 50 %	Satisfactory
Below 40%	Not Satisfactory

Assessment of PO attainment

At the end of the each programme, the Direct PO Assessment is done from the CO Attainment of all courses. The Direct PO Attainment for a particular course is determined from the attainment values obtained for each course outcome related to that PO and the CO-PO mapping values.

$$\text{Weighted contribution of the course in attainment of each PO} = \frac{\text{Weighted Percentage of contribution of the course in attainment of each PO}}{\text{average course attainment}} \times 100$$

Expected Level of Attainment for each of the Programme Outcomes

PO	Level of Attainment
Above 70%	Excellent
60 -70 %	Very good
50-60 %	Good
40 – 50 %	Satisfactory
Below 40%	Not Satisfactory

Attainment of Programme Educational Objectives (PEO)

PEOs are assessed after 3 to 4 years of graduation. Attainment is measured based on the Feedback from Stakeholders

1. Alumni
2. Parents
3. Employer

The analysis of this feedback questionnaire is done on the following score. The feedback forms will be sorted with various scores and feedbacks with a score more than 5.5 are considered as satisfactory level for calculations for Indirect Attainment.

A : 10-8.5 **B :** 8.4-7.0 **C :** 6.9-5.5 **D :** 5.4-4.0 **E :** 3.9-0

$$\text{Percentage attainment of PEOs} = \frac{\text{Satisfaction number}}{\text{Response Received}} \times 100$$

Expected Level of Attainment for each of the Programme Educational Objectives

PEO	Level of Attainment
Above 70%	Excellent
60 -70 %	Very good
50-60 %	Good
40 – 50 %	Satisfactory
Below 40%	Not Satisfactory

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DEPARTMENT OF PHYSICS
UG Programme - B.Sc. Physics
CURRICULUM STRUCTURE
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

S. No	Courses	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Credits
I	Tamil / Hindi / French	6 (3)	6 (3)	6 (3)	6 (3)	-	-	12
II	English	6 (3)	6 (3)	6 (3)	6 (3)	-	-	12
III	Core Courses	5 (5) 3P (2)	5 (5) 3P (2)	5 (5) 3P (2)	5 (4) 3P (2)	5 (5) 5 (5) 4 (4) 6P (4)	5(5) 5(5) 4(4) 4(4) 6P(4)	67
	Allied Courses	6 (5)	6 (5)	4 (4) 2P (1)	4 (4) 2P (1)		-	20
	Major Elective Courses	-	-	-		4(3) 4(3)	4(3)	9
	Self-paced Learning (Swayam Course)	-	-	-	(2)	-		2
IV	Ability Enhancement Compulsory Course (AECC) 1. Environmental Studies	2(1)	-	-	-	-	-	1
	2. Value Education	-	1(1)	-	-	-	-	1
	Non-Major Elective Courses	-	-	2 (1)	2 (1)	-	-	2
	Skill Enhancement Courses	2 (1)	2(2)	2 (2)	2(2)	2(2)	2 (2)	11
	Internship					(1)		1
	Disaster Management		1(1)					1
V	Extension	-	-	-	(1)	-	-	1
Total Hours (Per week)/ Credits		30(20)	30(22)	30(21)	30(23)	30(27)	30(27)	140 180

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DEPARTMENT OF PHYSICS
UG Programme - B.Sc. Physics
CURRICULUM PATTERN
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)
PROGRAMME CODE – UPH

Semester	Part	Course Code	Course Name	Hours	Credits
I	I	21UTAL11	Tamil / Hindi – I	6	3
	II	21UENL11	Communicative English – I	6	3
	III	21UPHC11	**Core Course –I :** Properties of Matter and Mechanics	5	5
		21UPHC1P	**Core Course –II :** Practical **-** Properties of Matter and Mechanics	3	2
		21UPHA11	**Allied Course – I :** Mathematics – I	6	5
	IV	21UESR11	**Ability Enhancement Compulsory Course –I:** Environmental Studies	2	1
		21UPHS1P	**Skill Enhancement Course I :** Practical - Introduction to Office Suite and Web Search	2	1
			Total	**30**	**20**
II	I	21UTAL21	Tamil / Hindi – II	6	3
	II	21UENL21	Communicative English – II	6	3
	III	21UPHC21	**Core Course III :** Heat and Thermodynamics	5	5
		21UPHC2P	**Core Course IV :** Practical **–** Thermal Physics	3	2
		21UPHA21	**Allied Course – II :** Mathematics – II	6	5
	IV	21UVED21	**Ability Enhancement Compulsory Course – II :** Value Education	1	1
		21UPHS21	**Skill Enhancement Course– II:** Sound and Ultrasonics	2	2
		21UDMG21	Disaster Management	1	1
			Total	**30**	**22**
III	I	21UTAL31	Tamil / Hindi– III	6	3
	II	21UENL31	Communicative English – III	6	3
	III	21UPHC31	**Core Course V –** Electricity and Electromagnetism	5	5
		21UPHC3P	**Core Course – VI :** Practical – Electricity and Electromagnetism	3	2
		21UPHA31	**Allied Course –III :** Chemistry - I	4	4
		21UPHA3P	**Allied Course –III :** Practical - Volumetric Analysis	2	1
	IV	21UPHN31	**Non Major Elective Course –I** : Physics of Home Appliances	2	1
		21UPHS31	**Skill Enhancement Course – III:** Electrical Wiring and Home Appliances	2	2
			Total	**30**	**21**
IV	I	21UTAL41	Tamil / Hindi – IV	6	3
	II	21UENL41	Communicative English – IV	6	3
	III	21UPHC41	**Core Course –VII :** Optics and Spectroscopy	5	4
		21UPHC4P	**Core Course – VIII** : Practical **–** Optics	3	2

		21UPHA41	**Allied Course – IV :** Chemistry – II	4	4
		21UPHA4P	**Allied Course – IV :** Practical – Organic Analysis	2	1
		21UPHM41 21UPHM42	**Self-paced Learning (Swayam Course)** 1. Nature and Properties of Materials 2. Soft Skill Development		2
	IV	21UPHN41	**Non Major Elective Course –II**: Non-Conventional Energy Resources	2	1
		21UPHS41	**Skill Enhancement Course– IV:** Instrumentation Skill	2	2
	V		Extension		1
			Total	**30**	**23**
V	III	21UPHC51	**Core Course – IX :** Atomic Physics	5	5
		21UPHC52	**Core Course – X :** Analog Electronics	5	5
		21UPHC53	**Core Course – XI :** Relativity and Quantum Mechanics	4	4
		21UPHC5P	**Core Course – XII :** Practical – General Physics	6	4
		21UPHO51 21UPHO52 21UPHO53	**Major Elective Course – I :** 1. Classical and Statistical Mechanics 2. Astrophysics 3. Basis of Data Communications and Programming in C	4	3
		21UPHO54 21UPHO55 21UPHO56	**Major Elective Course – II :** 1. Mathematical Physics 2. Mathematical Methods 3. Energy Physics	4	3
	IV	21UPHS51	**Skill Enhancement Course –V:** Fibre Optics	2	2
		21UPHJ51	**Internship**		1
			Total	**30**	**27**
VI	III	21UPHC61	**Core Course – XIII :** Solid State Physics	5	5
		21UPHC62	**Core Course – XIV :** Nuclear Physics	5	5
		21UPHC63	**Core Course – XV :** Digital and Communication Electronics	4	4
		21UPHJ61	**Core Course – XVI :** Project	4	4
		21UPHC6P	**Core Course – XVII :** Practical – Electronics	6	4
		21UPHO61 21UPHO62 21UPHO63	**Major Elective Course – III :** 1. Nano Physics 2. Microprocessor Fundamentals 3. Medical Physics	4	3
	IV	21UPHS61	**Skill Enhancement Course –VI:** Solar Photovoltaics	2	2
			Total	**30**	**27**

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OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

PROGRAMME ARTICULATION MATRIX (PAM)

Semester	Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	21UTAL11	Tamil / Hindi – I	10	7	2	8	2	2	2
	21UENL11	Communicative English – I	10	7	2	8	2	2	3
	21UPHC11	**Core Course –I :** Properties of Matter and Mechanics	15	10	5	5	2	5	3
	21UPHC1P	**Core Course –II :** Practical - Properties of Matter and Mechanics	15	10	7	4	2	5	4
	21UPHA11	**Allied Course – I :** Mathematics - I	15	10	4	4	1	5	2
	21UESR11	**Ability Enhancement Compulsory Course –I:** Environmental Studies	8	5	1	7	8	5	5
	21UPHS1P	**Skill Enhancement Course I :** Practical - Introduction to Office Suite and Web Search	13	5	4	4	1	4	3
II	21UTAL21	Tamil / Hindi – II	10	8	2	8	2	2	2
	21UENL21	Communicative English – II	10	8	2	8	2	2	3
	21UPHC21	**Core Course III :** Heat and Thermodynamics	15	10	5	5	2	5	3
	21UPHC2P	**Core Course IV :** Practical **–** Thermal Physics	15	10	7	4	2	5	4
	21UPHA21	**Allied Course – II :** Mathematics - II	15	10	4	4	1	5	2
	21UVED21	**Ability Enhancement Compulsory Course – II :** Value Education	8	5	1	5	9	4	7
	21UPHS21	**Skill Enhancement Course– II:** Sound and Ultrasonics	7	8	2	5	2	4	8
	21UDMG21	Disaster Management	13	8	4	4	0	3	3
III	21UTAL31	Tamil / Hindi– III	10	8	2	8	2	2	2
	21UENL31	Communicative English – III	10	8	3	9	3	3	2
	21UPHC31	**Core Course V –** Electricity and Electromagnetism	15	10	5	5	2	5	3
	21UPHC3P	**Core Course – VI :** Practical – Electricity and Electromagnetism	15	10	7	4	2	5	4
	21UPHA31	**Allied Course –III :** Chemistry - I	15	10	5	4	2	3	2
	21UPHA3P	**Allied Course –III :** Practical - Volumetric Analysis	15	10	5	2	2	4	3

	21UPHN31	**Non Major Elective Course –I** : Physics of Home Appliances	9	5	0	8	0	5	5
	21UPHS31	**Skill Enhancement Course – III:** Electrical Wiring and Home Appliances	13	8	4	4	1	4	3
IV	21UTAL41	Tamil / Hindi – IV	10	8	2	9	2	2	2
	21UENL41	Communicative English – IV	10	9	3	8	2	3	3
	21UPHC41	**Core Course –VII :** Optics and Spectroscopy	15	10	5	5	2	5	3
	21UPHC4P	**Core Course – VIII** : Practical – Optics	15	10	7	4	2	5	4
	21UPHA41	**Allied Course – IV :** Chemistry - II	15	10	5	4	2	3	2
	21UPHA4P	**Allied Course – IV :** Practical – Organic Analysis	15	10	5	2	2	4	3
	21UPHM41 21UPHM42	**Self-paced Learning (Swayam Course)** 1. Nature and Properties of Materials 2. Soft Skill Development	13	10	5	9	1	2	7
	21UPHN41	**Non Major Elective Course –II**: Non-Conventional Energy Resources	9	5	0	8	0	5	5
	21UPHS41	**Skill Enhancement Course– IV:** Instrumentation Skill	13	7	4	3	2	4	3
		Extension	8	2	1	7	9	8	5
V	21UPHC51	**Core Course – IX :** Atomic Physics	15	10	6	5	2	5	3
	21UPHC52	**Core Course – X :** Analog Electronics	15	10	6	5	2	5	3
	21UPHC53	**Core Course – XI :** Relativity and Quantum Mechanics	15	10	6	5	2	5	3
	21UPHC5P	**Core Course – XII :** Practical – General Physics	15	10	8	4	2	5	4
	21UPHO51 21UPHO52 21UPHO53	**Major Elective Course – I :** 1. Classical and Statistical Mechanics 2. Astrophysics 3. Basis of Data Communications and Programming in C	15	10	5	5	2	5	3
	21UPHO54 21UPHO55 21UPHO56	**Major Elective Course – II :** 1. Mathematical Physics 2. Mathematical Methods 3. Energy Physics	15	10	5	5	2	5	3
	21UPHS51	**Skill Enhancement Course –V:** Fibre Optics	13	8	4	4	2	4	3
	21UPHJ51	**Internship**	12	7	9	3	2	3	3
VI	21UPHC61	**Core Course – XIII :** Solid State Physics	15	10	6	5	2	5	3
	21UPHC62	**Core Course – XIV :** Nuclear Physics	15	10	6	5	2	5	3
	21UPHC63	**Core Course – XV :** Digital and Communication Electronics	15	10	6	5	2	5	3

	21UPHJ61	**Core Course – XVI :** Project	10	9	12	5	2	7	5
	21UPHC6P	**Core Course – XVII :** Practical – Electronics	15	10	8	4	2	5	4
	21UPHO61 21UPHO62 21UPHO63	**Major Elective Course – III :** 1. Nano Physics 2. Microprocessor Fundamentals 3. Medical Physics	15	10	5	5	2	5	3
	21UPHS61	**Skill Enhancement Course –VI:** Solar Photovoltaics	14	8	4	5	1	4	3
Total Weightage of all Courses Contributing to PO			**618**	**413**	**216**	**256**	**105**	**203**	**164**

SRI KALISWARI COLLEGE (AUTONOMOUS), Sivakasi
(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade (CGPA 3.11) by NAAC)
DEPARTMENT OF PHYSICS
UG Programme - B.Sc. Physics
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

PROGRAMME ARTICULATION MATRIX – WEIGHTED PERCENTAGE

Semester	Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	21UTAL11	Tamil / Hindi – I	1.62	1.69	0.93	3.13	1.9	0.99	1.22
	21UENL11	Communicative English – I	1.62	1.69	0.93	3.13	1.9	0.99	1.83
	21UPHC11	**Core Course –I :** Properties of Matter and Mechanics	2.43	2.42	2.31	1.95	1.9	2.46	1.83
	21UPHC1P	**Core Course –II :** Practical **-** Properties of Matter and Mechanics	2.43	2.42	3.24	1.56	1.9	2.46	2.44
	21UPHA11	**Allied Course – I :** Mathematics - I	2.43	2.42	1.85	1.56	0.95	2.46	1.22
	21UESR11	**Ability Enhancement Compulsory Course –I:** Environmental Studies	1.29	1.21	0.46	2.73	7.62	2.46	3.05
	21UPHS1P	**Skill Enhancement Course I :** Practical - Introduction to Office Suite and Web Search	2.1	1.21	1.85	1.56	0.95	1.97	1.83
II	21UTAL21	Tamil / Hindi – II	1.62	1.94	0.93	3.13	1.9	0.99	1.22
	21UENL21	Communicative English – II	1.62	1.94	0.93	3.13	1.9	0.99	1.83
	21UPHC21	**Core Course III :** Heat and Thermodynamics	2.43	2.42	2.31	1.95	1.9	2.46	1.83
	21UPHC2P	**Core Course IV :** Practical **–** Thermal Physics	2.43	2.42	3.24	1.56	1.9	2.46	2.44
	21UPHA21	**Allied Course – II :** Mathematics - II	2.43	2.42	1.85	1.56	0.95	2.46	1.22
	21UVED21	**Ability Enhancement Compulsory Course – II :** Value Education	1.29	1.21	0.46	1.95	8.57	1.97	4.27
	21UPHS21	**Skill Enhancement Course– II:** Sound and Ultrasonics	2.1	1.94	1.85	1.56	0	1.48	1.83
	21UDMG21	Disaster Management	1.13	1.94	0.93	1.95	1.9	1.97	4.88
III	21UTAL31	Tamil / Hindi– III	1.62	1.94	0.93	3.13	1.9	0.99	1.22
	21UENL31	Communicative English - III	1.62	1.94	1.39	3.52	2.86	1.48	1.22
	21UPHC31	**Core Course V –** Electricity and Electromagnetism	2.43	2.42	2.31	1.95	1.9	2.46	1.83
	21UPHC3P	**Core Course – VI :** Practical – Electricity and Electromagnetism	2.43	2.42	3.24	1.56	1.9	2.46	2.44
	21UPHA31	**Allied Course –III :** Chemistry - I	2.43	2.42	2.31	1.56	1.9	1.48	1.22

	21UPHA3P	**Allied Course –III :** Practical - Volumetric Analysis	2.43	2.42	2.31	0.78	1.9	1.97	1.83
	21UPHN31	**Non Major Elective Course –I** : Physics of Home Appliances	1.46	1.21	0	3.13	0	2.46	3.05
	21UPHS31	**Skill Enhancement Course – III:** Electrical Wiring and Home Appliances	2.1	1.94	1.85	1.56	0.95	1.97	1.83
IV	21UTAL41	Tamil / Hindi – IV	1.62	1.94	0.93	3.52	1.9	0.99	1.22
	21UENL41	Communicative English - IV	1.62	2.18	1.39	3.13	1.9	1.48	1.83
	21UPHC41	**Core Course –VII :** Optics and Spectroscopy	2.43	2.42	2.31	1.95	1.9	2.46	1.83
	21UPHC4P	**Core Course – VIII** : Practical – Optics	2.43	2.42	3.24	1.56	1.9	2.46	2.44
	21UPHA41	**Allied Course – IV :** Chemistry - II	2.43	2.42	2.31	1.56	1.9	1.48	1.22
	21UPHA4P	**Allied Course – IV :** Practical – Organic Analysis	2.43	2.42	2.31	0.78	1.9	1.97	1.83
	21UPHM41 21UPHM42	**Self-paced Learning (Swayam Course)** 1. Nature and Properties of Materials 2. Soft Skill Development	2.1	2.42	2.31	3.52	0.95	0.99	4.27
	21UPHN41	**Non Major Elective Course –II**: Non-Conventional Energy Resources	1.46	1.21	0	3.13	0	2.46	3.05
	21UPHS41	**Skill Enhancement Course– IV:** Instrumentation Skill	2.1	1.69	1.85	1.17	1.9	1.97	1.83
		Extension	1.29	0.48	0.46	2.73	8.57	3.94	3.05
V	21UPHC51	**Core Course – IX :** Atomic Physics	2.43	2.42	2.78	1.95	1.9	2.46	1.83
	21UPHC52	**Core Course – X :** Analog Electronics	2.43	2.42	2.78	1.95	1.9	2.46	1.83
	21UPHC53	**Core Course – XI :** Relativity and Quantum Mechanics	2.43	2.42	2.78	1.95	1.9	2.46	1.83
	21UPHC5P	**Core Course – XII :** Practical – General Physics	2.43	2.42	3.7	1.56	1.9	2.46	2.44
	21UPHO51 21UPHO52 21UPHO53	**Major Elective Course – I :** 1. Classical and Statistical Mechanics 2. Astrophysics 3. Basis of Data Communications and Programming in C	2.43	2.42	2.31	1.95	1.9	2.46	1.83
	21UPHO54 21UPHO55 21UPHO56	**Major Elective Course – II :** 1. Mathematical Physics 2. Mathematical Methods 3. Energy Physics	2.43	2.42	2.31	1.95	1.9	2.46	1.83
	21UPHS51	**Skill Enhancement Course –V:** Fibre Optics	2.1	1.94	1.85	1.56	1.9	1.97	1.83
	21UPHJ51	**Internship**	1.94	1.69	4.17	1.17	1.9	1.48	1.83
VI	21UPHC61	**Core Course – XIII :** Solid State Physics	2.43	2.42	2.78	1.95	1.9	2.46	1.83
	21UPHC62	**Core Course – XIV :** Nuclear Physics	2.43	2.42	2.78	1.95	1.9	2.46	1.83

	21UPHC63	**Core Course – XV :** Digital and Communication Electronics	2.43	2.42	2.78	1.95	1.9	2.46	1.83
	21UPHJ61	**Core Course – XVI :** Project	1.62	2.18	5.56	1.95	1.9	3.45	3.05
	21UPHC6P	**Core Course – XVII :** Practical – Electronics	2.43	2.42	3.7	1.56	1.9	2.46	2.44
	21UPHO61 21UPHO62 21UPHO63	**Major Elective Course – III :** 1. Nano Physics 2. Microprocessor Fundamentals 3. Medical Physics	2.43	2.42	2.31	1.95	1.9	2.46	1.83
	21UPHS61	**Skill Enhancement Course –VI:** Solar Photovoltaics	2.27	1.94	1.85	1.95	0.95	1.97	1.83
Total Weightage of all Courses Contributing to PO			**100**	**100**	**100**	**100**	**100**	**100**	**100**

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A./B.SC./BCA
SEMESTER - I
பொதுத்தமிழ் - I (21UTAL11)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**: 6**	**INT. MARKS**	**: 40**
CREDITS	**: 3**	**EXT. MARKS**	**: 60**
DURATION	**: 90 hrs**	**MAX. MARKS**	**: 100**

நோக்கம்

தற்கால இலக்கிய வகைமைகளை அறிமுகப்படுத்தும் நோக்கில் இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளை வெற்றிகரமாக முடித்தவுடன் மாணவர்கள்,

CO1[K1]: நவீன இலக்கிய வகைமைகளை அடையாளம் காண்பர்

CO2[K2]: மொழி இலக்கண அறிவினைப் புரிந்துகொண்டு பிழை இன்றி எழுதும் திறன் பெறுவர்

CO3[K3]: இக்கால இலக்கியங்களின் கருத்தம் சங்களை தம் வாழ்நிலையோடு பொருத்திப்பார்ப்பர்

CO4[K5]: நவீன இலக்கியங்கள் படைப்பதற்கு அடிப்படையாக அமைந்த முறைமை குறித்து மதிப்பீடு செய்து அவற்றை விமர்சிப்பர்

CO5[K6]: உலகளாவிய கவிதை நாடகப் படைப்புகளைக் கற்றுப் படைப்பர்

CO-PO Mapping Table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	2	-	-	-
CO2[K2]	2	2	-	2	-	-	-
CO3[K3]	2	1	-	2	1	-	-
CO4[K5]	2	1	1	1	1	1	1
CO5[K6]	2	1	1	1	-	1	1
Weightage of the course	10	07	02	08	02	02	02
Weighted percentage of Course Contribution to POs	**1.62**	**1.69**	**0.93**	**3.13**	**1.9**	**0.99**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

கூறு I **(18hrs)**

மரபுக்கவிதை: மரபுக்கவிதையின் தோற்றமும் வளர்ச்சியும், **பாரதியார்**: யாமறிந்தமொழிகளிலே, பகைவனுக்கு அருள்வாய். **பாரதிதாசன்**: வீரத்தமிழன், தொழிலாளர் விண்ணப்பம். **கவிமணி**: ஒற்றுமையே உயிர்நிலை. **நாமக்கல் கவிஞர்:** பெண் மனம். **முடியரசன்**: தமிழ் தான் என் பேர். **கண்ணதாசன்:** யாத்திரை. **பட்டுக்கோட்டை:** சின்னப்பயலே.

கூறு II **(18hrs)**

புதுக்கவிதை: புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் - ஹைக்கூவின் தோற்றமும் வளர்ச்சியும். **அப்துல் ரகுமான்** - பாருக்குள்ளே நல்லநாடு. **நா.காமராசர்:** கண். **மு.மேத்தா:** கால்களால் நடந்தகதை. **வைரமுத்து:** ஐந்து பெரிது ஆறு சிறிது, **பா.விஜய்:** பேனா பேசுச்சு. **கனிமொழி**: கருவறைவாசனை. **ஹைக்கூ கவிதை:** இ.பரிமளம் - அமுதபாரதி - பா.உதயகண்ணன் - இ.ரா.இரவி - மணிவேலன் - புதுவைசீனு. தமிழ்மணி - புதுவைத் தமிழ்நெஞ்சன் - அறிவுமதி - ஸ்ரீரசா - தங்கம் மூர்த்தி - புதுக்கவிதை - ஹைக்கூ படைப்பதற்குப் பயிற்சி அளித்தல்.

கூறு III **(18hrs)**

நாடகம்: நாடகத்தின் தோற்றமும் வளர்ச்சியும், புராண இலக்கிய நாடகங்கள் - **ஜெயந்திநாகராஜன்:** திருநாவுக்கரசர் - திருஞானசம்பந்தர்.

கூறு IV **(18hrs)**

நாடகம்: புராண இலக்கிய நாடகங்கள் - ஜெயந்தி நாகராஜன் 1. மாணிக்கவாசகர் 2. கண்ணப்பநாயனார் 3. மெய்ப்பொருள் நாயனார், நாடகம் படைப்பதற்குப் பயிற்சி அளித்தல்.

கூறு V **(18hrs)**

இலக்கணம்: முதல், சார்பெழுத்துக்கள் - மொழிமுதல், மொழி இறுதி எழுத்துக்கள் - வல்லினம் மிகும், மிகா இடங்கள்.

பாடநூல்கள்

1. *தொகுப்பு நூல்,* தமிழியல்துறை, ஸ்ரீ காளீஸ்வரிகல்லூரி (தன்னாட்சி), சிவகாசி.
2. ஜெயந்திநாகராஜன். *புராண இலக்கிய நாடகங்கள்*, தாமரை பப்ளிகேஷன்ஸ், சென்னை, 2014.
3. வாசுதேவன்,கா. *பன்முகநோக்கில் தமிழ் இலக்கிய வரலாறு,* தேவன் பதிப்பகம், திருச்சிராப்பள்ளி, 2017.

பார்வை நூல்கள்

1. சுதந்திர முத்து, மு. *படைப்புக் கலை,* அறிவுப் பதிப்பகம், சென்னை, 2008.
2. பாக்கியமேரி. *தமிழ் இலக்கியவரலாறு,* நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை, 2011.
3. ஸ்ரீதரன், என். *பிழையின்றித் தமிழ் எழுதுவோம்,* ஸ்ரீ நந்தினி பதிப்பகம், சென்னை, 2008.

வலைப்பதிவுகள்(Web Sources)

1. https://youtu.be/6mrdbprILo8
2. https://youtu.be/QYizo6YwBXl
3. https://youtu.be/-oUmlDvHvQg
4. https://youtu.be/3sY76BTiqPQ
5. https://youtu.be/xLosPsqJ6W0

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.Com./ B.B.A./B.SC./BCA
SEMESTER- I
COMMUNICATIVE ENGLISH - I (21UENL11)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**: 6**	**INT. MARKS**	**: 40**
CREDITS	**: 3**	**EXT. MARKS**	**: 60**
DURATION	**: 90 hrs**	**MAX. MARKS**	**: 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, speaking, reading, and writing practices.

Course Outcomes (CO)

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

CO1[K1]: relate and state ideas by reading and listening to simple recorded conversations and fables

CO2[K2]: demonstrate communicative skills through simple Descriptions, Requests and Instructions

CO3[K3]: apply knowledge of word power and grammar rules in Formal and Informal letter writings

CO4[K4]: analyze fairy tales and folk tales to develop language skills through literature

CO5[K6]: construct grammatically correct and meaningful simple sentences in English

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	2	-	-	-
CO2[K2]	2	2	-	2	-	-	-
CO3[K3]	2	1	-	2	1	-	1
CO4[K4]	2	1	1	1	1	1	1
CO5[K6]	2	1	1	1	-	1	1
Weightage of the course	10	07	02	08	02	02	03
Weightedpercentage of Course contributionto Pos	**1.62**	**1.69**	**0.93**	**3.13**	**1.9**	**0.99**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to simple conversations in everyday contexts

Listening to fables

Listening to News Bulletin

B. Speaking

Introducing oneself and others

Describing persons, places, things, daily routines, health and symptoms

Asking for time and date

Asking for directions and giving directions

Giving instructions and seeking clarifications

Making requests and responding to requests

Thanking someone and responding to thanks

UNIT II - READING AND WRITING **(18 hrs)**

A. Reading

Interpreting pictures/maps/pie-charts/tables/flow charts /diagrams

Skimming or scanning through the texts

B. Writing

Hints Developing

Story Completion/ completing the story based on given outline.

Letter Writing: Informal letters- Family, Friends and Relatives

Formal letters: Leave letters and Apology Letter

UNIT III - WORD POWER **(18 hrs)**

Prefixes and Suffixes

Homophones and Homonyms

Words related to Parts of the Body & their functions, Cries of Animals, Young Ones of Animals

Connotative and Denotative words

Contextual Usage of words

Puzzles and Anagrams

UNIT IV - GRAMMAR **(18 hrs)**

Nouns-Kinds, Number and Gender

Pronouns-Kinds

Adjectives- Kinds

Verbs-Regular and Irregular verbs, Transitive and Intransitive Verbs

Adverbs- Kinds and Position of Adverbs

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

Fairy Tales, Folk Tales and Legendary Heroes

Fairy Tales

The Pied Piper of Hamelin
The Ugly Duckling
Hansel and Gretel

Folk Tales

Alibaba and the Forty Thieves
Aladdin and the Magic Lamp
The Town Mouse and the Country Mouse

Legendary Heroes

Chhatrapati Shivaji Maharaj- Shivaji's great escape
Mahatma Gandhi- Mohandas takes a spelling test
Tenali Raman- The Stolen Brinjal
Akbar and Birbal- Re-Union

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna, and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Sreelekshmi. *Folk Tales- A WonderWorld of 150 Stories for Children*. Kerala: SL Publishers, 2004.

REFERENCES

Books

1. Babu, Sundara. *Leo's Tenali Raman Stories*. Chennai: Leo Book Publishers, 2015.
2. Kalyani V. *Fairy Tales 1*. Kerala: Sisco Publishers, 2004.
3. *Life Skills* (Jeevan Kaushal) *Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
4. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for Speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
5. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

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2. https://kathakids.com/great-personalities/stories-of-mahatma-gandhi/
3. https://www.infoplease.com/dictionary/brewers/animals-cries
4. https://www.zooborns.com/zooborns/baby-animal-names.html
5. https://learnenglish.britishcouncil.org/general-english/stories
6. https://www.talkenglish.com/lessonindex.aspx

7. https://www.englishhelper.com/
8. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - I
CORE COURSE - I: PROPERTIES OF MATTER AND MECHANICS (21UPHC11)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:5**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:75 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the elasticity of different materials, viscosity and surface tension of liquids, gravitation and dynamics of a rigid body.

Course Outcomes (CO)

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

CO1[K1]: define the elasticity of a material, viscosity of the liquid, surface tension, laws of gravitation and dynamics of a rigid body

CO2[K2]: explain the elasticity of a material, viscosity of the liquid, surface tension, gravitational field, potential and dynamics of a rigid body

CO3[K3]: calculate moduli of elasticity, viscosity, excess pressure of a liquid drop, the value of 'g' at various places of earth and moment of inertia of different bodies

CO4[K4]: compare the elasticity of different materials, viscosity of two liquids, surface tension of a liquid drop and bubble, the value of g at different points and moment of inertia of different bodies

CO5[K4]: examine the physical parameters related to properties of matter and mechanics

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	1	-	1	-	1	-
CO2[K2]	3	2	-	1	-	1	-
CO3[K3]	3	3	2	1	-	1	1
CO4[K4]	3	2	2	1	1	1	1
CO5[K4]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I – ELASTICITY **(15 hrs)**

Elasticity – Different Moduli of Elasticity – Relation Between Elastic Moduli – Poisson's Ratio of Rubber – Torsion of a Body – Work Done in Twisting a Wire – Torsional Oscillations of a Body – Rigidity Modulus by Dynamic Torsion Method (Torsional Pendulum) – Bending of Beams – Expression for Bending Moment – Cantilever – Measurement of E – Oscillations of a Cantilever – Depression at the Mid-Point of a Beam Loaded at the Middle – Uniform Bending of a Beam – Determination of Young's Modulus.

UNIT II – VISCOSITY **(15 hrs)**

Viscosity – Streamline Flow and Turbulent Flow – Poiseuille's Formula for the Flow of a Liquid Through a Capillary Tube – Corrections to Poiseuille's Formula – Poiseuille's Method for Determination of Coefficient of Viscosity of a Liquid (Constant and Variable Pressure Head) – Ostwald Viscometer – Terminal Velocity and Stoke's Formula – Stoke's Method for the Coefficient of Viscosity – Variation of Viscosity with Temperature and Pressure – Friction and Lubrication – Searle's Viscometer – Viscosity of Gases – Modification of Poiseuille's Formula for Gases – Rankine's Method.

UNIT III – SURFACE TENSION **(15 hrs)**

Surface Tension – Explanation of Surface Tension on Kinetic Theory – Work Done in Increasing the Area of a Surface – Work Done in Blowing a Bubble – Forms of Liquid Drops – Angle of Contact – Spreading of One Liquid Over Another – Pressure Difference Across a Liquid Surface – Excess Pressure Inside a Curved Liquid Surface – Force between Two Plates Separated by a Thin Layer of Liquid – Jaegar's Method – Variation of Surface Tension with Temperature – Drop Weight Method – Interfacial Tension Between Water and Kerosene.

UNIT IV – GRAVITATION **(15 hrs)**

Motion of Falling Bodies – Kepler's Laws of Motion – Derivation of Law of Gravitation – Newton's Universal Law of Gravitation – 'G' by Boy's Method – Acceleration due to Gravity 'g' – Variation of 'g' with Altitude, Depth and Rotation – Difference between Mass and Weight – Inertial Mass and Gravitational Mass – Gravitational Field, Potential and Potential Energy – Gravitational Potential and Field at a Point due to Spherical Shell and Solid Sphere. Satellites – Stationary Satellite – Escape Velocity – Rocket – Jet Plane.

UNIT V – DYNAMICS OF RIGID BODY **(15 hrs)**

Moment of Inertia and Its Physical Significance – Expression for M.I – Torque – General Theorems on Moment of Inertia – M.I of a Thin Uniform Rod, Rectangular Lamina, Disc, Solid Cylinder and Solid Sphere – M.I of a Flywheel and Axle – Practical Methods for the Determination of M.I of Flywheel and Axle – Law

of Conservation of Angular Momentum – Kinetic Energy of Rotation – Acceleration of a Body Rolling Down in an Inclined Plane – Compound Pendulum – Theory – Bar Pendulum.

TEXTBOOKS

1. Murugesan R. *Properties of Matter*. New Delhi: S.Chand & Co., Fifth Eidtion, 2020. **(UNITS I, II & III)**
2. Brij lal and Subramanian N. *Properties of Matter*. New Delhi: Chand & Company Ltd., First Edition, 2003. **(UNIT IV)**
3. Mathur D.S. *Elements of Properties of Matter*. New Delhi: Chand & Company Ltd., Revised Edition, 2007. **(UNIT V)**

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1. Chakrabarti P.K. *Mechanics and General Properties of Matter.* Kolkata: Books & Allied (P) Ltd., Third Edition, 2009.
2. Hallidary D, Resnick R and Walker J. *Fundamental of Physics*. New Delhi: Wiley India Pvt. Ltd., Ninth Edition, Reprint 2012.
3. Francis W.Sears, Mark W.Zemansky and Hugh D.Young. *University Physics*. New Delhi: Narosa Publising Home, Sixth Edition, Reprint 1998.

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1. https://www.pdfdrive.com/mechanics-of-materials-an-introduction-to-the-mechanics-of-elastic-and-plastic-deformation-of-solids-and-structural-materials-e158454857.html
2. https://www.pdfdrive.com/theory-of-elasticity-timoshenkopdf-e25858473.html
3. https://www.pdfdrive.com/viscosity-of-liquids-theory-estimation-experiment-and-data-e164512594.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - I
CORE COURSE - II: PRACTICAL: PROPERTIES OF MATTER AND MECHANICS
(21UPHC1P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:3**	**INT. MARKS**	**:50**
CREDITS	**:2**	**EXT. MARKS**	**:50**
DURATION	**:45 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to determine Young's modulus of wood, rigidity modulus of a metal, viscosity of water, surface tension of a water, radius of gyration of a wheel by applying basic theoretical concepts of the properties of matter and mechanics.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of properties of matter and mechanics underlying in the experiments

CO2[K2]: demonstrate the concepts of properties of matter and mechanics underlying in the experiments

CO3[K3]: calculate the physical parameters of a matter from the experimental data

CO4[K4]: analyze the experimental results

CO5[K5]: evaluate the physical parameters of a matter

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	1	1	1	-	-	-
CO2[K2]	3	2	2	1	1	2	1
CO3[K3]	3	3	2	1	1	1	1
CO4[K4]	3	2	1	1	-	1	1
CO5[K5]	3	2	1	-	-	1	1
Weightage of the course	15	10	07	04	02	05	04
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**3.24**	**1.56**	**1.9**	**2.46**	**2.44**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

LIST OF EXPERIMENTS (Any 8**):**

1. Determination of Young's Modulus of Elasticity of Material of the Beam by Uniform Bending Method using Pin and Microscope
2. Determination of Young's Modulus of Elasticity of Material of the Beam by Non-Uniform Bending Method using Pin and Microscope
3. Determination of Young's Modulus of Elasticity of Material of the Beam by Non-Uniform Bending Method using Optic Lever
4. Determination of Young's Modulus of Elasticity of the Material of Cantilever by the Method of Oscillations
5. Determination of Rigidity Modulus of the Material of Wire by Torsional Oscillations Method
6. Determination of the Co-efficient of Viscosity of the Viscous Liquid by Stoke's Method
7. Determination of Co-efficient of Viscosity of Water by Capillary Flow Method
8. Comparison of Viscosities of Two Liquids using Ostwald Viscometer
9. Determination of Surface Tension of Water by Capillary Rise Method
10. Determination of the Surface Tension of (i) Water (ii) Liquid and Interfacial Surface Tension between Liquid and Water by Drop Weight Method
11. Determination of Acceleration due to Gravity 'g' and Radius of Gyration of a Compound Bar Pendulum about Its Center of Gravity
12. Determination of Radius of Gyration of a Wheel and Axle Rolling Down in a Inclined Plane

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi: Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai: Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I.* Chennai: S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.

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1. Arora C.L. *B Sc Practical Physics.* New Delhi: S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi: Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi: Vayu Education of India, First Edition, 2011.

4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

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2. http://www.egyankosh.ac.in/bitstream/123456789/18814/1/Experiment-5.pdf
3. https://www.niser.ac.in/sps/sites/default/files/basic_page/Surface%20tension%20by%20capillary%20rise%20method_%202018.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Physics
SEMESTER - I
ALLIED COURSE - I: MATHEMATICS - I (21UPHA11)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners to some mathematical tools and methods that can be apply to problems in Physics and Chemistry.

Course Outcomes (CO)

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

CO1[K2]: express the relation between roots and coefficients of polynomial equations

CO2[K2]: calculate the derivative, integral, Laplace transform of functions

CO3[K3]: solve algebraic and transcendental equations numerically

CO4[K4]: investigate homogeneous function and Euler's theorem

CO5[K5]: determine the appropriate Fourier series expansion for functions

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	1	-	1	-
CO2[K2]	3	2	1	1	-	1	-
CO3[K3]	3	2	1	1	-	1	-
CO4[K4]	3	2	1	1	-	1	1
CO5[K5]	3	2	1	-	1	1	1
Weightage of the course	15	10	04	04	01	05	02
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**1.85**	**1.56**	**0.95**	**2.46**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(18 hrs)**

Theory of Equations: Introduction – Formation of Equations – Relation between Roots and Coefficients. **Algebaric and Transcendental Equations:** Introduction – Errors in Numerical Computation – Iteration Method – Bisection Method.

UNIT II **(18 hrs)**

Regula Falsi Method – Newton-Raphson Method. **Differentiation:** Higher Derivatives – n^{th} Derivative of some Standard Functions.

UNIT III **(18 hrs)**

Leibnitz's Theorem – Partial Differentiation – Homogeneous Function and Euler's Theorem.

UNIT IV **(18 hrs)**

Evaluation of Integrals: Evaluation of Definite Integrals – Integration by Parts. **Fourier Series:** The Cosine and Sine Series.

UNIT V **(18 hrs)**

Laplace Transform: Introduction – Laplace Transform – Inverse Laplace Transform.

TEXTBOOKS

1. S.Arumugam, A.Thangapandi Issac and A.Somasundaram. *Numerical Methods*. Chennai: Scitech Publications (India) Pvt. Ltd, 2007. **(UNITS I & II)**
2. S.Arumugam and A.Thangapandi Issac. *Calculus.* Palayamkottai: New Gamma Publishing House, 2014. **(UNITS II, III & IV)**
3. S.Arumugam and A.Thangapandi Issac. *Ancillary Mathematics Paper II (Revised).* Palayamkottai: New Gamma Publishing House, 2004. **(UNIT V)**

REFERENCES

Books

1. S.Narayanan and T.K.Manicavachagom Pillay. *Calculus - Volume III*. Chennai: S.Viswanathan (Printers & Publishers), PVT., LTD, Revised 18^{th} Edition, 2016.
2. P.R.Vittal. *Differential Equations, Fourier Series and Laplace Transforms, Probability*. Chennai: Margham Publications, Third Revised Edition, 2002.
3. S.Kalavathy. *Numerical Methods*. Chennai: Vijay Nicole Imprints Private Limited., 2004.

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1. https://www.pearsonschoolsandfecolleges.co.uk/secondary/Mathematics/16plus/AdvancingMathsForAQA2ndEdition/Samples/SampleMaterial/Chap01_FP1.pdf,

2. https://www.cliffsnotes.com/study-guides/calculus/calculus/the-derivative/higher-order-derivatives
3. https://byjus.com/jee/higher-order-derivatives-of-functions-in-parametric-form/
4. https://theengineeringmaths.com/wp-content/uploads/2017/08/Chapter-1-Successive-Differentiation-.pdf
5. https://tutorial.math.lamar.edu/classes/calcii/integrationbyparts.aspx
6. https://khitguntur.ac.in/shmat/M-II%20Unit%203%20material.pdf
7. https://www.math.tamu.edu/~francis.narcowich/m414/m414_notes/m414_half_intervals.html
8. https://lecturenotes.in/m/28397-jay-bhatt-professor-of-mathematics-hgce-ch-5-laplace-transform?reading=true

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG PROGRAMME
SEMESTER- I
ABILITY ENHANCEMENT COMPULSORY COURSE - I: ENVIRONMENTAL STUDIES (21UESR11)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:40**
CREDIT	**:1**	**EXT. MARKS**	**:60**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the essentials of Environmental Studies by focusing on variety of environmental issues and factors affecting environment.

Course Outcomes (CO)

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

CO1[K1]: recognize the importance of environment and role of Individuals in its protection

CO2[K2]: explain the key concepts of Ecosystem, Food Web and Bio geochemical

CO3[K3]: apply the right measures for the sustainable use of natural resources

CO4[K4]: analyse the ethical, cross-cultural, and historical context of environmental issues and the links between Human and Natural Systems

CO5[K4]: examine the impact of human action on the biological environment

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	2	2	1	1
CO2 [K2]	2	1	-	2	1	1	1
CO3 [K3]	2	1	-	1	1	1	1
CO4 [K4]	1	1	1	1	2	1	1
CO5 [K4]	1	1	-	1	2	1	1
Weightage of the course	08	05	01	07	08	05	05
Weighted percentage of Course contribution to Pos	**1.29**	**1.21**	**0.46**	**2.73**	**7.62**	**2.46**	**3.05**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(6 hrs)**

Structure of earth and its components: Atmosphere – Lithosphere – Hydrosphere – Biosphere. Renewable and non-renewable resources – Forest, water and energy resources.

UNIT II **(6 hrs)**

Ecosystem: Concept of ecosystem – Terrestrial and aquatic. Structure and function – Energy flow in the ecosystem – Food chain and food web – Ecological pyramids – Bio-geo chemical cycle – carbon and nitrogen cycle.

UNIT III **(6 hrs)**

Biodiversity: Introduction – Definition: genetic, species and ecosystem diversity. Indian Biodiversity Hotspots. Threats to biodiversity – Conservation of Biodiversity – In-situ and Ex-situ conservation strategies. IUCN Red list Categories.

UNIT IV **(6 hrs)**

Pollution: Definition – causes – effects and control measures of Air – Water – Noise – soil – nuclear pollution. Global issues – Global warming – acid rain – Ozone layer depletion. Water conservation – rain water harvesting and water recycling – solid waste management.

UNIT V **(6 hrs)**

Human Population and Environment: Population growth, variation among nations. Road safety awareness. Environment and human health. Human Rights. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health. Contribution of students and teachers in adoption of villages and steps to be taken for green villages.

TEXTBOOKS

1. Dharmaraj,J. *Text book of Environmental studies*, S. Chand and Co. New Delhi, 1995.
2. Susila Appadurai. *Environmental Studies*, New Century Book House, 2012.

REFERENCES

Books

1. Agarwal, K.C.*Environmental Biology*, Nidi publication Ltd, Bikaner, 2001.
2. Odum, E.P. *Fundamentals of Ecology*, W.B. Saunders Co. USA, 1971.
3. Miller, T.G. *Environmental sciences*, Wadsworth Publishing Co, New Delhi. 2004.

Web Sources

1. https://www.adcidl.com/pdf/India-Road, Traffic-Signs.pdf.

2. https://www.youtube.com/watch?v=QewEi2U1jLs
3. https://byjus.com/biology/endemic-species/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - I
SKILL ENHANCEMENT COURSE - I: PRACTICAL: INTRODUCTION TO OFFICE SUITE AND WEB SEARCH (21UPHS1P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:50**
CREDIT	**:1**	**EXT. MARKS**	**:50**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to learn the basics of computers, MS office, usage of various search engines and privacy options in browsers.

Course Outcomes (CO)

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

CO1[K1]: operate the computer to create and store the files in windows environment

CO2[K2]: explain the usage of word, excel, power point presentation and mail merge

CO3[K3]: utilize the technology to send and receive mail

CO4[K4]: examine the importance of browsers, MS office and search engines

CO5[K5]: choose the appropriate MS office functions for applications

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	1	1	1	-	1	-
CO2[K2]	3	-	-	1	-	1	-
CO3[K3]	2	1	1	1	-	1	1
CO4[K4]	2	1	1	-	-	-	1
CO5[K5]	3	2	1	1	1	1	1
Weightage of the course	13	05	04	04	01	04	03
Weighted percentage of Course contribution to POs	**2.1**	**1.21**	**1.85**	**1.56**	**0.95**	**1.97**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

LIST OF EXPERIMENTS (Any 8**):**

1. Usage of Various Search Engines
2. Preparing Bio Data with Letter Correspondence
3. Typesetting a Newspaper Model
4. Designing Multicolumn Model
5. Preparing Student Mark Sheet Using Tables and Formulae in Excel
6. Sending and Receiving Mail & Mail Merge
7. Designing a Certificate Using MS Word
8. Studying the Security and Privacy Options in Browsers
9. Designing Slide with Animation
10. Designing Advertisement Using Power Point Presentation

TEXTBOOKS

1. Rajaram V. *Introduction to Information Technology.* Mumbai: Prentice Hall of India Pvt. Ltd., Second Edition, 2013.
2. Leon A. *Internet for Everyone.* Mumbai: Vijash Publishing House, Second Edition, 2012.
3. Winston L.W. *Microsoft Excel*. New Delhi: Prentice Hall of India Pvt. Ltd., First Edition, 2014.

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1. Marty M and Mathew C. *Microsoft Office 2007 QuickStep.* New Delhi: Tata McGraw Hill Publishing Company Ltd., Third Edition, 2009.
2. Mansfield R. *Working in Microsoft Office.* New Delhi: Tata McGraw Hill Publishing Company Ltd., Fourth Edition, 2011.
3. Ze Nian Li and Mark S.Drew. *Fundamentals of Multimedia*. India: Pearson Education International, Third Edition, 2021.

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1. https://www.youtube.com/watch?v=2eH0JbEE-6k
2. https://www.computer-pdf.com/tutorials-ms-office-basics
3. https://ptgmedia.pearsoncmg.com/images/9780735699236/samplepages/9780735699236.pdf
4. https://www.researchgate.net/publication/335961842_Fundamental_of_MS-Office/link/5d85ffc5458515cbd1a64563/download

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A/B.SC/BCA
SEMESTER - II
பொதுத்தமிழ் - II (21UTAL21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

நோக்கம்

சமய இலக்கியம் தோன்றியதற்கான காலப்பின்னணி மற்றும் சமயம் சார்ந்த இலக்கியங்களை மாணவர்களுக்கு அறிவுறுத்தலும், பல்வேறு காலகட்ட சிறுகதை இலக்கியங்களை எடுத்துரைக்கும் நோக்கோடு அமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளை வெற்றிகரமாக முடித்தவுடன் மாணவர்கள்,

CO1[K1]: பல்வேறு சமயம் சார்ந்த இலக்கிய வரலாற்றினை அறிவர்

CO2[K2]: இறை உருவங்களையும் புராணக் கருத்துக்களையும் கூறுவர்

CO3[K3]: சமயப்பாடல்களின் அமைப்பினையும் நோக்கத்தினையும் தெளிவாக விளக்குவர்

CO4[K4]: தமிழ்ச் சிறுகதைகளின் பொருண்மைகளைப் பாகுபடுத்துவர்

CO5[K4]: சொல்லிலக்கணத்தைப் புரிந்துகொண்டுபிழையின்றி எழுதும் திறனைப் பெறுவர்

CO-PO Mapping Table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	1	1	-	-
CO3[K3]	2	2	-	2	-	1	-
CO4[K4]	2	2	1	2	1	-	1
CO5[K4]	2	2	1	2	-	1	1
Weightage of the course	10	8	2	8	2	2	2
Weighted percentage of Course contribution to POs	**1.62**	**1.94**	**0.93**	**3.13**	**1.9**	**0.99**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

கூறு I **(18hrs)**

சைவ இலக்கியவரலாறு - **திருஞானசம்பந்தர்**: முதல் திருமுறை - திருப்பிரமபுரம் - தோடுடைய செவியன் (10 பாடல்கள்). **திருநாவுக்கரசர்:** நான்காம் திருமுறை – திருவதிகை வீரட்டானம் - கூற்றாயினவாறு விலக்ககலீர் (10 பாடல்கள்). **சுந்தரர்:** ஏழாம் திருமுறை - திருவெண்ணெய்நல்லூர் பதிகம் - பித்தாபிறைசூடி (10 பாடல்கள்). **மாணிக்கவாசகர்:** குயிற்பத்து (10 பாடல்கள்).

கூறு II **(18hrs)**

வைணவ இலக்கிய வரலாறு - **ஆண்டாள்**: திருப்பாவை முழுவதும் (30 பாடல்கள்) - **நம்மாழ்வார்**: நான்காம் திருமொழி - நான்காம் பத்து - மண்ணையிருந்துதுழாவி.

கூறு III **(18hrs)**

கிறிஸ்தவ, இஸ்லாமிய இலக்கியவரலாறு - **கண்ணதாசன்:** இயேசுகாவியம் - மலைப்பொழிவு (முழுவதும்) - **குணங்குடியார்:** நந்தீஸ்வரக்கண்ணி (51 பாடல்கள்).

கூறு IV **(18hrs)**

சிறுகதை தோற்றம் வளர்ச்சி (தேர்ந்தெடுக்கப்பட்ட 10 சிறுகதைகள்) - **புதுமைப்பித்தன்:** அகல்யை. பி.எஸ். ராமையா: நட்ஷத்திரக் குழந்தைகள் **த.ஜெயகாந்தன்:** அக்ரஹாரத்துப ்பூனை. **வண்ணதாசன்**: ஒருசிறு இசை. **வண்ணநிலவன்:** கரையும் உருவங்கள். **கு.அழகிரிசாமி**: அன்பளிப்பு. **விஞ்ஞானி**: முன்னை இட்ட தீ. **ஆதவன்:** கறுப்பு அம்பா கதை. **மேலாண்மை பொன்னுச்சாமி**: அன்பெழுத்து. **நாஞ்சில் நாடன்**: சூடியபூ சூடற்க.

கூறு V **(18hrs)**

இலக்கணம்: சொல்விளக்கம், சொற்பாகுபாடு (பெயர்ச்சொல், வினைச்சொல், இடைச்சொல், உரிச்சொல்) – அறுவகை வினா - எண்வகை விடை - மொழிப்பயிற்சி: மயங்கொலிப் பிழைகள் (லகர ,ளகர, ழகர வேறுபாடு, ரகர, றகர வேறுபாடு - ணகர, னகர வேறுபாடு).

பாடநூல்கள்

1. *தொகுப்புநூல்,* தமிழியல்துறை, ஸ்ரீ காளீஸ்வரி கல்லூரி (தன்னாட்சி) ,சிவகாசி.
2. வாசுதேவன், கா. *பன்முகநோக்கில் தமிழ் இலக்கியவரலாறு,* தேவன் பதிப்பகம், திருச்சிராப்பள்ளி, பன்னிரெண்டாம் பதிப்பு: 2017.

பார்வை நூல்கள்

1. அப்துல் ரகுமான் (குறிப்புரை*). குணங்குடியார் பாடற்கோவை,* மணிவாசகர் பதிப்பகம், சென்னை, 2002.
2. பாக்கிய மேரி. *தமிழ் இலக்கியவரலாறு,* நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை, நான்காம் பதிப்பு: 2011.
3. ஜெகத் ரட்சகன், எஸ். *நூலாயிர திவ்யப் பிரபந்தம்,* முல்லை நிலையம், சென்னை, முதற்பதிப்பு: 1993.
4. ஸ்ரீமத் கந்தசாமித் தம்பிரான் சாமிகள் (பதி.ஆ.). *மூவர் தேவாரம்,* ஞானசம்பந்தம் பதிப்பகம், மயிலாடுதுறை, இரண்டாம் பதிப்பு: 1997.

வலைப்பதிவுகள் (Web Sources)

1. https://youtu.be/FPlNGftQnAo
2. https://youtu.be/Rj0S6KOruvA
3. https://youtu.be/Z8xgO8ff44g
4. https://youtu.be/PxeeauHz5CQ

5. https://youtu.be/TLU6MO9YEkA
6. https://podhutamizh.blogspot.com/2017/09/blog-post_42.html
7. https://youtu.be/vZ1FrQuhn_w

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.Com./ B.B.A./B.SC./BCA
SEMESTER- II
COMMUNICATIVE ENGLISH - II (21UENL21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

Preamble

This course helps the learners to develop their communication skills in English through listening, reading, speaking and writing practices.

Course Outcomes (CO)

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

CO1[K1]: relate and state ideas by reading and listening to recorded interviews and news

CO2[K2]: demonstrate effective speaking skills by offering suggestions, seeking permission and reporting ongoing activities

CO3[K3]: apply knowledge of word power and grammar rules through proverb expansion and paragraph writings

CO4[K4]: analyze simple poems and short stories to develop language skills through literature

CO5[K6]: construct grammatically correct and logically coherent paragraphs

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	1	-	-	-
CO2 [K2]	2	2	-	1	1	-	1
CO3 [K3]	2	2	-	2	-	1	-
CO4 [K4]	2	2	1	2	1	-	1
CO5 [K6]	2	1	1	2	-	1	1
Weightage of the course	10	08	02	08	02	02	03
Weighted percentage of Course contribution to POs	**1.62**	**1.94**	**0.93**	**3.13**	**1.9**	**0.99**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to interviews

Listening to news reading

Listening to instructions-download apps in mobile handsets, cooking, sending e-mail

B. Speaking

Inviting person, offering suggestion and seeking permission

Making complaints and asking apology

Expressing likes, dislikes, hopes, wishes, regrets, sympathy, offering condolences, compliments and praising

Reporting conversations, facts, meetings/interviews, ongoing activities and future plans

Talking about the weather, past &future events, interesting plans and arrangements

UNIT II - READING AND WRITING **(18 hrs)**

A. Reading

Reading advertisements

Reading notices

Reading short passages

B. Writing

Proverb Expansion

Paragraph Writing

Essay writing

UNIT III - WORD POWER **(18 hrs)**

Synonyms & Antonyms

Misspelt words

Words related to- House, Clothing, Food, Education, Speaking, Holidays and Sports

UNIT IV - GRAMMAR **(18 hrs)**

Preposition and its kinds

Conjunction and its kinds

Articles

Tenses

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

A. Poetry

Sarojini Naidu	-	The Queen's Rival
John Masefield	-	Laugh and be Merry
Alfred Noyes	-	The Highwayman

B. Short Story

Somerset Maugham	-	The Ant and the Grasshopper
Katherine Mansfield	-	A Cup of Tea

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Pillai, Radhakrishna. *Emerald English Grammar and Composition.* Chennai: Emerald Publishers, 2016.

REFERENCES

Books

1. *Life Skills (Jeevan Kaushal) Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Radha, Alamelu et.al. *Situational Grammar and Composition.* Chennai:New Century Book House Pvt. Ltd,2008.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Subramanian A.E. *Gifts to Posterity.* Chennai*: Anu Chitra Publications*, 2003.
5. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.
6. Tilak, Raghukul. *Sarojini Naidu Selected Poems.* New Delhi: Educational Publishers, 2009.

Web Sources

1. https://allpoetry.com/Laugh-and-be-Merry
2. https://lincolnprep.wildapricot.org/resources/Reading%20Selections%20for%20Reading%20Competion/The%20Highwayman.pdf
3. https://learnenglish.britishcouncil.org/general-english/stories
4. https://www.talkenglish.com/lessonindex.aspx
5. https://www.englishhelper.com/
6. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - II
CORE COURSE - III: HEAT AND THERMODYNAMICS (21UPHC21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:5**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:75 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with different modes of heat transfer, the laws of thermodynamics and applications of Maxwell's thermodynamical relations, the concept of specific heat capacity of matter, entropy and transport phenomena of gases.

Course Outcomes (CO)

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

CO1[K1]: define the basic principles from real gas behaviour, transmission of heat, thermodynamics, and entropy

CO2[K2]: explain the concepts of kinetic theory of gases, thermometry, calorimetry, modes of heat transfer, thermodynamics, and entropy

CO3[K3]: apply the concepts of thermal physics to solve problems

CO4[K4]: compare the transport phenomenon of gases, specific heat capacity of matter, modes of heat transfer and entropy

CO5[K4]: examine the parameters related to heat and thermodynamics

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	1	-	1	-	1	-
CO2[K2]	3	2	-	1	-	1	-
CO3[K3]	3	3	2	1	-	1	1
CO4[K4]	3	2	2	1	1	1	1
CO5[K4]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – KINETIC THEORY OF GASES (15 hrs)

Kinetic Model – Expression for Pressure Exerted by a Gas – Brownian Motion – Degree of Freedom – Maxwell's Law of Equipartition of Energy – Specific Heats of Mono, Di and Tri and Polyatomic Gases. Behavior of Real Gases – Change of State – Van der Walls Equation of State – Estimation of Critical Constants – Constants of Van der Waals Equation – Critical Coefficient – Limitations of Van der Waals Equation. Molecular Collisions – Mean Free Path – Expression for Mean Free Path – Transport Phenomenon (Viscosity, Thermal Conductivity and Self Diffusion).

UNIT II – THERMOMETRY AND CALORIMETRY (15 hrs)

Thermometry – Types of Thermometers – Centigrade, Fahrenheit and Rankie Scales and Their Relation – Platinum Resistance Thermometer – Calendar and Griffith's Bridge – Seebeck Effect – Peltier Effect – Thomson Effect – Thermo-Electric Power – Thermoelectric Thermometers – Standardization and Temperature Scale. Calorimetry – Regnault's Method of Mixtures (Solid) – Newton's Law of Cooling – Callendar and Barnes' Method – Specific Heat Capacity of Gases – C_p and C_v – C_v by Joly's Differential Steam Calorimeter– C_p by Regnault's Method.

UNIT III – TRANSMISSION OF HEAT (15 hrs)

Conduction – Coefficient of Thermal Conductivity – Rectilinear Flow of Heat Along a Bar – Forbe's Method – Lee's Disc Method for Bad Conductors – Cylindrical Flow of Heat – Thermal Conductivity of Rubber – Convection – Central Heating System – Thermopile – Thermos Flask – Radiation – Black Body in Practice – Kirchhoff's Law – Stefan-Boltzmann Law – Distribution Energy in Black Body Spectrum – Planck's Radiation Law – Derivation of Planck's Radiation Law – Solar Constant – Temperature of the Sun – Water Flow Pyroheliometer.

UNIT IV – THERMODYNAMICS (15 hrs)

Zeroth Law of Thermodynamics – Concept of Heat – First Law of Thermodynamics – Applications of First Law of Thermodynamics – Work Done during Isothermal and Adiabatic Process – Clement and Desormes Method – Reversible and Irreversible Processes – Carnot's Ideal Heat Engine – Carnot's Cycle – Effective Way to Increase Efficiency – Carnot's Engine and Refrigerator – Second Law of Thermodynamics – Carnot's Theorem – Otto Engine – Petrol Engine – Diesel Engine.

UNIT V – ENTROPY (15 hrs)

Entropy – Change in Entropy – Change in Entropy in Reversible Cycle and Irreversible Process – The T-S Diagram – Physical Significance of Entropy – Entropy of a Perfect Gas and Steam – Third Law of Thermodynamics – Zero Point

Energy – Negative Temperature. Extensive and Intensive Variables – Maxwell Thermodynamical Relations – Applications of Maxwell Thermodynamic Relations – Thermodynamic Potentials – The T-dS Equations – Clausius – Clapeyron's Latent Heat Equation.

TEXTBOOK

1. Brij lal, Subramanyam N and Hemne P.S. *Heat Thermodynamics and Statistical Physics*. New Delhi: S.Chand & Company Ltd., Revised Edition, Reprint 2020. **(UNITS I, II, III, IV & V)**.

REFERENCES

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1. Kumar A and Taneja S.P. *Thermal Physics*. New Delhi: R. Chand Publications, Second Edition, 2018.
2. Varma H.C. *Concepts of Physics Volume I and II.* New Delhi: Bharati Bhawan Publishers, 2015.
3. Sharma J.K and Sarkar K.K. *Thermodynamics and Statistical Physics.* Mumbai: Himalaya publishing House Pvt. Ltd., First Edition, Reprint 2021.

Web Sources

1. http://galileo.phys.virginia.edu/classes/152.mf1i.spring02/HeatLectures.pdf
2. https://www3.nd.edu/~powers/ame.20231/notes.pdf
3. https://www.youtube.com/watch?v=xCSInwHcV2g
4. http://courses.physics.ucsd.edu/2010/Spring/physics210a/LECTURES/210_COURSE.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - II
CORE COURSE - IV: PRACTICAL: THERMAL PHYSICS (21UPHC2P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:3**	**INT. MARKS**	**:50**
CREDITS	**:2**	**EXT. MARKS**	**:50**
DURATION	**:45 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to determine thermal properties of materials by applying basic theoretical concepts of thermal physics.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of thermal physics underlying in the experiments

CO2[K2]: demonstrate the concepts of thermal physics underlying in the experiments

CO3[K3]: calculate the physical parameters of a matter from the experimental data

CO4[K4]: analyze the experimental results

CO5[K5]: evaluate the physical parameters of a matter

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	1	1	-	-	-
CO2 [K2]	3	2	2	1	1	2	1
CO3 [K3]	3	3	2	1	1	1	1
CO4 [K4]	3	2	1	1	-	1	1
CO5 [K5]	3	2	1	-	-	1	1
Weightage of the course	15	10	07	04	02	05	04
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**3.24**	**1.56**	**1.9**	**2.46**	**2.44**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

LIST OF EXPERIMENTS (Any 8**):**

1. Determination of Specific Heat Capacity of Solid by the Method of Mixtures
2. Determination of Specific Latent Heat of Fusion of Ice by the Method of Mixtures
3. Determination of Specific Latent Heat of Steam by the Method of Mixtures
4. Determination of the Saturated Vapour Pressure of Water at Different Temperatures
5. Determination of Co-efficient of Thermal Conductivity of a Bad Conductor by Lee's Disc Method
6. Determination of the Emissivity of a Surface of the Calorimeter by Drawing Cooling Curve.
7. Determination of Specific Heat of a Liquid by Newton's Law of Cooling Method
8. Determination of Thermo e.m.f of a Thermocouple using Potentiometer
9. Determination of Specific Heat Capacity of a Liquid using Joule's Calorimeter
10. Determination of Thermal Conductivity of a Good Conductor by Forbe's Method
11. Determination of Solar Constant and Surface Temperature of Sun using Lee's Disc
12. Estimation of Temperature of a Flame

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi: Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai: Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I.* Chennai: S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.

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1. Arora C.L. *B Sc Practical Physics.* New Delhi: S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi: Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi: Vayu Education of India, First Edition, 2011.

4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

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1. https://www.youtube.com/watch?v=WtIG3zWaTK8
2. http://egyankosh.ac.in/bitstream/123456789/18821/1/Experiment-7.pdf
3. http://www.iiserpune.ac.in/~bhasbapat/phy221_files/Lee's%20Method.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF MATHEMATICS
UG Programme - B.Sc. Physics
SEMESTER - II
ALLIED COURSE - II: MATHEMATICS - II (21UPHA21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners to some mathematical tools and methods that can be apply to problems in Physics and Chemistry.

Course Outcomes (CO)

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

CO1[K2]: indicate the binomial series representation of functions and the exponential series

CO2[K2]: explain gradient of a scalar valued function, divergence and curl of a vector valued function and its properties, rank of a matrix

CO3[K3]: compute inverse of a matrix using Cayley-Hamilton theorem, eigen values and eigen vectors of a square matrix

CO4[K4]: appraise equivalent definitions of a group, properties of a group

CO5[K5]: determine the mathematical function that has the best fit to a series of data points

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	-	1	-	1	-
CO2[K2]	3	2	-	1	-	1	-
CO3[K3]	3	2	2	1	-	1	-
CO4[K4]	3	2	1	1	-	1	1
CO5[K5]	3	2	1	-	1	1	1
Weightage of the course	15	10	04	04	01	05	02
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**1.85**	**1.56**	**0.95**	**2.46**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(18 hrs)**

Summation of Series: Binomial Series – Exponential Series.

UNIT II **(18 hrs)**

Vector Calculus: Introduction – Vector Algebra – Differentiation of Vectors – Gradient – Velocity and Acceleration – Divergence and Curl.

UNIT III **(18 hrs)**

Matrices: Introduction – Matrices – Simultaneous Linear Equations – Cayley Hamilton Theorem – Eigen Values and Eigen Vectors.

UNIT IV **(18 hrs)**

Groups: Definition and Examples – Elementary Properties of a Group – Equivalent Definitions of a Group – Permutation Groups.

UNIT V **(18 hrs)**

Straight Lines: Equation of a Straight Line. **Curve Fitting:** Introduction – Linear Law – Method of Group Averages – Method of Least Squares.

TEXTBOOKS

1. S.Arumugam and A.Thangapandi Issac. *Ancillary Mathematics Paper I (Revised)*. Palayamkottai: New Gamma Publishing House, 2002. **(UNITS I & V)**
2. S.Arumugam and A.Thangapandi Issac. *Ancillary Mathematics Paper II (Revised).* Palayamkottai: New Gamma Publishing House, 2004. **(UNIT II)**
3. S.Arumugam and A.Thangapandi Issac. *Ancillary Mathematics Paper III.* Palayamkottai: New Gamma Publishing House, 2006. **(UNITS III & IV)**
4. S.Arumugam, A.Thangapandi Issac and A.Somasundaram. *Numerical Methods.* Chennai: Scitech Publications (India) Pvt. Ltd, Second Edition, 2007. **(UNIT V)**

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Books

1. T.K.Manicavachagom Pillay, T.Natarajan and K.S.Ganapathy. *Algebra–Volume II. Chennai:* S.Viswanathan (Printers & Publishers) Pvt. Ltd., 2006.
2. S.Arumugam and A.Thangapandi Issac. *Modern Algebra*. Chennai: Scitech Publications (India) Pvt.Ltd, 2008.
3. S.Arumugam and A.Thangapandi Isaac. *Algebra Theory of Equations, Theory of Numbers and Trigonometry.* Palayamkottai: New Gamma Publishing House, 2011.

Web Sources

1. https://www.esaral.com/exponential-and-logarithmic-functions-class-12-iit-jeeexponential-and-logarithmic-functions-notes-for-class-12-iit-jee/
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SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG PROGRAMME
SEMESTER –II
ABILITY ENHANCEMENT COMPULSORY COURSE: II -VALUE EDUCATION
(21UVED21)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK	**:1**	**INT. MARKS**	**:40**
CREDIT	**:1**	**EXT. MARKS**	**:60**
DURATION	**:15 hrs**	**MAX. MARKS**	**:100**

Preamble

This course aims to promote the values of peace, non-violence, religious tolerance and secular thinking among the learners and equip the learners for a harmonious living in the multi-cultural pluralistic society.

Course Outcomes (CO)

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

CO1[K1]: identify the basic human values and ethics necessary for harmonious Human relationship

CO2[K2]: explain the significance of social values and religious tolerance to live in Peace

CO3[K3]: articulate the life-changing principles of brotherhood, honesty, loyalty and community solidarity

CO4[K4]: analyse emotional, social, spiritual attribute to acquire well balanced Personality

CO5[K4]: examine the importance of harmonious living in the multi-cultural pluralistic society

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	1	1	-	2
CO2 [K2]	2	1	-	1	2	1	2
CO3 [K3]	2	1	-	1	2	1	1
CO4 [K4]	1	1	1	1	2	1	1
CO5 [K4]	1	1	-	1	2	1	1
Weightage of the course	08	05	01	05	09	04	07
Weighted percentage of Course contribution to Pos	**1.29**	**1.21**	**0.46**	**1.95**	**8.57**	**1.97**	**4.27**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I – VALUES AND INDIVIDUAL (3 hrs)

Meaning of values – classification of values – Need for value education – Personal values like adaptability, courage, cheerfulness, dignity of labour and self control – Self discipline - Self Confidence - Self initiative - Social values like sacrifice, forgiveness, Honesty, good manners, tolerance, friendship, hospitality, cooperation and civic sense – Moral values like purity, dedication, punctuality, loyalty, truthfulness and sense of duty.

UNIT II – VALUES AND SOCIETY (3 hrs)

Definition of society – democracy – secularism – socialism – Human rights – social integration – Social Justice – Role models: Akbar, Balagangadhar Tilak, Abdul Kalam, Mother Teresa.

UNIT III – VALUES AND RELIGIONS (3 hrs)

Values in Hinduism, Christianity, Islam and Buddhism – Need for religious harmony inter faith dialogue – Role Models: Vivekananda, Narayana Guru, Aravindar, Tagore, Vallalar Ramalingar, Gandhi.

UNIT IV – VALUES AND NATIONAL INTEGRATION (3 hrs)

Secularism and National Integration – Message from the life of Gandhiji, Nehru, Bharathi, Subash Chandra Bose, Sarojini Naidu etc.

UNIT V – VALUES AND SCIENCE (3 hrs)

Indian Gurus – Indian Scientists – Indian Universities – Indian Mathematicians and World Scientists – Science and Religion – Science, Technology development and values – Science and Human values.

TEXTBOOK

1. Pitchaikani Prabhaharan, A. Babu Franklin, M.Archanadevi, *Value education*, Sri Kaliswari college (Autonomous), Sivakasi, 2017.

REFERENCES

Books

1. Subramanyam, K. *Values in Education*, Ramana Publications, 1995
2. Swamy Chidbhavananda, *Indian National Education*, Publication by Ramakirshna Tapovanam.
3. அறிஞர் குழு (தொகுப்பு). *வாழ்வியல் விழுமியங்கள்*, உலக சமுதாய சேவா சங்கம், ஆழியாறு.

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1. https://www.youtube.com/watch?v=ruKY3GqBvYQ.

2. https://www.republicworld.com/technology-news/science/15-famous-indian-scientists-list-know-what-were-their-innovations.html.
3. https://www.youtube.com/watch?v=M9_l9DDvEsw

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - II
SKILL ENHANCEMENT COURSE - II: SOUND AND ULTRASONICS (21UPHS21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:40**
CREDITS	**:2**	**EXT. MARKS**	**:60**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the concepts of sound and ultrasonics, and their applications.

Course Outcomes (CO)

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

CO1[K1]: describe the velocity of sound, Doppler effect, acoustics of building, production of ultrasonics and its applications

CO2[K2]: explain the concepts of sound and ultrasonics

CO3[K3]: present concepts of sound, Doppler effect, acoustics of building, production and applications of ultrasonics

CO4[K4]: analyze the concepts of sound and ultrasonics used in instruments and devices

CO5[K4]: distinguish applications of sound and ultrasonics

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	-	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	1	2	1	-	1	1
CO4 [K4]	2	2	1	-	-	1	1
CO5 [K4]	2	2	1	1	-	-	1
Weightage of the course	13	08	04	04	00	03	03
Weighted percentage of Course contribution to POs	**2.1**	**1.94**	**1.85**	**1.56**	**0**	**1.48**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – VELOCITY OF SOUND (6 hrs)

Origin of Sound – Material Medium for Propagation of Sound – Velocity of Longitudinal Waves in Gases – Newton's Formula for Velocity of Sound – Velocity of Sound in Water – Velocity of Sound in Air – Velocity of Sound in Isotropic Solids.

UNIT II – DOPPLER EFFECT & PRACTICAL APPLICATIONS (6 hrs)

Doppler Effect – Observer at Rest and Source in Motion – Source at Rest and Observer in Motion – Source and Observer are in Motion. Practical Applications – Siren – Falling Plate Method – Gramophone – Microphone and Loud Speaker – Tape Recording.

UNIT III – BASIC ACOUSTICS OF A BUILDINGS (6 hrs)

Acoustics of Building – Reverberation – Sabine's Reverberation Formula (No derivation) – Factors Affecting Acoustics of Building – Sound Distribution in an Auditorium – Requisites for Good Acoustics.

UNIT IV – ULTRASONICS AN OVERVIEW (6 hrs)

Ultrasonics in Nature – Historical Development – Physical Acoustics – Low-Frequency Bulk Acoustic Wave Applications – Surface Acoustic Waves – Piezoelectric Materials – High Power Ultrasonics.

UNIT V – ULTRASONICS - PRODUCTION & APPLICATIONS (6 hrs)

Production - Galton Whistle Method – Piezo Electric Oscillator – Magnetostriction Method – Applications – Depth of Sea – Signaling – Heating Effects – Mechanical Effects – Cracks in Metals – Formation of Alloys Chemical Effect – Soldering – Medical Applications.

TEXTBOOKS

1. Subrahmanyam N and Brij lal. *A Text Book of Sound*. New Dehi: Vikas Publishing House Pvt. Ltd., Second Revised Edition, Reprint 2018. **(UNITS I, II, III & V)**
2. David J and Cheeke N. *Fundamentals and Applications of Ultrasonic Waves*. Londan: CRC Press, Taylor & Francis Group, Second Edition, 2012. **(UNIT IV)**

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1. Mike Goldsmith. *Sound: A very Short Introduction*. UK: Oxford University Press, First Edition, 2015.
2. Muthupandian Ashokkumar. *Hand book of Ultrasonics and Sonochemistry*. Singapore: Springer, 2016.

3. Chattopadhyay D and Rakshit P C. *Vibrations, Waves and Acoustics*. Kolkata: Books and Allied (P) Ltd., Fourth Edition, 2005.

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1. https://www.pdfdrive.com/sound-a-very-short-introduction-d199812208.html
2. http://engineeringphysics.weebly.com/uploads/8/2/4/3/8243106/unit_ii_-_svck_-_ultrasonics.pdf
3. https://www.youtube.com/watch?v=32q5x-81H5Q
4. https://www.pdfdrive.com/building-acoustics-d33493000.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG PROGRAMME
SEMESTER – II
DISASTER MANAGEMENT (21UDMG21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:1**	**INT. MARKS**	**:40**
CREDIT	**:1**	**EXT. MARKS**	**:60**
DURATION	**:15 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners to know the causes and impact of disasters and the agencies for disaster management in India.

Course Outcomes (CO)

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

CO1[K1]: outline the causes and impact of disasters
CO2[K2]: explain the features of national policy on disaster management
CO3[K3]: present the issues in rehabilitation
CO4[K4]: classify the mitigation measures
CO5[K5]: assess the role of the agencies for disaster management

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	1	1	-	2	2
CO2[K2]	2	1	-	1	-	-	1
CO3[K3]	1	2	1	1	-	-	2
CO4[K4]	1	2	-	1	1	2	2
CO5[K5]	1	2	-	1	1	-	1
Weightage of the course	07	08	02	05	02	04	08
Weighted percentage of Course contribution to POs	**1.13**	**1.94**	**0.93**	**1.95**	**1.9**	**1.97**	**4.88**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I **(3 hrs)**

Introduction – Disaster – Hazards – Causes and Impact of Disasters – Levels ofDisaster – Casual Factors of Disaster – Phases of a Disaster.

UNIT II **(3 hrs)**

Disaster Mitigation – Risk Reduction Measures – Mitigation Actions – DisasterManagement Cycle – Classification of Mitigation Measures.

UNIT III **(3 hrs)**

Disaster Preparedness and Planning – Objectives – Strategies – Elements of DisasterPreparedness – Principles of Disaster Planning.

UNIT IV **(3 hrs)**

Disaster Rehabilitation – Issues in Rehabilitation – Objectives – Approaches –Elements of a Rehabilitation Programme.

UNIT V **(3 hrs)**

Framework Disaster Management in India – Features of National Policy on DisasterManagement – Primary and Secondary Relief Functions of Central Government – DisasterManagement Act 2005 – Agencies for Disaster Management: India Red Cross Society,NIDM – Bharat Scouts and Guides, India Paramilitary Forces.

TEXTBOOK

1. Satish Modh. *Introduction to Disaster Management*. New Delhi: Macmillan Publishers India Limited, 1st Edition, 2015.

REFERENCES

Books

1. Balamurugan P K and Ajith Kumar S. *Disaster Management*. Chennai: New Century Book House Private Limited, 1st Edition, 2020.
2. Dasgupta R.*Disaster Management and Rehabilitation.* New Delhi: Mittal Publications, 1st Edition, 2010.
3. NarayananB.*Disaster Management*. NewDelhi: A.P.H. Publishing Corporation, 1st Edition, 2009.

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1. https://nptel.ac.in/courses/105/104/105104183/
2. https://nidm.gov.in/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A/B.Sc/BCA
SEMESTER - III
பொதுத்தமிழ் - III (21UTAL31)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

நோக்கம்

காப்பியம், சிற்றிலக்கியம், உரைநடை உள்ளிட்ட இலக்கியவகைகளை அறிமுகம் செய்து, அவற்றைச் சமூக ,சமயச் சூழலில் விளங்கவைத்து, யாப்பு, அணி உள்ளிட்ட மொழிக் கட்டமைப்புகளை உணர்த்தி, உரைநடை மூலம் படைப்பாளராகும் தகுதியைப் பெறவைத்து, பல்வேறு நிகழ்வுகளில் நடைபெறும் போட்டிகளில் பங்கேற்கச் செய்யும் வகையில் இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளை வெற்றிகரமாக முடித்தவுடன் மாணவர்கள்,

CO1[K1]: காப்பியங்களில் கூறப்பட்டுள்ள வாழ்வியல் நெறிகளாகிய அறம், பொருள், இன்பம், வீடு ஆகியவற்றைப் பற்றி அறிவர்

CO2[K2]: செய்யுட்களில் இடம் பெறும் அணி நலன்களைக் காண்பர்

CO3[K3]: யாப்பு மரபைக் கற்றுணர்ந்து கவிதையை இனம் காணும் ஆற்றலைப் பெறுவர்

CO4[K4]: சிற்றிலக்கியங்கள் உணர்த்தும் சமூகத்தையும் விழுமியத்தையும் விவாதிக்கும் திறனைப் பெறுவர்

CO5[K4]: சமயங்கள் உணர்த்தும் அறக்கருத்துக்களைப் பகுப்பாய்வு செய்வர்

CO-PO Mapping Table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	1	-	-	-
CO2 [K2]	2	1	-	1	-	-	-
CO3 [K3]	2	2	-	2	1	-	-
CO4 [K4]	2	2	1	2	-	1	1
CO5 [K4]	2	2	1	2	1	1	1
Weightage of the course	10	08	02	08	02	02	02
Weighted percentage of Course contribution to POs	**1.62**	**1.94**	**0.93**	**3.13**	**1.9**	**0.99**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

கூறுI **(18 hrs)**

காப்பியம் I: காப்பிய இலக்கியவரலாறு, சிலப்பதிகாரம் - அடைக்கலக் காதை (முழுவதும்) - மணிமேகலை - பளிக்கறை புக்ககாதை (முழுவதும்) – சீவக சிந்தாமணி - காந்தர்வதத்தையார் இலம்பகம் (தேர்ந்தெடுக்கப்பட்ட 15 பாடல்கள்) - சிலைத்தொழிற் (657), கருங்கொடிப் புருவம் (658), திருமலர்க் கமலத் (662) ,விடுகணை விசையின்(701), கழித்த வேலேறு (715), தடங்கணாள் பணியினால் (716), சுரந்துவானம் (717), நீர்நின் றளகிற் (718), கல்சேர் பூண்கொள் (719), இருநில மடந்தை (720), தீந்தொடை நரம்பின் (721), பணிவரும் (722), விண்ணவர் வியப்ப (729), பருந்தும் நிழலும் (730), பண்ணொன்றுபாட (735)

கூறு II **(18 hrs)**

காப்பியம் II: திருவிளையாடற் புராணம் - கடல் சுவறவேல்விட்டபடலம் முழுவதும் - (19 பாடல்கள்) - கம்பராமாயணம் - ஆரணியகாண்டம் - சவரி பிறப்பு நீங்கு படலம் முழுவதும் (9 பாடல்கள்) - பாரதிதாசன் - சஞ்சீவி பர்வதத்தின் சாரல் (முழுவதும்)

கூறு III **(18 hrs)**

சிற்றிலக்கியம்: சிற்றிலக்கியவரலாறு, காரைக்காலம்மையார் - அற்புதத் திருவந்தாதி - (1-15 பாடல்கள்) - மீனாட்சியம்மை பிள்ளைத்தமிழ்- வருகைப்பருவம் (10 பாடல்கள்) - முக்கூடற்பள்ளு - குடிமை - பெருமை (12-22 பாடல்கள்)

கூறு IV **(18 hrs)**

உரைநடை: உரைநடையின் தோற்றமும் வளர்ச்சியும், சொல்லின் செல்வன் - க.நஞ்சையன், படிப்பது எப்படி? - ம.திருமலை, தொல்காப்பியத்தில் கோளியல் நெறி - ச.பாரிஜாதம், பாவேந்தரின் சமுதாயப் பார்வை - பாக்கியமேரி, இசையும் இயல்பும் - கி.ஈஸ்வரி, கம்பராமாயணத்தில் உறவுகள் - பெ.மகேஸ்வரி

கூறு V **(18 hrs)**

யாப்பு: பாவின் பொதுவிலக்கணமும் வகைகளும் (வெண்பா - ஆசிரியப்பா - கலிப்பா - வஞ்சிப்பா) **அணிகள்:** உவமையணி – உருவக அணி – பிறிது மொழிதல் அணி - வேற்றுமையணி - தற்குறிப்பேற்ற அணி – சிலேடை அணி

பாடநூல்

1. *தொகுப்பு நூல்,* தமிழியல்துறை, ஸ்ரீ காளீஸ்வரி கல்லூரி (தன்னாட்சி), சிவகாசி.

பார்வைநூல்கள்

1. சீனிவாசன், ரா. *சீவகசிந்தாமணி,* அணியகம், சென்னை, 2000.
2. தமிழண்ணல். *புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு,* மீனாட்சி புத்தகநிலையம், மதுரை, 2008.
3. ஜகந்நாதன். கி.வா. *தமிழ்க் காப்பியங்கள் (ஆராய்ச்சி),* அமுதநிலையம் லிமிடெட், சென்னை, 1991.

வலைப்பதிவுகள்(Web Sources)

1. https://youtu.be/AY7R2D2GGQA
2. https://youtu.be/hmqTbZjrnu0
3. www.tamilvu.org/ta/courses-degree-c031-c0313-html-c03132I1-18030
4. https://ta.m.wikipedia.org/wiki/jkpopy;rpw;wpyf;fpaq;fs;
5. https://youtu.be/Q7du9EglmBg

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.SC./BCA
SEMESTER- III
COMMUNICATIVE ENGLISH - III (21UENL31)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

Preamble

This course helps the learners to develop their communication skills in English through listening, speaking, reading and writing practices.

Course Outcomes (CO)

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

CO1[K1]: relate and state ideas by reading simple poems and listening to telephonic conversations

CO2[K2]: demonstrate effective speaking skills by making speech presentations, discussing television programmes and sports events

CO3[K3]: apply knowledge of word power and grammar rules through diary writing, dialogue writing and writing newspaper reports

CO4[K4]: analyze short fiction to develop language skills through literature

CO5[K6]: construct grammatically correct and logically coherent essays on global problems and environmental issues

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	2	-	-	-
CO2[K2]	2	2	-	2	1	1	-
CO3[K3]	2	2	1	2	1	1	-
CO4[K4]	2	2	1	2	-	-	1
CO5[K6]	2	1	1	1	1	1	1
Weightage of the course	10	08	03	09	03	03	02
Weighted percentage of Course contribution to POs	**1.62**	**1.94**	**1.39**	**3.52**	**2.86**	**1.48**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I -LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to short speech

Listening to telephonic conversation

Listening to poetry

B. Speaking

Telephone etiquette in telephone conversation

Answering the Telephone and asking for someone

Making enquiries on the phone, Leaving messages

Presentation: Global Warming, Pollution, Women Empowerment, Communicable Diseases, System of Education, Economy, Industry, Government etc

Discussion: Television Programmes, Lessons, College facilities, Local facilities, Sports-watching or Playing, Types of food, Types of transport.

UNIT II - READING AND WRITING **(18 hrs)**

Reading: Comprehension Passages: Newspaper articles, Reports and Paraphrase Stories.

Writing: Diary Writing**,** Dialogue Writing**,** Report Writing: Newspaper Reports, Field visits, Meetings and Future Plans

UNIT III - WORD POWER **(18 hrs)**

Portmanteau words

Idioms & Phrases

Words related to- Work, Time, Distance and Dimension, Environment, The Natural World and Global Problems

UNIT IV - GRAMMAR **(18 hrs)**

Sentence-Subject and Predicate

Kinds of Sentences

Sentence Patterns

Question Words and Framing Questions

Question Tags

Degrees of Comparison

Voice

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

Abridged version of Fiction

Alexandre Dumas	- The Count of Monte Cristo
Charles Dickens	- Oliver Twist
R.M.Ballantyne	- The Coral Island

TEXTBOOKS

1. Dickens, Charles. *Oliver, Twist*. Chennai: Nesting Books Publishing and Distributors (p) Ltd, 2018.
2. Dumas, Alexandre. The *Count of Monte Cristo*. Chennai: Nesting Books Publishing and Distributors (p) Ltd, 2018.
3. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
4. Pillai, Radhakrishna and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.

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1. *Life Skills* (Jeevan Kaushal) *Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Dickens, Charles. *Oliver Twist*. Bangalore: Vasan Publications, 2011.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

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2. https://www.vappingo.com/word-blog/86-great-examples-of-portmanteau/
3. https://blog.hubspot.com/service/phone-etiquette
4. https://www.talkenglish.com/lessonindex.aspx
5. https://www.englishhelper.com/
6. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - III
CORE COURSE - V: ELECTRICITY AND ELECTROMAGNETISM (21UPHC31)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:5**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:75 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts of electricity, electrical measurements, and magnetic effects of electric current, electromagnetic induction, AC and DC circuits.

Course Outcomes (CO)

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

CO1[K1]: describe the electric field, potential, electric current, magnetic effects of currents, electromagnetic induction, AC current and working of AC bridges

CO2[K2]: explain the concepts of electric field, electric potential, inductance, magnetic effects of currents, electromagnetic induction, and alternating currents

CO3[K3]: apply the concepts of electricity and electromagnetism to solve problems

CO4[K4]: analyze the applications of Gauss's law, magnetic effect of electric currents, electromagnetic induction, AC currents and AC bridges

CO5[K4]: examine the parameters related to electricity and electromagnetism

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K4]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I – ELECTRIC FIELD AND ELECTRIC POTENTIAL (15 hrs)

Electric Field – Electric Flux – Gauss's Law – Differential Form of Gauss Law – Applications of Gauss's law – An Insulated Conductor – Uniformly Charged Sphere – Charged Conducting Sphere – Charged Non-Conducting Sphere – An Infinite Line of Charge – Infinite Plane Sheet of Charge – Coulomb's Theorem. Electric Potential – Electric Potential as Line Integral of Electric Field – Potential due to a Point Charge – Relation between Field and Potential – Potential due to Uniformly Charged Conducting Sphere – Charged Non-Conducting Solid Sphere – Potential and Field due to an Electric Dipole – Electric Potential Energy.

UNIT II – CURRENT AND ELECTRICAL MEASUREMENTS (15 hrs)

Current and Current Density – Expression for Current Density – Equation of Continuity – Ohm's Law and Electrical Conductivity – Kirchhoff's Laws – Application of Kirchhoff's Law to Wheatstone's Network – Sensitivity of Wheatstone's Bridge – Carey Foster Bridge – Potentiometer – Calibration of Ammeter – Calibration of Voltmeter (Low Range) – Calibration of Voltmeter (High Range) – Measurement of Low Resistance (Kelvin Double Bridge Method) – Comparison of Capacitances of Two Capacitors – Capacitance of a Capacitor (Kelvin's Null Method).

UNIT III – MAGNETIC EFFECTS OF ELECTRIC CURRENTS (15 hrs)

The Biot and Savart's law – Magnetic Induction at a Point due to a Straight Conductor – Magnetic Induction at a Point on the Axis of a Circular Coil & Solenoid – Torque on a Current Loop in a Uniform Magnetic Field – Moving Coil Ballistic Galvanometer – Current and Voltage Sensitivities of a Moving Coil B.G. – Figure of Merit of B.G. – Uses of B.G. – Absolute Capacitance of a Capacitor – Comparison of Two Capacitances and emf's – Ampere's Circuital Law – Differential Form of Ampere's Law – Divergence of Magnetic Field Vector – Magnetic Field Inside a Long Solenoid – Magnetic Induction due to a Toroid.

UNIT IV – ELECTROMAGNETIC INDUCTION (15 hrs)

Faraday's Laws of Electromagnetic Induction – Vector Form – Self Induction – Self Inductance of a Long Solenoid – Determination of Self Inductance by Raleigh's and Anderson's Bridge Method – Mutual Induction – Mutual Induction between Two Coaxial Solenoids – Experimental Determination of Mutual Inductance – Coefficient of Coupling – Eddy Currents. Transient Currents – Growth and Decay of Current in a Circuit Containing R and L – Charge and Discharge of a Capacitor through a Resistor – Measurement of High Resistance by Leakage.

UNIT V – AC CURRENTS AND AC BRIDGES (15 hrs)

EMF Induced in a Coil Rotating in a Magnetic Field – AC Circuit Containing L, C & R in Series – j-Operator Method (LCR Series Resonance Circuit) – LCR

Parallel Resonance Circuit – Comparison between Series and Parallel Resonance Circuits – Power in AC Circuits Containing L, C & R – Wattles Current – Choke Coil – Transformer. Maxwell's Bridge – Owen's Bridge – De Sauty's Bridge – Wein's Bridge – Schering Bridge.

TEXTBOOK

1. Murugeshan R. *Electricity and Magnetism*. New Delhi: S.Chand & Co., Tenth Edition, 2017 **(UNITS I, II, III, IV & V)**.

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1. Vasudeva D.N. *Fundamentals of Magnetism and Electricity*. New Delhi: S.Chand Publishing Company, Ninth Edition, 2013.
2. Tayal D.C. *Electricity and Magnetism*. India: Himalaya Publishing House Pvt. Ltd., Fourth Edition, 2019.
3. Shegal D.L, Chopra K.L and Shegal N.K. *Electricity and Magnetism*. New Delhi: S.Chand & Co., Sixth Edition, Reprint 2013.

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2. https://www.pdfdrive.com/electricity-and-magnetism-an-introduction-to-the-theory-of-electric-and-magnetic-fields-e162096831.html
3. https://www.pdfdrive.com/electromagnetism-e15772652.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - III
CORE COURSE - VI: PRACTICAL: ELECTRICITY AND ELECTROMAGNETISM
(21UPHC3P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:3**	**INT. MARKS**	**:50**
CREDITS	**:2**	**EXT. MARKS**	**:50**
DURATION	**:45 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to determine the resistance, specific resistance, magnetic moment of a bar magnet (M) and horizontal component of Earth's magnetic field (B_H), capacitance of a condenser, self inductance of a coil and calibrate the ammeter and voltmeter.

Course Outcomes (CO)

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

CO1[K1]: identify the basic concepts of electricity and electromagnetism underlying in the experiments

CO2[K2]: demonstrate the concepts of electricity and electromagnetism by connecting electrical circuits

CO3[K3]: calculate the electrical and magnetic parameters from the experimental data

CO4[K4]: analyze the results of the experiments

CO5[K5]: evaluate the physical parameters

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	1	1	-	-	-
CO2 [K2]	3	2	2	1	1	2	1
CO3 [K3]	3	3	2	1	1	1	1
CO4 [K4]	3	2	1	1	-	1	1
CO5 [K5]	3	2	1	-	-	1	1
Weightage of the course	15	10	07	04	02	05	04
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**3.24**	**1.56**	**1.9**	**2.46**	**2.44**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

LIST OF EXPERIMENTS (Any 8**):**

1. Determination of Resistance and Specific Resistance of a given coil using Carey-Foster's Bridge
2. Calibration of Low Range Voltmeter using Potentiometer
3. Calibration of High Range Voltmeter using Potentiometer
4. Calibration of Ammeter using Potentiometer
5. Determination of Current and Voltage Sensitivity of a Table Galvanometer – Figure of Merit
6. Comparison of e.m.f. of Two Primary Cells using Spot Galvanometer
7. Determination of Magnetic Moment of a Bar Magnet (M) and Horizontal Component of Earth's Magnetic Field (B_H) using Vibration Magnetometer in Tan C Position
8. Determination of Horizontal Component of Earth's Magnetic Field (B_H) using Circular Coil and Deflection Magnetometer
9. Determination of Magnetic Moment of a Bar Magnet (M) using Circular Coil and Deflection Magnetometer
10. Determination of Magnetic Moment of a Bar Magnet (M) and Horizontal Component of Earth's Magnetic Field (B_H) using Copper Voltameter
11. Comparison of Capacitances of Two Capacitors by forming De Sauty's Bridge
12. Determination of Self Inductance of the Coil by Maxwell's Bridge Method

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi: Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai: Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I.* Chennai: S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.

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1. Arora C.L. *B Sc Practical Physics.* New Delhi: S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi: Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi: Vayu Education of India, First Edition, 2011.
4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

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2. https://www.pdfdrive.com/experiments-in-physics-physics-1292-general-physics-ii-lab-d34669771.html
3. https://www.youtube.com/watch?v=6Zcv3gbNxJM

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF CHEMISTRY
UG Programme – B.Sc. Physics
SEMESTER - III
ALLIED COURSE – III: CHEMISTRY - I (21UPHA31)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course explains various types of adsorption, photochemistry and enable the students to gain knowledge on periodic properties.

Course Outcomes (CO)

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

CO1[K1]: list out the types of adsorptions, chemical bonding and various kinds of oils and fats

CO2[K2]: differentiate types of chemical bonding and photophysical processes

CO3[K3]: present the concepts of adsorption, photochemistry, periodicity in properties and chemical bonding

CO4[K4]: distinguish between soaps and detergents, oils and fats, photochemical and thermochemical reactions, absorption and adsorption

CO5[K4]: analyze hybridization and structure of compounds and quality of soaps

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	2	1	-	-	1	-
CO2 [K2]	3	2	1	1	-	-	-
CO3 [K3]	3	2	1	1	1	1	1
CO4 [K4]	3	2	1	1	-	-	1
CO5 [K4]	3	2	1	1	1	1	-
Weightage of the course	15	10	05	04	02	03	02
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.56**	**1.9**	**1.48**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – ADSORPTION (12 hrs)

Adsorption - Adsorbent – Adsorbate - Definition with Illustration - Characteristics of Adsorption – Types of Adsorption – Physisorption – Chemisorption –Difference between Physisorption and Chemisorption – Factors Affecting Adsorption - Adsorption Isotherms – FreundlichAdsorption Isotherm – Application of Adsorption.

UNIT II – PHOTO CHEMISTRY (12 hrs)

Thermochemical Reactions – Photochemical Reactions – Difference between Photochemical Reaction and Thermochemical Reactions – Laws of Photochemistry, Grothus–Draper Law – Stark-Einstein Law - Quantum Efficiency – Causes of High and Low Quantum Efficiency - Determination of Quantum Efficiency – Photophysical Processes – Jablonski Diagram – Fluorescence – Phosphorescene – Chemiluminescence.

UNIT III – PERIODIC TABLE AND PERIODICITY IN PROPERTIES (12 hrs)

Long Form of Periodic Table – Division of Elements into s, p, d and f Blocks – Definition and Periodic Trends of Various Periodic Properties -Covalent Radius - Ionic Radius – Ionization Energy - Electron Affinity – Electronegativity – Factors Affecting Ionization Energy – Factors Affecting Electron Affinity – Determination of Electronegativity – Pauling Approach – Mullikan Approach – Application of Electronegativity.

UNIT IV – CHEMICAL BONDING (12 hrs)

Chemical Bonding – Types of Bonding –Covalent Bonding – Overlapping – s-s Overlapping – s-p Overlapping, p-p Overlapping - VB Theory and its Limitation – Hybridization – Definition, Characteristics and Determination – Hybridization of BeH_2, BF_3 andCH_4- MO Theory – Postulates – MOT of H_2, He_2, N_2, O_2.

UNIT V – FATS AND OILS (12 hrs)

Fats and Oils – Definition, Properties and Analysis of Fats and Oils – Difference between Fats and Oils –Manufacture of Vanaspati – Soaps – Definition – Manufacture of Soaps by – Kettle Process – Cleaning Action of Soaps – Synthetic Detergents – Synthetic Detergents verses Soaps.

TEXTBOOKS

1. Arun Bhal and B. S. Bhal. *A Text Book of Organic Chemistry*. New Delhi: S. Chand & Company, 2013.
2. Arun Bhal and B.S. Bhal. *Essential of Physical Chemistry.* New Delhi: S.Chand & Company, 2013.

3. B.R. Puri, L. R. Sharma and K. C. Kalia, *Principles of Inorganic Chemistry*. Milstones publishers & distributors, 2013.

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1. B.R. Puri, L. R. Sharma and Madan S. Pathania *Text Book of Physical Chemistry.* Jalandar: Vishal Publishing and Co, 2008.
2. P.L. Soni. *Text Book of Organic Chemistry*. New Delhi: S.Chand and Company, 2008.

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1. https://www.youtube.com/watch?v=8QH853ffG2U
2. https://www.youtube.com/watch?v=8VBs_xf7yLs
3. https://www.youtube.com/watch?v=NPvWSo0Us9A

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF CHEMISTRY
UG Programme – B.Sc. Physics
SEMESTER - III
ALLIED COURSE – III: PRACTICAL: VOLUMETRIC ANALYSIS
(21UPHA3P)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:50**
CREDIT	**:1**	**EXT. MARKS**	**:50**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the students to acquire practical skill in quantitative estimation of inorganic compounds by volumetric method.

Course Outcomes (CO)

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

CO1[K2]: estimate oxalic acid by acidimetric and permanganometric method
CO2[K3]: choose suitable indicator for carrying out volumetric estimation
CO3[K4]: apply acidimetric and alkalimetric method for the quantitative volumetric estimation of acids and bases
CO4[K5]: measure quantitatively the amount of inorganic compound accurately with the help of colour change of the indicator
CO5[K6]: plan various volumetric procedures for the estimation of any inorganic compounds

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K2]	3	2	1	-	-	-	1
CO2 [K3]	3	2	1	1	-	1	-
CO3[K4]	3	2	1	-	-	1	-
CO4 [K5]	3	2	1	1	1	1	1
CO5 [K6]	3	2	1	-	1	1	1
Weightage of the course	15	10	05	02	02	04	03
Weighted percentage of course contribution to POs	**2.43**	**2.42**	**2.31**	**0.78**	**1.9**	**1.97**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

VOLUMETRIC ANALYSIS

LIST OF EXPERIMENTS

I. ACIDIMETRY AND ALKALIMETRY

1. Estimation of Na_2CO_3
2. Estimation of NaOH / KOH
3. Estimation of Oxalic acid
4. Estimation of Hydrochloric acid

II. REDOX TITRATIONS

A. Permanganometry

5. Estimation of Oxalic acid
6. Estimation of Ferrous Ammonium Sulphate

B. Dichrometry

7. Estimation of Ferrous Ion
8. Estimation of Potassium Dichromate

REFERENCE

Book

1. G. H. Jeffery, J. Bassett, J. Mendham and R, C Denney, *Vogel's Quantitative Chemical Analysis*. England: Longman Scientific and Technical.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - III
NON MAJOR ELECTIVE COURSE - I: PHYSICS OF HOME APPLIANCES
(21UPHN31)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:40**
CREDIT	**:1**	**EXT. MARKS**	**:60**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners the basic concepts of electricity, batteries, DC motors, UPS, electrical home appliances and the utilization of solar energy.

Course Outcomes (CO)

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

CO1[K1]: reproduce the basic principles of electricity, DC motors, UPS, solar energy devices and electrical home appliances

CO2[K2]: explain the concepts of electricity, DC motors, transformers, solar energy utilization and electrical devices

CO3[K3]: present the functions of various devices used in everyday life

CO4[K4]: analyze the concepts of physics in everyday life

CO5[K4]: examine the concepts of physics in everyday life

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	2	-	1	-
CO2 [K2]	2	1	-	2	-	1	-
CO3 [K3]	2	1	-	2	-	1	2
CO4 [K4]	2	1	-	1	-	1	2
CO5 [K4]	1	1	-	1	-	1	1
Weightage of the course	09	05	00	08	00	05	05
Weighted percentage of Course contribution to POs	**1.46**	**1.21**	**0**	**3.13**	**0**	**2.46**	**3.05**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I – ELECTRICITY (6 hrs)

Electricity – Current – Voltage – Power – Energy – Conductors – Insulators – Semiconductors – Resistors – Resistors in Series and Parallel – Ohm's Law – Capacitors – Inductors.

UNIT II – CELLS AND MOTORS (6 hrs)

Primary Cells – Secondary Cells – EMF – Batteries – DC to AC Convertor – Transformer – DC Motors – Universal Motor – Uses of Motor – Uninterrupted Power Supply.

UNIT III – HOME APPLIANCES – I (6 hrs)

Filament Lamp – Fluorescent Tube – Moon Light Lamp – CFL – TV and Color TV – Table Fan – Ceiling Fan – Mixy.

UNIT IV – HOME APPLIANCES – II (6 hrs)

Hot Plate & Range – Room Heater – Water Heater – Geasers – Electric Kettle – Induction Stove – Electric Toasters – Electric Iron.

UNIT V – SOLAR ENERGY (6 hrs)

Introduction – Measurement of Solar Radiation Data – Flat Plate Collector – Solar Water Heater – Solar Cooker (Box Type) – Solar Furnace – Solar Cell – Solar Dryer.

TEXTBOOK

1. Study material is prepared by Department of Physics, Sri Kaliswari College, Sivakasi**.**

REFERENCES

Books

1. Khan B.H. *Non-Conventional Energy Resources.* New Delhi: McGraw Hill Education (India) Pvt. Ltd., Second Edition, Reprint 2014.
2. Premkumar N and Gnanavadivel J. *Basic Electrical and Electronics Engineering*. Kumbakonam: Anuradha Agencies, Fourth Edition, 2010.
3. Theraja B.L. *Electrical, Electronics and Tele Communication Engineering*. New Delhi: S.Chand and Company Ltd., Sixth Edition, 2012.

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2. https://www.youtube.com/watch?v=hXLA5sdT9Cs
3. https://www.yourarticlelibrary.com/energy/solar-energy-10-major-application-of-solar-energy-explained/28197
4. https://ecee.colorado.edu/~bart/book/book/chapter4/ch4_6.htm

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - III
SKILL ENHANCEMENT COURSE - III: ELECTRICAL WIRING AND HOME APPLIANCES (21UPHS31)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:40**
CREDITS	**:2**	**EXT. MARKS**	**:60**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts of electrical wiring, safety measurements during the wiring and electrical home appliances, and gives hands on training for constructing simple electrical circuits.

Course Outcomes (CO)

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

CO1[K1]: identify the basic concepts of electricity, electrical wiring and home appliances

CO2[K2]: explain the usage of AC and DC currents, motors, lighting accessories, earthing, fuses and electric devices

CO3[K3]: apply concepts of electricity, electrical wiring and home appliances to solve problems

CO4[K4]: analyze the functions of AC and DC currents, AC and DC machines, switches, types of wires, fuses and home appliances

CO5[K5]: justify the simple house wiring circuits

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	1	-	-	-	-
CO2 [K2]	3	2	-	2	-	1	-
CO3 [K3]	3	2	1	1	-	1	1
CO4 [K4]	2	2	1	1	-	1	1
CO5 [K5]	2	1	1	-	1	1	1
Weightage of the course	13	08	04	04	01	04	03
Weighted percentage of Course contribution to POs	**2.1**	**1.94**	**1.85**	**1.56**	**0.95**	**1.97**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – FUNDAMENTAL CONCEPTS OF AC AND DC CURRENT (6 hrs)

AC and DC Power Supply – Ohm's Law – Resistances in Series and Parallel – Types of Circuits – Effect of Electric Current – Power Factor – Single Phase – Poly Phase – Connections of Three Phases – Electromagnetism – Faraday's Law – Eddy Currents.

UNIT II – LIGHTING ACCESSORIES AND WIRES (6 hrs)

Switches – Lamp Holders – Wires and Cables – Types of Wires – Systems of Wiring – Megger Testing – Instruction for Wiring – Conduit Pipe Wiring – Surface Conduit Wiring – Concealed Conduit Wiring – Types of Conduit – Rules Related to Wiring.

UNIT III – EARTHING, FUSES AND SAFETY MEASUREMENTS (6 hrs)

Introduction – Pipe Earthing – Plate Earthing – Specifications Required for Earthing – Artificial Respiration – Fuses – Types of Fuses – Safety Precautions in Electricity and Handling Tools – Line Tester.

UNIT IV – AC AND DC MACHINES (6 hrs)

Transformer – Types of Transformers – Transformer in Distribution System – Alternator – Induction Motor – Appliances Run by Motors (Table Fan, Ceiling Fan, Mixy and Hair Dryer) – DC Generator and DC Motor.

UNIT V – ELECTRICAL DEVICES (6 hrs)

Filament Lamp – Fluorescent Tube – Moon Light Lamp – Room Heater – Hot Plate – Water Heater – Electric Kettle – Induction Stove – Electric Iron.

Hands on Training:

1. Control of One Lamp by a Switch
2. Control of Two Lamps by Two Switches Independently
3. Connect Three Lamps in Series and Verify the Properties of Series Circuit.
4. Control of One Lamp by Three Switches at Three Different Locations
5. Staircase Wiring
6. Control of One Lamp and Two Ceiling Roses Through Fuse by Three Switches Independently
7. Control of a Calling Bell from Three Different Places
8. Control of One Lamp and Two Ceiling Roses by Three Switches Independently
9. Hospital Wiring Circuit for Light Control using Switches

Note: Topics under Hands on training are NOT for theory examination.

TEXTBOOK

1. Study material is prepared by Department of Physics, Sri Kaliswari College, Sivakasi.

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Books

1. Premkumar N and Gnanavadivel J. *Basic Electrical and Electronics Engineering*. Kumbakonam: Anuradha Agencies, Fourth Edition, 2010.
2. Theraja B.L. *Electrical, Electronics and Tele Communication Engineering*. New Delhi: S.Chand and Company Ltd., Sixth Edition, 2012.
3. Rongy D.W. *Home Electrical Wiring: A Complete Guide.* New Delhi: Tata McGraw-Hill Pvt. Ltd., Second Edition, 2013.

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4. https://www.electricaltechnology.org/2015/09/types-of-wiring-systems-electrical-wiring-methods.html
5. https://www.electricaltechnology.org/2020/03/hospital-wiring-circuit-using-switches.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A./B.SC./BCA
SEMESTER-IV
பொதுத்தமிழ் - IV (21UTAL41)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

நோக்கம்

சங்க இலக்கியங்களின் மேன்மைகளையும் வாழ்வியல் அறங்களையும் மாணவர்களுக்கு எடுத்துரைப்பதையும் புதின இலக்கியத்தை அறிமுகப் படுத்துவதையும் நோக்கமாகக் கொண்டு இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளை வெற்றிகரமாக முடித்தவுடன் மாணவர்கள்,

CO1[K1]: புதின இலக்கியவகைகளை அடையாளம் காண்பர்

CO2[K2]: சங்க இலக்கியங்களில் உள்ள அறக்கருத்துக்களை எடுத்துரைப்பர்

CO3[K3]: அக,புற இலக்கணங்களைக் கற்பர்

CO4[K4]: சங்க இலக்கியங்களின் வாயிலாகமக்களின் வாழ்க்கைமுறையினைப் பாகுபடுத்துவர்

CO5[K5]: பண்டையதமிழ் இலக்கிய ஆளுமைகளை மதிப்பிடுவர்

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	1	-	-	-
CO2 [K2]	2	1	-	2	-	-	-
CO3 [K3]	2	2	-	2	1	-	1
CO4 [K4]	2	2	1	2	1	1	-
CO5 [K5]	2	2	1	2	-	1	1
Weightage of the course	10	08	02	09	02	02	02
Weighted percentage of Course contribution to POs	**1.62**	**1.94**	**0.93**	**3.52**	**1.9**	**0.99**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

கூறு I **(18 hrs)**

எட்டுத்தொகை இலக்கியவரலாறு - **குறிஞ்சித்திணை - நற்றிணை:** ஓங்குமலைநாட (55) - கழுதுகால்கிளர (255). **முல்லைத்திணை - குறுந்தொகை:** பெருந்தண் மாரிப்(94), மடவவாழிமஞ்ஞை (251). **மருதத்திணைகலித்தொகை:** அகன்துறை அணிபெற(73), புள்இமிழ் அகல் வயல் (79). **நெய்தல் திணை - ஐங்குறுநூறு:** தாய்க்கு உரைத்தபத்து (10 பாடல்கள்). **பாலைத்திணை -அகநானூறு:** வளம் கெழுதிருநகர்ப் (17), கடல் முகந்து கொண்ட கமஞ்சூல் (43). **பரிபாடல்:** வையை - வளி பொருமின்னொடு (12). **புறநானூறு**: இரும்பனைவெண்தோடு (45) - எமக்கேகலங்கல் (298), **பதிற்றுப்பத்து:** ஐந்தாம்பத்தில் மாமலைமுழக்கின்.

கூறு II **(18 hrs)**

பத்துப்பாட்டு இலக்கிய வரலாறு - **பத்துப்பாட்டு:** குறிஞ்சிப்பாட்டு (முழுவதும்)

கூறு III **(18 hrs)**

சங்கமருவியகால இலக்கியவரலாறு - **திரிகடுகம்:** தற்புகழ்ச்சிக்குக் கூடாதவை - தொல் அவையும் (8) - புகழுக்குரிய மூவர் - மண்ணின் மேல் வான்(16), வீடுபேறு அடையும் வழிகள் - பற்று (22) - கற்றறிந்தார் கடமை -நுண்மொழி நோக்கிப ᾽பொருள் (32), நல்லோர் நெறி - சான்றாருள் சான்றான் எனப்படுதல் (82). **நாலடியார்**: கூடாநட்பு (231-240). **இனியவை நாற்பது**: உடையான் வழக்கினிது (2) - மானம் அழிந்தபின் (13) - குழவிதளர்நடை (14) - பிறன்கைப் பொருள்வெளவான் (21) - வருவாய் அறிந்து (22). **இன்னாநாற்பது:** உண்ணாதுவைக்கும் (16) - மாரிநாள் கூவும ᾽(20) - யானையில் மன்னாக் (22) - சிறையில்லா மூதூரின் (23) - ஏமம் இல் மூதூர் (24). **திருக்குறள்**: அறத்துப்பால் - புகழ், இன்பத்துப்பால் - குறிப்பறிதல் (அதிகாரங்கள் முழுவதும்).

கூறு IV **(18 hrs)**

புதின இலக்கியவரலாறு, கூட்டுக்குஞ்சுகள் - இராஜம் கிருஷ்ணன்.

கூறு V **(18 hrs)**

இலக்கணம் - தொல்காப்பியர் குறிப்பிடும் திணைக்கோட்பாடுகள் - அகப்பொருள் - புறப்பொருள் - உள்ளுறை - இறைச்சி - விண்ணப்பம் - புகார் - பாராட்டுக் கடிதங்கள் - அறிக்கை - செய்திஎழுதுதல்.

பாடநூல்கள்

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2. இராஜம் கிருஷ்ணன். *கூட்டுக்குஞ்சுகள்,* நியூ செஞ்சுரி புத்தகநிலையம், சென்னை, 2011.
3. வாசுதேவன்,கா. *பன்முக நோக்கில் தமிழ் இலக்கிய வரலாறு,* தேவன் பதிப்பகம், திருச்சிராப்பள்ளி, 2017.

பார்வை நூல்கள்

1. சுப்பிரமணியன், க. *சங்ககாலச் சமுதாயம்,* ஜனசக்தி அச்சகம், சென்னை, 1993.
2. பாலசுப்பிரமணியன் சிற்பி & நீலபத்மநாபன் (பதி.), *புதியதமிழ் இலக்கிய வரலாறு.* மணமலர்ப் பதிப்பகம், சென்னை, 2000.
3. பாலசுப்பிரமணியன், சி. *தமிழ் இலக்கிய வரலாறு,* மண்மலர்ப் பதிப்பகம், சென்னை, 2003.
4. மோகன், இரா. *பத்துப்பாட்டு மூலமும் உரையும்,* நியூ செஞ்சுரி புத்தக நிலையம்,சென்னை, 2004.

வலைப்பதிவுகள்(Web Sources)

1. https://youtu.be/Gv84KCknV_g
2. https://youtu.be/B42bzKeb-aI
3. https://youtu.be/sLE4yH-7PeE
4. https://youtu.be/wdlw8CyEBP8

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.SC./BCA
SEMESTER- IV
COMMUNICATIVE ENGLISH - IV (21UENL41)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**: 40**
CREDITS	**:3**	**EXT. MARKS**	**: 60**
DURATION	**:90 hrs**	**MAX. MARKS**	**: 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, reading, speaking and writing practices.

Course Outcomes (CO)

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

CO1[K1]: relate and state ideas by listening to lectures and reading narratives

CO2[K2]: demonstrate effective speaking skills through group discussions and answering interview questions

CO3[K3]: apply knowledge of word power and grammar rules through drafting Memorandum, Minutes of the meetings and Agenda

CO4[K4]: analyze tales from Shakespeare to develop language skills through literature

CO5[K6]: construct grammatically correct and meaningful sentences for Covering letters and Resume Writing and thereby preparing students towards employability

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	1	-	-	-
CO3[K3]	2	2	1	2	1	1	1
CO4[K4]	2	2	1	2	1	1	1
CO5[K6]	2	3	1	2	-	1	1
Weightage of the course	10	09	03	08	02	03	03
Weighted percentage of Course contribution to POs	**1.62**	**2.18**	**1.39**	**3.13**	**1.9**	**1.48**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

LISTENING

Listening to lectures

Listening to commentaries

Listening to narratives

SPEAKING

Welcome address and Vote of Thanks

Role Play

Anchoring

Group discussion

Interview questions

UNIT II - READING AND WRITING **(18 hrs)**

Reading Newspaper- articles, letter to editor, sports and entertainment

WRITING

Drafting:

Memorandum

Minutes of the meeting

Agenda

Resume writing & Covering letter

UNIT III - WORD POWER **(18 hrs)**

Words often confused

Analogy

Words related to- Health and Medicine, Pleasant and Unpleasant feelings, Success and Failure, Science and Technology and Travel

UNIT IV - GRAMMAR **(18 hrs)**

Identify Phrases and Clauses

Transformation of Sentences: Reported speech, Simple, Compound and Complex Sentences

Error Spotting

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

TALES FROM SHAKESPEARE

Romeo and Juliet

A Midsummer Night's Dream

The Merchant of Venice

King Lear

Macbeth

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna G., and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Pillai, Radhakrishna G. *Emerald English Grammar and Composition.* Chennai: Emerald Publishers, 2016.

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1. *Life Skills (Jeevan Kaushal) Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Radha, Alamelu and Kasthuri Bai. *Situational Grammar and Composition.* Chennai: New Century Book House Pvt. Ltd, 2008.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

Web Sources

1. https://www.litcharts.com/how-to-guides/shakespeare-research-resources
2. https://steffesziri.files.wordpress.com/2019/04/illustrated-stories-from-shakespeare-0.pdf
3. https://www.talkenglish.com/lessonindex.aspx
4. https://www.englishhelper.com/
5. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - IV
CORE COURSE - VII: OPTICS AND SPECTROSCOPY (21UPHC41)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:5**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:75 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts of combination of lenses & prisms, aberrations in lenses and its removal, interference in parallel and wedge shaped films, diffraction at different optical elements, production & analysis of polarized light, different spectroscopy techniques and applications of all these basic concepts.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of geometrical optics, physical optics and spectroscopy

CO2[K2]: describe the concepts of geometrical optics, physical optics and spectroscopy

CO3[K3]: apply the concepts of geometrical optics, physical optics and spectroscopy to solve problems

CO4[K4]: distinguish optical phenomena due to refraction, interference, diffraction, polarization and light matter interaction

CO5[K4]: examine the concepts of optics used in the optical devices/instruments

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K4]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – GEOMETRICAL OPTICS (15 hrs)

Cardinal Points of an Optical System – Graphical Construction of Image using Cardinal Points – Newton's Formula – Cardinal Points of a Coaxial System of Two Thin Lenses – Telephoto Lens – Telescope Lens – Angular and Chromatic Dispersion of a Prism – Achromatic Combination of Prism – Deviation without Dispersion – Dispersion without Deviation – Direct Vision Spectroscope – Aberration – Spherical Aberration in Lenses and its Removal – Chromatic Aberration in Lenses – Achromatic Lenses.

UNIT II – INTERFERENCE (15 hrs)

Interference in Plane Parallel Film – Interference due to Reflected Light – Narrow Versus Extended Light Source – Restriction on Thickness of the Film – Haidinger Fringes – Interference in Wedge Shaped Film – Determination of the Wedge Angle – Fizeau Fringes – Newton's Rings – Determination of Wavelength of Light – Determination of Refractive Index of a Liquid – Michelson's Interferometer – Measurement of Wavelength – Multiple Beam Interference (Qualitative) – Antireflection Coatings – Dielectric Mirror – Interference Filter.

UNIT III – DIFFRACTION (15 hrs)

Fresnel Diffraction – Huygens-Fresnel Theory – Fresnel's Assumptions – Rectilinear Propagation of Light – Zone Plate – Action of Zone Plate for an Incident Spherical Wave Front – Difference between a Zone Plate and Convex Lens – Diffraction at a Circular Aperture – Diffraction at an Opaque Circular Disc. Fraunhoffer Diffraction – Plane Diffraction Grating – Theory – Oblique Incidence – Dispersive Power of Grating. Resolving Power – Rayleigh's Criterion for Resolution – Limit of Resolution of the Eye – Resolving Power of a Microscope.

UNIT IV – POLARIZATION (15 hrs)

Types of Polarization – Polarizer and Analyser – Malus' Law – Anisotropic Crystals – Double Refraction in Calcite Crystals – Huygen's Explanation of Double Refraction – Positive and Negative Crystals – Nicol Prism – Huygen's Construction of Wave Fronts – Quarter Wave Plate – Half Wave Plate – Production and Analysis of Linear, Elliptically and Circularly Polarized Light – Applications of Polarized Light – Optical Activity – Optical Rotation – Specific Rotation – Fresnel's Explanation – Theory – Laurent's Half Shade Polarimeter.

UNIT V – SPECTROSCOPY (15 hrs)

Types of Spectra – Microwave Spectroscopy – The Rotation of Molecules – Rotational Spectra – The Rigid Diatomic Molecule – Frequency of Rotational Spectral Lines. Infrared Spectroscopy – Energy of a Diatomic Molecule – Vibrating Diatomic Molecule as Harmonic Oscillator – Sources – Detectors – Wadsworth Prism-Mirror Spectrograph – Uses – Ultraviolet Spectroscopy – Sources – Detecting Devices – Spectrographs for UV Regions – Applications –

Raman Effect – Experimental Study of Raman Effect – Quantum Theory of Raman Effect – Applications.

TEXTBOOKS

1. Subraminyam N, Brij lal and Avadhanulu M.N. *A Textbook of Optics.* New Delhi: S.Chand & Company Ltd., Twenty Fifth Revised Edition, Reprint 2018. **(UNITS I, II, III & IV)**
2. Murugeshan R. *Optics and Spectroscopy*. New Delhi: S.Chand & Company Ltd., Sixth Edition, 2006. **(UNIT V)**

REFERENCES

Books

1. Ajoy Ghatak. *Optics*. New Delhi: McGraw Hill Education (India) Pvt. Ltd., Fifth Edition, Reprint 2013.
2. Kakani S.L and Bhandari K.C. *A Textbook of Optics.* New Delhi: Sultan Chand & Sons, Second Edition, Reprint 2015.
3. Colin N.Banewell and Elaine M.Mccash. *Fundamentals of Molecular Spectroscopy.* New Delhi: McGraw Hill Education (India) Pvt. Ltd., Fifth Edition, Reprint 2014.

Web Sources

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2. https://www.youtube.com/watch?v=PgW7qaOZD0U
3. https://www.youtube.com/watch?v=wTEIYtivVhM
4. https://www.youtube.com/watch?v=6_C8KyU67RU
5. https://nptel.ac.in/courses/122/107/122107035/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - IV
CORE COURSE - VIII: PRACTICAL: OPTICS (21UPHC4P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:3**	**INT. MARKS**	**:50**
CREDITS	**:2**	**EXT. MARKS**	**:50**
DURATION	**:45 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to find cardinal points of a lens system, wavelength of a light, thickness of a wire, dispersive and resolving powers of a plane transmission grating and prism, refractive index, Brewster's angle and specific rotary power of materials by applying basic theoretical concepts of the Optics.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of image formation, dispersion, interference, diffraction & polarization underlying in the experiments

CO2[K2]: demonstrate the concepts of geometrical optics and physical optics underlying in the experiments

CO3[K3]: calculate the physical parameters from the experimental data

CO4[K4]: analyze the experimental results

CO5[K5]: evaluate the physical parameters

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	1	1	-	-	-
CO2 [K2]	3	2	2	1	1	2	1
CO3 [K3]	3	3	2	1	1	1	1
CO4 [K4]	3	2	1	1	-	1	1
CO5 [K5]	3	2	1	-	-	1	1
Weightage of the course	15	10	07	04	02	05	04
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**3.24**	**1.56**	**1.9**	**2.46**	**2.44**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

LIST OF EXPERIMENTS (Any 8**):**

1. Finding Cardinal Points of a Lens System (in contact)
2. Finding Cardinal Points of a Lens System (out of contact)
3. Determination of Diameter of a Thin Wire by Air Wedge Arrangement
4. Determination of Wavelength of Monochromatic Source by Forming Newton's Rings
5. Determination of Dispersive Power of the Material of the Prism and Resolving Power of the Prism using Spectrometer
6. Determination of Dispersive Power and Resolving Power of a Grating using Spectrometer
7. Determination of Refractive Index of Material of a Prism by Minimum Deviation Method
8. Determination of the Wavelengths of Prominent Spectral Lines of Mercury Spectrum by Grating Normal Incidence Method
9. Determination of Radius of the Circular Aperture using Laser
10. Determination of Wavelength of Diode Laser and Particle size using Optic Bench
11. Determination of Brewster's Angle and Refractive Index of a Glass using Polarizer and Analyzer
12. Determination of the Specific Rotatory Power of Cane-Sugar Solution using the Laurent's Half-Shade Polarimeter

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi: Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai: Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I.* Chennai: S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.

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1. Arora C.L. *B Sc Practical Physics.* New Delhi : S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi : Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi : Vayu Education of India, First Edition, 2011.
4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

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1. http://www.bsauniv.ac.in/UploadImages/Downloads/PHYSICS-LAB-MANUAL2017-(new-regulation).pdf
2. https://www.iitr.ac.in/departments/PH/uploads/Teaching%20Laboratory/12%20Brewsters%20angle.pdf
3. http://www.stpius.ac.in/crm/assets/download/Practical_paper-2.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF CHEMISTRY
UG Programme – B.Sc. Physics
SEMESTER - IV
ALLIED COURSE – IV: CHEMISTRY - II (21UPHA41)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the students to gain knowledge on catalyst, electrochemistry, acids, bases, polymers and dyes.

Course Outcomes (CO)

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

CO1[K1]: describe catalysis, terms in electrochemistry, nuclear reactions, types of polymers and dyes

CO2[K2]: illustrate the fundamental concepts of electrochemistry and nuclear chemistry

CO3[K3]: make use of the various concepts of acids, bases and theory of dyes

CO4[K4]: compare nuclear fission and fusion, homogeneous and heterogeneous catalysts

CO5[K4]: classify polymers and dyes based on structure and properties of different types of polymers and its application

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	2	1	-	-	1	-
CO2 [K2]	3	2	1	1	-	-	-
CO3 [K3]	3	2	1	1	1	1	1
CO4 [K4]	3	2	1	1	-	-	1
CO5 [K4]	3	2	1	1	1	1	-
Weightage of the course	15	10	05	04	02	03	02
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.56**	**1.9**	**1.48**	**1.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – CATALYSIS **(12 hrs)**

Catalysis – Definition- Characteristics of Catalysis – Types of Catalysis – Homogeneous Catalysis – Intermediate Formation Theory – Heterogeneous Catalysis – Adsorption Theory - Promotors – Auto Catalyst – Positive Catalyst - Negative Catalyst – Catalytic Poisons –Enzyme Catalysis – Mechanism of Enzyme Catalysis – Characteristics of EnzymeCatalysis -Michalies – MentonEquation.

UNIT II – ELECTRO CHEMISTRY **(12 hrs)**

Electrolysis – Definition –Faraday's Law of Electrolysis –Electrolytes – Conductance of Electrolytes – Specific Conductance –Equivalent Conductance – Molar Conductance – Equivalent Conductance on Infinite Dilution – Strong Electrolytes – Weak Electrolytes – pH – Buffer – Buffer Action – Henderson Equation to Determine the pH of Buffer.

UNIT III – NUCLEAR CHEMISTRY **(12 hrs)**

Fundamental Composition of Nucleus – Mass Defect – Binding Energy - Radioactivity – Comparison of α, β and γ rays – Nuclear Fission – Nuclear Reactor - Nuclear Fusion – Stellar Energy – Proton – Proton Cycle, Carbon – Nitrogen Cycle – Application of Radioactive Isotopes in Medicine – Industry – Agriculture – Radiocarbon Dating – Nuclear Waste Disposal Management.

UNIT IV – POLYMERS **(12 hrs)**

Polymers – Definition – Classification of Polymers – Addition and Condensation Polymers – Preparation, Properties and Uses of Polyethylene, Polystyrene, PVC, Teflon, Nylon 66 – Thermoplastics and Thermosetting Polymers - Definition - Preparation, Properties and Uses of Bakelite – Natural and Synthetic Rubbers - Preparation, Properties and Uses of Neoprene and Buna – S.

UNIT V – DYES **(12 hrs)**

Dyes - Definition – Characteristics of Dyes - Color and Constitution Theory of Dyes – Chromophore – Auxochrome Theory –Classification of Dyes Based on Structure and Applications – Preparation of Congo Red, Bismark Brown, Malachite Green , Alizarine and Indigo.

TEXTBOOKS

1. Arun Bhal and B.S. Bhal. *A Text Book of Organic Chemistry*. New Delhi: S.Chand & Company, 2013.
2. Arun Bhal and B.S. Bhal. *Essential of Physical Chemistry.* New Delhi: S.Chand & Company, 2013.
3. B. R. Puri, L. R. Sharma and K. C. Kalia, *Principles of Inorganic Chemistry*, Milstones publishers & distributors, 2013.

REFERENCES

Books

1. B. R. Puri, L. R. Sharma and Madan S. Pathania. *Text Book of Physical Chemistry.* Jalandar: Vishal Publishing and Co, 2008.
2. P. L. Soni. *Text Book of Organic Chemistry*, NewDelhi: S.Chand and Company, 2008
3. H. I. Arnikar, Essentials of Nuclear Chemistry, 3rd Edition. Wiley Eastern Ltd., New Delhi.

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2. https://www.youtube.com/watch?v=kOK_0dYr4S4
3. https://www.youtube.com/watch?v=vZ02XIyflJY

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF CHEMISTRY
UG Programme – B.Sc. Physics
SEMESTER - IV
ALLIED COURSE – IV: PRACTICAL: ORGANIC ANALYSIS (21UPHA4P)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:50**
CREDIT	**:1**	**EXT. MARKS**	**:50**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This lab course enables the students to acquire practical skill on qualitative analysis of simple organic compounds.

Course Outcomes (CO)

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

CO1[K2]: recognize the analytical procedure to identify the given organic compounds

CO2[K3]: determine the saturation/unsaturation natureof given organic compounds

CO3[K4]: inspect the aliphatic/aromatic and natureof given organic compounds

CO4[K5]: predict elements (other than C, H and O) present in the given compound

CO5[K6]: perform systematic analysis and report the functional groups present in the given organic compound

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K2]	3	2	1	-	-	-	1
CO2 [K3]	3	2	1	1	-	1	-
CO3 [K4]	3	2	1	-	-	1	-
CO4 [K5]	3	2	1	1	1	1	1
CO5 [K6]	3	2	1	-	1	1	1
Weightage of the course	15	10	05	02	02	04	03
Weighted percentage of course contribution to POs	**2.43**	**2.42**	**2.31**	**0.78**	**1.9**	**1.97**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

ANALYSIS OF ORGANIC COMPOUNDS

1. Aromatic Mono and Bi carboxylic acids
2. Aromatic Phenol
3. Aromatic Ester
4. Aromatic Amines
5. Aromatic Aldehydes
6. Aromatic Ketones
7. Aliphatic Diamide, Diamide Containing Sulphur
8. Aliphatic Carbohydrate

REFERENCE

Book

1. B. S. Furniss, A.J. Hannford, P.W.G. Smith, A. R. Tatchell, *Vogel's Textbook of Practical Organic Chemistry,* Longman Scientific and Technical, England.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - IV
SELF-PACED LEARNING (SWAYAM COURSE): NATURE AND PROPERTIES OF MATERIALS (21UPHM41)
(From 2021-2022 Batch onwards)

CREDITS	**:2**	**EXT. MARKS**	**:100**
DURATION	**:8 weeks**	**MAX. MARKS**	**:100**

Preamble

This course provides the learners with an opportunity for a lifelong learning by meeting the demand in terms of knowledge, skills, and competencies.

Course Outcomes (CO)

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

CO1[K1]: identify the background and the key words in Nature and Properties of Materials

CO2[K2]: demonstrate independent and self-paced learning for clear understanding of the concept

CO3[K3]: develop computer and communication skills to broaden their knowledge in the course

CO4[K3]: use high quality reading resources, communication tools and technology to send assignments and to take up test

CO5[K4]: analyse critically and apply technical skills to comprehend the ideas prescribed

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	2	1	2	-	-	2
CO2 [K2]	3	2	1	1	-	-	2
CO3 [K3]	3	2	1	2	1	1	1
CO4 [K3]	2	2	1	2	-	-	1
CO5 [K4]	2	2	1	2	-	1	1
Weightage of the course	13	10	05	09	01	02	07
Weighted percentage of Course contribution to POs	**2.1**	**2.42**	**2.31**	**3.52**	**0.95**	**0.99**	**4.27**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

COURSE LAYOUT

Week 1: Introduction to Engineering Materials & Mechanical Properties
Week 2: Atomic Bonding and Crystal Structure
Week 3: Metals and Ceramics
Week 4: Polymers
Week 5: Composite Materials
Week 6: Smart Materials
Week 7: Materials Selection in Engineering Design
Week 8: Non-Mechanical Properties and Laboratory Demonstration.

TEXTBOOKS

1. Callister W.D. *Material Science and Engineering: An Introduction.* US : Wiley Publication, 2009.
2. Michael F.Ashby and David Jones. *Engineering Materials.* USA : Elsevier Publication, 2009.
3. Michael F.Ashby. *Materials Selection in Mechanical Design.* US : Elsevier Publication, 2017.
4. Robert M.Jones. *Mechanics of Composite by Materials.* USA : Taylor & Francis Publication, 1999.
5. Inderjit Chopra and Jayant Sirohi. *Smart Structures Theory*. UK : Cambridge Press, 2013.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - IV
SELF-PACED LEARNING (SWAYAM COURSE): SOFTSKILL DEVELOPMENT
(21UPHM42)
(From 2021-2022 Batch onwards)

CREDITS	**:2**	**EXT. MARKS**	**:100**
DURATION	**:8 weeks**	**MAX. MARKS**	**:100**

Preamble

This course provides the learners with an opportunity for a lifelong learning by meeting the demand in terms of knowledge, skills, and competencies.

Course Outcomes (CO)

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

CO1[K1]: identify the background and the key words in softskill development

CO2[K2]: demonstrate independent and self-paced learning for clear understanding of the concept

CO3[K3]: develop computer and communication skills to broaden their knowledge in the course

CO4[K3]: use high quality reading resources, communication tools and technology to send assignments and to take up test

CO5[K4]: analyse critically and apply technical skills to comprehend the ideas prescribed

.

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	2	1	2	-	-	2
CO2 [K2]	3	2	1	1	-	-	2
CO3 [K3]	3	2	1	2	1	1	1
CO4 [K3]	2	2	1	2	-	-	1
CO5 [K4]	2	2	1	2	-	1	1
Weightage of the course	13	10	05	09	01	02	07
Weighted percentage of Course contribution to POs	**2.1**	**2.42**	**2.31**	**3.52**	**0.95**	**0.99**	**4.27**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

Course layout

Week 1: Communication Skills 1: The Basic

1. Understanding The Communicative Environment-I
2. Understanding The Communicative Environment-II
3. What to Listen for and Why
4. When to Speak and How
5. Starting and Sustaining a Conversation

Week 2: Communication Skills 2 : Presentation and Interaction

1. What to Present and How – I
2. What to Present and How – II
3. Multimedia Presentation: Understanding the Basics
4. Communication Styles
5. Speaking in Groups

Week 3: Communication Skills 3: Visual, Nonverbal and Aural Communication

1. The World of Visual Culture
2. Visual Perception
3. The Aural: Its Relevance and Impact
4. The Body and The Way It Communicates
5. The Face, Its Expressions and What It Says

Week 4: Interpersonal Communication 1: Individuals, Groups and Cultures

1. Building Relationships
2. Understanding Group Dynamics- I
3. Understanding Group Dynamics- II
4. Groups, Conflicts and Their Resolution
5. Social Network, Media and Extending Our Identities

Week 5: Interpersonal Communication 2: Emotional and Social Skills

Week 6: Developing Key Traits 1: Creativity, Critical Thinking and Problem Solving

Week 7: Developing Key Traits 2: Motivation, Persuasion, Negotiation and Leadership

1. Motivating Oneself
2. The Art of Persuasion-I
3. The Art of Persuasion-II
4. From Persuasion to Negotiation
5. Leadership and Motivating Others

Week 8: Essential and Vocational Skills: Survival Strategies

1. Managing Time
2. Managing Stress
3. Resilience
4. Work-Life Balance
5. Applying Soft-Skills to Workplace

TEXTBOOK

1. Lectures by NPTEL.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - IV
NON MAJOR ELECTIVE COURSE - II: NON-CONVENTIONAL ENERGY RESOURCES (21UPHN41)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:40**
CREDIT	**:1**	**EXT. MARKS**	**:60**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the need and applications of non-conventional energy resources such as geothermal energy, wind energy, biomass energy, tidal energy, wave energy and ocean thermal energy which will be fruitful information for other major students.

Course Outcomes (CO)

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

CO1[K1]: outline the basic concepts in non-conventional energies.
CO2[K2]: specify the applications and environmental impacts of non-conventional energy resources
CO3[K3]: report the present status of non conventional energy resources
CO4[K4]: analyze the physics concepts involved in non-conventional energies
CO5[K4]: compare the merits and demerits of non-conventional energies

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	2	-	1	-
CO2 [K2]	2	1	-	2	-	1	1
CO3 [K3]	2	1	-	2	-	1	1
CO4 [K4]	2	1	-	1	-	1	2
CO5 [K4]	1	1	-	1	-	1	1
Weightage of the course	09	05	00	08	00	05	05
Weighted percentage of Course contribution to POs	**1.46**	**1.21**	**0**	**3.13**	**0**	**2.46**	**3.05**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I – ENERGY RESOURCES (6 hrs)

Classification of Energy Resources – Importance of Non-Conventional Energy Sources – Energy Chain – Common Forms of Energy – Advantages and Disadvantages of Conventional Energy Sources – Salient Future of Non-Conventional Energy Sources – Greenhouse Effect – Consequence of Global Warming.

UNIT II – WIND ENERGY (6 hrs)

Origin of Winds – Nature of Winds – Major Applications of Wind Power – Energy Available in Wind – Energy Estimation of Wind – Wind Turbine Types – Horizontal Axis Wind Turbine (HAWT) – Vertical Axis Wind Turbine (VAWT) – Wind Energy Storage – Environmental Aspects.

UNIT III – BIOMASS ENERGY (6 hrs)

Biomass Energy – Usable Form of Biomass – Biomass Resources – Biomass Conversion Technologies – Biomass Gasification – Down Draft Type – Biogas Production from Waste Biomass – Advantage of Anaerobic Digestion-Classification of Biogas Plants.

UNIT IV – GEOTHERMAL ENERGY (6 hrs)

Geothermal Energy – Applications of Geothermal Energy – Origin and Distribution of Geothermal Energy – Hydro Thermal Resources – Vapor Dominated Steam – Liquid Dominated System – Environmental Consideration – Geothermal Energy in India.

UNIT V – OCEAN ENERGY (6 hrs)

Tidal Energy – Origin and Nature – Limitations of Tidal Energy – Environmental Impacts – Wave Energy – Power in Waves – Environmental Impacts – Ocean Thermal Energy – Origin and Characteristics of Resource – Environmental Impacts.

TEXTBOOK

1. Study material is prepared by Department of Physics, Sri Kaliswari College, Sivakasi.

REFERENCES

Books

1. Khan B.H. *Non-Conventional Energy Resources.* New Delhi: McGraw Hill Education (India) Pvt. Ltd., Second Edition, Reprint 2014.
2. Soab Nath Singh. *Nonconventional Energy Resources.* Pearson India Education Services Pvt. Ltd., Second Edition, 2016.

3. Kothari D.P, Singal K.C and Rakesh Ranjan. *Renewable Energy Sources and Emerging Technologies.* New Delhi: Prentice Hall of India Pvt. Ltd., Second Edition, 2011.

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1. https://www.vssut.ac.in/lecture_notes/lecture1428910296.pdf
2. https://www.pdfdrive.com/renewable-energy-systems-advanced-conversion-technologies-and-applications-e186505978.html
3. https://www.pdfdrive.com/renewable-energy-fourth-edition-physics-engineering-environmental-impacts-economics-planning-e185663668.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - IV
SKILL ENHANCEMENT COURSE - IV: INSTRUMENTATION SKILL (21UPHS41)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:40**
CREDITS	**:2**	**EXT. MARKS**	**:60**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts, operations and usage of various basic electrical instruments that will enhance the learner's basic instrumentation skills.

Course Outcomes (CO)

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

CO1[K1]: list the various analog and digital devices and instruments
CO2[K2]: classify the various basic electrical instruments
CO3[K3]: operate the various analog and digital instruments
CO4[K4]: measure various physical parameters using various digital and analog instruments
CO5[K4]: analyze the various physical parameters of digital and analog instruments

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	-	-
CO2 [K2]	3	2	1	1	-	1	-
CO3 [K3]	3	1	1	-	1	1	1
CO4 [K4]	2	1	1	-	1	1	1
CO5 [K4]	2	2	1	1	-	1	1
Weightage of the course	13	07	04	03	02	04	03
Weighted percentage of Course contribution to POs	**2.1**	**1.69**	**1.85**	**1.17**	**1.9**	**1.97**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I – BASIC OF MEASUREMENT (6 hrs)

Instruments Accuracy – Precision – Sensitivity – Resolution Range etc. - Errors in Measurements and Loading Effects – Multimeter – Principles of Measurement of DC Voltage and DC Current, AC Voltage, AC Current and Resistance – Specifications of a Multimeter and their Significance.

UNIT II – ELECTRONIC VOLTMETER (6 hrs)

Advantage Over Conventional Multimeter for Voltage Measurement with respect to Input Impedance and Sensitivity – Principles of Voltage, Measurement (Block Diagram Only) – Specifications of an Electronic Voltmeter/ Multimeter and their Significance.

AC millivoltmeter: Type of AC Millivoltmeters: Amplifier – Rectifier and Rectifier – Amplifier – Block Diagram AC Millivoltmeter**,** Specifications and their Significance.

UNIT III – CATHODE RAY OSCILLOSCOPE (6 hrs)

Block Diagram of Basic CRO – Construction of CRT, Electron Gun, Electrostatic Focusing and Acceleration (Explanation Only – No Mathematical Treatment) – Time Base Operation – Synchronization – Front Panel Controls – Use of CRO for the Measurement of Voltage (DC and AC Frequency, Time Period) – Lissajous Figures.

UNIT IV – SIGNAL GENERATORS AND IMPEDANCE BRIDGES (6 hrs)

Signal Generators – Block Diagram – Explanation and Specifications of Low Frequency Signal Generators – Pulse Generator and Function Generator – Brief Idea for Testing, Specifications – Distortion Factor Meter and Wave Analysis.

Impedance Bridges – Block Diagram of Bridge – Working Principles of Basic (Balancing Type) RLC bridge – Specifications of RLC Bridge – Digital LCR bridges.

UNIT V – DIGITAL INSTRUMENTS & DIGITAL MULTIMETER (6 hrs)

Digital Instruments – Principle and Working of Digital Meters – Comparison of Analog & Digital Instruments – Characteristics of a Digital Meter – Working Principles of Digital Voltmeter

Digital Multimeter – Block Diagram and Working of a Digital Multimeter – Working Principle of Time Interval, Frequency and Period Measurement using Universal Counter/ Frequency Counter – Time-Base Stability – Accuracy and Resolution.

Hands on Training:

1. Use of Oscilloscope
2. CRO as a Versatile Measuring Device

3. Circuit Tracing of Laboratory Electronic Equipment
4. Use of Digital Multimeter for Measuring Voltages
5. Winding a Coil / Transformer
6. Balancing of Impedance Bridges
7. Forming Lissajous Patterns in CRO
8. Trouble Shooting in a Circuit

TEXTBOOK

1. Study material is prepared by Department of Physics, Sri Kaliswari College, Sivakasi.

REFERENCES

Books

1. Theraja B.L and Theraja A.K. *A Text Book of Electrical Technology – Volume – I* . New Delhi: S.Chand and Company Pvt. Ltd., Reprint 2015.
2. Maurice George Say. *Performance and Design of Alternating Current Machines*. New Delhi: CBS publishers and Distributors Pvt. Ltd., First Edition, 2005.
3. Venugopal. *Digital Circuits and Systems*. New Delhi: Tata McGraw Hill Education Pvt. Ltd., 2011.
4. Shimon P. Vingron. *Logic Circuit Design*. New York : Springer-Verlag Berlin Heidelberg. 2012.
5. Subrata Ghosal. *Digital Electronics.* Cengage India Pvt Ltd., 2017.
6. Salivahanan S and Suresh Kumar N. *Electronic Devices and Circuits.* Chennai: McGraw Hill Education (India) Pvt. Ltd., Fourth Edition, Reprint 2018.

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2. https://www.pdfdrive.com/measurement-and-instrumentation-principles-d19238305.html
3. https://www.pdfdrive.com/a-course-in-electronics-electrical-measurements-and-instrumentation-d187832611.html
4. https://www.youtube.com/watch?v=BlargRKYyUk
5. https://www.youtube.com/watch?v=sI_jdArBA5Q

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG Programme
SEMESTER III & IV
PART V – EXTENSION
(From 2021 -2022 Batch Onwards)

HOURS/WEEK :2 **INT. MARKS :100**
CREDIT :1
DURATION :60 hrs

Preamble

This course aims to promote holistic development among the youth by defining their roles and responsibilities towards ones family and their society and enables them to acquire professional skills and ethics.

Course Outcomes (CO)

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

CO1[K1]: recognize the importance of community service through training and education

CO2[K2]: interpret ecological concerns, consumer rights, gender issues & legal protection

CO3[K3]: develop team spirit, verbal/non verbal communication and organizational ethics by participating in community service

CO4[K4]: examine the necessity of professional skills & community-oriented services for a holistic development

CO5[K6]: create awareness on human rights, legal rights, First Aid, Physical fitness and wellbeing

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	-	-	2	2	1	1
CO2 [K2]	2	1	-	2	1	1	1
CO3 [K3]	2	-	-	1	2	2	1
CO4 [K4]	1	1	1	1	2	2	1
CO5 [K6]	1	-	-	1	2	2	1
Weightage of the course	08	02	01	07	09	08	05
Weighted percentage of Course contribution to Pos	**1.29**	**0.48**	**0.46**	**2.73**	**8.57**	**3.94**	**3.05**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

Details of the Courses

1	National Cadet Corps (NCC)	– 190 hrs
2	National Service Scheme (NSS)	– 240 hrs
3	Physical Education	
4	Red Ribbon Club (RRC)	
5	Youth Red Cross (YRC)	
6	Fine Arts Club	
7	Library and Information Service Club	
8	Yoga Club	
9	ECO Club	
10	Consumer Club	
11	Human Rights Club	
12	Women Empowerment Cell	
13	Legal Awareness League	

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
CORE COURSE - IX: ATOMIC PHYSICS (21UPHC51)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:5**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:75 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the electrons, positive rays, structure of atoms, fine structure of atomic spectral lines, X-rays and laser emission lines.

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K1]: reproduce the characteristics of rays, various atom models, fine structure of spectral lines, X-rays and atomic spectra

CO2[K2]: describe the concepts of atomic physics

CO3[K3]: apply the concepts of atomic physics to solve problems

CO4[K4]: analyze the characteristics of rays, various atom models, fine structure of spectral lines, X-rays and laser emission lines

CO5[K5]: evaluate the different physical parameters related to atomic physics

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	2	1	1	1	1
Weightage of the course	15	10	06	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.78**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – ELECTRONS AND POSITIVE RAYS (15 hrs)

Determination of Electronic Charge by Millikan's Oil-Drop Method – Balanced Oil-Drop Method – Dunnington's Method for Determining e/m – Positive Rays – Discovery and Properties of Positive Rays –Positive Ray Analysis – Thomson's Parabola Method – Limitations of Parabola Method – Aston's Mass Spectrograph – Bain's Bridge's Mass Spectrograph – Dampster's Mass Spectrograph – Rutherford's Experiments on Scattering of α-Particles – Theory of α-Particle Scattering.

UNIT II – STRUTURE OF THE ATOM (15 hrs)

Bohr Atom Model – Effect of Nuclear Motion on Atomic Spectra – Evidences in Favour of Bohr's Theory – Ritz Combination Principle – Bohr's Correspondence Principle – Critical Potentials – Atomic Excitation – Experimental Determination of Critical Potentials – Franck-Hertz's Experiment – Drawbacks of Bohr Atom Model – Sommerfeld's Relativistic Atom Model – The Vector Atom Model – Quantum Numbers Associated with the Vector Atom Models – Pauli Exclusion Principle – The Periodic Elements – Electron Configurations.

UNIT III – FINE STRUTURE OF SPECTRAL LINES (15 hrs)

Magnetic Dipole Moment due to Orbital Motion of the Electron – Magnetic Dipole Moment due to Spin – Stern and Gerlach Experiment - L-S Coupling – The j-j Coupling – Spectral Terms and Notations – Selection Rules – Intensity Rule and Interval Rule – Fine Structure of Sodium D Lines – Fine Structure of H_α Line – Zeeman Effect – Larmour's Theorem – Debye's Quantum Mechanical Explanation of the Normal Zeeman Effect – Anamolous Zeeman Effect (Qualitative) – Paschen Back Effect and Stark Effect.

UNIT IV – X-RAYS (15 hrs)

Introduction – Production of X-Rays – Absorption of X-Rays – X-Ray Absorption Edges – Bragg's Law – Bragg's X-Ray Spectrometer – Main Features of Continuous X-Ray Spectrum – Characteristic X-Ray Spectrum – Auger Effect – Satellite Lines – Mosley's Law and Its Importance – Compton Effect – Derivation of Expression for Change in Wavelength – Experimental Verification – Direction of Recoil Electron – K.E of Recoil Electron.

UNIT V – ATOMIC SPECTRA (15 hrs)

Emission and Absorption of Electromagnetic Radiation by Atoms – Thermal Equilibrium – Absorption of Light – Spontaneous Emission of Light – Stimulated Emission – Einstein's Coefficients – Light Amplification – Population Inversion – Meta Stable State – Components of Laser – Lasing Action – Three and Four Level Pumping Schemes – Types of Lasers – Solid State Lasers – Ruby Laser

– Nd-YAG Laser – Gas Lasers – Argon Ion Laser – He-Ne Laser – CO_2 Laser – Applications of Lasers.

TEXTBOOKS

1. Murugeshan R and Kiruthiga Sivaprasath. *Modern Physics.* New Delhi: S.Chand & Company Ltd., Eighteenth Edition, Reprint 2019. **(UNITS I, II, III & IV)**
2. Richa Sharma and Vibhu Sharma. *Laser Systems and Applications*. India: ALTBS Publishers, First Edition, 2010. **(UNIT V)**

REFERENCES

Books

1. Arthur Beiser. *Concepts of Modern Physics.* New Delhi: Tata McGraw-Hill Publication, Sixth Edition, Reprint 2006.
2. Kenneth S.Karne. *Modern Physics*. Canada: John Wiley & Sons, Second Edition, 2009.
3. Raymond A.Serway, Clement J.Moses and Curt A.Moyer. *Modern Physics.* New Delhi: Cengage Learning India Pvt. Ltd., Third Edition, Reprint 2018.

Web Sources

1. https://www.pdfdrive.com/atoms-molecules-and-photons-an introduction-to-atomic-molecular-and-quantum-physics-d156914451.html
2. http://www.physics.udel.edu/~jim/PHYS425_20S/Class%20Notes/Notes_3.pdf
3. https://www.youtube.com/watch?v=WgzynezPiyc
4. https://www.youtube.com/watch?v=ACY-Wbudg0o

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
CORE COURSE - X: ANALOG ELECTRONICS (21UPHC52)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:5**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:75 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners to the basic principles and working of semiconductor diode circuits, transistor amplifiers, op-amp circuits, oscillator circuits, special type semiconductor devices, and its applications.

Course Outcomes (CO)

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

CO1[K1]: identify the basic principles behind electronic devices and circuits
CO2[K2]: describe the basic principle and working of electronic circuits
CO3[K3]: apply basic principles to solve problems in electronics circuits
CO4[K4]: examine the electronic devices, electronic circuits and its applications
CO5[K5]: evaluate the working of electronic circuits

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	2	1	1	1	1
Weightage of the course	15	10	06	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.78**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – DIODE AND ITS APPLICATIONS (15 hrs)

PN Junction Diode Rectifier – Efficiency – Ripple Factor – Capacitor Filter, Choke Input Filter and Π Section Filter – Half Wave Voltage Doublers – Diode Clipping and Clamping Circuits. Voltage Stabilisation – Zener Diode – Zener Diode as Voltage Stabiliser – Solving Zener Diode Circuits – Fixed Positive and Negative Voltage Regulators – Regulator Dual Power Supply – Adjustable Voltage Regulators.

UNIT II – TRANSISTOR AMPLIFIER (15 hrs)

Characteristics of CE connection – Load line Analysis and Operating Point – Cut Off and Saturation Points – Faithful Amplification – Transistor Biasing – Stabilization – Base Bias – Collector Feedback Bias – Voltage Divider Bias – Emitter Bias – Design of Transistor Biasing Circuits – Mid-Point Biasing – Single Stage Amplifier – A.C and D.C Equivalent Circuits – Voltage Gain of Loaded Amplifier – Emitter Follower – Multistage Amplifiers – RC Coupled Amplifier – Transformer Coupled Amplifier – Direct Coupled Amplifiers.

UNIT III – POWER AMPLIFIERS AND OP-AMP (15 hrs)

Classification of Power Amplifiers – Transformer Coupled Class A Power Amplifier and Its Maximum Efficiency – Class B Push-Pull Power Amplifier and Its Maximum Efficiency – Differential Amplifier – Operation of Differential Amplifier – Common Mode and Differential Mode Signals – Common Mode Rejection Ratio (CMRR) – Operational Amplifier Characteristics and Parameters – Inverting Amplifier – Non-Inverting Amplifier – Unity Follower – Summing Amplifier – Difference Amplifier – Differentiator and Integrator Using Op-Amp – Comparator.

UNIT IV – OSCILLATORS AND MULTIVIBRATORS (15 hrs)

Positive and Negative Feedback in Amplifier – Principle of Negative Voltage Feedback in Amplifier – Feedback Circuit – Gain of Negative Voltage Feedback Amplifier – Advantage of Negative Voltage Feedback in Amplifier – Oscillator Circuit – Positive Feedback Amplifier Oscillator – Barkhausen Criterion – Hartley, Colpitt's and Phase Shift Oscillators – Limitations of LC and RC Oscillators – Transistor Crystal Oscillator – Transistor Astable and Monostable Multivibrator.

UNIT V – SPECIAL SEMICONDUCTOR DEVICES (15 hrs)

Junction Field Effect Transistor (JFET) – n type and p type JFET – Principle and Working of JFET – Output Characteristics of JFET – Important Terms – Expression for Drain Current – Parameters of JFET – Relation among JFET Parameters – Salient Features and Advantages of JFET – Metal Oxide Semiconductor FET (MOSFET) – Types of MOSFET – Silicon Controlled Rectifier

(SCR) – Working – Important Terms – VI Characteristics – SCR as Switch – Unijunction Transistor (UJT) – Characteristics – UJT as Relaxation Oscillator.

TEXTBOOK

1. Mehta V.K and Rohit Mehta. *Principles of Electronics.* New Delhi: S.Chand & Company Ltd., Revised Eleventh Edition, Reprint 2013. **(UNITS I, II, III, IV & V)**

REFERENCES

Books

1. Albert Malvino and David J.Bates. *Electronic Principles*. Chennai: McGraw Hill Education (India) Pvt. Ltd., Seventh Edition, Reprint 2018.
2. Salivahanan S and Suresh Kumar N. *Electronic Devices and Circuits.* Chennai: McGraw Hill Education (India) Pvt. Ltd., Fourth Edition, Reprint 2018.
3. Theraja B.L. *Basic Electronics*. New Delhi: S.Chand & Company Ltd., Reprint 2003.

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1. https://nptel.ac.in/courses/117/107/117107094/
2. https://www.electronics-tutorials.ws/transistor/tran_6.html
3. https://www.electronicshub.org/types-of-semiconductor-devices/
4. https://www.pdfdrive.com/fundamentals-of-electronics-book-1-electronic-devices-and-circuit-applications-e186374504.html
5. https://www.pdfdrive.com/electronic-principles-d51577263.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
CORE COURSE - XI: RELATIVITY AND QUANTUM MECHANICS (21UPHC53)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basics of special theory of relativity, wave nature of matter, uncertainty principle and its applications, Schrodinger equations and its applications.

Course Outcomes (CO)

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

CO1[K1]: state basic terms in relativity and quantum mechanics

CO2[K2]: explain about relativity, wave mechanical concepts, general formalism and applications of Schrödinger equations

CO3[K3]: apply the concepts of relativity and quantum mechanics to solve problems

CO4[K4]: analyze the validity conditions of relativity and quantum mechanics concepts

CO5[K5]: deduce the solutions of various problems in relativity and quantum mechanics

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	2	1	1	1	1
Weightage of the course	15	10	06	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.78**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – RELATIVITY **(12 hrs)**

Frames of Reference – Inertial and Non-Inertial Frames – Galilean Transformation – Michelson-Morley Experiment – Postulates of Special Theory of Relativity – Lorentz Transformation – Length Contraction – Time Dilation – Relativity of Simultaneity – Addition of Velocities – Variation of Mass with Velocity – Mass Energy Equivalence Relation – Elementary Ideas of General Relativity.

UNIT II – WAVE NATURE OF MATTER **(12 hrs)**

Expression for de-Broglie Wavelength – de-Broglie Wavelength Associated With Moving Objects – de-Broglie Wavelength Associated With Electrons – Characteristics of Matter Waves – Wave Packet – Phase and Group Velocities – Expression for Group Velocity – Group Velocity and Phase Velocity of de-Broglie Waves – Relation between Group Velocity and Phase Velocity – Experimental Study of Matter Waves – Davisson and Germer's Experiment – G.P. Thomson Experiment.

UNIT III – UNCENTAINTY PRINCIPLE **(12 hrs)**

Heisenberg's Uncertainty Principle – Physical Significance of Heisenberg's Uncertainty Relation – Heisenberg's Gamma Ray Microscope – Diffraction of a Beam of Electrons by a Slit – Applications – The Non-Existence of the Electron in the Nucleus – Radius of the Bohr's First Orbit – Light Quanta – Minimum Energy of a Harmonic Oscillator – Bohr's Atomic Energy Levels– Energy of a Particle in One-Dimensional Box.

UNIT IV – SCHRODINGER EQUATIONS **(12 hrs)**

Equation of Motion of Matter Wave – Time Independent Schrödinger Equation – Schrödinger Equation for an Free Particle – Time Dependent Schrödinger Equation – Physical Interpretation of the Wave Function – Normalized and Orthogonal Wave Functions – Conditions Satisfied by Wave Function – Solution of a Schrödinger Equation – Stationary State Solution – Operators associated with Different Observables – Expectation Values of Dynamical Quantities – Probability Current Density.

UNIT V – APPLICATIONS OF SCHRODINGER EQUATIONS **(12 hrs)**

Free Particle Solution of Schrödinger Equation – Particle in a Potential Well – Particle in a Box – Electrons in a Metal – Finite Potential Barriers and Barrier Penetration Problem – Tunnel Effect – Linear Harmonic Oscillator – Significance of Zero Point Energy – Hydrogen Atom.

TEXTBOOKS:

1. Palanisamy P.K. *Relativity and Quantum Mechanics*. Chennai: Scitech Publications India Pvt. Ltd., 2007. **(UNITS I, II & V)**

2. Satya Prakash and Swati Saluja. *Quantum Mechanics*. Meerut: Kedar Nath Ram Nath, 2019. **(UNITS III & IV)**

REFERENCES

Books

1. Kakani S.L and Chandalia H.M. *Quantum Mechanics: Theory and Problems.* New Delhi: Sultan Chand & Sons, Fourth Edition, Reprint 2007.
2. Aruldhas G. *Quantum Mechanics*. New Delhi: PHI Learning Pvt. Ltd., Second Edition, 2016.
3. Arthur Beiser. *Concepts of Modern Physics.* New Delhi: Tata McGraw-Hill Publication, Sixth Edition, Reprint 2006.

Web Sources

1. https://www.pdfdrive.com/quantum-mechanics-d19668777.html
2. https://www.youtube.com/watch?v=TcmGYe39XG0
3. http://wcchew.ece.illinois.edu/chew/course/QMALL20121005.pdf
4. http://physics.mq.edu.au/~jcresser/Phys378/LectureNotes/VectorsTensorsSR.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
CORE COURSE - XII: PRACTICAL: GENERAL PHYSICS (21UPHC5P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:50**
CREDITS	**:4**	**EXT. MARKS**	**:50**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to do the experiments to determine physical parameters by applying basic theoretical concepts of the optics, electricity and electromagnetism and modern physics.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of optics, electricity and electromagnetism and modern physics underlying in the experiments

CO2[K2]: demonstrate the concepts of optics, electricity and electromagnetism and modern physics

CO3[K3]: calculate the physical parameters from the experimental data

CO4[K4]: analyze the experimental results

CO5[K5]: evaluate the physical parameters

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	1	1	-	-	-
CO2 [K2]	3	2	2	1	1	2	1
CO3 [K3]	3	3	3	1	1	1	1
CO4 [K4]	3	2	1	1	-	1	1
CO5 [K5]	3	2	1	-	-	1	1
Weightage of the course	15	10	08	04	02	05	04
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**3.7**	**1.56**	**1.9**	**2.46**	**2.44**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

LIST OF EXPERIMENTS (Any 16**):**

1. Determination of Wavelengths of Prominent Spectral Lines of Mercury Spectrum using Hartmann's Formula
2. Determination of Refractive Index of the Material of the Prism by Drawing the i-d Curve
3. Determination of Refractive Index of the Material of the Prism by i-i' Curve Method
4. Determination of Cauchy's Constants of the Material of the Prism using Spectrometer
5. Determination of Refractive Index of the Material of the Small Angled Prism using Spectrometer
6. Determination of Refractive Index of the Liquid using Hollow Prism by Minimum Deviation Method
7. Determination of Wavelengths of Prominent Spectral Line of Mercury Spectrum by Grating Minimum Deviation Method using Spectrometer
8. Determination of Refractive Index of a Material of a Prism for e–ray and o–ray using Spectrometer
9. Determination of Rydberg's Constant using Diffraction Grating and Hydrogen Discharge Tube
10. Determination of Refractive Index of the Liquid by Forming Newton's Rings
11. Determination of the Value of High Resistance by Method of Leakage using Spot Galvanometer
12. Determination of Ratio of Capacitances of Capacitors (C1/C2) and Un-Known Value of Capacitance of a Capacitor by Forming Wien's Bridge
13. Studying the Characteristics of LCR – Series & Parallel Resonance Circuits and Finding Associated Parameters
14. Determination of Self Inductance of a Coil by Anderson's Bridge Method
15. Determination of Self Inductance of a Coil by Rayleigh Bridge Method using Spot Galvanometer
16. Determination of Mutual Inductance of a Pair of Coils using Spot Galvanometer
17. Comparison of Mutual Inductances of the Two Pairs of Coils Using Spot Galvanometer
18. Determination of Boltzmann's Constant using Transistor Characteristics
19. Determination of Planck's Constant by Photoelectric Effect Method
20. Drawing the Hysteresis Loop for a Specimen of Iron

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi: Sultan Chand & Sons, First Edition, Reprint 2011.

2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai: Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I.* Chennai: S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.

REFERENCES

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1. Arora C.L. *B Sc Practical Physics.* New Delhi: S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi: Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi: Vayu Education of India, First Edition, 2011.
4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

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2. https://www.youtube.com/watch?v=Z_3LFQNOkG8
3. https://www.niser.ac.in/sps/sites/default/files/basic_page/emission%20spectra%20of%20hydrogen.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
MAJOR ELECTIVE COURSE - I: CLASSICAL AND STATISTICAL MECHANICS
(21UPHO51)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts of Newtonian mechanics, Lagrangian and Hamiltonian formulations, classical and quantum statistics, and its applications.

Course Outcomes (CO)

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

CO1[K1]: state the laws, principles and functions involved in classical and statistical mechanics

CO2[K2]: explain the concepts of classical and statistical mechanics

CO3[K3]: apply the Newtonian mechanics, Lagrangian formulations, Hamiltonian formulations, classical and quantum statistics to different systems

CO4[K4]: classify the different formulations in classical mechanics and different distribution laws in statistical mechanics

CO5[K5]: justify the different formulations/statistics in classical and statistical mechanics

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – NEWTONIAN MECHANICS (12 hrs)

Introduction – Space and Time – Newton's Laws of Motion – Inertial Frames – Mechanics of a System of Particle – External and Internal Forces, Center of Mass Conservation of Linear Momentum – Centre of Mass Frame of Reference – Conservation of Angular Momentum – Relation Between Angular Momentum and Angular Momentum about Centre of Mass – Conservation of Energy – Kinetic Energy – Potential Energy – Conservation Theorem – Box Train – Atwood's Machine – Simple Harmonic Oscillator.

UNIT II – LAGRANGIAN FORMULATIONS (12 hrs)

Constraints – Types of Constraints – Degrees of Freedom – Generalized Coordinates (Transformation Equations) – Forces of Constraints – Principle of Virtual Work – D'Alembert's Principle – Lagrange's Equation from D'Alembert's Principle – Newton's Equation from Lagrange's Equation – Simple Pendulum - Atwood's Machine – Compound Pendulum – Motion Under Central Force – Hamilton's Principle – Deduction of Lagrange's Equation of Motion from Hamilton's Principle.

UNIT III – HAMILTONIAN FORMULATIONS (12 hrs)

Introduction – Generalized Momentum and Cyclic Coordinates – Conservation Theorems: Conservation of Linear Momentum – Conservation of Angular Momentum – The Hamiltonian Function H and Conservation of Energy: Jacobi's Integral – Physical Significance of H – Hamilton's Equations – Harmonic Oscillator – Motion Under Central Force – Compound Pendulum.

UNIT IV – CLASSICAL STATISTICS (12 hrs)

Macrostate and Microstate – The Mu-Space and Gamma Space – Fundamental Postulates of Statistical Mechanics – Statistical Ensembles – Thermodynamic Probability – Entropy and Probability – Boltzmann's Canonical Distribution Law – Partition Function and its Relation With Thermodynamic Quantities – Gibbs Paradox – Three Kinds of Particles – Maxwell-Boltzmann Energy Distribution Law – Applications of M.B Energy Distribution Law – Mean, RMS And Most Probable Speeds of Gas Molecules – Maxwell's Distribution Laws of Velocities – Limitations of M. B Method.

UNIT V – QUANTUM STATISTICS (12hrs)

Need Of Quantum Statistics – Development of Quantum Statistics – 'h' as a Natural Constant – Indistinguishability of Particles and Its Consequences – Bose - Einstein Distribution Law – Photon Gas – Planck's Radiation Law – Fermi-Dirac Distribution Law – Free Electrons in Metal: Electron Gas – Fermi Level and Fermi Energy – Fermi Energy at 0 K for Electrons in Metal – Difference Between Classical and Quantum Statistics.

TEXTBOOKS

1. Upadhyaya J.C. *Classical Mechanics*. Mumbai: Himalya Publishing House, Third Revised Edition, 2019. **(UNITS I, II & III)**
2. Brij lal, Subramanyam N and Hemne P.S. *Heat Thermodynamics and Statistical Physics*. New Delhi: S.Chand & Company Ltd., Revised Edition, Reprint 2020. **(UNITS IV & V)**

REFERENCES

Books

1. Gupta A.B. *Fundamentals of Classical Mechanics*. Books & Allied (P) Ltd., First Edition, Reprint 2015.
2. Gupta S.L, Kumar V and Sharma H.V. *Classical Mechanics*. Meerut: Pragati Prakashan Publicaitons, Thirteenth Edition, 2019.
3. Arthur Beiser. *Concepts of Modern Physics.* New Delhi: Tata McGraw-Hill Publication, Sixth Edition, Reprint 2006.

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2. https://www.cmi.ac.in/~govind/teaching/cm2-e16/cm2-lecture-notes-gk-2016.pdf
3. http://farside.ph.utexas.edu/teaching/sm1/statmech.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
MAJOR ELECTIVE COURSE - I: ASTROPHYSICS (21UPHO52)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners with the foundation of astronomy, astronomical telescopes, properties of sun, earth, asteroids, meteoroids, structure of Milky Way galaxy.

Course Outcomes (CO)

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

CO1[K1]: describe the birth of astronomy, astronomical tools, properties of sun, earth and galaxy

CO2[K2]: explain the history of astronomy, different types of telescopes and stars, history of sun & earth and galaxy models

CO3[K3]: calculate the different physical parameters of sun, stars, earth and galaxies

CO4[K4]: distinguish different types of astronomical tools, stars and galaxy models

CO5[K5]: justify the concepts behind with astrophysics

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low ,'-' No Correlation)

UNIT I – THE BIRTH OF MODERN ASTRONOMY (12 hrs)

Ancient Astronomy – Geocentric and Heliocentric Theories of Solar System – Kepler's Laws of Planetary Motion – Birth of Modern Astronomy – Newtonian Gravitation – Celestial Sphere – Planets – Terrestrial and Jovian Planets (Planets Individual Description is not Required in Detail) – Asteroids-Meteorites – Comets.

UNIT II – THE TOOLS OF ASTRONOMY (12 hrs)

Telescopes – Elements of Telescope – Properties of Images – Types of Optical Telescopes – Refracting and Reflecting Telescopes – Radio Telescope – Infrared Telescope – Ultraviolet Telescope – High Energy Telescope – Spectrograph – Limitations – Photographic Photometry – Spectrophotometry – Detectors and Image Processing.

UNIT III – SUN AND EARTH (12 hrs)

Sun – Physical Properties – Composition – Core – Nuclear Reactions – Photosphere – Chromosphere – Corona – Sunspots – Sunspot Cycle – Solar Wind – Auroras – Space Weather Effects – History of the Earth – Temperature of a Planet – The Atmosphere – Pressure and Temperature Distribution – Magnetosphere – Eclipses – Solar and Lunar eclipses.

UNIT IV – STARS (12 hrs)

Classification of Stars – The Harvard Classification System – Luminosity of a Star – Hertzprung-Russel Diagram – Stellar Evolution using the HR Diagram – Theoretical Evolution of Stars – White Dwarfs – Neutron Stars – Black Holes – Event Horizon – Basic Physics of Black Holes.

UNIT V – GALAXY (12 hrs)

Galaxy Nomenclature – Types of Galaxies – Spiral – Elliptical – Irregular galaxies – Milky Way galaxy and its Structure – Rotation and Mass Distribution – Rotation Curve and Doppler Shift – Star Clusters – Galactic Clusters – Pulsars – Cosmological Models – Big Bang theory – Steady State Theory – Hubble's Law – Olber's Paradox.

TEXTBOOK

1. Eric Chaisson and Steve McMillan. *Astronomy Today.* New Jersey: Prentice Hall, Third edition, 1999 **(UNITS I, II, III, IV and V).**

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1. David Morrison, Sidney Wolff and Andrew Fraknoi. *Exploration of the Universe*. Saunders College Publications, Fifth Edition, 1987.
2. Niclolas A.Pananides and Thomas Arny. *Introductory Astronomy*. Addison

Wesley Longman Publishing Co., 1979.
3. Mujiber Rahman A. *Concepts to Astrophysics*. Chennai: Scitech Publications (India) Pvt. Ltd., 2018.

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1. http://lilith.fisica.ufmg.br/~wag/TRANSF/TEACHING/ESTELAR/AULAS/ASTEST_TELESCOPIOS.ppt.gz
2. https://www.enchantedlearning.com/subjects/astronomy/stars/startypes.shtml
3. http://hosting.astro.cornell.edu/academics/courses/astro201/galaxies/types.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
MAJOR ELECTIVE COURSE - I: BASIS OF DATA COMMUNICATIONS AND PROGRAMMING IN C (21UPHO53)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basis of data communications and programming in C.

Course Outcomes (CO)

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

CO1[K1]: recognize basic terms in data communications and c programming
CO2[K2]: explain the way of data communications and basic structure of programming in C
CO3[K3]: compute various problems using programming in C
CO4[K4]: analyze the behaviors of computer network, data communication and applications of C programming
CO5[K5]: elaborate the data communications and the procedure of writing programs

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – DATA COMMUNICATION & NETWORKS (12 hrs)

Data Communications – Components – Data Representations – Data Flow. Neetworks – Network Criteria – Physical Structures. Network Types – Local Area Network – Wide Area Network – Swithcing – The Internet – Accessing the Internet – Internet Standards – Internet administration.

UNIT II – DIGITAL AND ANALOG TRANSMISSION (12 hrs)

Digital Transmission – Line Coding – Line Coding Schemes – Block Coding – Scrambling – Pulse Code Modulation – Delta Modulation – Parallel transmission – Serial Transmission. Analog Transmission – Aspects of Digital -to- Analog Conversion – Amplitude Shift Keying – Frequency Shift Keying – Quadrature Amplitude Modulation.

UNIT III – MULTIFLEXING AND TRANSMISSION MEDIA (12 hrs)

Multiplexing – Frequency-Division Multiplexing – Wavelength-Division Multiplexing – Time-Division Multiplexing. Spread Spectrum – Frequency Hopping Spread Spectrum – Direct Sequence Spread Spectrum. Guided Media – Twisted-Pair Cable – Coaxial cable – Fiber-Optic Cable. Unguided Media – Radio waves – Microwaves – Infrared.

UNIT IV – DATA TYPES, DECISION MAKING AND LOOPING (12 hrs)

Introduction to C – Character Set – Identifiers and Keywords – Data Types – Variables and Constants – Operators – Expressions – Mathematical Functions – If and If – Else statement – Switch Statements – Goto Statement – While Statement – For Loop – Jumping in Loops – Exit Functions – Program Exercise: a) Find the Distance Travelled by a Particle at the Given Time and b) Find the Resonance Frequency of LCR Circuit for Different Values of C.

UNIT V – ARRAYS (12 hrs)

One Dimensional Array – Processing One Dimensional Array – Two Dimensional Arrays – Initialization of Two Dimensional Array – Multidimensional Array – Strings and Character Arrays – String Handling Functions – Program Exercise - a) To Find Standard Deviation b) To Find the Most Probable Velocity of System of Particles.

TEXTBOOKS

1. Behrouz A.Forouzan. *Data Communications and Networking.* New York: McGraw Hill, Fifth Edition, 2013. **(UNITS I, II & III)**
2. Balagurusamy E. *Programming in ANSI C*. New Delhi: Tata McGraw Hill Publishing Company Ltd., Sixth Edition, 2012. **(UNITS IV & V)**

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1. William Stallings. *Data and Computer Communications*. New Delhi: Prentice Hall of India Pvt. Ltd., Fifth Edition, 2001.
2. Ramasamy S and Radhaganesan P. *Programming in C.* Chennai: Scitech Publications (India) Pvt. Ltd., 2006.
3. Yashvant Kanetkar. *Let us C*. India: BPB Publications, Sixteenth Revised and Updated Edition, 2018.

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1. https://www.pdfdrive.com/data-communication-and-networking-5th-edition-by-behrouz-a-frouzen-d200721151.html
2. https://www.pdfdrive.com/c-for-engineers-and-scientists-an-introduction-to-programming-with-ansi-c-d158826907.html
3. https://www.youtube.com/watch?v=sG6WGvzmVaw
4. https://vardhaman.org/wp-content/uploads/2018/12/Computer%20Programming.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
MAJOR ELECTIVE COURSE - II: MATHEMATICAL PHYSICS (21UPHO54)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with vectors, matrices, differential equations and partial differential equations which are the basic mathematical tools used in physics.

Course Outcomes (CO)

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

CO1[K1]: outline the fundamental rules and laws in vectors, matrix, differential equations and partial differential equations

CO2[K2]: explain the fundamental theorems in vectors, matrix differential equations, partial differential equations and its applications

CO3[K3]: apply the formulae, theorems and laws to solve the problems

CO4[K4]: classify the types of operators, matrices, differential and partial differential equations

CO5[K5]: evaluate a physical system by using various mathematical methods, theorems and functions

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – VECTORS **(12 hrs)**

The Scalar and Vector Fields – Directional Derivates – Level Surfaces – The Gradient of a Scalar Field – The Gradient of a Scalar Point Function, Sum of Two Scalar Point Functions, Product of Two Scalar Point Functions – The Divergence and Curl of a Vector Point Function, Sum of Two Vector Functions, Product of Two Vector Point Functions. Gauss' Divergence Theorem – Physical Interpretation of Gauss' Divergence Theorem – Green's Theorem in Plane – Stokes' Theorem in Space.

UNIT II – MATRIX **(12 hrs)**

Special Types of Matrices – Inverse of a Matrix – Non-homogeneous Linear Equations – Cramer's Rule for Solving Non-Homogeneous Linear Equations – Theorem – Homogeneous Linear Equations – Theorem – Linear Transformation – Resultant of Two Linear Transformations – Similarity Transformation – Theorem – Unitary Transformation – Orthogonal Transformation – Diagonalization of Matrices – Rank of a Matrix – Eigen Values – Eigen Vectors – Characteristic Equation of a Matrix – Cayley-Hamilton Theorem.

UNIT III – FIRST ORDER DIFFERENTIAL EQUATIONS **(12 hrs)**

Definition – Order and Degree of a Differential Equation – Formation and Solution of Differential Equations – Geometrical Meaning of Differential Equation of First Order and First Degree – Variables Separable – Homogeneous Differential Equations – Equations Reducible to Homogeneous Form – Linear Differential Equations – Bernoulli's Equations – Exact Differential Equations – Equations Reducible to Exact Equations – Applications – L-R Series Circuit – C-R Circuit.

UNIT IV – SECOND ORDER DIFFERENTIAL EQUATIONS **(12 hrs)**

Linear Differential Equations of Second Order – Dimension of Space Solution – Homogeneous – Non Homogeneous – Super Position or Linearity Principle – Linear Dependence and Independence – Wronskian – Existence of Linear Dependence. Complete Solution – Method for Finding The Complementary Function – Rules to Find Particular Integral – Applications – Oscillations of Spring – Free Oscillations – Damped Free Oscillations – Forced Oscillations (With and Without Damping).

UNIT V – PARTIAL DIFFERENTIAL EQUATIONS **(12 hrs)**

Linear Homogeneous Partial Differential Equations of n^{th} Order with Constant Coefficients – Rules for Finding the Complementary Function – General Rules for Finding the Particular Integral – General Rule – Short Formulae – Particular Integral of any Function – Classifications of Partial Differential Equations – Solution of Partial Differential Equation by Method of Separation of

Variables – Applications – Equation of Vibrating String – Wave Equations by D'Alembert's Method – One Dimensional Heat Flow.

TEXTBOOKS

1. Gupta B.D, *Mathematical Physics*, New Delhi: Vikas Publishing House Pvt. Ltd., Fourth Edition, Reprint 2020. **(UNIT I)**
2. Murugesan R. *Mechanics and Mathematical Physics.* New Delhi: S.Chand & Company Pvt. Ltd., Third Edition, Reprint 2014. **(UNIT II)**
3. Dass H.K and Rama Verma. *Mathematical Physics.* New Delhi: S.Chand and Company Ltd., Eighth Edition, Reprint 2019. **(UNITS III, IV & V)**

REFERENCES

Books

1. George B.Arfken and Han J.Weber. *Mathematical Methods for Physicists*. USA: Academic Press, Fifth Edition, Reprint 2005.
2. Chattopadhyay P.K. *Mathematical Physics.* New Delhi: New Age International Pvt. Ltd., Publishers, First Edition, Reprint 2005.
3. Satya Prakash. *Mathematical Physics.* New Delhi: Sultan Chand & Sons, Sixth Edition, Reprint 2019.

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1. https://physics.bgu.ac.il/~gedalin/Teaching/Mater/mmp.pdf
2. https://nptel.ac.in/courses/115/103/115103036/
3. https://www.pdfdrive.com/mathematical-physics-d12240074.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
MAJOR ELECTIVE COURSE – II: MATHEMATICAL METHODS (21UPHO55)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners to various approximation methods to find the solution to the problems which do not have exact solutions.

Course Outcomes (CO)

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

CO1[K1]: list various numerical methods available to solve problems
CO2[K2]: explain the procedures to apply the various approximation methods
CO3[K3]: compute the solution of given equation by using appropriate methods
CO4[K4]: analyze the validity of various numerical or approximation methods
CO5[K5]: deduce the exact solutions of given binomial, linear, differential and integration equations

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – ERRORS AND ROOT OF EQUATIONS (12 hrs)

Numerical Analysis – Numbers and their Accuracy – Errors – Measurement of Errors – Round Off Error – Inherent Error – Truncation Error – Absolute, Relative and Percentage Error – Accumulated Error – General Error Formulae – Bisection Method – Iteration Method – Method of False Position – Newton-Raphson Method – Ramanujan's Method.

UNIT II – INTERPOLATION (12 hrs)

Introduction – Finite Differences – Forward Differences – Backward Differences – Central Differences – Newton's Formulae for Interpolation – Central Difference Interpolation Formulae – Gauss's Central Difference Formulae – Stiriling's Fomula – Bessel's Formula – Everett's Formula – Lagrange's Interpolation Formula.

UNIT III – NUMERICAL DIFFERENTIATION AND INTEGRATION (12 hrs)

Numerical Differentiation – Errors in Numerical Differentiation – The Cubic Spline Method – Maximum and Minimum Values of a Tabulated Function – Numerical Integration – Trapezoidal Rule – Simpson's 1/3 and 3/8 Rules – Boole's and Weddle's Rule.

UNIT IV – NUMERICAL SOLUTION OF A LINEAR SYSTEMS (12 hrs)

Introduction – Direct Methods – Matrix Inversion Method – Gaussian Elimination Method – Method of Gauss Method to Compute the Inverse – Method of Factorization – Solution of Triangular System - Iterative Method – Eigen Value Problems – House Holder's Method – Eigen Values of Symmetric Tri Diagonal Matrix – QR Method.

UNIT V – NUMERICAL SOLUTION OF A DIFFERENTIAL EQUATIONS (12 hrs)

Introduction – Taylor's Series Method – Picard's Method – Euler's Method – Error Estimates – Modified Euler's Method – Runge-Kutta Method – Predictor Corrector Methods – Adams – Moulton Method – Milne's Method.

TEXTBOOK

1. Sastry S.S. *Introductory Methods of Numerical Analysis*. New Delhi: Prentice Hall of India Pvt. Ltd., Third Edition, 1999. **(UNITS I, II, III, IV & V)**

REFERENCES

Books

1. Murugesan R. *Mechanics and Mathematical Methods*. New Delhi: S.Chand & Co., Reprint 2003.
2. Kandasamy P, Thilagavathy K and Gunavathy K. *Numerical Methods.* New Delhi: S.Chand & Co., First Edition, Reprint 2002.

3. Arumugam S, Thangapandi Isaac A and Somasundaram A. Numerical Analysis with Programming in C. Palayamkottai: New Gamma Publishing House, 2007.

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1. https://www.pdfdrive.com/introductory-methods-of-numerical-analysis-by-ss-sastry-e148704487.html
2. https://www.pdfdrive.com/an-introduction-to-numerical-methods-and-analysisd33474269.html
3. https://nptel.ac.in/courses/111/107/111107105/
4. https://www.youtube.com/watch?v=QqhSmdkqgjQ

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
MAJOR ELECTIVE COURSE – II: ENERGY PHYSICS (21UPHO56)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the need, applications and energy harvesting technologies of non-conventional energies such as solar energy, ocean energy, wind energy, biomass and geothermal energy.

Course Outcomes (CO)

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

CO1[K1]: list out the various non-conventional energies available in our world

CO2[K2]: explain the physics concepts behind construction and working of systems which are used to convert nonconventional energies into electrical energy

CO3[K3]: present the applications of non-conventional energies

CO4[K4]: analyze the environmental impacts and present status of solar, ocean, wind, biomass and geothermal energy

CO5[K5]: justify the merits and demerits of non-conventional energies

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	1	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – FUNDAMENTALS OF ENERGY – SCIENCE AND TECHNOLOGY (12 hrs)

Classification of Energy Resources – Importance of Non-Conventional Energy Sources – Energy Chain – Common Forms of Energy – Advantages and Disadvantages of Conventional Energy Sources – Salient Future of Non-Conventional Energy Sources – Greenhouse Effect – Consequence of Global Warming – Energy Scenario in India. Energy Conservation – Various Aspects of Energy Conservation – Principles of Energy Conservation – General Electrical Eco's – Cogeneration.

UNIT II – SOLAR ENERGY AND SOLAR THERMAL SYSTEM (12 hrs)

The sun as a Source of Energy – Sun, Earth Radiation Spectrums – Measurements of Solar Radiation – Solar Radiation Data – Solar Collectors – Liquid Flat Plate Collector – Flat Plate Air Heating Collector – Modified Flat Plate Collector – Compound Parabolic Concentrator – Paraboloidal Dish Collector – Solar Water Heater – Solar Passive Space-Heating and Cooling Systems – Solar Cookers – Solar Furnaces – Solar Greenhouse – Solar Dryer.

UNIT III – OCEAN ENERGY (12 hrs)

Tidal Energy – Origin and Nature – Limitations of Tidal Energy – Tidal Energy Technology – Environmental Impacts – Wave Energy – Power in Waves – Wave Energy Technology – Present Status – Environmental Impacts – Ocean Thermal Energy – Origin and Characteristics of Resource – Ocean Thermal Energy Conversion Technology – Present Status – Environmental Impacts.

UNIT IV – WIND ENERGY (12 hrs)

Origin of Winds – Nature of Winds – Wind Turbine Siting – Major Applications of Wind Power – Energy Available in Wind – Energy Estimation of Wind – Power Extraction from Wind – Wind Turbine Types and Their Construction – Horizontal Axis Wind Turbine (HAWT) – Vertical Axis Wind Turbine (VAWT) – Wind Energy Conversion Systems – Fixed Speed Drive Scheme – Variable Speed Drive Scheme – Wind Energy Storage – Environmental Aspects.

UNIT V – BIOMASS AND GEOTHERMAL ENERGY (12 hrs)

Biomass Energy – Usable form of Biomass – Biomass Resources – Biomass Conversion Technologies – Biomass Gasification – Down Draft Type – Biogas Production from Waste Biomass – Advantage of Anaerobic Digestion-Classification of Biogas Plants. Geothermal Energy – Applications of Geothermal Energy – Origin and Distribution of Geothermal Energy – Hydro Thermal Resources – Vapor Dominated Steam – Liquid Dominated System – Environmental Consideration – Geothermal Energy in India.

TEXTBOOK

1. Khan B.H. *Non-Conventional Energy Resources.* New Delhi: McGraw Hill Education (India) Pvt. Ltd., Second Edition, Reprint 2014. **(UNITS I, II, III, IV & V)**

REFERENCES

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1. Soab Nath Singh. *Nonconventional Energy Resources.* Pearson India Education Services Pvt. Ltd., Second Edition, 2016.
2. Hasan Saeed S and Sharma D.K. *Non Conventional Energy Resources.* S.K. Kataria & Sons, Reprint 2013.
3. Kothari D.P, Singal K.C and Rakesh Ranjan. *Renewable Energy Sources and Emerging Technologies.* New Delhi: Prentice Hall of India Pvt. Ltd., Second Edition, 2011.

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1. https://www.vssut.ac.in/lecture_notes/lecture1428910296.pdf
2. https://www.pdfdrive.com/renewable-energy-systems-advanced-conversion-technologies-and-applications-e186505978.html
3. https://www.pdfdrive.com/renewable-energy-fourth-edition-physics-engineering-environmental-impacts-economics-planning-e185663668.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER- V
SKILL ENHANCEMENT COURSE - V: FIBRE OPTICS (21UPHS51)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:40**
CREDITS	**:2**	**EXT. MARKS**	**:60**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the concepts of physics behind optical fibre wave guide, characteristics of optical fibre, optical fibre connections, optical fibre's parameters measurement methods and its applications.

Course Outcomes (CO)

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

CO1[K1]: list the types, characteristic physical parameters, different ways of connections, measurement methods and applications of optical fibre wave guide

CO2[K2]: explain theory of ray and mode transmission concepts, characteristics, different ways of connections, measurement methods and applications of optical fibre wave guide

CO3[K3]: apply the concepts of fibre optics to solve problems

CO4[K4]: identify the measurement methods to characterize the optical fibres

CO5[K4]: differentiate the characteristics, connecting methods and applications of different types of optical fibres

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	2	2	1	1	1	1
CO4 [K4]	2	1	1	-	-	-	1
CO5 [K4]	2	2	1	1	1	1	1
Weightage of the course	13	08	04	04	02	04	03
Weighted percentage of Course contribution to POs	**2.1**	**1.94**	**1.85**	**1.56**	**1.9**	**1.97**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – OPTICAL FIBRE (6 hrs)

Optical Fibre – Necessity of Cladding – Optical Fibre System – Optical Fibre Cable – Total Internal Reflection – Propagation of Light Through an Optical Fibre – Critical Angle of Propagation – Acceptance Angle – Fractional Refractive Index Change – Numerical Aperture – Double Crucible Technique.

UNIT II – PROPAGATION OF MODES IN OPTICAL FIBRES (6 hrs)

Modes of Propagation – Meridional and Skew Rays – Number of Modes and Cutoff Parameters of Fibres – Single Mode Propagation – Classification of Optical Fibres – Stepped Index Fibre – Stepped Index Monomode Fibre – Graded Index Multimode Fibre – Comparison – Plastic Fibres.

UNIT III – TRANSMISSION CHARACTERISTICS OF OPTICAL FIBRES (6 hrs)

Losses in Optical Fibre – Attenuation – Different Mechanisms – Intrinsic Attenuation – Extrinsic Attenuation (Bending Losses) – Distortion – Intermodal Dispersion – Intramodal Dispersion – Total Dispersion – Bandwidth.

UNIT IV – OPTICAL FIBRE CONNECTION (6 hrs)

Fibre Alignment and Joint Loss – Multimode Fibre Joints – Single Mode Fibre Joints. Fibre Splices – Fusion Splices – Mechanical Splices – Multiple Splices. Fibre Connectors – Expanded Beam Connecters – GRIN Lenses – Fibre Couplers – Three and Four Port Couplers.

UNIT V – MEASUREMENT METHODS AND APPLICATIONS (6 hrs)

Measurement of Numerical Aperture and Its Related Terms – Optical Time-Domain Reflectometer (OTDR) – Measurement of Fibre Attenuation – Measurement of Dispersion Losses – Measurement of Refractive Index – Cut-Off Wavelength Measurement – Macrobending Loss Measurement.

Hands on Training:

1. Fiber Continuity and Core Size Identification
2. To Measure the Numerical Aperture of an Optical Fiber
3. To Study the Variation of the Bending Loss in a Multimode Fiber
4. To Determine the Attenuation Per Unit Length of a Fiber
5. Fiber Joints – Joining Two Fibers using Connectors and Measuring Joint Loss

TEXTBOOKS

1. Subraminyam N, Brij lal and Avadhanulu M.N. *A Textbook of Optics.* New Delhi: S.Chand & Company Ltd., Twenty Fifth Revised Edition, Reprint 2018. **(UNITS I & III)**

2. Subir Kumar Sarkar. *Optical Fibers & Fibre Optical Communication Systems.* New Delhi: S.Chand & Company Ltd., Fourth Revised Edition, Reprint 2014. **(UNITS II & V)**
3. John M.Senior. *Optical Fiber Communications – Principles and Practices*. New Delhi: Prentice Hall of India Pvt. Ltd., Second Edition, 2001. **(UNIT IV)**

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1. Ray Tricker. *Optoelectronic and Fiber Optic Technology*. New Delhi: Elsevier India Pvt. Ltd., First Edition, 2006.
2. Ajoy Ghatak. *Optics*. New Delhi: McGraw Hill Education (India) Pvt. Ltd., Fifth Edition, Reprint 2013.
3. Gupta S.C. *Text Book on Optical Fiber Communications and Its Applications.* New Delhi: Prentice Hall India Learning Pvt. Ltd., Second Edition, 2012.

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2. https://technobyte.org/ray-theory-light
3. https://www.cedengineering.com/userfiles/introduction to fiber optics 0428.pdf
4. https://www.pdfdrive.com/handbook-of-fiber-optic-data-communication-third-edition-a-practical-guide-to-optical-networking-d177047081.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - V
INTERNSHIP (21UPHJ51)
(From 2021-2022 Batch onwards)

CREDIT	**:1**	**INT. MARKS**	**:50**
DURATION	**:25 Days**	**EXT. MARKS**	**:50**
		MAX. MARKS	**:100**

Preamble

This course enables the learners to develop professionalism in a working environment, acquire practical skill to make them immediately employable and stimulates the learners to become an efficient entrepreneur.

Course Outcomes (CO)

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

CO1[K1]: identify the companies/industries/institutions for their career
CO2[K3]: operate the machines/equipments available in the chosen companies/industries/ institutions
CO3[K4]: inspect the performance of machines/equipments available in the chosen companies/industries/institutions
CO4[K5]: choose their career in a particular field
CO5[K6]: plan to become an entrepreneur

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	2	2	1	-	1	1
CO2 [K3]	3	2	2	-	1	1	1
CO3 [K4]	3	3	3	1	1	1	1
CO4 [K5]	2	-	1	1	-	-	-
CO5 [K6]	2	-	1	-	-	-	-
Weightage of the course	12	07	09	03	02	03	03
Weighted percentage of Course contribution to POs	**1.94**	**1.69**	**4.17**	**1.17**	**1.9**	**1.48**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

Guidelines

1. Each Student has to undergo minimum 25 days institutional/industry based training during the fourth semester summer vacation.
2. Internships could be undertaken in different organizations, industries and agencies approved by the department.
3. Students should keep a detailed record of activities performed and hrs spent in training and report the same to the Faculty Coordinator every week.
4. The Internship report should be of minimum 20 pages.
5. Attendance certificate from the organization has to be submitted to the HOD.
6. Two copies of the Internship report should be submitted.
7. The Internship carries 100 marks out of which 50 marks for Internal Assessment and 50 Marks for External Examination.
8. The student has to appear for Viva-voce.
9. The viva voce board shall consist of the Head of the Department and the Internal Examiner

The following rubrics will be taken into account for the evaluation of the Training Programme:

Internal Assessment (50 Marks)		**External Examination(50 Marks)**	
Training Report & Review	: 40 Marks	Training Report	: 20 Marks
Daily Log Report/Attendance	: 5 Marks	Viva Voce	: 30 Marks
PPT Presentation	: 5 Marks		

Internship report must contain the following details:

- Title Page
- College Certificate Page
- Internship Certificate provided by the internship institution
- Declaration Page
- Acknowledgement
- Company Profile
- Organizational structure of the concern
- Weekly work plan
- List of figures, List of Tables
- Index
- Chapters

List of Chapters

1. Introduction
2. Nature of work
3. Role in the organization
4. Questionnaires and Observations about work
5. Operating Environment
6. Detailed Description of Technology used

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - VI
CORE COURSE - XIII: SOLID STATE PHYSICS (21UPHC61)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:5**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:75 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the different types of bonding in solids, crystal structure of solids, quantum electron theory of metals, origin, properties and applications of magnetic, dielectric and superconducting materials.

Course Outcomes (CO)

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

CO1[K1]: reproduce the basic principles behind the solid state materials

CO2[K2]: explain the basic concepts of bonding in solids, crystal structures, electron theory of metals, magnetic, superconducting and dielectric materials

CO3[K3]: apply the concepts of solid state physics to solve problems

CO4[K4]: examine the importance of types of bonding, structure determination, electron theory of solids, magnetic, dielectric and superconducting materials

CO5[K5]: evaluate the different physical parameters of solid materials

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	2	1	1	1	1
Weightage of the course	15	10	06	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.78**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – BONDING IN SOLIDS (15 hrs)

Bonding in Solids – Cohesive Energy – Ionic Bonding – Bond Energy of NaCl Molecule – Calculation of Cohesive Energy of Ionic Solids – Application to Sodium Chloride Crystal – Evaluation of Madelung Constant for NaCl – Covalent Bonding – Metallic Bonding – Hydrogen Bonding – Van der Waals' Bonding – Specific Heat of Solids – Classical Theory (Dulong and Petit Law) – Einstein's Theory of Specific Heat – Debye's Theory of Specific Heat – Phonons.

UNIT II – CRYSTAL STRUCTURE AND CRYSTAL DIFFRACTION (15 hrs)

Crystal Structure – Unit Cell – Primitive Cell – Lattice Parameters of an Unit Cell – Seven Crystal Systems – Bravais Lattice – Simple Cubic (SC) Structure – Body Centered Cubic (BCC) Structure – Face Centered Cubic (FCC) Structure – Hexagonal Close Packed Structure (HCP) – Diamond Cubic Structure – Zinc Sulphide Structure – Sodium Chloride Structure – Caesium Chloride Structure – Directions in Crystals – Planes in Crystals – Miller Indices – Distances of Separation between Successive Planes – Diffraction of X-Rays by Crystal Planes – Experimental Methods of X-Ray Diffraction – Laue Method – Debye-Scherrer Method – Rotating Crystal Method.

UNIT III – MAGNETIC MATERIALS (15 hrs)

Magnetic Materials – Classification of Magnetic Materials (Dia, Para, Ferro Anti-Ferro and Ferri) – Origin of Magnetic Moment – Langevin Theory of Diamagnetism – Langevin Theory of Paramagnetism – Weiss Theory of Para Magnetism - Ferromagnetism – Weiss Theory on Ferromagnetism – Domain Theory of Ferromagnetism – Hysteresis – Hard and Soft Magnetic Materials – Anti-Ferro Magnetism – Ferri Magnetism – Ferrites in Computer Memories.

UNIT IV – QUANTUM FREE ELECTRON THEORY AND SUPERCONDUCITY (15 hrs)

Quantum Theory of Free Electrons – Electrical Conductivity – Fermi-Dirac Distribution Function – Density of Energy States – Sources of Electrical Resistance – Electron in a Periodic Potential – Brillouin Zones – Brillouin Zones in 2D And 3D – Fermi Surface – Effective Mass of a Electron – Concept of Hole – Energy Bands in Solids. Superconductivity – General Features of Superconductors – Effect of Magnetic Field – The Meissner Effect – Effect of Current – Thermal Properties – Type I And Type II Superconductors – London Equations – Penetration Depth – BCS Theory (Qualitatively) – Applications of Superconductors – High Temperature Superconductors.

UNIT V – DIELECTRIC MATERIALS (15 hrs)

Introduction – Polarization Processes – Electronic Polarization – Ionic Polarization – Orientational Polarization – Space Charge Polarization – Internal Field (Lorentz Method) – Clausius Mosotti Relation – Frequency Dependence of

Dielectric Constant – Measurement of Dielectric Constant – Dielectric Loss – Effect of Temperature on Dielectric Constant – Dielectric Breakdown – Required Qualities of Good Insulating Materials – Classification of Insulating Materials – Important Applications of Dielectric Materials – Ferro and Piezo Electricity – Pyro Electricity.

TEXTBOOKS

1. Palanisamy P.K. *Solid State Physics.* Chennai: Scitech Publications (India) Pvt. Ltd., Reprint 2006. **(UNIT I)**
2. Palanisamy P.K. *Solid State Physics*. Chennai: Scitech Publications (India) Pvt. Ltd., Reprint 2004. **(UNITS II, III, IV & V)**

REFERENCES

Books

1. Dekker J. *Solid State Physics*. New Delhi: Macmillan India Ltd., First Edition, Reprint 2003.
2. Wahab M.A. *Solid State Physics.* New Delhi: Narosa Publishing House Pvt. Ltd., Second Edition, Reprint 2006.
3. Pillai S.O. *Solid State Physics*. New Delhi: New Age International (P) Ltd., Sixth Edition, Reprint 2006.

Web Sources

1. https://authors.library.caltech.edu/105209/15/TR000574_06_chapter-6.pdf
2. https://www.youtube.com/watch?v=HCWwRh5CXYU
3. https://www.youtube.com/watch?v=aFyjUhFCL5Q
4. http://www.phys.ubbcluj.ro/~iosif.deac/courses/ASSP/5_dielectrics.pdf
5. https://www.brainkart.com/article/Classification-of-Magnetic-Materials_38453/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - VI
CORE COURSE - XIV: NUCLEAR PHYSICS (21UPHC62)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:5**	**INT. MARKS**	**:40**
CREDITS	**:5**	**EXT. MARKS**	**:60**
DURATION	**:75 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the structure of atomic nuclei, different nuclear models, radio activity, nuclear reactions, particle accelerators and radiation detectors.

Course Outcomes (CO)

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

CO1[K1]: describe the concepts of nuclear physics
CO2[K2]: explain the important phenomena in nuclear physics
CO3[K3]: apply the concepts of nuclear physics to solve the problems
CO4[K4]: analyse the structure of atomic nuclei, various nuclear models, decay process, particle accelerators and radiation detectors
CO5[K5]: evaluate the properties of nuclei

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	2	1	1	1	1
Weightage of the course	15	10	06	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.78**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – STRUTURE OF NUCLEI (15 hrs)

Constituents of the Nucleus – Proton-Electron Hypothesis – Proton-Neutron Hypothesis – Terms Associated With the Nucleus – Quantitative Facts about Nucleus – Size – Mass – Density – Energy – Charge – Binding Energy – Mass Defect – Packing Fraction – Fusion and Fission – Binding Energy Per Nucleon – Nuclear Angular Momentum – Nuclear Moments – Magnetic Dipole Moment – Electric Quadrupole Moment – Wave Mechanical Properties – Parity – Statistics – Nature of Nuclear Forces – Yukawa Theory of Nuclear Forces.

UNIT II – NUCLEAR MODELS (15 hrs)

Liquid Drop Model – Semi Empirical Mass Formula – Mass of Most Stable Isobar – Achievements of Liquid Drop Model – Failures of Liquid Drop Model – Shell Model – Square Well Potential – Harmonic Oscillator Potential – Spin-Orbit Coupling – Predictions, Achievements and Failures of Shell Model – Fermi Gas Model – Collective Model.

UNIT III – RADIOACTIVITY (15 hrs)

Laws of Disintegration – Activity and Its Units – Half-Life – Average (Mean) Life – Radioactive Series – Law of Successive Disintegration – Radioactive Equilibrium – Alpha Emission – Properties of Alpha Particles – Alpha Spectrum – Range of Alpha-Particles – Geiger-Nuttal law – Gamow Theory of Alpha Decay – Beta Decay – Conditions for Spontaneous Emission of β Particles – β Particle Spectrum – Electron Capture – Neutrino and Antineutrino – Detection of Neutrino and Antineutrino – Gamma Decay – Internal Conversion – Internal Pair Conversion – Artificial Radioactivity – Applications of Radioactivity – Medicine – Radioactive Dating – Radioactive Tracers.

UNIT IV – NUCLEAR REACTIONS (15 hrs)

Types of Reactions – Reaction Based on Reaction Mechanism and Mass of Projectile – Nuclear Reaction Cross Section – Units of Cross Section – Different Types of Cross Section – Conservation Laws in Nuclear Reactions – Kinematics of Nuclear Reactions – Exoergic Reactions – Endoergic Reactions – Threshold Energy – Compound Nucleus – Nuclear Fission – Neutron – Induced Fission – Nuclear Reactors – Safety and Waste – Nuclear Fusion – Energy Released in Fusion – Hydrogen Burning and Solar Energy – Helium Burning in Stars – Fusion Reactor Design – Advantages and Problems of Fusion.

UNIT V – PARTICLE ACCELERATORS AND DETECTORS (15 hrs)

Van de Graaff Accelerator – Linear Accelerator – Wave-guide Accelerators – Cyclotrons – Betatron – Azimuthally Varying Field or Sector Focusing Cyclotron – Synchrotrons – Proton Synchrotron – Gas Filled Detectors – Ionization Chamber – Proportional Counters – G-M Counters – Scintillation

Detectors – Cloud Chamber – Bubble Chamber – Spark Chamber – Cerenkov Counters – Radiation Hazards – Radiation Dosimeters.

TEXTBOOK

1. Mittal V.K, Verma R.C and Gupta S.C*. Introduction to Nuclear and Particle Physics.* New Delhi: PHI Learning Pvt. Ltd., Fourth edition, 2018. **(UNITS I, II, III, IV & V)**

REFERENCES

Books

1. Tayal D.C. *Nuclear Physics. Mumbai*: Himalaya Publishing House, Fifth Edition, Reprint 2020.
2. Devanathan V. *Nuclear Physics.* New Delhi: Narosa Publishing House, 2006.
3. Irving Kaplan. *Nuclear Physics.* New Delhi: Narosa Publishing House, Second Edition, Reprint 2002.

Web Sources

1. https://www.pdfdrive.com/nuclear-physics-exploring-the-heart-of-matter-e157721075.html
2. https://www.pdfdrive.com/nuclear-and-particle-physics-fisicanet-e8611196.html
3. https://hcverma.in/ncl_phy_lectures

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - VI
CORE COURSE - XV: DIGITAL AND COMMUNICATION ELECTRONICS
(21UPHC63)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners to different number systems, digital logic circuits, Boolean algebra, arithmetic and data processing circuits, flip flops, registers, counters, analog, digital and satellite communication systems.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of digital and communication electronics
CO2[K2]: describe the concepts of digital and communication electronics
CO3[K3]: apply basic principles to solve problems in digital and communication electronics
CO4[K4]: examine the digital circuits, communication systems and its applications
CO5[K5]: evaluate the concepts of digital and communication electronics

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	2	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K5]	3	2	2	1	1	1	1
Weightage of the course	15	10	06	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.78**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – NUMBER SYSTEMS AND BOOLEAN ALGEBRA (12 hrs)

Number System – Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexa Decimal Numbers, Logic Gates – NOT, OR, AND (Realization Using Diode and Transistor), NOR & NAND as Universal Gates – XOR and XNOR Gates – Parity Checkers and Generators. Boolean Laws and Theorems – Principle of Duality - Sum of the Product Method – Truth Table to K-map – K-map Simplifications – Don't Care Conditions – Product of Sum Method – Product of Sum Simplifications.

UNIT II – ARITHMATIC AND DATA PROCESSING CIRUCITS (12 hrs)

Binary Addition – Binary Subtraction by 1's Complement and 2's Complement – Binary Multiplication and Division – Arithmetic Building Blocks – Half Adder – Full Adder – Adder – Subtractor – Multiplexers – 16-to-1 Multiplexer – Nibble Multiplexers – Demultiplexers – 1-of-16 Decoder – BCD to Decimal Decoders – 7 Segment Decoders – Encoders – Decimal to BCD Encoder.

UNIT III – FLIP FLOPS, REGISTERS AND COUNTERS (12 hrs)

RS Flip-Flop – Gated Flip-Flops – Edge-Triggered RS Flip-Flop – Edge Triggered D Flip Flop – Edge-Triggered JK Flip flop – Flip-Flop Timing – JK Master Slave Flip Flop –Types of Registers – Serial In - Serial Out (SISO) – Serial In Parallel Out – Ring Counter – Asynchronous Counter – Synchronous Counter. IC 555 Timer – Astable and Monostable Multivibrators.

UNIT IV – MODULATION AND DEMODULATION (12 hrs)

Radio Broadcasting – Transmission and Reception – Modulation – Types of Modulation – Amplitude Modulation – Modulation Factor – Analysis of Amplitude Modulated Wave – Sideband Frequencies in AM Wave – Transistor AM Modulator – Power in AM wave – Limitations of Amplitude Modulation – Frequency Modulation – Theory of FM – Demodulation – Essential of Modulation – AM Diode Detector – AM Radio Receivers – Types of AM Radio Receivers – Stages and Advantages of Superhetrodyne Radio Receivers – FM Receiver – Difference between AM and FM Receivers.

UNIT V – DIGITAL AND SATELLITE COMMUNICATION (12 hrs)

Sampling – Sampling Rate – Natural and Flat Topped Sampling – Analog Pulse Modulation – Pulse Code Modulation – Quantization and Quantizing Noise – Coding and Decoding – Frequency-Shift Keying – Phase-Shift Keying – Frequency-Division Multiplexing and Multiple Access – Time-Division Multiplexing and Multiple Access. Satellite Communications – Satellite Orbits – Uses of Satellites for Communications – Satellite and Transponders – Systems Using Geostationary Satellites – Systems Using Low-Earth-Orbit Satellites – Systems Using Medium-Earth-Orbit Satellites.

TEXTBOOKS

1. Albert P.Malvino, Donald P.Leach and Goutam Saha. *Digital Principles and Applications.* Chennai: Tata McGraw Hill Education (India) Pvt. Ltd., Eighth Edition, Reprint 2017. **(UNITS I, II & III)**
2. Mehta V.K and Rohit Mehta. *Principles of Electronics.* New Delhi: S.Chand & Company Ltd., Revised Eleventh Edition, Reprint 2013. **(UNIT IV)**
3. Roy Blake. *Wireless communication Technology*. USA: Delmar Cengage Learning, First Edition, 2000. **(UNIT V)**

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1. Thomas L.Floyd. *Digital Fundamentals.* New Delhi: Pearson Education (Singapore) Pvt. Ltd., Seventh Edition, Reprint 2002.
2. George Kennedy and Bernard Davis. *Electronic Communication Systems.* New Delhi: Tata McGraw Hill Pvt. Ltd., Fourth Edition, Reprint 2002.
3. Dennis Roddy and John Coolen. *Electronic Communications.* New Delhi: Prentice-Hall of India Pvt. Ltd., Fourth Edition, 2004.

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1. https://www.pdfdrive.com/digital-electronics-d25910596.html
2. https://nptel.ac.in/courses/108/105/108105132/
3. https://nptel.ac.in/courses/117/102/117102059/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - VI
CORE COURSE - XVI: PROJECT (21UPHJ61)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:50**
CREDITS	**:4**	**EXT. MARKS**	**:50**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to develop the research and interpersonal communication skills that leads to professional growth.

Course Outcomes (CO)

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

CO1[K2]: demonstrate the physical, chemical and mathematical concepts of their project work

CO2[K3]: present the physical, chemical and mathematical concepts of their project work

CO3[K4]: analyze the their project work qualitatively and quantitatively

CO4[K5]: justify the benefits of their project work to the society

CO5[K6]: develop new plans for further improvement of their project work

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K2]	2	2	3	1	-	1	1
CO2 [K3]	2	1	3	2	-	2	1
CO3 [K4]	2	3	3	1	1	2	1
CO4 [K5]	2	2	2	1	1	1	1
CO5 [K6]	2	1	1	-	-	1	1
Weightage of the course	10	09	12	05	02	07	05
Weighted percentage of Course contribution to POs	**1.62**	**2.18**	**5.56**	**1.95**	**1.9**	**3.45**	**3.05**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

Guidelines

1. Students will work individually or in groups with maximum 5 members on a semester-long project.
2. Depending on the interest of the students, project research areas will be chosen.
3. Students must meet the guide periodically.
4. The project carries 100 marks of which 50 marks for Internal Assessment and 50 Marks for External Examination.
5. There will be two project review sessions.
6. A draft of the final project report should be submitted to the Project Guide for review at least two weeks prior to the end of the semester.
7. The project report should be of minimum 20/40 pages (excluding bibliography & appendices)
8. Two copies of the final project report should be submitted.
9. The Head of the department and the Project Guide will evaluate the final Project Report.
10. The viva-voce board shall consist of the External Examiner, the Head of the Department and the Internal Examiner.

The following rubrics will be taken into account for the evaluation of Project work and viva-voce:

Internal Assessment (50 Marks)	**External Examination (50 Marks)**
Project Report & Review : 40 Marks	Project Report : 20 Marks
Powerpoint Presentation : 5 Marks	Viva Voce/Demo: 30 Marks
Demo/Performance : 5 Marks	

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - VI
CORE COURSE - XVII: PRACTICAL: ELECTRONICS (21UPHC6P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:6**	**INT. MARKS**	**:50**
CREDITS	**:4**	**EXT. MARKS**	**:50**
DURATION	**:90 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to do the experiments to determine physical parameters by applying basic concepts of analog and digital electronics.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of analog and digital electronics underlying in the experiments
CO2[K2]: demonstrate the concepts of analog and digital electronics
CO3[K3]: calculate the physical parameters from the experimental data
CO4[K4]: analyze the experimental results
CO5[K5]: evaluate the physical parameters

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	1	1	-	-	-
CO2 [K2]	3	2	2	1	1	2	1
CO3 [K3]	3	3	3	1	1	1	1
CO4 [K4]	3	2	1	1	-	1	1
CO5 [K5]	3	2	1	-	-	1	1
Weightage of the course	15	10	08	04	02	05	04
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**3.7**	**1.56**	**1.9**	**2.46**	**2.44**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

LIST OF EXPERIEMENTS (Any 16**):**

1. Study of Reverse Bias Characteristics of a Zener Diode and Voltage Regulation Properties
2. Study of Characteristics of a Transistor under C.E. Mode
3. Construction of Bridge Rectifier Circuit with LC and π filters
4. Construction of Integrator and Differentiator using Discrete Components
5. Determination of Self Inductance of Pair of Coils by Constructing Hartley Oscillator
6. Determination of Self Inductance of a Coil by Constructing Colpitt's Oscillator
7. Construction of Astable Multivibrator using Discrete Components
8. Construction of Logic Gates (AND, OR, NOT, NAND, NOR) using Discrete Components
9. Construction of IC Regulated Dual Power Supply using IC 7812 and IC 7912
10. Construction of Astable Multivibrator using IC 555
11. Construction of Shift Register and Ring Counter using IC7473
12. Implementation of Half Adder and Full adder Circuits using Logic Gates
13. Construction of Four Bit Binary Adder using IC7483
14. Construction of Integrator and Differentiator using IC 741
15. Construction of Adder and Subtractor using IC 741
16. Verification of Universality of NAND and NOR Gates using IC 7400 and IC 7402 respectively
17. Implementation of RS and D Flip Flop using NOR Gate
18. Construction of Digital Circuits for the given Truth Table using K–Map POS and SOP Simplifications
19. Construction of Mod-8 Asynchrous Counter using JK Flip Flops
20. Construction of Multiplexer using IC 74151

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi: Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai: Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I & II.* Chennai: S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.
4. Virendra Kumar. *Digital Electronics: Theory and Experiments*. New Delhi: New Age International (P) Ltd., Second Edition, 2015.
5. Palaniappan M. *B.Sc. Practical Physics*. Madurai: LMN Publicatons, First Edition, 1994.

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1. Arora C.L. *B Sc Practical Physics.* New Delhi: S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi: Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi: Vayu Education of India, First Edition, 2011.
4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

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2. http://vlabs.iitkgp.ernet.in/be/exp18/index.html#:~:text=In%20the%20differentiator%20circuit%20the,resistor%20being%20replaced%20with%20each
3. https://electronicsclub.info/cro.htm

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - VI
MAJOR ELECTIVE COURSE - III: NANO PHYSICS (21UPHO61)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners with the different nanostructures, methods of its synthesis and characterization techniques, properties and applications of nano-materials, quantum wells, quantum wires, quantum dots and carbon nanostructures.

Course Outcomes (CO)

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

CO1[K1]: reproduce the basic principles on synthesis, characterization and properties of nano-materials

CO2[K2]: explain the concepts of preparation, characterization and properties of nano-materials

CO3[K3]: report the physical and chemical parameters of nano-materials

CO4[K4]: examine the importance of nano-materials

CO5[K4]: analyze the scientific perspective of nano-materials

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	1	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K4]	3	2	2	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – SYNTHESIS OF NANO-STRUCTURE MATERIALS (12 hrs)

Introduction – Top-Down and Bottom-Up Fabrication Methods – Photolithography – Ball Milling – Inert Gas Condensation – Physical Vapour Deposition – Arc Discharge Method – Thermal Evaporation – E-beam Evaporation – Pulsed Laser Deposition – Homogeneous Nucleation – Chemical Vapour Deposition – Molecular Beam Epitaxy – Sol-Gel Method – Electro-Deposition – Spray Pyrolysis – Hydrothermal Synthesis – Microwave Method – Challenges in Fabrication.

UNIT II – NANO-SCALE CHARACTERIZATION (12 hrs)

Introduction – Scanning Electron Microscope – Construction and Working – Characterization Mechanism – Advantages and Disadvantages – Transmission Electron Microscope – Construction and Working – Characterization Mechanism – Scanning Tunneling Microscope – Construction and Working – Operational Modes – Atomic Force Microscope – Construction and Working – Operational Modes – Atomic Force Microscope Probes – X-Ray Diffraction.

UNIT III – PROPERTIES OF NANOPARTICLES (12 hrs)

Introduction – Metal Nanoclusters – Magic Numbers – Theoretical Modeling of Nanoparticles – Geometric Structure – Electronic Structure – Reactivity – Fluctuations – Magnetic Clusters – Bulk To Nanotransition – Semiconducting Nanoparticles – Optical Properties – Photo Fragmentation – Coulombic Explosion – Magnetic Nanoparticles – Permanent Magnetic Material – Theoretical Background – Super Paramagnetism.

UNIT IV – QUANTUM WELLS, WIRES AND DOTS (12 hrs)

Introduction – Super Lattice – Preparation of Quantum Nanostructures – Quantum Well Laser – Quantum Cascade Laser – Quantum Wire – Quantum Dot – Application of Quantum Dots – Coulomb Blockade – Single Electron Tunneling – Infrared Detectors – Quantum Dot Lasers – Quantum Cellular Automata.

UNIT V – CARBON NANOSTRUCTURES (12 hrs)

Introduction – Carbon – The Versatile Element in the Nano World – Graphite – Graphite Oxide – Diamond – Fullerenes – Graphene – Carbon Nano Tubes – Structure and Types Of Carbon Nano Tubes – Properties of CNTs – Growth Of CNTs – CVD Method – Arc Discharge and Laser Ablation Methods – Applications of CNT – Field Emission and Shielding – Computers – Fuel Cells – Chemical Sensors – Catalysis.

TEXTBOOKS

1. Shah M.A and Shah K.A. *Nanotechnology-The science of small.* New Delhi: Wiley India Pvt. Ltd., First Edition, 2013 **(UNITS I, II and IV)**.

2. Charles P.Poole and Frank J.Owens. *Introduction to Nanotechnology.* New Delhi: Wiley India Pvt. Ltd., Reprint 2009 **(UNITS III and IV)**.

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1. Pradeep T. *Nano: The Essentials*. New Delhi: Tata Mc.Graw Hill Education Pvt. Ltd., Reprint 2013.
2. Bandyopadhyay A.K. *Nano Materials.* New Delhi: New age Internationals Publishers, Second Edition, Reprint 2012.
3. Michael F.Ashby, Paulo J.Ferreira and Daniel L.Schodek. *Nanomaterials, Nanotechnologies and Design.* New Delhi: Reed Elsevier India Pvt. Ltd., Reprint 2013.

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1. https://www.japsonline.com/admin/php/uploads/159_pdf.pdf
2. https://nanobiotec.iqm.unicamp.br/download/preparation%20nanoparticles-chapter%205.pdf
3. https://juniperpublishers.com/omcij/pdf/OMCIJ.MS.ID.555705.pdf
4. https://www.youtube.com/watch?v=8YflxVwm6cE

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - VI
MAJOR ELECTIVE COURSE - III: MICROPROCESSOR FUNDAMENTALS
(21UPHO62)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course introduces the learners to the basic concepts of microprocessor (Intel 8085), programming instructions, usage of interrupts and interfacing devices.

Course Outcomes (CO)

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

CO1[K1]: describe the basic principles of microprocessor architecture, instructions and interfacing devices

CO2[K2]: explain the concepts of assembly language programs, interrupts and interfacing of microprocessor (Intel 8085)

CO3[K3]: write simple programs using instruction set and interface a microprocessor to an I/O device

CO4[K4]: analyze architecture of 8085, assembly language program and apply it to other practical situations

CO5[K4]: examine the importance of an assembly language program and interfacing of 8085

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	1	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K4]	3	2	2	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – INTEL 8085 MICROPROCESSOR ARCHITECTURE (12 hrs)

Introduction – Architecture of 8085 – Arithmetic and Logic Unit – General Purpose Registers – Special Purpose Registers – Instructions Register and Decoder – Timing and Control Unit – Pin Layout and Description of Signals – Address and Data Buses – Control and Status Signals – Externally Initiated Signals – Serial I/O Signals – Power Supply and Clock – Microcomputer System Based on 8085 – Opcode Fetch Machine Cycle – Memory Read/Write Machine Cycle – I/O Read/Write Cycle – Timing Diagram for Select Instructions.

UNIT II – INSTRUCTION SET (12 hrs)

Microprocessor Instructions – Classifications of Instructions – Data Transfer Operations – Arithmetic Operations – Logical Operations – Branching Operations – Machine Control Operations – Classifications Based on Length – Addressing Modes in Instructions – Immediate Addressing – Memory Direct Addressing – Register Direct Addressing – Indirect Addressing – Implicit Addressing – Instruction Set of 8085 – Data Transfer Instructions – Arithmetic Instructions – Logical Instructions – Branching Instructions – Machine Control Instructions.

UNIT III – ASSEMBLY LANGUAGE PROGRAMMING OF 8085 (12 hrs)

Assembly Language Programs – Addition of Two 8-bit Numbers – Multiplication of 8-bit Number Repetitive Addition – 8-bit Subtraction – One's Complement of an 8-bit Number – Two's Complement of an 8-bit Number – Shift an 8-bit Number Left by One Bit – Mask Off Least Significant 4 Bits of an 8-bit Number – Mask Off Most Significant 4 Bits of an 8-bit Number – Larger of Two Numbers – 8-bit Multiplication – 8-bit Division – Largest and Smallest Number in a Series.

UNIT IV – DATA TRANSFER AND INTERRUPTS IN 8085 (12 hrs)

Data Transfer Mechanisms – Memory Mapped and I/O Mapped Data Transfer – Programmed Data Transfer – Direct Memory Access – Parallel Data Transfer – Serial Data Transfer – Interrupt Structure – Types of Interrupts – Interrupt Holding Procedure – Software Interrupts – Hardware Interrupts and Priorities – Masking of Interrupts – SIM Instruction – RIM Instruction – Timing of Interrupts – Interfacing of INTR Interrupt with 8085.

UNIT V – INTERFACING DEVICES FOR 8085 (12 hrs)

Intel 8255 Programmable Peripheral Interface – Features of 8255 – Block Diagram of Intel 8255 – Operating Modes and Control Words of 8255 – Programmable Interrupt Controller – Features and Architecture of 8259 – Pin Diagram and Details of 8259 – Initialization of 8259 – Operation of 8259 – Interfacing 8259 with 8055 – 8237 DMA Controller – Features, Pin Details and

Architecture of 8237 – DMA Initialization and Operation – Operation of 8237 with 8085.

TEXTBOOK

1. Senthilkumar N, Saravanan M and Jeevananthan S. *Microprocessors and Microcontrollers.* New Delhi: Oxford University Press, Reprint 2014. **(UNITS I, II, III, IV & V)**

REFERENCES

Books

1. Douglas V.Hall, *Microprocessors and Interfacing: Programming and Hardware*. New Delhi: Tata McGraw-Hill Publishing Company Limited, Second Edition, Reprint 2000.
2. Ram B. *Fundamentals of Microprocessors and Microcomputers*. New Delhi: Dhanpat Rai Publications, Seventh Edition, 2013.
3. Ramesh S.Gaonkar. *Microprocessor Architecture, Programming and Applications with 8085.* Mumbai : Penram International Publishing (India) Pvt. Ltd., Sixth Edition, 2013.

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1. https://www.elprocus.com/8085-microprocessor-architecture/
2. https://www.youtube.com/watch?v=nxryfWg5Hm4
3. https://www.geeksforgeeks.org/data-transfer-instructions-8085-microprocessor/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme – B.Sc. Physics
SEMESTER - VI
ELECTIVE MAJOR COURSE - III: MEDICAL PHYSICS (21UPHO63)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:3**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts and applications of physics in Medical field.

Course Outcomes (CO)

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

CO1[K1]: state the human physiological systems, biopotential transducers, recorders and equipments used in medical field

CO2[K2]: explain the concepts of physics applied in medical instruments

CO3[K3]: apply the physics concepts in biomedical instrumentation

CO4[K4]: examine the results of biopotential recorders and various medical equipments

CO5[K4]: compare the different types of biopotential electrodes, transducers and recorders used in Biomedical instrumentation.

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	3	1	1	-	1	1
CO4 [K4]	3	2	2	1	1	1	1
CO5 [K4]	3	2	2	1	1	1	1
Weightage of the course	15	10	05	05	02	05	03
Weighted percentage of Course contribution to POs	**2.43**	**2.42**	**2.31**	**1.95**	**1.9**	**2.46**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – HUMAN PHYSIOLOGICAL SYSTEM AND BIOPOTENTIAL ELECTRODES (12 hrs)

Cells and Their Nature – Transport of Ions Through Cell Membrane – Resting and Action Potential – Characteristic of Resting Potential – Bio Electric Potentials – Nerve Tissues and Organs. Design of Medical Instrumentation – Components of the Biomedical Instrument System – Electrodes – Half cell Potential – Purpose of the Electrode Paste – Electrode Material – Types of Electrodes – Micro Electrodes – Depth and Needle Electrodes – Surface Electrodes.

UNIT II – BIOPOTENTIAL TRANSDUCERS (12 hrs)

Transducers – Active Transducers – Magnetic Induction Type Transducers – Piezoelectric Type Transducers – Photovoltaic Type Transducers – Thermoelectric Type Transducers – Passive Transducers – Resistive Transducers – Loading Effect and Sensitivity of a Bridge – Strain Gauge – Photo Electric Type Resistive Transducer – Thermistors Type Transducers – Capacitive Transducers – Inductive Transducer – Linear Variable Differential Transducer.

UNIT III – BIOPOTENTIAL RECORDERS (12 hrs)

Characteristics of the Recording System – Electrocardiography (ECG): Origin of Cardiac Action Potential – ECG Lead Configurations – ECG Recording System – Practical Considerations For ECG Recording – Analysis of Recorded ECG Signals – Electroencephalography (EEG) – Origin of EEG – Brain Waves – Recording Setup – Analysis of EEG – Electromyography (EMG) – Recording Setup – Electroretinography (ERG) and Electrooculography (EOG).

UNIT IV – SPECIALISED MEDICAL EQUIPMENT (12 hrs)

Blood Cell Counter – Electron Microscope – Scanning Electron Microscope – Radiation Detectors – Photometers and Colorimeter – Filter Photometer – Spectrophotometer – Flame Photometer – Digital Thermometer – Audiometers - Human Ear – Disorders of Hearing – Pure Tone And Speech Audiometers – X-Ray Machine – Radiography and Fluoroscopy – Applications of X-Ray Examination.

UNIT V – ADVANCES IN BIOMEDICAL INSTRUMENTATION (12 hrs)

Endoscopes – Nuclear Imaging Techniques – Computer Tomography – Applications of Computer Tomography – Ultrasonic Imaging Systems - Construction of an Ultrasonic Transducer – Ultrasonic Propagation Through Tissues – Display – Recording Devices – Ultrasonic Imaging Instrumentation – Applications of Diagnostic Ultrasound – Magnetic Resonance Imaging – Magnetic Resonance Phenomenon – MRI Instrumentation.

TEXTBOOK

1. Arumugam M. *Biomedical Instrumentation*. Kumbakonam: Anuradha Publications, Second Edition, 2010. **(UNITS I, II, III, IV & V)**

REFERENCES

Books

1. Anandanatarajan R. *Biomedical Instrumentation and Measurements*. New Delhi: PHI Learning Pvt. Ltd., 2011.
2. Kandhpur R.S. *Handbook of Biomedical Instrumentation.* New Delhi: Tata McGraw Hill, Second Edition, Reprint 2008.
3. Arumugam N. and Kumaresan V. *Biophysics.* Nagercoil: Saras Publication, First Edition, 2016.

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1. https://www.pdfdrive.com/medical-devices-and-human-engineering-the-biomedical-engineering-handbook-fourth-edition-e165981005.html
2. https://www.pdfdrive.com/biomedical-instrumentation-and-measurements-e186986101.html
3. https://www.pdfdrive.com/biomedical-instrumentation-e54727228.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Physics
SEMESTER - VI
SKILL ENHANCEMENT COURSE - VI: SOLAR PHOTOVOLTAICS (21UPHS61)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:40**
CREDITS	**:2**	**EXT. MARKS**	**:60**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the concepts of solar energy, photo-voltaic, types of solar cells and design of photovoltaic power systems.

Course Outcomes (CO)

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

CO1[K1]: state the basic principles of solar energy, photo-voltaic, and types of solar cells and design of PV systems

CO2[K2]: explain the concepts of solar energy, photo-voltaic, and types of solar cells and design of PV systems

CO3[K3]: present the concepts of solar energy, photo-voltaic, and types of solar cells and design of PV systems

CO4[K4]: examine the importance of solar energy and solar cells.

CO5[K4]: analyse the scientific perspective of solar cells

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	2	-	1	-	1	-
CO3 [K3]	3	1	1	1	-	1	1
CO4 [K4]	3	2	1	1	-	1	1
CO5 [K4]	2	2	2	1	1	-	1
Weightage of the course	14	08	04	05	01	04	03
Weighted percentage of Course contribution to POs	**2.27**	**1.94**	**1.85**	**1.95**	**0.95**	**1.97**	**1.83**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – SOLAR RADIATION ANALYSIS (6 hrs)

The Sun as a Source of Energy – The Earth – Sun and Earth Radiation Spectrums – Extraterrestrial and Terrestrial Radiations – Measurements of Solar Radiation – Solar Radiation Data – Solar Time – Solar Radiation Geometry.

UNIT II – SOLAR PHOTOVOLTAIC SYSTEMS (6 hrs)

Solar Cell Fundamentals – Semiconductors – A pn Junction – Generation of Electron-Hole Pair by Photo Absorption – Photoconduction – Solar Cell Characteristics – I-V Characteristic – Effect of Variation of Insolation and Temperature – Energy Losses and Efficiency – Maximizing the Performances – Cell Size – Energy Payback Period.

UNIT III – SOLAR CELL CLASSIFICATION (6 hrs)

Solar Cell Classification – On the Basis of Thickness of Active Material – On the Basis of Junction Structure – On the Basis of Type of Active Material – Silicon Crystal Silicon Solar Cell – Multicrystalline Silicon Solar Cell – Amorphous Silicon Solar Cell – Ga-As Cell – Copper Indium Diselenide Cell – Cadmium Telluride Cell.

UNIT IV – DESIGN OF PV SYSTEMS (6 hrs)

Solar Cell – Solar PV Module – Cell Mismatch in a Module – Effect of Shadowing – Solar PV Panel – Solar PV Array – Maximizing the Solar PV Output and Load Matching – Maximum Power Point Tracker – Balance of System Components.

UNIT V – SOLAR PV SYSTEMS AND APPLICATIONS (6 hrs)

Classification – Stand Alone Solar PV System – Grid –Interactive Solar PV System – Hybrid Solar PV System – Solar PV Applications – Grid-Interactive PV Power Generation – Water Pumping – Lighting – Medical Refrigeration – Village Power – Telecommunication and Signaling.

Hands on Training:

1. Measure the Voltage and Current of a Given Solar Cells
2. Perform the Parallel and Series Circuit Design using Solar Cells
3. Power a Small Light Bulb using Solar Cells
4. Calculate the Power Output and Efficiency of a Solar Arrays
5. Observe the Voltage, Current and Power Output of a Solar Cell When It Is Placed at Different Heights
6. Observe the Voltage, Current and Power Output of a Solar Cell When It Is Placed in an Environment Like Cloudy Day/Dust Accumulation/ Dark Room/ Snow Covered.

TEXTBOOK

1. Khan B.H. *Non-Conventional Energy Resources.* New Delhi: McGraw Hill Education (India) Pvt. Ltd., Second Edition, Reprint 2014. (**UNITS I, II, III, IV & V**).

REFERENCES

Books

1. Chenming Hu and Richard M.White. *Solar Cells from Basic to Advanced Systems*. USA: McGraw-Hill Book Company, 1983.
2. Klaus Jäger, Olindo Isabella, Arno H.M. Smets, René A.C.M.M. Van Swaaij, and Miro Zeman. *Solar Energy Fundamentals, Technology and Systems*. Delft University of Technology, 2014.
3. Zekaisen. *Solar Energy Fundamentals and Modeling Techniques*. Springer-Verlag London Ltd., 2008.

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1. https://www.nrel.gov/docs/legosti/old/16319.pdf
2. https://www.pveducation.org/pvcdrom/solar-cell-operation/solar-cell-structure
3. https://www.youtube.com/watch?v=5bRt_LxKwpg

Courses Offered to Other Departments

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Maths/Chemistry
SEMESTER - I/III
ALLIED COURSE - I/III: PHYSICS - I (21UMAA11/21UCHA31)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts of strength of materials, viscous properties of liquids, modes of heat transmission, geometrical and physical optics.

Course Outcomes (CO)

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

CO1[K1]: outline the basic concepts of properties of matter, heat transmission, geometrical and physical optics

CO2[K2]: explain the basic concepts of properties of matter, heat transmission, geometrical and physical optics

CO3[K3]: choose appropriate formulae to solve problems

CO4[K4]: analyze the physical and optical parameters of materials

CO5[K4]: examine the physical and optical parameters of materials

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	1	-	2	-	1	-
CO3 [K3]	3	3	1	1	-	1	1
CO4 [K4]	2	3	2	1	-	1	1
CO5 [K4]	2	3	2	1	1	1	1
Weightage of the course	13	11	05	06	01	05	03
Weighted percentage of Course contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – ELASTICITY **(12 hrs)**

Elasticity – Different Moduli of Elasticity – Torsion of a Body – Work Done in Twisting a Wire – Torsional Oscillations of a Body – Rigidity Modulus by Dynamic Torsion Method (Torsional Pendulum) – Bending of Beams – Expression for Bending Moment – Depression at the Mid-Point of a Beam Loaded at the Middle – Uniform Bending of a Beam – Determination of Young's Modulus.

UNIT II – VISCOSITY **(12 hrs)**

Viscosity – Streamline Flow and Turbulent Flow – Poiseuille's Formula for the Flow of a Liquid Through a Capillary Tube – Poiseuille's Method for Determination of Coefficient of Viscosity of a Liquid (Constant and Variable Pressure Head) – Ostwald Viscometer – Terminal Velocity and Stoke's Formula – Stoke's Method for the Coefficient of Viscosity – Friction and Lubrication.

UNIT III – TRANSMISSION OF HEAT **(12 hrs)**

Conduction – Coefficient of Thermal Conductivity – Forbe's Method – Lee's Disc Method for Bad Conductors – Convection – Central Heating System – Thermopile – Thermos Flask – Radiation – Black Body in Practice – Kirchhoff's Law – Stefan-Boltzmann Law – Distribution Energy in Black Body Spectrum – Planck's Radiation Law (No Derivation) – Solar Constant – Temperature of the Sun – Water Flow Pyroheliometer.

UNIT IV – GEOMENTRICAL OPTICS **(12 hrs)**

Cardinal Points of an Optical System – Graphical Construction of Image using Cardinal Points – Newton's Formula – Cardinal Points of a Coaxial System of Two Thin Lenses. Angular and Chromatic Dispersion of a Prism – Achromatic Combination of Prism – Deviation without Dispersion – Dispersion without Deviation – Direct Vision Spectroscope – Aberration – Spherical and Chromatic Aberrations in Lenses.

UNIT V – PHYSICAL OPTICS **(12 hrs)**

Interference in a Wedge-Shaped Film – Air Wedge – Newton's Rings – Theory and Experiment. Types of Polarization – Double Refraction – Nicol Prism – Optical Activity – Biot's Laws for Rotatory Polarisation – Specific Rotation – Laurent's Half Shade Polarimeter – Determination of Specific Rotation of Sugar Solution. Resolving Power – Rayleigh's Criterion for Resolution – Limit of Resolution of the Eye – Resolving Power of a Microscope.

TEXTBOOKS

1. Murugesan R. *Properties of Matter*. New Delhi: S.Chand & Co., Fifth Eidtion, 2020. **(UNITS I & II)**

2. Brij lal, Subramanyam N and Hemne P.S. *Heat Thermodynamics and Statistical Physics*. New Delhi: S.Chand & Company Ltd., Revised Edition, Reprint 2020. **(UNIT III)**
3. Subraminyam N, Brij lal and Avadhanulu M.N. *A Textbook of Optics.* New Delhi: S.Chand & Company Ltd., Twenty Fifth Revised Edition, Reprint 2018. **(UNITS IV & V)**

REFERENCES

Books

1. Mathur D.S. *Elements of Properties of Matter*. New Delhi: Chand & Company Ltd., Revised Edition, 2007.
2. Mathur D.S and Bapat M.N. *Heat and Thermodynamics*. New Delhi: Sultan Chand & Sons, Fifth Edition, Reprint 2014.
3. Kakani S.L, and Bhandari K.C. *A Textbook of Optics.* New Delhi: Sultan Chand & Sons, Second Edition, Reprint 2015.

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2. https://www.pdfdrive.com/general-properties-of-matter-e157569735.html
3. https://www.pdfdrive.com/heat-and-themodynamics-by-mark-waldo-zemanskyrichard-dittman-d37736570.html
4. https://www.youtube.com/watch?v=wTEIYtivVhM
5. https://www.youtube.com/watch?v=6_C8KyU67RU

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Maths/Chemistry
SEMESTER - I/III
ALLIED COURSE - I/III: PRACTICAL: PHYSICS - I (21UMAA1P/21UCHA3P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:50**
CREDIT	**:1**	**EXT. MARKS**	**:50**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to determine material's specific physical parameters and study the behaviour of electrical circuits by applying physics concepts.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of physics underlying in the experiments
CO2[K2]: demonstrate the concepts of physics underlying in the experiments
CO3[K3]: calculate the physical parameters of a matter/electrical circuits from the experimental data
CO4[K4]: analyze the experimental results
CO5[K5]: evaluate the physical parameters of a matter/electrical circuits

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	2	-	-	-	1	-
CO2 [K2]	2	2	1	1	-	2	-
CO3 [K3]	2	2	1	1	1	1	1
CO4 [K4]	2	2	2	1	1	1	1
CO5 [K5]	2	3	1	1	1	1	1
Weightage of the course	10	11	05	04	03	06	03
Weighted percentage of Course contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

LIST OF EXPERIMENTS (ANY 8**):**

1. Determination of Young's Modulus of Elasticity of Material of the Beam by Uniform Bending Method using Pin and Microscope
2. Determination of Young's Modulus of Elasticity of Material of the Beam by Non-Uniform Bending Method using Optic Lever
3. Determination of Rigidity Modulus of the Material of Wire by Torsional Oscillations Method
4. Determination of Co-efficient of Viscosity of Water by Capillary Flow Method
5. Determination of Acceleration due to Gravity 'g' and Radius of Gyration of a Compound Bar Pendulum about Its Center of Gravity
6. Determination of Co-efficient of Thermal Conductivity of a Bad Conductor by Lee's Disc Method
7. Determination of Specific Heat of a Liquid by Newton's Law of Cooling Method
8. Determination of Specific Heat Capacity of Solid by the Method of Mixtures
9. Determination of Diameter of a Thin Wire by Air Wedge Arrangement
10. Determination of Refractive Index of Material of a Prism by Minimum Deviation Method
11. Studying the Characteristics of LCR – Series Resonance Circuit and Finding Associated Parameters
12. Calibration of Low Range Voltmeter using Potentiometer

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi: Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai: Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I.* Chennai: S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.

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1. Arora C.L. *B Sc Practical Physics.* New Delhi: S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi: Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi: Vayu Education of India, First Edition, 2011.

4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

Web Sources

1. http://arunkumard.yolasite.com/resources/3%20Young's%20Modulus%20Uniform%20Bending.pdf
2. http://www.egyankosh.ac.in/bitstream/123456789/18814/1/Experiment-5.pdf
3. http://www.iiserpune.ac.in/~bhasbapat/phy221_files/Lee's%20Method.pdf

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG Programme –B.Sc. Maths/Chemistry
SEMESTER - II/IV
ALLIED COURSE - II/IV: PHYSICS - II (21UMAA21/21UCHA41)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:4**	**INT. MARKS**	**:40**
CREDITS	**:4**	**EXT. MARKS**	**:60**
DURATION	**:60 hrs**	**MAX. MARKS**	**:100**

Preamble

This course familiarizes the learners with the basic concepts of special theory of relativity, structure of atoms, crystal structures of solids, analog and digital electronics.

Course Outcomes (CO)

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

CO1[K1]: outline the basic concepts of relativity, atomic and crystal physics, analog and digital electronics

CO2[K2]: explain the basic concepts of relativity, atomic and crystal physics, analog and digital electronics

CO3[K3]: choose appropriate formulae to solve problems

CO4[K4]: analyze the applicability of special theory of relativity, physical parameters of atoms, crystals, and behavior of electronic circuits

CO5[K4]: inspect the applicability of special theory of relativity, physical parameters of atoms, crystals, and behavior of electronic circuits

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	1	-	1	-	1	-
CO2 [K2]	3	1	-	2	-	1	-
CO3 [K3]	3	3	1	1	-	1	1
CO4 [K4]	2	3	2	1	-	1	1
CO5 [K4]	2	3	2	1	1	1	1
Weightage of the course	13	11	05	06	01	05	03
Weighted percentage of Course contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I – SPECIAL THEORY OF RELATIVITY (12 hrs)

Theory of Relativity - Frame of Reference – Inertial Frames – Non Inertial Frames – Galilean Transformation Equations – Michelson Morley Experiment. Einstein's Special Theory of Relativity – Lorentz Transformations – Lorentz-Fitzgerald Contraction – Time Dilation – Variation of Mass with Velocity – Mass-Energy Equivalence.

UNIT II – ATOMIC PHYSICS (12 hrs)

Bohr Atom Model – Drawbacks of Bohr Atom Model – Sommerfeld's Relativistic Atom Model – Stern and Gerlach Experiment – Space Quantization - The Vector Atom Model – Quantum numbers Associated with the Vector Atom Models – Pauli Exclusion Principle – The Periodic Elements – Electron Configurations.

UNIT III – CRYSTAL PHYSICS (12 hrs)

Introduction – Different Features of the Crystals – Bravais Lattice – Seven Crystal Systems – Cubic Crystal Structures (SC, BCC, FCC, diamond, ZnS & NaCl structures) – Miller Indices – Distances of Separation between Successive Planes – Diffraction of X-rays by Crystal Planes – X-ray Diffraction Methods – Laue Method – Debye-Scherrer Method – Rotating Crystal Method.

UNIT IV – ANALOG ELECTORNICS (12 hrs)

PN Junction Diode Rectifier – Ripple Factor – Capacitor Filter, Choke Input Filter and Π Section Filter – Voltage Stabilization – Zener Diode – Zener Diode as Voltage Stabilizer – Solving Zener Diode Circuits –Transistors – Characteristics of CE Mode Connection – Faithful Amplification – Transistor Biasing – Stabilization – Voltage Divider Bias – Single Stage Amplifier.

UNIT V – DIGITAL ELECTRONICS (12 hrs)

Number System – Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexa Decimal Numbers – Logic Gates – NOT, OR, AND (Realization Using Diode and Transistor) – NOR & NAND as Universal Gates – Boolean Laws and Theorems – Binary Addition – Arithmetic Building Blocks – Half Adder – Full Adder.

TEXTBOOKS

1. Murugeshan R and Kiruthiga Sivaprasath. *Modern Physics.* New Delhi: S.Chand & Company Ltd., Eighteenth Edition, Reprint 2019. **(UNITS I, II & III)**
2. Mehta V.K and Rohit Mehta. *Principles of Electronics.* New Delhi: S.Chand & Company Ltd., Revised Eleventh Edition, Reprint 2013. **(UNIT IV)**

3. Albert P.Malvino, Donald P.Leach and Goutam Saha. *Digital Principles and Applications.* Chennai: Tata McGraw Hill Education (India) Pvt. Ltd., Eighth Edition, Reprint 2017. **(UNIT V)**

REFERENCES

Books

1. Arthur Beiser. *Concepts of Modern Physics.* New Delhi: Tata McGraw-Hill Publication, Sixth Edition, Reprint 2006.
2. Albert Malvino and David J.Bates. *Electronic Principles*. Chennai: McGraw Hill Education (India) Pvt. Ltd., Seventh Edition, Reprint 2018.
3. Thomas L.Floyd. *Digital Fundamentals.* New Delhi: Pearson Education (Singapore) Pvt. Ltd., Seventh Edition, Reprint 2002.

Web Sources

1. https://www.pdfdrive.com/digital-principles-application-by-malvino-e34313541.html
2. https://www.pdfdrive.com/electronic-principles-e51577263.html
3. https://www.pdfdrive.com/fundamentals-of-physics-textbook-e33735280.html
4. https://www.pdfdrive.com/materials-science-and-engineering-a-first-course-d187628834.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF PHYSICS
UG PROGRAMME –B.Sc. Maths/Chemistry
SEMESTER - II/IV
ALLIED COURSE - II/IV: PRACTICAL: PHYSICS - II (21UMAA2P/21UCHA4P)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**:2**	**INT. MARKS**	**:50**
CREDIT	**:1**	**EXT. MARKS**	**:50**
DURATION	**:30 hrs**	**MAX. MARKS**	**:100**

Preamble

This course enables the learners to acquire practical skill to determine material's specific physical parameters and study the behaviour of electronic circuits by applying physics concepts.

Course Outcomes (CO)

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

CO1[K1]: identify the concepts of physics underlying in the experiments
CO2[K2]: demonstrate the concepts of physics underlying in the experiments
CO3[K3]: calculate the physical parameters of a matter/electronic circuits from the experimental data
CO4[K4]: analyze the experimental results
CO5[K5]: evaluate the physical parameters of a matter/electronic circuits

CO-PO Mapping table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	2	-	-	-	1	-
CO2 [K2]	2	2	1	1	-	2	-
CO3 [K3]	2	2	1	1	1	1	1
CO4 [K4]	2	2	2	1	1	1	1
CO5 [K5]	2	3	1	1	1	1	1
Weightage of the course	10	11	05	04	03	06	03
Weighted percentage of Course contribution to POs							

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

LIST OF EXPERIMENTS (any 8**):**

1. Comparison of Viscosities of Two Liquids using Ostwald Viscometer
2. Determination of Dispersive Power of the Material of the Prism of a Prism using Spectrometer
3. Determination of Wavelength of Monochromatic Source by Forming Newton's Rings
4. Determination of the Wavelengths of Prominent Spectral Lines of Mercury Spectrum by Grating Normal Incidence Method
5. Study of Characteristics of a Zener Diode
6. Study of Characteristics of a Transistor under C.E. Mode
7. Construction of Logic Gates (AND, OR, NOT, NAND, NOR) using Discrete Components
8. Verification of Universality of NAND and NOR Gates using IC 7400 and IC 7402 respectively
9. Implementation of Half Adder and Full adder Circuits using Logic Gates
10. Determination of Charge of an Electron using Copper Voltammeter.
11. Determination of Resistance and Specific Resistance of a given coil using Carey-Foster's Bridge
12. Calibration of High Range Voltmeter using Potentiometer

TEXTBOOKS

1. Srinivasan M.N, Balasubramanian S and Ranganathan R. *A Textbook of Practical Physics.* New Delhi: Sultan Chand & Sons, First Edition, Reprint 2011.
2. Ouseph C.C, Rao U.J and Vijayendran V. *Practical Physics and Electronics*. Chennai: Ananda Book Depot, First Edition, Reprint 2019.
3. Ouseph C.C, Srinivasan V and Balakrishnan R. *A Textbook of Practical Physics - Part I & II.* Chennai: S.Viswanathan (Printers & Publishers) Pvt., Ltd., Revised Edition, Reprint 2000.
4. Virendra Kumar. *Digital Electronics: Theory and Experiments*. New Delhi: New Age International (P) Ltd., Second Edition, 2015.

REFERENCES

Books

1. Arora C.L. *B Sc Practical Physics.* New Delhi: S.Chand & Sons Co. Ltd., Reprint 2018.
2. Kakani S.L and Shubhra K. *Applied Physics: Theory and Practical*. New Delhi: Viva Books Pvt. Ltd., First Edition, 2015.
3. Manjeet S and Anita D. *Applied Physics: Theory and Experiment*. New Delhi: Vayu Education of India, First Edition, 2011.
4. Tayal D.C. *University Practical Physics*. Mumbai: Himalaya Publishing House, First Millennium Edition, 2000.

Web Sources

1. https://www.youtube.com/watch?v=fWhgguWc8rk
2. https://www.youtube.com/watch?v=wkdz1T-ywVk
3. https://www.youtube.com/watch?v=BxbXnYFqygU&t=311s
4. https://www.youtube.com/watch?v=YslaWEpTDWk
5. https://www.youtube.com/watch?v=aXFNoYa95-8