MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous College)

Affiliated to Periyar University, Salem | Accredited by **NAAC** with '**A**' Grade

Recognized by **UGC** under Section 2(f) & 12 (B)

ESTD-1994

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

A UNIT OF VANETRA GROUP

Learn. Lead

DEGREE OF BACHELOR OF SCIENCE

Learning Outcomes - Based Curriculum Framework

- Choice Based Credit System

Syllabus for B.Sc.,Physics

(Semester Pattern)

(For Candidates admitted from the academic year 2023-2024 and onwards)

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous) A UNIT OF VANETRA GROUP | Learn. | Lead

Regulation and Syllabus for

B.Sc., Physics

(With effect from the Academic Year 2023-24

Vision:

To redefine the scope of higher education by infusing into each of our pursuits, initiatives that will encourage intellectual, emotional, social and spiritual growth, thereby nurturing a generation of committed, Knowledgeable and socially responsible citizens.

Mission:

*To Ensure State of the world learning experience

*To Espouse value based Education

*To Empower rural education

*To Instill the sprite of entrepreneurship and enterprise

*To create a resource pool of socially responsible world citizens

QUALITY POLICY

To Seek – To Strive – To Achieve greater heights in Arts and Science, Engineering, Technological and Management Education without compromising on the Quality of Education.

DEPARTMENT OF PHYSICS

Vision:

- To provide a transformative learning and research ambiance with the inclusion of all the weaker sections of society to create leaders and innovators tied with holistic values to generate new knowledge and to serve the globe.

Mission:

- Periodical course revision to assimilate with the current state of fields in physics learningand research with modern gadgets.
- Individuals apparatus to enhance experimental skills with well-equipped special laboratoriesand workshop assistance are provided for the different programmes.
- Platform to inculcate and nurture creativity through eminent scholarly lectures, sharing of resources at interdepartmental level, numerous activities of various clubs, MoU for interaction with leading research institutions, inbuilt incubation centre etc.
- For integral formation, assistance and guidance to individual students, faculty members are assigned as mentors for the programme of stay.

PREAMBLE

Physics is the branch of science dealing with matter and energy to comprehend the laws of nature which attempts to explain the way nature works. At post graduatelevel in our college, it assimilates basics for a deeper understanding of nature and enable students to follow the latest developments not only in basic science but also in areas of advanced technology. It comprehends, theoretical as well as practical knowledge about the principles behind every physical process.

The curriculum for B.Sc. degree in Physics based on the Learning Outcome based Curriculum Framework (LOCF) model covers a fascinating range of fundamental topics like Mechanics, Electricity and Magnetism, Quantum Mechanics, Materials Science, Solid State Physics, Mathematical Physics and Electronics. It encapsulates interdisciplinary branches by incorporating Energy Physics, Astrophysics and Geophysics as Major Elective subjects of significance. The learning outcomes of the subject are intended to provide a deeper understanding of the principles of Physics combined with developing the required practical skills for engaging in the exploration of avenues related to Physics. The curriculum, teaching methodology and assessment methods are assigned with suitable cognitive levels as per the revised BLOOM's Taxonomy. The Outcome Based Education (OBE) methods will evaluate theexpected course outcome attainment.

The LOCF curriculum for B.Sc. Physics is all about understanding physical systems and developing creative ability to produce highly motivated young scientific minds. It is designed to cater to the student's needs in view of launching their career in diverse fields. As the curriculum framed is based on the syllabus of the National level entrance examinations like Joint Admission Test for Masters (JAM) and Joint Entrance Screening Test (JEST), it will support the students to compete in competitive examinations for their post- graduation studies. The students are expected to learn the courses with passion and enjoy learning the science. They can enrich their knowledge in the field of their choice by taking up Self-Study Papers. This program gives the provision to the students to undergo an internship program during the course of the study. Students in turn can earn academic credits for the industry linked internship program. The department endeavors to impart an understanding of basic concepts of Physics and its relevance in modern technological advances by way of skills acquisition, innovation and entrepreneurship required for buildingtheir career in the appropriate fields of interest.

PROGRAMME LEARNING OUTCOME

NATURE AND EXTENT OF THE PROGRAMME

B.Sc. in Physics is a three-year undergraduate program comprising of theory and experimental courses mainly from Physics and few interdisciplinary courses from Mathematics, Chemistry and Computer Science.

The program emphasises on the fundamentals of Physics while introducing modern concepts such as Quantum Mechanics and Relativity proceeding over to Classical Mechanics Electrodynamics taking forward the courses like Electricity and Magnetism Optics and Waves similarly Statistical Mechanics and Thermodynamics.

The mission of the programme is to lay a strong foundation in classical and modern physics. Through the course curriculum and the opportunities to conduct individual research and field trips the students get holistic all-round development. They will also gain expertise in lab work through ample practical sessions training them at conception design and fabrication of laboratory equipment.

The undergraduate degree programme paves a solid ground for students to further acquire mastery in physics concentration areas. The programme trains graduate to establish entry-level careers in the government and private sectors.

AIM OF THE PROGRAMME

The aim of physics is to understand how the universe behaves at its most fundamental levels. It seeks to uncover the fundamental principles and laws that govern the natural world, from the smallest particles to the largest galaxies. Physics also aims to describe and predict the interactions of matter and energy through mathematical models and experiments. Ultimately, the goal is to provide a coherent and comprehensive understanding of the physical universe and its phenomena.

GRADUATE ATTRIBUTES

The graduate attributes for a Bachelor of Science (B. Sc) in Physics are similar to those found in many science and engineering disciplines but tailored specifically to the field of physics. These attributes reflect the knowledge, skills, and qualities that students are expected to develop by the time they complete their undergraduate studies. Here are some key graduate attributes for a B. Sc in Physics:

GA 1 Analytical Reasoning

GA 2 Critical Thinking

GA 3 Problem Solving Skills

GA 4 Communication Skills

GA 5 Leadership Quality

GA 6 Team work

GA 7 Lifelong Learning

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1: Graduates will be able to promote learning environment to meet the industry expectation

PEO2: Graduates will be incorporated the critical thinking with Good Communication and Leadership skills to become a self-employed

PEO3: Graduates will be uphold the human values and environmental sustenance for the betterment of the society.

PROGRAMME OUTCOMES (POs)

PO1: Graduates will acquire dynamic skills through proper perception of the course Objectives that leads to scientific and analytical comprehension of the concepts.

PO2: Graduates will focus on sustainable goals that might bring about spherical developments

PO3: Graduates will infuse a spirit converging on bricking a team work, interpersonal and administrative skills to think critically and execute effectively

PO4: Graduates will apply reasoning appropriately to scale the humps in learning and solute them to the core.

PO5: Graduates will engage the skills obtained in independent and collaborative learning as a perennial process.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Gained knowledge about properties of different matter and its application for developing technology to the problems related to the society.

PSO2: Analysed the applications to the problems in Physics through experimental and theoretical means.

PSO3: Developed practical knowledge behind the theory papers through laboratory experiments.

PSO4: Acquired the ability to design knowledge and demonstrate their understanding of the scientific methods and processes.

PSO5: Apply appropriate techniques and modern tools to complex scientific activities, and develop skills in communicating Physics-related topics by learning beyond syllabus.

REGULATIONS (2023-2024)

1. DURATION OF THE PROGRAME

1.1. Three years (six semesters)

1.2. Each academic year shall be divided into two semesters. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to May of each year.

1.3. There shall be not less than 90 working days for each semester.

2.ELIGIBILITY FOR ADMISSION

2.1. Candidate for admission to the first year of B.Sc. Degree Course in Microbiology shall be required to have passed the Higher Secondary Examination with Biological Sciences (Botany/Zoology, Biology) Academic/Vocational Stream-Agri, Home Science, and Poultry as per norms set by the Government of Tamilnadu or an Examination Accepted as equivalent thereto by the syndicate.

3. CREDIT REQUIRMENTS AND ELIGIBILITY FOR AWARD OF DEGREE

3.1. A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years and passed the examinations of all the Six Semesters prescribed earning a minimum of 140 credits as per the distribution given in Regulation for Part I, II, III, IV & V and also fulfilled such other conditions as have been prescribed thereof.

4. COURSE OF STUDY, CREDITS AND SCHEME OF EXAMINATION

4.1. The Course Components and Credit Distribution shall consist of the following:

(Minimum Number of Credits to be obtained)

Part Wise Distribution	Study Components	Credit Distribution
PART I	Tamil or Other Languages	12
PART II	English	12
PART III	Core, Allied, Elective and Project Courses	91
PART IV	i. Basic Tamil/ Advanced Tamil/ NME	04
	ii. Soft Skill Courses / SBEC	10
	iii. Environmental Studies	02
	iv. Value Education	02
	v. Internship	02
	vi. Foundation Course	02
	vii. Professional Competency Skills	02
PARTV	Extension Activity	01
Total Credits		140

4.2 DETAILS OF COURSE OF STUDY OF PARTS I - V

4.2.1 PART I: Tamil and Other Languages Hindi or French at the option of candidates and according to the syllabus and text-books prescribed from time to time:

4.2.2 PART II: English: According to the syllabus and text-books prescribed from time to time

4.2.3 PART III: Core, Allied Project and Elective Courses: As prescribed by the concerned Board of Studies

4.2.4 PART IV:

i. Basic Tamil / Advanced Tamil/NME:

a. Students who have not studied Tamil up to XII STD and have taken any Language other than Tamil in Part I shall take Basic Tamil comprising of Two Courses (level will be at 6th Standard).
b. Students who have studied Tamil up to XII STD and have taken any Language other than Tamil in Part – I shall take Advanced Tamil comprising of Two Courses.
c. Students who have studied Tamil up to XII STD and also have taken Tamil in Part – I shall take Non-Major Elective comprising of Two Courses.

i. Soft Skill Courses/SBEC
ii. Environmental Studies
iii. Value Education
iv. Internship
v. Foundation Course
vi. Professional Competency Skills(Online)

4.2.5 PART V: Extension Activity:

Students shall be awarded a maximum of 1 Credit for Compulsory Extension Service. All the Students shall have to enroll for NSS /NCC/ NSO (Sports & Games) Retract / Youth Red Cross or any other Service Organizations in the College and shall have to put in compulsory minimum attendance of 40 hours which shall be duly certified by the Principal of the College before 31st March in a year. If a student lacks 40 hours attendance in the first year, he or she shall have to compensate the same during the subsequent years.

Those students who complete minimum attendance of 40 hours in one year will get 'half-a- credit and those who complete the attendance of 80 or more hours in Two Years will get 'one credit'. Literacy and Population Education and Field Work shall be compulsory components in the above extension service activities.

4.3. Inclusion of the Massive Open Online Courses (MOOCs)available on SWAYAM and NPTEL

4.3.1 Students can choose the MOOC Course Available on SWAYAM and NPTEL under Core, Elective or Soft skill category. He/ she will be awarded degree only after producing valid certificate of the MOOC course for credit Mobility

5. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER

5.1 Eligibility: Students shall be eligible to go to subsequent semester only if they earn sufficient attendance as prescribed by the Periyar University.

5.2. Attendance: All Students must earn 75% and above of attendance for appearing for the End Semester Examination.(Theory/Practical)

5.3. Condonation of shortage of attendance: If a Student fails to earn the minimum attendance (Percentage stipulated), the Principals shall condone the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) after collecting the prescribed fee for Theory/Practical examination separately, towards the condonation of shortage of attendance. Such fees collected and should be remitted to the University.

5.4. Non-eligibility for condonation of shortage of attendance: Students who have secured less than 65% but more than 50% of attendance are NOT ELIGIBLE for condonation of shortage of attendance and such Students will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year/next semester of the program and they may be permitted to take next University examination by paying the prescribed condonation fee

5.5. Detained students for want of attendance: Students who have earned less than 50% of attendance shall not be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the College from time to time.

5.6. Condonation of shortage of attendance for married women students: In respect of married women students undergoing UG programs, the minimum attendance for condonation (Theory/Practical) shall be relaxed and prescribed as 55% instead of 65% if they conceive during their academic career. Medical certificate from the Doctor (D.G.O) from the Government Hospital and the prescribed fee along with attendance details shall be forwarded to the college to consider the condonation of

attendance mentioning the category

5.7. Zero Percent (0%) Attendance: The Students, who have earned 0% of attendance, have to repeat the program (by rejoining) without proceeding to succeeding semester and they have to obtain prior permission from the College/University immediately to rejoin the program.

5.8 Transfer of Students and Credits: The strength of the credits system is that it permits inter Institutional transfer of students. By providing mobility, it enables individual students to develop their capabilities fully by permitting them to move from one Institution to another in accordance with their aptitude and abilities by obtaining necessary permission from the university.

5.8.1 Transfer of Students is permitted from one Institution to another Institution for the same program with same nomenclature.

Provided, there is a vacancy in the respective program of Study in the Institution where the transfer is requested.

Provided the Student should have passed all the courses in the Institution from where the transfer is requested.

5.8.2 The marks obtained in the courses will be converted and grades will be assigned as per the College norms.

5.8.3 The transfer students are eligible for classification.

5.8.4 The transfer students are not eligible for Ranking, Prizes and Medals.

5.8.5 Students who want to go to foreign Universities up to two semesters or Project Work with the prior approval of the Departmental/College Committee are allowed to get transfer of credits and marks which will be converted in to Grades as per the University norms and are eligible to get CGPA and Classification; they are not eligible for Ranking, Prizes and Medals.

5.9 Students are exempted from attendance requirements for online courses of the College and MOOC's.

6. EXAMINATION AND EVALUATION

6.1. Register for all subjects: Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.

6.2. Marks for Internal and End Semester Examinations for PART I, II, III, and IV

Category	Theory	Practical
Internal Assessment	25	**40**
End semester Examination	**75**	**60**

6.3. Procedure for Awarding Internal Marks

Internal Examination Marks – Theory

Components	Marks
CIA I&II	**15**
Attendance	**5**
Assignment/Quiz	**5**
Total	**25**

6.4 Awarding Marks for Attendance (out of 5)

Percentage of Attendance	Marks
Below 60%	0 marks
60% to 75%	3 marks
75% to 90%	4 marks
Above 90%	5 marks

6.5 Components for Practical CIA.

Components	Marks
CIA -I	**15**
CIA - II	**15**
Observation Note	**05**
Attendance	**5**
Total	**40**

6.6 Components for Practical ESE.

Components	Marks
Completion of Experiments	**50**
Record	**05**
Viva voce	**05**
Total	**60**

6.7 Guidelines for Value Education Yoga and Environmental Studies (Part IV)

6.7.1. The Course Value Education Yoga is to be treated as 100% CIA course which is offered in V Semester for I year UG students.

6.7.2. The Course Environmental Studies is to be treated as 100% CIA course which is offered in IV Semester for I year UG students.

6.7.3 Total Marks for the Course = 100

Components	Marks
Two Tests(2 x30)	**60**
Field visit and report (10+10)	**20**
Two assignments (2 x10)	**20**
Total	**100**

The passing minimum for this course is 40%

6.7.3 In case, the candidate fails to secure 40% passing minimum, he/she may have to reappear for the same in the subsequent odd/even semesters.

6.8 Internship/ Industrial Training, Mini Project and Major Project Work

Internship/Industrial Training		Mini Project	Major Project Work		
Components	Marks	Marks	Components		Marks
CIA*2			CIA a) Attendance b) Review / Work Diary*1	10 Marks 30 Marks	40
Work Diary	25	-			
Report	50	50			
Viva-voce	25	50			
Examination					
Total	100	100	ESE*2 a) Final Report 40Marks b)Viva-voce 20Marks		60
			Total		100

*1. Review is for Individual Project and Work Diary is for Group Projects (Group consisting of minimum 3 and maximum 5)

*2 Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

6.9 Guidelines for Professional Competency Skill- Online Mode(Part IV)- Online Exam 3 hours

Components	Marks
100 Objective Type Questions 100*1=100 Marks	**100**

Objective type Questions from Question Bank.

- The passing minimum for this paper is 40%

In case, the candidate fails to secure 40% passing minimum, he/ she may have to reappear for the same in the subsequent semesters.

QUESTION PAPER PATTERN FOR CIA I, II AND ESE	
(3 HOURS)	**MAXIMUM:75Marks**
SECTION-A (Objective Type) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(10 x1=10 marks)
SECTION-B (Either or Type) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(5 x 5 = 25 marks)
SECTION-C (Either or Type) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(5 x 8 = 40 marks)
(Syllabus for CIA-I 2.5 Unit ,Syllabus for CIA-II All 5 Unit)	

6.6 PASSING MINIMUM

6.6.1 There shall be no passing minimum for Internal.

6.6.2 For external examination, passing minimum shall be 40% [Forty Percentage] of the maximum marks prescribed for the course for each Course/Practical/Project and Viva-Voce.

6.6.2 In the aggregate [External/Internal] the passing minimum shall be of 40%.

6.6.3 He / She shall be declared to have passed the whole examination, if he/she passes in all the Courses and Practical wherever prescribed as per the scheme of the examinations by earning 140 CREDITS in Part I, II, III, IV& V. He/she shall also fulfill the extension activities prescribed earning a minimum of 1 credit to qualify for the Degree.

6.7. SUPPLIMENTARY EXAMINATION:

Supplementary Examinations is conducted for the students who appeared in the final semester examinations. Eligible criteria for appearing in the Supplementary Examinations are as follows:

6.7.1. Eligibility: A Student who is having arrear of only one theory course in any of the semester or two theory course in the Final semester of the UG degree programme alone is eligible for Supplementary Examinations.

6.7.2 Non-eligibility for those completed the program: Students who have completed their Program duration but having arrears are not eligible to appear for Supplementary Examinations.

6.8. RETOTALLING, REVALUATION AND PHOTOCOPY OF THE ANSWER SCRIPTS:

6.8.1. Re-totaling: All UG Students who appeared for their Semester Examinations are eligible for applying for re-totaling of their answer scripts.

6.8.2. Revaluation: All current batch Students who have appeared for their Semester Examinations are eligible for Revaluation of their answer scripts. Passed out candidates are not eligible for Revaluation.

6.8.3. Photo copy of the answer scripts: Students who have applied for revaluation can apply for the Photocopy of answer scripts by paying prescribed fee.

7. CLASSIFICATION OF SUCCESSFUL STUDENTS

RANGE OF MARKS	GRADE POINTS	LETTER GRADE	DESCRIPTION
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average
40-49	4.0-4.9	C	Satisfactory
00-39	0.0	U	Re-appear
ABSENT	0.0	AAA	**ABSENT**

7.1 Computation of Grade Point Average (GPA) in a Semester, Cumulative Grade Point Average(CGPA) and Classification

GPA for a Semester: = ∑iCiGi ,∑iCi

That is, GPA is the sum of the multiplication of grade points by the credits of the courses divided by the sum of the credits of the courses in a semester.

CGPA for the entire programme: = ∑n∑iCniGni ,∑n∑iCni That is, CGPA is the sum of the multiplication of grade points by the credits of the entire programme divided by the sum of the credits of the courses of the entire programme

Where,

Ci= Credits earned for course I in any semester,

Gi=GradePointsobtainedforcourseiinanysemestern=Semesterinwhichsuchcourseswere credited.

7.2 Letter Grade and Classification

CGPA	GRADE	CLASSIFICATION OF FINAL RESULT
9.5-10.0	O+	First Class -Exemplary*
9.0 and above but below9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C +	Third Class
4.0 and above but below 4.5	C	
0.0 and above but below 4.0	U	Re-appear

*The Students who have passed in the first appearance and within the prescribed semester of the UG Programme (Major, Allied and Elective courses only) are eligible.

8. RANKING

Students who pass all the examinations prescribed for the Program in the FIRST APPEARANCE ITSELF ALONE are eligible for Ranking I, II and III.

9. MAXIMUM PERIOD FOR COMPLETION OF THE PROGRAM TO QUALIFY FOR A DEGREE

9.1. A Student who for whatever reasons is not able to complete the program within the normal period (N) or the Minimum duration prescribed for the programme, may be allowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span =N+2years for the completion of programme.)

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MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous) | Learn.

B.Sc., PHYSICS abstract under LOCF-CBCS Pattern with effect from 2023-2024 Onwards

Structure of Credit Distribution as per the TANSCHE / UGC Guidelines

S.No.	Study Components	Part	Sem. I		Sem. II		Sem. III		Sem. IV		Sem. V		Sem. VI		No. of Paper	Total Credit
			No. of Paper	Credit	No. of Paper	Credit	No. of Paper	Credit	No. of Paper	Credit	No. of Paper	Credit	No. of Paper	Credit		
1	LANGUAGE - I	I	1	3	1	3	1	3	1	3					4	12
2	LANGUAGE - II	II	1	3	1	3	1	3	1	3					4	12
3	DSC THEORY	III	1	4	1	4	1	4	1	4	3	12	3	12	10	40
4	DSC PRACTICAL	III	1	3	1	3	1	3	1	3	1	3	1	3	6	18
5	DSE THEORY	III									2	8	1	4	3	12
6	GEC THEORY	III	1	3	1	3	1	3	1	3					4	12
7	GEC PRACTICAL	III			1	2			1	2					2	4
8	PROJECT WORK	III											1	5	1	5
12	INTERNSHIP	IV									1	2			1	2
14	PROFESSIONAL COMPETENCY SKILLS	IV											1	2	1	2
9	SKILL ENHANCEMENT COURSES (SEC)	IV			1	2	2	4	2	4					5	10

11	NON MAJOR ELECTIVE COURSES (NMEC)	IV	1	2	1	2									2	4
10	FOUNDATION COURSE	IV	1	2											1	2
15	ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)-EVS	IV							1	2					1	2
16	ABILITY ENHANCEMENT COMPULSORY COURSES (AECC)- VALUE EDUCATION - YOGA	IV									1	2			1	2
17	EXTENSION ACTIVITY	V											1	1	1	1
	Cumulative Credits		**7**	**21**	**8**	**22**	**7**	**20**	**9**	**24**	**8**	**27**	**8**	**26**	**47**	**140**

Total No. of Subjects	44
Marks	**4300**

PART	No. of Credits
PART - I	12
PART - II	12
PART - III	91
PART - IV	24
PART - V	1
Grand Total	**140**

Extra Credit	4
Total	**144**

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous) - Rasipuram - 637 408

Scheme of Examinations - CBCS Pattern

(For the Students Admitted Academic Year: 2023-2024 Onwards)

Programme Name: B. Sc. Physics

S.No.	PART	STUDY COMPONENTS	COURSE_CODE	TITLE OF THE COURSE	Hrs.		CREDIT	MARKS		
					Lect.	Lab.		CIA	ESE	TOTAL
SEMESTER - I										
1	I	LANGUAGE - I	23M1UFTA01	TAMIL - I	6		3	25	75	100
2	II	LANGUAGE - II	23M1UFEN01	ENGLISH-I	6		3	25	75	100
3	III	DSC THEORY-I	23M1UPHC01	PROPERTIES OF MATTER AND SOUND	5		4	25	75	100
4	III	DSC PRACTICAL-I	23M1UPHP01	PRACTICAL:PROPERTIES OF MATTER		3	3	40	60	100
5	III	GEC THEORY-I	23M1UMAA01	ALLIED: MATHEMATICS-I	4		3	25	75	100
6	III	GEC PRACTICAL-I	23M2UMAAP1	PRACTICAL:ALLIED MATHEMATICS		2	-	-	-	-
7	IV	NMEC-I	23M1UCAN01	FUNDAMENTALS OF INFORMATION TECHNOLOGY	2		2	25	75	100
8	IV	FC THEORY-I	23M1UPHFC1	INTRODUCTORY PHYSICS	2		2	25	75	100
				TOTAL	**25**	**5**	**20**	**190**	**510**	**700**
SEMESTER - II										
1	I	LANGUAGE - I	23M2UFTA02	TAMIL - II	6		3	25	75	100
2	II	LANGUAGE - II	23M2UFEN02	ENGLISH-II	6		3	25	75	100
3	III	DSC THEORY-II	23M2UPHC02	HEAT,THERMODYNAMICS AND STATISTICAL PHYSICS	5		4	25	75	100
4	III	DSC PRACTICAL-II	23M2UPHP02	PRACTICAL:HEAT, OSCILLATIONS, WAVES AND SOUND EXPERIMENTS		3	3	40	60	100
5	III	GEC THEORY-II	23M2UMAA02	ALLIED: MATHEMATICS-II	4		3	25	75	100
6	III	GEC PRACTICAL-I	23M2UMAAP1	PRACTICAL:ALLIED MATHEMATICS		2	2	40	60	100
7	IV	NMEC-II	23M2UCAN02	INTRODUCTION TO HTML	2		2	25	75	100
8	IV	SEC THEORY -I	23M2UPHS01	INSTRUMENTATION	2		2	25	75	100
				TOTAL	**25**	**5**	**22**	**230**	**570**	**800**

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous) - Rasipuram - 637 408
Scheme of Examinations - CBCS Pattern
(For the Students Admitted Academic Year: 2023-2024 Onwards)
Programme Name: B. Sc. Physics

S.No.	PART	STUDY COMPONENTS	COURSE_CODE	TITLE OF THE COURSE	Hrs.		CREDIT	MARKS		
					Lect.	Lab.		CIA	ESE	TOTAL
SEMESTER - III										
1	I	LANGUAGE - I	23M3UFTA03	TAMIL - III	6		3	25	75	100
2	II	LANGUAGE - II	23M3UFEN03	ENGLISH-III	6		3	25	75	100
3	III	DSC THEORY-III	23M3UPHC03	GENERAL MECHANICS AND CLASSICAL MECHANICS	5		4	25	75	100
4	III	DSC PRACTICAL-III	23M3UPHP03	PRACTICAL:ELECTRICITY		3	3	40	60	100
5	III	GEC THEORY-III	23M3UCHA01	ALLIED: CHEMISTRY-I	4		3	25	75	100
6	III	GEC PRACTICAL-II	23M4UCHAP1	PRACTICAL:ALLIED CHEMISTRY		2	-	-	-	-
7	IV	SEC THEORY-II	23M3UPHS02	HOME ELECTRICAL INSTALLATION	2		2	25	75	100
8	IV	SEC THEORY-III	23M3UPHS03	COMPUTATIONAL METHODS AND PROGRAMMING IN C	2		2	25	75	100
				TOTAL	**25**	**5**	**20**	**190**	**510**	**700**
SEMESTER - IV										
1	I	LANGUAGE - I	23M4UFTA04	TAMIL - IV	6		3	25	75	100
2	II	LANGUAGE - II	23M4UFEN04	ENGLISH-IV	6		3	25	75	100
3	III	DSC THEORY-IV	23M4UPHC04	OPTICS AND SPECTROSCOPY	5		4	25	75	100
4	III	DSC PRACTICAL-IV	23M4UPHP04	PRACTICAL:LIGHT		3	3	40	60	100
5	III	GEC THEORY-IV	23M4UCHA02	ALLIED: CHEMISTRY-II	4		3	25	75	100
6	III	GEC PRACTICAL-II	23M4UCHAP1	PRACTICAL:ALLIED CHEMISTRY		2	2	40	60	100
7	IV	SEC THEORY -IV	23M4UPHS04	ELECTRONIC DEVICES	2		2	25	75	100
8	IV	SEC THEORY-V	23M4UPHS05	COMMUNICATION SYSTEMS	2		2	25	75	100
9	IV	AECC-ENVIRONMENTAL STUDIES (EVS)*	23M4UEVS01	ENVIRONMENTAL STUDIES (EVS)	-		2	100	-	100
				TOTAL	**25**	**5**	**24**	**330**	**570**	**900**

*- SELF STUDY

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous) - Rasipuram - 637 408
Scheme of Examinations - CBCS Pattern
(For the Students Admitted Academic Year: 2023-2024 Onwards)
Programme Name: B. Sc. Physics

S.No.	PART	STUDY COMPONENTS	COURSE_CODE	TITLE OF THE COURSE	Hrs.		CREDIT	MARKS		
					Lect.	Lab.		CIA	ESE	TOTAL
SEMESTER - V										
1	III	DSC THEORY-V	23M5UPHC05	ATOMIC PHYSICS AND LASERS	5		4	25	75	100
2	III	DSC THEORY-VI	23M5UPHC06	RELATIVITY AND QUANTUM MECHANICS	5		4	25	75	100
3	III	DSC THEORY-VII	23M5UPHC07	ELECTRICITY AND MAGNETISM	5		4	25	75	100
4	III	DSE THEORY-I	23M5UPHE01	ENERGY PHYSICS	5		4	25	75	100
5	III	DSE THEORY-II	23M5UPHE02	MATERIAL SCIENCE	5		4	25	75	100
6	III	DSC PRACTICAL-V	23M5UPHP05	PRACTICAL:GENERAL EXPERIMENTS		3	3	40	60	100
7	IV	AECC-VALUE EDUCATION	23M5UVED01	YOGA	2		2	100	-	100
8	IV	INTERNSHIP	23M5UPHIS1	INTERNSHIP	-		2	100	-	100
				TOTAL	**27**	**3**	**27**	**365**	**435**	**800**
SEMESTER - VI										
1	III	DSC THEORY-VIII	23M6UPHC08	NUCLEAR AND PARTICLE PHYSICS	5		4	25	75	100
2	III	DSC THEORY-IX	23M6UPHC09	SOLID STATE PHYSICS	5		4	25	75	100
3	III	DSC THEORY-X	23M6UPHC10	DIGITAL ELECTRONICS AND MICROPROCESSOR 8085	5		4	25	75	100
4	III	DSE THEORY-III	23M6UPHE03	NANO SCIENCE AND NANO TECHNOLOGY	5		4	25	75	100
5	III	DSC PRACTICAL-VI	23M6UPHP06	PRACTICAL:ELECTRONICS		3	3	40	60	100
6	III	PROJECT WORK	23M6UPHPR1	PROJECT WORK	5		5	-	100	100
7	IV	PROFESSIONAL COMPETENCY SKILLS	23M6UPHOE1	PHYSICS FOR COMPETATIVE EXAMINATION	2		2	100	-	100
8	V	EXTENSION ACTIVITY	23M6UEXA01	EXTENSION ACTIVITY	-		1	-	-	-
				TOTAL	**27**	**3**	**27**	**240**	**460**	**700**
				OVERALL TOTAL	154	26	140	1545	3055	4600
1		EXTRA CREDIT		MOOC Courses offered in SWAYAM / NPTEL	-	-	2	-	-	-
2		VALUE ADDED COURSE		VALUE ADDED COURSE	-	-	2	-	-	-

The students should undergo compulsory 2 weeks internship programs during the IV Semester vacation. The students should submit the report at the end of the V semester. project report should be submitted at the end of the VI semester.

HOD MEMBER SECRETARY ACADEMIC COUNCIL PRINCIPAL

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UPHC01	**PROPERTIES OF MATTER AND SOUND**	**DSC THEORY-I**	**I**	**5**	**3**	**2**	**-**	**4**
Objective	Study of the properties of matter leads to information which is of practical value to both the physicist and the engineers.							

Unit	Course Content	Knowledge Levels	Sessions
I	**ELASTICITY:** Hooke's Law – Stress-Strain Diagram – Elastic Constants –Poisson's Ratio – Relation between Elastic Constants and Poisson's Ratio – Work done in Stretching and Twisting a wire – Twisting Couple on a Cylinder – Rigidity Modulus by Static Torsion– Torsional Pendulum (With and Without Masses).	K3	12
II	**BENDING OF BEAMS:** Cantilever– Expression for Bending Moment – Expression for Depression at the Loaded end of the Cantilever– Oscillations of a Cantilever – Expression for Time Period – Experiment to find Young's Modulus – Non-Uniform Bending– Experiment to Determine Young's Modulus by Koenig's Method – Uniform Bending – Expression for Elevation – Experiment to determine Young's Modulus using Microscope.	K4	12
III	**FLUID DYNAMICS:** Surface Tension: Definition – Molecular Forces– Excess Pressure over Curved Surface – Application to Spherical and Cylindrical drops and Bubbles – Determination of Surface Tension by Jaegar's Method– Variation of Surface Tension with Temperature. **Viscosity:** Definition – Streamline and Turbulent Flow – Rate of Flow of Liquid in a Capillary Tube – Poiseuille's Formula –Corrections – Terminal Velocity and Stoke'sFormula– Variation of Viscosity with Temperature.	K4	12
IV	**WAVES AND OSCILLATIONS:** Simple Harmonic Motion (SHM) – Differential Equation of SHM – Graphical Representation of SHM – Composition of Two SHM in a Straight Line and at Right Angles – Lissajous's Figures– Free, Damped, Forced Vibrations –Resonance and Sharpness of Resonance.Laws of Transverse Vibration in Strings – Sonometer – Determination of AC Frequency using Sonometer –Determination of Frequency using Melde's	K5	12

	String Apparatus.		
V	**ACOUSTICS OF BUILDINGS AND ULTRASONICS:** Intensity of Sound – Decibel – Loudness of Sound – Reverberation – Sabine's Reverberation Formula – Acoustic Intensity – Factors Affecting the Acoustics of Buildings. **Ultrasonic Waves:** Production of Ultrasonic Waves – Piezoelectric Crystal Method – Magnetostriction Effect – Application of Ultrasonic Waves.	K5	12
Course Outcome	**CO1:** Develop elasticity, stress-strain relationships, Poisson's Ratio, and the mechanics of stretching, twisting, and torsion	K3	
	CO2: Classify elastic behavior in terms of three moduli of elasticity and working of torsion pendulum, discuss the concepts of acoustics	K4	
	CO3: Analyze simple harmonic motions mathematically and apply them.	K4	
	CO4: Evaluate the frequency of vibration using the concept of resonance. Set up experiment to evaluate frequency of ac mains.	K5	
	CO5: Explain the principles for determining rigidity modulus and measuring torsional pendulum behavior both with and without masses.	K5	

Learning Resources

Text Books	1.D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand& Co. 2.BrijLal& N. Subrahmanyam, 2003, Properties of Matter, S.Chand& Co. 3.D.R.Khanna&R.S.Bedi, 1969, Textbook of Sound, AtmaRam& sons. 4. BrijLal and N.Subrahmanyam, 1995, A Text Book of Sound, Second revised edition,Vikas Publishing House. 5. R.Murugesan,2012, Properties of Matter, S.Chand& Co.
Reference Books	1.C.J. Smith, 1960, General Properties of Matter, Orient Longman Publishers 2.H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition,R. Chand & Co. 3.A.P French, 1973, Vibration and Waves, MIT Introductory Physics, Arnold-Heinmann India.
Website Link	1. https://www.biolinscientific.com/blog/what-are-surfactants-andhow-do-they-work 2. http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html 3. https://www.youtube.com/watch?v=gT8Nth9NWPM

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UPHC01	**PROPERTIES OF MATTER AND SOUND**	**DSC THEORY-I**	**I**	**5**	**3**	**2**	**-**	**4**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	S	M	M	S	M	S
CO2	M	S	S	S	M	M	S	M	S	S
CO3	S	M	S	M	S	S	M	S	S	S
CO4	S	S	S	S	S	M	S	M	M	M
CO5	M	M	S	S	M	S	S	S	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group discussion
Teaching and Learning Methods	Chalk and talk method, PowerPoint Presentation
Assessment Methods	Assignments, CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. K.SANGEETHA	**Dr. M.REVATHI**	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHC02	**HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS**	**DSC THEORY-II**	**II**	**5**	**3**	**2**	**-**	**4**
Objective	The course focuses to understand a basic in conversion of temperature in Celsius, Kelvin and Fahrenheit scales.							

Unit	Course Content	Knowledge Levels	Sessions
I	**CALORIMETRY:** Specific Heat Capacity – Specific Heat Capacity of Gases CP& CV– Meyer's Relation – Joly's Method for Determination of CV – Regnault's Method for Determination of CP. **Low Temperature Physics:** Joule-Kelvin Effect – Porous Plug Experiment– Joule-Thomson Effect –Boyle temperature– Temperature of Inversion –Liquefaction of Gas by Linde's Process – Adiabatic Demagnetisation.	K3	12
II	**THERMODYNAMICS - I:** Zeroth Law and First Law of Thermodynamics – P-V Diagram – Heat Engine –Efficiency of Heat Engine – Carnot's Engine, Construction, Working and Efficiency of Petrol Engine and Diesel Engines – Comparison of Engines.	K3	12
III	**THERMODYNAMICS - II:** Second Law of Thermodynamics –Entropy of an Ideal Gas – Entropy Change in Reversible and Irreversible Processes – T-S Diagram – Thermodynamical scale of Temperature – Maxwell's Thermodynamical Relations –Clasius -Clapeyron's Equation (First Latent Heat Equation) – Third Law of Thermodynamics – Unattainability of Absolute Zero – Heat Death	K4	12
IV	**HEAT TRANSFER:** **Modes of Heat Transfer:** Conduction, Convection and Radiation. **Conduction:** Thermal Conductivity – Determination of Thermal Conductivity of a Good Conductor by Forbe's Method – Determination of thermal Conductivity of a Bad Conductor by Lee's Disc Method. **Radiation:** Black Body Radiation (Ferry's Method) – Distribution of Energy in Black Body Radiation – Wien's Law and Rayleigh Jean's Law –Planck's Law of Radiation – Stefan's Law – Deduction of Newton's Law of Cooling from	K4	12

	Stefan's Law.		
V	**STATISTICALMECHANICS:** Definition of Phase-Space – Micro and Macro States – Ensembles – Different types of Ensembles – Classical and Quantum Statistics – Maxwell-Boltzmann Statistics – Expression for Distribution Function – Bose-Einstein Statistics – Expression for Distribution Function – Fermi-Dirac Statistics –Expression for Distribution Function – Comparison of three statistics.	K5	12
Course Outcome	**CO1:** Acquires knowledge on how to distinguish between temperature and heat	K3	
	CO2: Execute the efficiency of Carnot's engine	K3	
	CO3: Compare the performance of thermodynamic systems	K4	
	CO4: Examine different parameters related to heat, relate them with various physical parameters	K4	
	CO5: Evaluate and develop the classical and statistical mechanics concepts.	K5	

Learning Resources	
Text Books	1. Brijlal & N. Subramaniam, 2000, Heat and Thermodynamics, S.Chand & Co. 2. Narayanamoorthy & Krishna Rao, 1969, Heat, Triveni Publishers, Chennai. 3.V.R. Khanna & R. S. Bedi, 1998 1st Edition, Text book of Sound, Kedhar naath Publish&Co, Meerut 4.Brijlal and N. Subramanyam, 2001, Waves and Oscillations, Vikas Publishing House, New Delhi.
Reference Books	1.J.B.Rajam&C.L.Arora, 1976, Heat and Thermodynamics, 8th edition, S.Chand& Co. Ltd. 2.D.S.Mathur, Heat and Thermodynamics, Sultan Chand & Sons. 3.Gupta, Kumar, Sharma, 2013, Statistical Mechanics, 26th Edition, S. Chand & Co.
Website Link	1. https://youtu.be/M_5KYncYNyc 2. https://www.youtube.com/watch?v=4M72kQulGKk&vl=en

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHC02	**HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS**	**DSC THEORY-II**	**II**	**5**	**3**	**2**	**-**	**4**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	M	S	M	S	S	M	M
CO2	S	M	S	S	M	S	M	M	S	S
CO3	M	S	M	S	S	M	M	M	S	M
CO4	S	M	S	M	S	M	S	S	M	S
CO5	M	M	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group discussions
Teaching and Learning Methods	Chalk and talk method, PowerPoint Presentation
Assessment Methods	Assignments, CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. K.SANGEETHA	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UPHC03	**GENERAL MECHANICS AND CLASSICAL MECHANICS**	**DSC THEORY-III**	**III**	**5**	**3**	**2**	**-**	**4**
Objective	Students understand the basic laws, principles of mechanics and forces of physics in everyday life.							

Unit	Course Content	Knowledge Levels	Sessions
I	**LAWS OF MOTION, IMPULSE, IMPACT AND FRICTION :** Gravitation: Kepler's Laws, Newton's Law of Gravitation - Determination of G by Boy's Method. Impulse – elastic and Inelastic Collision - Impulse of a force - Laws of impact - Direct impact between two smooth spheres - oblique impact between two smooth spheres - Loss of KE due to direct impact - Oblique impact. Friction – Laws of friction – angle of friction – resultant reaction – cone of friction – Equilibrium of a body on a rough inclined plane to the horizontal and when the inclination is greater than the angle of friction.	K3	12
II	**CONSERVATION LAWS OF LINEAR AND ANGULAR MOMENTUM:** Conservation of Linear and Angular Momentum – Internal Forces and momentum Conservation – Center of Mass – Examples - General Elastic Collision of Particles of Different Masses - System with Variable Mass – Examples – Conservation of Angular Momentum – Torque due to Internal Forces – Torque due to Gravity – Angular Momentum about Center of Mass – Proton Scattering by Heavy Nucleus.	K4	12
III	**CONSERVATION LAWS OF ENERGY:** Introduction – Significance of Conservation Laws – Law of Conservation of Energy concepts of Work- Power – Energy - Conservative Forces – Potential Energy and Conservation of Energy in gravitational and Electric Field – Examples -Non-Conservative Forces – General Law of Conservation of Energy.	K4	12

IV	**RIGID BODY DYNAMICS:** Translational and Rotational Motion – Angular Momentum – Moment of Inertia – General Theorems of Moment of Inertia – Examples – Rotation About Fixed Axis – Kinetic Energy of Rotation – Examples – Body Rolling along a Plane Surface – Body Rolling Down an Inclined Plane–Gyroscopic Precision – Gyrostatic Applications.	K5	12
V	**LAGRANGIAN MECHANICS:** Generalized Coordinates – Degrees of Freedom – Constraints - Principle of Virtual Work and D'Alembert's Principle - Lagrange's Equation from D' Alembert's Principle – Application –Simple Pendulum – Atwood's Machine. ***Current Trends: Dynamics of a Spinning Disk.**	K5	12
	*** Self Study.**		
Course Outcome	**CO1:** Utilize the Newton's Law of motion, Realize the basic principles behind impulse force.	K3	
	CO2: Examine the knowledge on the conservation laws.	K4	
	CO3: Categorize the conservation law and calculate energy of various systems.	K4	
	CO4: Estimate the knowledge on rigid body dynamics and solve problems based on this concept.	K5	
	CO5: Evaluate Lagrangian system of mechanics, apply D' Alembert's principle.	K5	
Learning Resources			
Text Books	1. J.C.Upadhyaya, Classical Mechanics, Himalaya Publishing house, Mumbai, (2019). 2. D. S. Mathur & P. S. Hemne, Mechanics, S.Chand & Co Ltd., Revised Edition, (2000). 3. Narayanamurthi and M. Nagarathnam, Statics, Hydrostatics and Hydrodynamics, The National Publishing Company, 8th Edition (2008).		
Reference Books	1. Herbert Goldstein, Charles Poole and John Safco, Classical Mechanics, Addition Wesley Publications (2005). 2. Halliday & Resnick Principles of Physics, 12th edition (2023). 3. Halliday, David Robert Resnick and Walker Jearl, Fundamentals of Physics, John		

	Wiley, New Delhi, 12th edition (2021).			
Website Link	1.https://youtu.be/X4_K-XLUIB4 2.https://nptel.ac.in/courses/115103115 3.https://www.youtube.com/watch?v=p075LPq3Eas 4.https://www.youtube.com/watch?v=mH_pS6fruyg 5. https://onlinecourses.nptel.ac.in/noc22_me96/preview 6. https://www.youtube.com/watch?v=tdkFc88Fw-M 7. https://onlinecourses.nptel.ac.in/noc21_me70/preview			
Self Study Material	1. https://www.researchgate.net/publication/298334570_Dynamics_of_a_Spinning_Disk			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UPHC03	**GENERAL MECHANICS AND CLASSICAL MECHANICS**	**DSC THEORY-III**	**III**	**5**	**3**	**2**	**-**	**4**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	M	S	S	M	S
CO2	M	S	S	S	M	S	M	S	S	M
CO3	S	M	M	M	S	S	S	M	S	S
CO4	S	S	S	S	S	M	S	M	S	S
CO5	M	M	S	S	M	S	M	S	M	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Providing chart work to students, Open book problem solving
Teaching and Learning Methods	Chalk and talk method, Power point presentations, Group discussions, Interactions
Assessment Methods	Assignments, CIA – I,CIA – II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Ms. M.SARANYA	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHC04	**OPTICS AND SPECTROSCOPY**	**DSC THEORY-IV**	**IV**	**5**	**3**	**2**	**-**	**4**

Objective	The students should acquire knowledge basic properties and behavior of light in different medium .To understand the differences in the important phenomena namely interference, diffraction and Polarization and apply the knowledge in day to day life.

Unit	Course Content	Knowledge Levels	Sessions
I	**Aberrations:** Spherical Aberration, Chromatic Aberrations, Coma, and Astigmatism- Curvature of the Field – Distortion – Chromatic Aberrations Methods. Prism: Dispersion, Deviation, Aberrations - Applications Rainbows and Halos, Constant Deviation Spectroscope. **Eyepieces:** Advantage of an Eyepiece over a Simple Lens - Huygen's and Ramsden's Eyepieces, Construction and Working - Merits and Demerits of the Eyepiece. **Resolving power:** Rayleigh's Criterion for Resolution – Limit of Resolution for the Eye – Resolving Power of, (i) Prism (ii) Grating (iii) Telescope.	K4	12
II	**INTERFERENCE:** Division of Wave Front, Fresnel's Biprism – Fringes with White Light – Division of Amplitude: Interference in Thin Films due to, (i) Reflected Light, (ii) Transmitted Light – Colors of Thin Films Applications – Air Wedge – Newton's Rings. Interferometers: Michelson's Interferometer – Applications, (i) Determination of the Wavelength of a Monochromatic Source of Light, (ii) Determination of the Wavelength and Separation D1 And D2 Lines of Sodium Light, (iii) Determination of a Thickness of a Mica Sheet.	K4	12
	DIFFRACTION: Fresnel's assumptions – zone plate – action of zone plate for an		

III	incident spherical wave front – differences between a zone plate and a convex lens –Fresnel type of diffraction – diffraction pattern due to a straight edge – positions of maximum and K4minimum intensities – diffraction due to a narrow slit – Fraunhofer type of diffraction – Fraunhofer diffraction at a single slit – plane diffraction grating– experiment to determine wavelengths – width of principal maxima.	K4	12
IV	**POLARISATION:** Optical Activity – Optically Active Crystals – Polarizer and Analyser– Double Refraction – Optic Axis, Principal Plane – Huygens's Explanation of Double Refraction in Uniaxial Crystals – Nicol Prism – Polaroids and Applications – Circularly and Elliptically Polarized Light –Quarter Wave Plate – Half Wave Plate – Production and Detection of Circularly and Elliptically Polarized Lights – Fresnel's Explanation – Specific Rotation – Laurent Half Shade Polarimeter – Experiment to Determine Specific Rotatory Power.	K5	12
V	**SPECTROSCOPY:** Infra-Red Spectroscopy Near Infra-Red and Far Infra-Red – Properties – Origin of IR spectra – IR Spectrophotometer – Applications Interpretation of IR Spectra – CH, CO, CN Bending and Stretching Vibration Modes Only – Scattering of Light – Raman Effect –Classical Theory –Mutual Exclusion Principle – Raman Spectrometer- Characteristics of Raman Lines – Applications – Ultraviolet and Visible Spectroscopy –Properties. ***Current Trends: Connecting the dots: Reinventing optics for nanoscale dimensions.**	K5	12
	*** Self Study.**		
	CO1: Examine the basic knowledge of methods of rectifying different defects in lenses.	K4	
	CO2: Determine the wave nature of light through working of interferometer.	K5	

Course Outcome	**CO3:** Analyze the knowledge about nature of light through diffraction techniques.	K4	
	CO4: Interpret the basic formulation of polarization and gain knowledge about polarimeter.	K5	
	CO5: Explain the principles of optics to various fields of IR, Raman and UV spectroscopy.	K5	

Learning Resources				
Text Books	1. Subramaniam . N & Brijlal, Optics, S.Chand & Co, 25thedition, (2014). 2. G.Aruldhass, Molecular Structure and Spectroscopy, PHI Pvt Ltd, New Delhi , 2nd edition (2007). 3. K.Rajagopal, Engineering Physics, PHI Pvt Ltd, New Delhi (2017).			
Reference Books	1. R.Murughesan, Optics and Spectroscopy, S.Chand publisher,(2015). 2. C.N.Banewell, Introduction to Molecular Spectroscopy,TMH Publishing Co, New Delhi,7th edition (2016).			
Website Link	1. https://byjus.com/chemistry/uv-vis-spectroscopy/#:~:text=Ultraviolet%2Dvisible%20(UV%2DVIS,light%20received%20by%20the%20analyte. 2. https://www.britannica.com/technology/optical-interferometer 3. https://www.youtube.com/watch?v=tylRyyAMw9s 4. https://photographylife.com/what-is-spherical-aberration 5. https://www.britannica.com/technology/diffraction-grating			
Self Study Material	1. https://www.pnas.org/doi/full/10.1073/pnas.0900796106			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHC04	**OPTICS AND SPECTROSCOPY**	**DSC THEORY-IV**	**IV**	**5**	**3**	**2**	**-**	**4**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	M	S	M	S	S	S
CO2	S	M	S	M	S	M	S	S	M	S
CO3	S	S	S	S	M	S	S	M	S	M
CO4	M	S	M	S	S	S	S	M	S	S
CO5	S	S	S	M	M	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Open book problem solving
Teaching and Learning Methods	Chalk and talk method, Power point presentations ,Group discussions, Interactions
Assessment Methods	Assignments, CIA – I, CIA – II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
Ms. M.SARANYA	Dr. M.REVATHI	Dr. S. Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHC05	**ATOMIC PHYSICS AND LASERS**	**DSC THEORY-V**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Students are to learn gain knowledge on photoelectric effect, excitation and ionization potentials, splitting of spectral lines in magnetic and electric fields. To understand the principle, production and applications of lasers.							

Unit	Course Content	Knowledge Levels	Sessions
I	**THE ELECTRON AND POSITIVE RAYS:** e/m of electron by Dunning ton's method –charge of electron by Millikan's oil drop method – properties of positive rays –e/m of positive rays by Thomson's parabola method (problems calculation of e/m ratio of positive rays)–mass spectrographs and uses.	K3	12
II	**PHOTOELECTRIC EFFECT:** Photoelectric Emission – Leonard's Experiment – Richardson and Compton Experiment –Laws of Photoelectric Emission – Einstein's Photoelectric Equation (Problems using Einstein's Photoelectric Equation) –Experimental Verification by Millikan's Method – Photoelectric Cell– Photo Emissive Cell –Photovoltaic Cell – Photo Conducting Cell – Applications of Photoelectric Cells.	K4	12
III	**ATOMIC STRUCTURE:** Sommer field's relativistic atom model –vector atom model – various quantum numbers – L-S and J-J coupling – Pauli's exclusion principle – magnetic dipole moment of an electron due to orbital and spin motion – Bohr magnetron - Stern and Gerlach experiment – Lande g' factor.	K4	12
	SPLITTING OF SPECTRAL LINES: Excitation, Ionization and Critical Potentials – Davis and Goucher's Method – Optical Spectra – Spectral Notation and		

IV	Selection Rules – Fine Structure of Sodium D-Line – Zeeman Effect – Experimental Arrangement and Classical Theory of Normal Zeeman Effect – Larmor's Theorem –Quantum Theory of Normal Zeeman Effect –Anomalous Zeeman Effect –Explanation of Splitting of D1 And D2 lines of Sodium – Paschen Back Effect - Stark Effect (Qualitative Only).	K5	12
V	**LASERS:** General Principles of Lasers – Properties of Lasers Action - Spontaneous and Stimulated Emission – Population Inversion - Optical Pumping – He- Ne Laser (Principle and Working) - Semiconductor Laser – Laser Applications–Holography. ***Current Trends: The Iron Project: Photo ionization and Photo excitation of Fe XVII in Solar Opacity.**	K5	12
	*** Self Study.**		
Course Outcome	**CO1:** Apply the properties of electrons and positive rays, know different mass spectrographs.	K3	
	CO2: Examine the experiments and applications of photo electric effect.	K4	
	CO3: Classify different atom models, Describe different quantum numbers and different coupling schemes.	K4	
	CO4: Comparing the excitation and ionization potentials, Apply selection rule, Analyze Paschen-Back effect.	K5	
	CO5: Evaluating the condition for production of laser, Appreciate various properties and applications of lasers.	K5	
Learning Resources			
Text Books	1. R. Murugesan, Modern Physics, S. Chand & Co, (2019). (All units) (Units I&II-Problems) 2. Brijlal & N. Subrahmanyam, Atomic & Nuclear Physics, S. Chand & Co, (2007). (All units) 3. Avadhahnulu, An Introduction to Lasers - Theory and Applications, M.N., S.Chand & Co., New Delhi, (2013).		

Reference Books	1. Ram Prakash, Modern Physics, Wave books publisher, (2018). 2. B.B.Laud, Laser and Non-Linear Optics, Wiley Easter Ltd., New York, (2011).			
Website Link	1. http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html 2. https://makingphysicsfun.files.wordpress.com/2015/01/photoelec t ric-effect.pptx 3. https://byjus.com/physics/types-of-laser/			
Self Study Material	1. https://link.springer.com/chapter/10.1007/978-3-642-38167-6_7			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M5UPHC05	**ATOMIC PHYSICS AND LASERS**	**DSC THEORY-V**	**V**	**5**	**3**	**2**	**-**	**4**	

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	M	S	S	M	S	S
CO2	S	M	S	M	S	S	M	S	M	S
CO3	S	S	M	S	M	M	S	S	S	M
CO4	S	S	M	S	S	S	S	M	S	S
CO5	M	S	S	M	M	S	M	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Open book problem solving
Teaching and Learning Methods	Chalk and talk method, Power point presentations, Group discussions, Interactions
Assessment Methods	Assignments, CIA – I, CIA – II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UPHC06	RELATIVITY AND QUANTUM MECHANICS	DSC THEORY-VI	V	5	3	2	-	4

Objective	To provide students with a comprehensive understanding of the foundational principles and advanced concepts in relativity and quantum mechanics.

Unit	Course Content	Knowledge Levels	Sessions
I	**SPECIAL THEORY OF RELATIVITY:** Michelson-Morley Experiment-Frames of Reference -Galilean Relativity - Postulates of Special Theory of Relativity - Lorentz Transformation - Consequences - Time Dilation- Concept of Simultaneity - Doppler Effect - Length Contraction-Variation Of Mass with Velocity - Einstein's Mass-Energy Relation- Relativistic Momentum - Energy Relation	K3	12
II	**TRANSFORMATION RELATIONS:** Transformation of velocity, mass, energy and momentum - four vector - invariance under transformation - Lorentz transformation and velocity addition equations in terms of hyperbolic functions. **GENERAL THEORY OF RELATIVITY:** Inertial and Gravitational mass - Principle of equivalence - Experimental evidences for General theory of Relativity	K4	12
III	**PHOTONS AND MATTER WAVES:** Difficulties of classical physics and origin of quantum theory -black body radiation - Planck's law - Einstein's photoelectric equation - Compton effect -pair production - De Broglie waves - phase velocity and group velocity- Davisson and Germer"s experiment -uncertainty principle - consequences -illustration of Gamma ray microscope.	K4	12
IV	**OPERATORS AND SCHRODINGER EQUATION:** postulates of quantum mechanics - Wave function and its interpretation - Schrodinger's equation - linear operators - Eigen value - Hermitian operator - properties of Hermitian operator- observable - operators for position, linear Momentum, angular momentum components - commutator algebra -commutator between these operators -expectation values of position and momentum.	K4	12

V	**SOLVING SCHRÖDINGER EQUATION FOR SIMPLE PROBLEMS:** One-dimensional problems: (i) particle in a box, (ii) barrier penetration problem – quantum mechanical tunneling, (iii) linear harmonic oscillator. higher dimensional problems: Hydrogen atom (qualitative) ***Current Trends:** Taste of post-quantum cryptography - Comparison to quantum cryptography		K5	12
	*** Self Study.**			
Course Outcome	**CO1:** Acquire the various postulates of special theory of relativity.		K3	
	CO2: Analyze the importance of transformation equations and also the general theory of relativity.		K4	
	CO3: Examine the wave nature of matter and understand its importance.		K4	
	CO4: Inspect the Schrodinger equation and also realize the use of operators.		K4	
	CO5: Deduct Schrödinger equation to simple problems.		K5	

Learning Resources				
Text Books	1. S. P. Puri, Special Theory of Relativity, Pearson Education, India, 2013. 2. A.Beiser Concepts of Modern Physics, , 6th Ed., McGraw-Hill, 2003. 3. R. Murugeshan, Kiruthiga Sivaprasath, Modern Physics, S. Chand & Co.,17th Revised Edition, 2014. 4. S.P.Singh, M.K.Bagde Quantum Mechanics, , S.Chand & Co., New Delhi, 2000.			
Reference Books	1. Peter J. Nolan, Fundamentals of Modern Physics, 1stEdition, 2014, by Physics 2. V.Murugan, Quantum Mechanics, Pearson Education, India, 2014. 3. Alastair I. M. Rae and Jim Napolitano Quantum Mechanics, , 6th Edition, CRC Press:Taylor& Francis, 2010.			
Website Link	1. http://hyperphysics.phy-astr.gsu.edu/hbase/qapp.html 2. https://swayam.gov.in/nd2_arp19_ap83/preview 3. https://swayam.gov.in/nd1_noc20_ph05/preview 4. https://www.khanacademy.org/science/physics/special-relativity/minkowski-spacetime/v/introduction-to-special- relativity-and-minkowski-spacetime-diagrams			
Self Study Material	https://nlist.inflibnet.ac.in/search/Record/978-3-540-88702-7			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHC06	**RELATIVITY AND QUANTUM MECHANICS**	**DSC THEORY-VI**	**V**	**5**	**3**	**2**	**-**	**4**

CO-PO Mapping

CO Number	PO 1	PO 2	PO3	PO4	PO 5	PSO 1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	M	M	M
CO2	S	S	M	S	M	M	M	M	M	M
CO3	M	M	S	M	S	S	S	S	S	S
CO4	M	S	S	S	S	S	S	M	L	M
CO5	S	M	S	S	M	M	S	S	M	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session, group discussions
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. C. INDIRA PRIYADHARSINI	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHC07	ELECTRICITY AND MAGNETISM	DSC THEORY-VII	V	5	3	2	-	4

Objective	To acquire in-depth knowledge of measuring instruments involving electric and magnetic fields. On the successful completion of the course, students will be able to recognize basic principles and applications of electrometers.

Unit	Course Content	Knowledge Levels	Sessions
I	**CAPACITORS AND ELECTROMETERS:** Spherical Capacitors - Cylindrical capacitors- Parallel plate capacitor – Effect of dielectric - the force of attraction between plates of a charged parallel plate capacitor – Guard Ring capacitor – Mica capacitor – uses of capacitors - Quadrant electrometer - measurement of potential, ionization current and dielectric constant – Earth Magnetometer.	K3	12
II	**ELECTRICAL MEASUREMENTS AND THERMOELECTRICITY:** potentiometer – calibration of ammeter and high range voltmeter – thermoelectricity – laws of thermos e.m.f.- measurement of thermos e.m.f. using potentiometer-Peltier effect and Peltier coefficient – Thomson effect and Thomson coefficient – relation between π and σ – thermoelectric diagrams and their uses.	K3	12
III	**MAGNETIC PROPERTIES OF MATERIALS:** Relation between three magnetic vectors B, H and M- Intensity of magnetization - Susceptibility – Permeability -Intensity of magnetization and the relation B = $\mu_0 (H +$ $)$ – I-H and B-H curves of magnetic materials – Energy loss - determination of susceptibility: Gouy's method.	K4	12
IV	**ELECTROMAGNETIC INDUCTION:** Magnetic flux and Magnetuc induction – Biot savart law - Magnetic induction due to a straight conductor carrying current – Moving coil ballistic galvanometer – damping correction – Ampere's circuital Law- Faradays Laws of electromagnetic induction –	K5	12

	vector form - self – inductance by Anderson's Bridge method – Mutual inductance – Experimental determination - coefficient of coupling.		
V	**ALTERNATING CURRENT:** Peak, average and RMS value of current and voltage– form factor – ac circuit containing resistance and inductance – ac circuit containing resistance and capacitance – series and parallel resonance circuits –Q factor – power in an ac circuit containing LCR – Wattles current – choke coil - Transformer – construction, theory and uses – energy loss – skin effect. **Current Trends:*** HVDC Transmission System, Equipments Required for HVDC, other factors in favor of HVDC Transmission System *	K5	12
	*** Self Study**		
Course Outcome	**CO1:** Define and Derive The Laws Of Electricity And Magnetism	K3	
	CO2: Summarise the Knowledge Of Properties And Magnetism	K3	
	CO3: Analyze the underlying theories and principles governing magnetic phenomena.	K4	
	CO4: Evaluate The Properties Of Electric And Magnetic Materials.	K5	
	CO5: Intrepret Experimental Skills To Construct Technically Useful Devices.	K5	

Learning Resources	
Text Books	1. Brij Lal and Subrahmanyam, Electricity and Magnetism, S. Chand & Co, New Delhi (2016) 2. R. Murugesan, Electricity and Magnetism, S. Chand & Co, New Delhi(2016)
Reference Books	1.D. N. Vasudeva, Electricity and Magnetism, S. Chand & Co, New Delhi(2016) 2. K. K. Tewari, Electricity and Magnetism, S. Chand & Co, New Delhi (2016) 3. B.D.Duggal and C.L. Chhabra, Fundamentals of Electricity and Magnetism –Vishal Publishing Co(2004)
Website Link	1. https://www.askiitians.com/revision-notes/physics/current- electricity.html 2.https://www.askiitians.com/revision-notes/physics/electromagnetic-induction-and-alternating- current/
Self Study Material	https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=5121211

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHC07	**ELECTRICITY AND MAGNETISM**	**DSC THEORY-VII**	**V**	**5**	**3**	**2**	**-**	**4**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	M	S	M
CO2	S	M	S	S	S	M	S	S	M	S
CO3	S	S	L	S	S	S	M	S	S	S
CO4	M	S	S	L	L	S	S	M	M	M
CO5	S	M	S	S	M	M	S	M	M	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving sessions, group discussions, hands on experiments
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. C.INDIRA PRIYADHARSINI	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc.-Physics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHC08	**NUCLEAR AND PARTICLE PHYSICS**	**DSC THEORY-VIII**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	Students to understand the constituents, properties and models, particle detectors and accelerators, nuclear reactions and elementary particles.							

Unit	Course Content	Knowledge Levels	Sessions
I	**PROPERTIES OF NUCLEUS:** constituents of nucleus - isotopes, isobars, isotones - nuclear size, mass, density, charge, spin, angular momentum, magnetic dipole moment, electric quadrupole moment (qualitative) - binding energy - mass defect - packing fraction - nuclear stability - binding energy per nucleon graph - properties of nuclear force - meson theory of nuclear forces - Yukawa potential. **Nuclear Models:** liquid drop model -Weizacker's semi-empirical mass formula - shell model - magic numbers.	K4	12
II	**RADIO ACTIVITY:** radio activity - laws of radioactivity - radioactive disintegration, decay constant, half-life, mean-life (only final formulae) - units of radioactivity-successive disintegration - transient and secular equilibrium-properties of alpha, beta and gamma rays - Geiger-Nuttal law - α-ray spectra -Gammow's theory of α-decay (qualitative) -β-ray spectrum - neutrino theory of β-decay - nuclear isomerism - K-shell capture - internal conversion - non-conservation of parity in weak interactions.	K5	12
III	**PARTICLE DETECTORS AND ACCELERATORS DETECTORS:** Gas Detectors -Ionization Chamber - G-M Counter - Scintillation Counter - Photo Multiplier Tube (Pmt) - Semiconductor Detectors - Neutron Detector.	K4	12

	Accelerators: Linear Accelerators – Cyclotron – Synchrotron – Betatron.		
IV	**NUCLEAR REACTIONS:** Types Of Nuclear Reactions –Conservation Laws in Nuclear Reaction – Q- Value– Threshold Energy – Nuclear Fission – Energy Released In Fission – Chain Reaction – Critical Mass – Nuclear Reactor – Nuclear Fusion – Sources Of Stellar Energy – Proton-Proton Cycle – Carbon-Nitrogen Cycle – Thermonuclear Reactions – Controlled Thermonuclear Reactions.	K5	12
V	**COSMIC RAYS AND ELEMENTARY PARTICLES COSMIC RAYS:** Discovery Of Cosmic Rays – Primary And Secondary Cosmic Rays – Cascade Theory Of Cosmic Ray Showers – Altitude And Latitude Effects –Discovery Of Positron – Pair Production – Annihilation Of Matter. **Elementary Particles:** particles and antiparticles – classification of elementary particles – types of fundamental interactions – quarks and types – quark model (elementary ideas only). ***Current Trends:** Advancing Radiation Detection Instruments for Nuclear Security	K5	12
	*** Self Study.**		
Course Outcome	**CO1:** Analyze the basic properties of nucleus, nuclear models and radioactivity	K4	
	CO2: Evaluate the basic aspects of nuclear structure and fundamentals of radioactivity	K5	
	CO3: Classify the principle and working of particle accelerators	K4	
	CO4: Explain the different types of nuclear reactions and their applications	K5	

	CO5: Evaluate the basic principles of elementary particle physics		K5	
Learning Resources				
Text Books	1. R Murugeshan & Kiruthiga Sivaprasath, Modern Physics, S. Chand & Co. (2013) 2. Brijlal & N. Subramaniyan, Atomic and Nuclear Physics S.Chand & Co (2008)			
Reference Books	1. Kenneth S. Krane ,Introductory nuclear Physics (Wiley India Pvt. Ltd., 2008) 2. R.A. Dunlap, Introduction to the physics of nuclei & particles (Thomson Asia, 2004). 3. S. N. Ghoshal, S Chand & Co, Nuclear Physics,. Edition 2003			
Website Link	1. http://hyperphysics.phy-astr.gsu.edu/hbase/nuccon.html 2. https://www.kent.edu/physics/nuclear-physics-links 3. https://www2.lbl.gov/abc/links.html			
Self Study Material	https://www.iaea.org/newscenter/news/advancing-radiation-detection-instruments-for-nuclear-security			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc -Physics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M6UPHC08	**NUCLEAR AND PARTICLE PHYSICS**	**DSC THEORY-VIII**	**VI**	**5**	**3**	**2**	**-**	**4**	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	M	M	S	M	M	S	M
CO2	M	S	M	S	M	S	M	S	M	S
CO3	L	M	S	M	M	M	S	M	S	M
CO4	M	S	M	S	M	M	S	M	M	S
CO5	M	M	S	M	M	S	M	S	M	M
Level of Correlation Between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Online QUIZ
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I, CIA-II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHC09	**SOLID STATE PHYSICS**	**DSC THEORY -IX**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	This course is designed to the students to Study About the Different Bondings in Solids and to study about the magnetic materials.							

Unit	Course Content	Knowledge Levels	Sessions
I	**BONDING IN SOLIDS, CRYSTAL STRUCTURE:** Types of Bonding –Ionic Bonding – Bond Energy of NaCl Molecule – Covalent Bonding – Metallic Bonding – Hydrogen Bonding – Van-Der Waals Bonding – Crystal Lattice – Lattice Translational Vectors – Lattice with Basis – Unit Cell – Bravais‟ Lattices – Miller Indices – Procedure for finding them –Packing of BCC and FCC Structures – Structures of Nacl and Diamond Crystals – X-Rays – Bragg's Law(Simple Problems) – Experimental Methods: Laue Method, Powder Method.	K5	12
II	**ELEMENTARY LATTICE DYNAMICS:** Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons – Qualitative description of the Phonon Spectrum in Solids – Dulong and Petit's Law –Properties of Metals – Classical Free Electron Theory of Metals (Drude-Lorentz) – Ohm's Law – Electrical and Thermal Conductivities – Weidemann-Franz'Law – Sommerfeld's Quantum Free Electron Theory	K5	12

	(Qualitative Only).		
III	**MAGNETIC PROPERTIES OF SOLIDS:** Permeability, Susceptibility, Relation Between them – Classification of Magnetic Materials – Properties of Dia, Para, Ferro, Ferri and Antiferromagnetism – Langevin‟s theory of Diamagnetism – Langevin‟s Theory of Paramagnetism – Curie-Weiss Law – Weiss Theory of Ferromagnetism(Qualitative Only) –Domains – Discussion of B-H Curve –Hysteresis and Energy Loss – Soft and Hard Magnets – Magnetic Alloys	K4	12
IV	**DIELECTRIC PROPERTIES OF MATERIALS:** Polarization and Electric Susceptibility –Local Electric Field of an Atom – Dielectric Constant and Polarisability – Polarization Processes: Electronic Polarization– Calculation of Polarisability – Ionic, Orientational and Space Charge Polarization– Frequency Dependence of Dielectric Constant –Dielectric Loss – Effect of Temperature on Dielectric Constant – Dielectric Breakdown and its types – Langevin - Debye Equation – Complex Dielectric Constant.	K5	12
V	**FERROELECTRIC & SUPERCONDUCTING PROPERTIES OF MATERIALS:** Ferroelectric Effect: Curie-Weiss Law – Ferroelectric Domains, P-E Hysteresis Loop – Conductor, Semiconductor (P And N Type) and Insulator –Conductivity of Semiconductor – Mobility – Hall Effect - Hall Coefficient. Super conductivity: experimental results –critical temperature –critical magnetic field – Meissner effect – type-I and type-II superconductors – isotope effect. ***Current Trends** - **Nanostructured superconductors**	K3	12
	***Self Study**		

Course Outcome	**CO1:** Classify the bonding & crystal structure.	K5	
	CO2: Understand the lattice dynamics and thus learn the electrical and thermal properties of materials	K5	
	CO3: Describe the various magnetic material on the basis of their behavior.	K4	
	CO4: Comprehend the dielectric behavior of materials.	K5	
	CO5: Appreciate the ferroelectric and super conducting materials.	K3	

Learning Resources	
Text Books	1. Introduction to Solid State Physics, Kittel, Willey Eastern Ltd (2003). 2. Solid state Physics, Rita John,1st edition, TataMcGraw Hill publishers (2014). 3. Solid State Physics , R L Singhal, Kedarnath Ram Nath& Co., Meerut (2003)
Reference Books	1. Puri & Babber – Solid State Physics – S.Chand & Co. New Delhi (2010). 2. Raghavan - Materials science and Engineering, PHI , Sixth Edition, (2015). 3. S.O.Pillai - Solid State Physics, Narosa publication, 10th Edition (2022).
Website Link	1. https://nptel.ac.in/courses/115105099/ 2. https://nptel.ac.in/courses/115106061
Self Study Materials	1. https://nlist.inflibnet.ac.in/search/Record/EBC840586

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHC09	SOLID STATE PHYSICS	DSC THEORY -IX	VI	5	3	2	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	S	S	S	M	S	S
CO2	M	S	M	S	M	M	S	M	M	M
CO3	S	M	S	M	S	M	M	S	S	S
CO4	S	S	S	S	M	S	S	M	M	M
CO5	S	M	S	S	M	S	M	S	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group discussions, Quiz
Teaching and Learning Methods	Chalk and Talk , Power Point Presentation
Assessment Methods	Assignments, CIA-I,CIA-II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UPHC10	DIGITAL ELECTRONICS AND MICROPROCESSOR 8085	DSC THEORY-X	VI	5	3	2	-	4

Objective	Students to learn all types of number systems ,digital circuits s and get the knowledge on fundamentals of 8085 architecture

Unit	Course Content	Knowledge Levels	Sessions
I	**Number systems:** Decimal, Binary, Octal, Hexadecimal Numbers Systems and their Conversions – Codes: BCD, Gray and Excess-3 Codes – Code Conversions –Complements (1's, 2's, 9's And 10's) – Binary Addition, Binary Subtraction using 1's & 2's Complement Methods – Boolean Laws – De-Morgan's Theorem –Standard Representation of Logic Functions (SOP & POS) – Minimization Techniques (Karnaugh Map: 2, 3, 4 Variables).	K4	12
II	**Digital circuits:** Adders ,Half &Full Adder – Subtractors, Half & Full Subtractor – Parallel Binary Adder – Magnitude Comparator – Multiplexers (4:1) & Demultiplexers (1:4), Encoder (8-Line-To-3- Line) And Decoder (3-Line-To-8-Line), BCD to Seven Segment Decoder.	K4	12
III	**Flip-Flops:** S-R Flip-Flop, J-K Flip-Flop, T and D Type Flip- Flops, Master-Slave Flip-Flop, Truth Tables, Registers:- Serial in Serial Out And Parallel in And Parallel Out – Counters Asynchronous:-Mod-8, Mod-10, Synchronous - 4-Bit &Ring Counter –IC – Logic. Families: RTL, DTL, TTL Logic, CMOS NAND & NOR Gates, CMOS Inverter.	K1-K4	12
IV	**8085 Microprocessor:** Introduction To Microprocessor – INTEL 8085 Architecture –	K5	12

	Register Organization –Pin Configuration Of 8085, – Program Status Word (PSW) – Instruction Set Of 8085 –Addressing Modes Of 8085 –Assembly Language Programming Using 8085 –Programmes For Addition (8-Bit), Subtraction (8-Bit) Multiplication (8-Bit), Division (8-Bit) – Largest and Smallest Number In An Array.		
V	**I/O Interfaces:** Serial Communication Interface (8251-USART) – Programmable Peripheral Interface (8255-PPI) – Programmable Interval Timers (8253) – Keyboard And Display (8279), DMA Controller (8237). ***Current Trends:** Microcontroller and Microprocessor Market Size, Trends Evaluation	K4	12
	*** Self Study.**		
Course Outcome	**CO1:** Recall the number system and basic logic gates	K4	
	CO2: Categorize the combinational logic circuits.	K4	
	CO3: Classify the different semiconductor memories.	K4	
	CO4: Explain the architecture & organization of 8085 Microprocessor	K5	
	CO5: categorize Interface various pheripheral IC's with Intel 8085/8086 microprocessor for its various application.	K4	

Learning Resources	
Text Books	1.M.Morris Mano, "Digital Design "3rd Edition, PHI, New Delhi.(2018) 2.S.Salivahana & S. Arivazhagan-Digital circuits and design (2018) 3.Ramesh S.Gaonakar ,Microprocessor Architecture, Programming and Applications with the 8085 – Penram International Publishing, Mumbai.-(2013)
Reference Books	1.Herbert Taub and Donald Schilling. "Digital Integrated Electronics" McGraw Hill (2017). 2.S.K. Bose. "Digital Systems". 2/e. New Age International (2014). 3.D.K. Anvekar and B.S. Sonade. "Electronic Data Converters: Fundamentals & Applications". TMH.1994.
Website Link	1. https://youtu.be/-paFaxtTCkI 2. https://youtu.be/s1DSZEaCX_g
Self Study Material	https://www.linkedin.com/pulse/microcontroller-microprocessor-market-size-trends-evaluation-qsm9f/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHC10	**DIGITAL ELECTRONICS AND MICROPROCESSOR 8085**	**DSC THEORY-X**	**VI**	**5**	**3**	**2**	**-**	**4**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	L	M	S	M	M	S	M	S
CO2	M	M	S	S	M	M	S	M	S	M
CO3	M	S	M	M	S	M	M	S	M	S
CO4	M	S	M	S	S	M	S	M	S	M
CO5	M	M	S	M	M	S	M	S	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Open book Problem solving
Teaching and Learning Methods	chalk and talk , power point presentation
Assessment Methods	CIA –I CIA-II, Assignments , ESE

Designed By	**Verified By**	**Approved By** Member secretary
V.SATHEESHKUMAR	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. Physics Syllabus LOCF - CBCS with effect from 2023-2024Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UPHP01	**PRACTICAL: PROPERTIES OF MATTER**	**DSC PRACTICAL-I**	**I**	**3**	**-**	**-**	**3**	**3**
Objective	Apply various physics concepts to students understand Properties of Matter, setup experimentation to verify theories, quantify and analyze, able to do error analysis and correlate results.							

S. No.	List of Experiments (Any EIGHT Experiments)	Knowledge Levels	Sessions
1.	Determination of rigidity modulus without mass using Torsional pendulum	K5	3
2.	Determination of rigidity modulus with masses using Torsional pendulum	K6	3
3.	Determination of moment of inertia and g using Bifilar pendulum	K6	3
4.	Determination of Young's modulus by stretching of wire with known masses	K6	3
5.	Determination of Young's modulus by uniform bending – load depression graph	K5	3
6.	Determination of Young's modulus by non-uniform bending – scale & telescope	K5	3
7.	Determination of Young's modulus by cantilever – load depression graph	K6	3
8.	Determination of Young's modulus by cantilever – oscillation method	K6	3
9.	Determination of Young's modulus by Koenig's method – (or unknown load)	K6	3
10.	Determination of rigidity modulus by static torsion	K5	3
11.	Determination of surface tension & interfacial surface tension by drop weight method.	K6	3
12.	Determination radius of capillary tube by mercury pellet method.	K5	3
13.	Determination of g using compound pendulum.	K6	3

Course Outcome	**CO1:** Determine the rigidity modulus of the material with and without using masses	K5	
	CO3: Compose the effects of surface tension on liquids and solids, and analyze its relevance in capillary action and wetting phenomena	K6	
	CO2: Deduct the moment of inertia of an irregular body, gravitational constant using compound pendulum	K5	
	CO4: Explain the co-efficient of viscosity by Stokes' method and critical pressure for streamline flow.	K5	
	CO5: Design a thorough understanding of various experimental methods to determine Young's modulus for analyzing material properties	K6	

Learning Resources				
Text Books	1. S.L. Gupta and Kumar, Pragati Prakashan, Practical Physics -25th Edition (2002). 2. M.N. Srinivasan, Sultan Chand & Sons, A text book of Practical Physics, (2017).			
Reference Books	1. C.L.Arora, B.Sc. Practical Physics, S Chand & Company; Classic Edition (2010). 2. Singh Harnam, P.S. Hemne, B.Sc. Practical Physics, S Chand & Company; New edition (2000). 3. M.K.Subramanian, S. Padmanathan S.Somasundaran, B.Sc Practical Physics, Apsara publications, Trichy, Revised edition (2020).			
Website Link	1. https://www.youtube.com/watch?v=iUhfstf10rk 2. https://www.birmingham.ac.uk/teachers/study-resources/stem/physics/youngs-modulus.aspx 3. https://www.leybold-shop.com/physics/physics-experiments/heat.html			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M1UPHP01	**PRACTICAL:PROPERTIES OF MATTER**	**DSC PRACTICAL-I**	**I**	**3**	**-**	**-**	**3**	**3**	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	M	S	M
CO2	M	S	S	S	M	S	S	M	M	M
CO3	S	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	S	S	S	M	M	M
CO5	S	M	S	S	S	S	S	M	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Demonstration and practical sessions
Assessment Methods	CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. K. SANGEETHA	**Dr. M.REVATHI**	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHP02	**PRACTICAL: HEAT, OSCILLATIONS, WAVES AND SOUND EXPERIMENTS**	**DSC PRACTICAL-II**	**II**	**3**	**-**	**-**	**3**	**3**
Objective	Apply their knowledge gained about the concept of heat and sound waves, resonance, calculate frequency of ac mains set up experimentation to verify theories, quantify and analyze, able to do error analysis and correlate results.							

Unit	List of the experiments (Any EIGHT Experiments)	Knowledge Levels	Sessions
1.	Determination of specific heat by cooling – graphical method.	K5	3
2.	Determination of thermal conductivity of good conductor by Searle's method.	K5	3
3.	Determination of thermal conductivity of bad conductor by Lee's disc method	K5	3
4.	Determination of thermal conductivity of bad conductor by Charlaton's method.	K6	3
5.	Determination of specific heat capacity of solid	K5	3
6.	Determination of specific heat of liquid by Joule's electrical heating method (applying radiation correction by Barton's correction/graphical method),	K5	3
7.	Determination of Latent heat of a vaporization of a liquid	K6	3
8.	Determination of Stefan's constant for Black body radiation.	K5	3
9.	Verification of Stefan's-Boltzmans law.	K5	3
10.	Determination of thermal conductivity of rubber tube	K6	3
11.	Helmholtz resonator.	K5	3
12.	Velocity of sound through a wire using Sonometer.	K5	3
13.	Determination of velocity of sound using Kunds tube	K6	3

14.	Determination of frequency of an electrically maintained tuning fork	K5	3
15.	To verify the laws of transverse vibration using sonometer.	K6	3
16.	To verify the laws of transverse vibration using Melde's apparatus.	K5	3
17.	To compare the mass per unit length of two strings using Melde's apparatus	K5	3
18.	Frequency of AC by using sonometer	K5	3
Course Outcome	**CO1:** Criticize the basic concept of heat.	K5	
	CO2: Combine special sound waves experiments.	K6	
	CO3: Evaluate the resonance.	K5	
	CO4: Estimate the frequency of ac mains set up experimentation.	K6	

	CO5: Design the mass per unit length of two strings using Melde's apparatus .		K6	
Learning Resources				
Text Books	1 S.L.Gupta and Kumar pragati prakashan,. practical physics -25th Edition (2002). 2 M.N .Srinivasan , A text book of practical physics , New delhi, edition (2017)			
Reference Books	1. Visvanathan , A text book of practical physics ,publisher prat II (1966). 2. M.K.Subramanian,S,Padmanathan S.Somasundaran, B.Sc practical physics,Apsara publications,Trichy ,Revised edition (2020).			
Website Link	1. https://www.nature.com/articles/099041b0 2. https://www.fizzicseducation.com.au/category/150-science-experiments/heat-experiments/ 3. https://www.leybold-shop.com/physics/physics-experiments/heat.html			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHP02	**PRACTICAL:HEAT, OSCILLATIONS, WAVES AND SOUND EXPERIMENTS**	**DSC PRACTICAL-II**	**II**	**3**	**-**	**-**	**3**	**3**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	S	S	S	S	S	M
CO2	S	S	S	s	S	S	M	S	M	S
CO3	S	M	S	M	S	S	M	S	S	S
CO4	S	S	S	S	S	S	s	S	S	S
CO5	S	s	S	S	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Demonstration and practical sessions
Assessment Methods	To conduct model practical

Designed By	**Verified By**	**Approved By** Member secretary
Ms. L.MOHANA	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UPHP03	**PRACTICAL:ELECTRICITY**	**DSC PRACTICAL-III**	**III**	**3**	**-**	**-**	**3**	**3**

Objective	Students construct circuits to learn about the concept of electricity, current, resistance in the path of current, different parameters that affect a circuit. Set up experiments, observe, analyze and assimilate the concept.		
S. No.	**List Of Experiments (any EIGHT Experiments)**	**Knowledge Levels**	**Sessions**
1	Calibration of low range and high range voltmeter using potentiometer	K5	3
2	Calibration of ammeter using potentiometer.	K6	3
3	Measurement of low resistances using potentiometer.	K5	3
4	Determination of field along the axis of a current carrying circular coil.	K5	3
5	Determination of earth's magnetic field using field along axis of current carrying coil.	K5	3
6	Determination of specific resistance of the material of the wire using PO box.	K6	3
7	Determination of resistance and specific resistance using Carey Foster's bridge.	K6	3
8	Determination of internal resistance of a cell using potentiometer.	K5	3
9	Determination of specific conductance of an electrolyte.	K5	3
10	Determination of e.m.f of thermo couple using potentiometer.	K5	3
11	Determination of capacitance using Desauty's bridge and B.G./Spot galvanometer/head phone.	K5	3
12	Determination of figure of merit of BG or spot galvanometer.	K5	3
13	Comparison of EMF of two cells using BG.	K5	3
14	Comparison of capacitance using BG.	K6	3
Course Outcome	**CO1:** Calibrate the range of potentiometer.	K5	
	CO2: Understand measurement of Resistance and temperature coefficient of resistance.	K6	
	CO3: Construct and measurement of internal and specific Resistance.	K5	
	CO4: Performed the experiment of BG.	K6	

	CO5: Determine the emf of cells.	K5	

Learning Resources

Text Books	1. Gupta and Kumar, Practical Physics, Pragati Prakasan, 2020. 2. D.Chattopadhyay, P,C.Rakshit, An Advanced Course in Practical Physics, New Central Book Agency(P) Ltd., 2007. 3. , R. Srinivasan K.R Priolkar,Kit Developed for doing experiments in Physics-Instruction manual Indian Academy of Sciences. 4. S.K.Ghosh, A Textbook of Advanced Practical Physics, New Central, Fourth Edition, 2000.
Reference Books	1. S.P Singh, Advanced Practical Physics, PragatiPrakasan,2017. 2. D. Chattopadhayay, C.R Rakshit ,An advanced course in Practical Physics, , New Central Book Agency Pvt. Ltd.2011.
Website Link	1. https://clearthistest.com/post-office-box-experiment-in-physics-practical/ 2. https://circuitdigest.com/tutorial/calibration-of-ammeter-voltmeter-and-wattmeter-usingpotentiometer#:~:text=Calibration%20of%20Voltmeter%20using%20Potentiometer&text=So%20standard%20voltage%20cell%20with,as%20shown%20in%20the%20figure. 3. https://www.gopracticals.com/physics/physics-calibrate-ammeter-potentiometer/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M3UPHP03	**PRACTICAL:ELECTRICITY**	**DSC PRACTICAL-III**	**III**	**3**	**-**	**-**	**3**	**3**	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	S	S	S	S	S	M
CO2	S	S	S	M	S	S	S	S	L	S
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	M	S	S	M	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. C. INDIRA PRIYADHARSINI	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHP04	**PRACTICAL:LIGHT**	**DSC PRACTICAL-IV**	**IV**	**3**	**-**	**-**	**3**	**3**
Objective	Students demonstrate various optical phenomena principles, working, apply with various materials and interpret the results.							

S. No.	List of Experiments (Any EIGHT Experiments)	Knowledge Levels	Sessions
1.	Determination of refractive index of prism using spectrometer.	K5	3
2.	Determination of refractive index of liquid using hollow prism and spectrometer	K6	3
3.	Determination of dispersive power of a prism.	K5	3
4.	Determination of radius of curvature of lens by forming Newton's rings.	K5	3
5.	Determination of thickness of a wire using air wedge.	K6	3
6.	Determination of Cauchy's Constants.	K6	3
7.	Determination of resolving power of grating	K5	3
8.	Determination of resolving power of telescope	K5	3
9.	Comparison of intensities using Lummer Brodhum Photometer.	K6	3
10.	Determination of range of motion using Searles goniometer.	K5	3
11.	Verification of Newton's formula for a lens separated by a distance.	K6	3

12.	Determination of refractive index of a given liquid by forming liquid lens	K5	3
13.	Determination of refractive index using Laser.	K5	3
14.	Determination of wavelengths, particle size using Laser/Monochromatic source.	K6	3
15.	Determination of resolving power of Diffraction grating using Laser	K5	3
16.	Determination of wire using Laser.	K5	3
Course Outcome	**CO1:** Determine the refractive index of liquid and Prism	K5	
	CO3: Estimate the radius of curvature of lens by forming Newton's rings.	K6	
	CO2: Estimate the Newton's formula for a lens separated by a distance.	K6	
	CO4: Determine the resolving power of telescope.	K5	
	CO5: Determine the resolving power of Diffraction grating using Laser	K5	

Learning Resources	
Text Books	1. S.L. Gupta and Kumar, Pragati Prakashan, Practical Physics (2018). 2. M.N. Srinivasan, Sultan Chand & Sons, A text book of Practical Physics, (2017).
Reference Books	1. C.L.Arora, B.Sc. Practical Physics, S Chand & Company; Classic Edition (2010). 2. M.K.Subramanian, S. Padmanathan S.Somasundaran, B.Sc Practical Physics, Apsara publications, Trichy, Revised edition (2020).
Website Link	1. https://www.youtube.com/watch?v=b2_7fGcGXYg 2. https://www.youtube.com/watch?v=3s9jrMQkLi4 3. https://www.youtube.com/watch?v=g_lXxvrK_KI

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHP04	**PRACTICAL:LIGHT**	**DSC PRACTICAL-IV**	**IV**	**3**	**-**	**-**	**3**	**3**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	M	S	M
CO2	M	S	S	S	M	S	S	M	M	M
CO3	S	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	S	S	S	M	M	M
CO5	S	M	S	S	S	S	S	M	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Demonstration and practical sessions
Assessment Methods	CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
V.SATHEESHKUMAR	Dr. M.REVATHI	Dr. S. Shahitha

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Rasipuram - 637 408.

B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHP05	**PRACTICAL : GENERAL EXPERIMENTS**	**DSC PRACTICAL - V**	**V**	**3**	**-**	**-**	**3**	**3**
Objective	Demonstrate various optical phenomena principles, working, apply with various materials and interpret the results.							

S. No	List of Experiments (Any EIGHT Experiments)	Knowledge Levels	Sessions
1	Diffraction at a wire and straight edge.	K6	3
2	Specific rotation of a sugar solution.	K6	3
3	Brewster's law- polarization.	K6	3
4	Biprism – determination of refractive index.	K6	3
5	Dispersive power of plane diffraction grating.	K6	3
6	Y- by Corlus Method.	K6	3
7	e/m Thomson Method.	K6	3
8	Kundt's tube – Velocity of sound, Adiabatic Young's modulus of the material of the rod.	K6	3
9	Forbe's method – Thermal conductivity of a metal rod.	K6	3
10	Spectrometer – Grating - Normal incidence - Wave length of Mercury spectral lines.	K6	3
11	Spectrometer – Grating - Minimum deviation - Wave length of Mercury spectral lines.	K6	3
12	Spectrometer – (i-d) curve.	K6	3
13	Spectrometer – (i-i)' curve.	K5	3
14	Spectrometer – Narrow angled prism.	K5	3
15	Rydberg's constant.	K6	3
16	Spectral response of photo conductor (LDR).	K6	3
17	Potentiometer –Resistance and Specific resistance of the coil.	K5	3
18	Potentiometer – E.M.F of a thermocouple.	K5	3

19	Carey Foster's bridge - Temperature coefficient of resistance of the coil.	K6	3
20	Deflection Magnetometer – Determination of Magnetic moment of a bar magnet and BH using circular coil carrying current.	K6	3
21	Vibration magnetometer - Determination of BH using circular coil carrying current– Tan B position.	K6	3
22	B.G – Figure of Merit – Charge Sensitivity.	K6	3
Course Outcome	**CO1:** Remember the knowledge of the potentiometer and it applies it for various experiments.	K6	
	CO2: Understand the usage of basic law and theories to determine various properties of the materials given.	K6	
	CO3: Apply the knowledge of physical optics using spectrometer.	K6	
	CO4: Students are analyzing experimental learning methods.	K6	
	CO5: Execute the practical knowledge for various experiments.	K5	

Learning Resources	
Text Books	1. S.L. Gupta and V. Kumar – Practical Physics – Pragati Prakashan – (2023). 2. Ouseph, Srinivasan & Vijayendran, Practical Physics. 3. M.N.Srinivasan - A text book of practical physics, New Delhi Edition (2017).
Reference Books	1. C.L Arora, B.Sc Practical Physics, S.Chand & Company , Classic Edition (2010). 2. M.K Subramanian, S.Padmanathan, S.Somasundaram, B.Sc Physics Practical, Apsara Publications, Trichy, Revised edition 2020.
Website Link	1. https://www.youtube.com/watch?v=0OibVufdMbA 2. https://www.youtube.com/watch?v=a4Fxjw-ZHG4 3. https://www.youtube.com/watch?v=N0lxwqANsd4 4. https://www.youtube.com/watch?v=RrSBOHvhSI4&t=26s 5. https://www.youtube.com/watch?v=UVSMfAnKy90

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHP05	**PRACTICAL : GENERAL EXPERIMENTS**	**DSC PRACTICAL - V**	**V**	**3**	**-**	**-**	**3**	**3**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	S	S	S	M	S	S
CO2	S	M	S	S	S	M	S	S	S	M
CO3	S	S	S	S	M	S	M	M	S	S
CO4	S	M	M	S	S	M	S	S	M	S
CO5	M	S	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Demonstrations and practical sessions
Assessment Methods	CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Ms. M.SARANYA	Dr. M.REVATHI	Dr. S. Shahitha

B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHP06	**PRACTICAL:ELECTRONICS**	**DSC PRACTICAL-VI**	**VI**	**3**	**-**	**-**	**3**	**3**
Objective	The students will acquire the knowledge to conduct experiments and identifying, formulating, analyzing and creating efficiently.							

S. No	List of Experiments (Any EIGHT Experiments)	Knowledge Levels	Sessions
1	Draw the characteristics of Zener diode and find its break down voltage.	K5	3
2	Construct the four diodes using Bride rectifier	K5	3
3	Construct a Colpitt's oscillator using a transistor, determine its frequency for various values of 'C' and also determine the self induction of the given coil.	K5	3
4	Construct a Hartley oscillator using a transistor, determine its frequency for various values of 'C' and also determine the self induction of the given coil.	K5	3
5	Construct a Astable multivibrtaor using IC 555 timer and study their performance.	K5	3
6	Study the Characteristic curve of FET. Draw the suitable graph and calculate its parameters.	K6	3
7	Study the V-I characteristics of UJT and measure the peak point voltage and valley point voltage.	K5	3

8	Construct Integrator and differentiator circuit using OP – AMP	K5	3
9	Design differentiator and integrator circuits and study its performance using OP-Amp.	K6	3
11	Verify the truth tables of basic logic gates (NOT,OR,AND, NOR,NAND, XOR, XNOR) using integrated chips	K6	3
12	Verification of De Morgan's theorem using ICs –NOT, OR,AND	K5	3
13	Show that NAND and NOR as universal building block.	K5	3
14	Construct the half adder and full adder using logic gates and to verify their truth table.	K6	3
15	Construct the Full adder and full Subtractor using logic gates and to verify their truth table.	K5	3
16	Using 8085 microprocessor, write and execute the program to find the sum and difference of a two 8 bit number.	K6	3
17	Using 8085 microprocessor, write and execute the program to find the Largest and Smallest number of a 8 bit number.	K6	3
Course Outcome	**CO1:** Construct the forward and reverse bias characteristics of Zener diode.	K6	
	CO2: Evaluate and test full wave bridge rectifier circuit.	K5	
	CO3: Estimate of students' understanding of operational Amplifiers (op-amps).	K5	
	CO4: Explain the 8085 microprocessor.	K5	
	CO5: Design the logic gates.	K6	

Learning Resources				
Text Books	1. S. Poornachandra Rao,B.Sasikala,Handbook of Experiments in Electronics and Communication Engineering,**S Chand.** 2. S.V. Subrahmanyam, Experiments in Electronics, Laxmi Publications; Second edition (1 January 2011).			
Reference Books	1. Jagmehender Sheoran, N K Agarwal, Modern Book of Electronic Experiments: Electronics Experiments, Book Kindle Edition,1 May 2014. 2. Geeta Bhatt (Author), Geeta Mongia (Author),Experiments Based on Analog and Digital Electronics Paperback – 28 February 2012. 3. Rajesh B M (Author), Shubha S (Author) ,Practical Electronics Experiment:			
Website Link	1. https://youtu.be/hA_rZZTfcFM?si=dn2D4Egl8Eoe6-F_ 2. https://youtu.be/X-i1MevYcpM?si=NCuW_fvqQJPNVAJx 3. https://youtu.be/x9sVElYLnWY?si=5DhPcl-c3TdMRBLD 4. https://youtu.be/8VS0o3uxMNE?si=nVpdmwAoXIj88FZ2 5. https://youtu.be/jonWWaBdMNU?si=t_ayUe315bFeRYhP			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHP06	**PRACTICAL:ELECTRONICS**	**DSC PRACTICAL-VI**	**VI**	**3**	**-**	**-**	**3**	**3**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	M	S	M
CO2	S	S	S	S	M	S	S	S	S	M
CO3	S	S	S	S	M	S	S	S	S	M
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	S	S	S	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Lab Demonstration
Assessment Methods	CIA-I, CIA-II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
MOHANDASS GANDHI A	Dr.M.REVATHI	Dr. S. Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

DISCIPLINE SPECIFIC ELECTIVESs
SYLLABUS - CBCS PATTERN
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards
LIST OF ELECTIVES

S.NO	SEM	COURSE_CODE	TITLE OF THE COURSE
1	V	23M5UPHE01	ENERGY PHYSICS
2	V	23M5UPHE02	MATERIAL SCIENCE
3	VI	23M6UPHE03	NANO SCIENCE AND NANO TECHNOLOGY

B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHE01	**ENERGY PHYSICS**	**DSE THEORY-I**	**V**	**5**	**3**	**2**	**-**	**4**
Objective	Students to get the knowledge of the conventional and non-conventional energy Sources, their conservation and storage systems.							

Unit	Course Content	Knowledge Levels	Sessions
I	**INTRODUCTION TO ENERGY SOURCES:** Energy Consumption as a Measure of Prosperity – World Energy Future – Energy Sources and their Availability – Conventional Energy Sources – Non-Conventional and Renewable Energy Sources – Comparison – Merits and Demerits.	K4	12
II	**SOLAR ENERGY:** Solar Energy Introduction – Solar Constant – Solar Radiation at the Earth's Surface –Solar Energy Storage And Storage Systems – Solar Pond – Solar Cooker – Solar Water Heater – Solar Greenhouse – Types Of Greenhouses – Solar Cells.	K4	12
III	**WIND ENERGY:** Introduction –Nature of the Wind – Basic Principle of Wind Energy Conversion – Wind Energy Data and Energy Estimation – Basic Components of Wind Energy Conversion Systems (WECS) – Advantages and Disadvantages of WECS – Applications – Tidal Energy	K4	12
IV	**BIOMASS ENERGY:** Introduction – Classification – Biomass Conversion Technologies – Photosynthesis – Fermentation - Biogas Generation – Classification of Biogas Plants – Anaerobic Digestion for Biogas – Wood Gasification – Advantages & Disadvantages.	K4	12
V	**ENERGY STORAGE:** Importance of Energy Storage- Batteries - Lead Acid Battery -	K4	12

	Nickel- Cadmium Battery – Fuel Cells – Types of Fuel Cells – Advantages And Disadvantages of Fuel Cells – Applications of Fuel Cells - Hydrogen Storage. ***Current Trends:** Lithium ion battery , super capacitor		
	*** Self Study.**		
Course Outcome	**CO1:** Categorize conventional and non conventional energy sources	K4	
	CO2: Explain Solar Radiation and Solar Energy Storage Systems	K4	
	CO3: Interpret the wind energy Conversion	K4	
	CO4: Analyze the basic ideas of biomass energy	K4	
	CO5: justify the importance of Energy storage devices	K4	

Learning Resources

Text Books	1. G.D.Rai, Non-Conventional Sources of Energy, Khanna Publishers, 2009, 4thEdn. 2. S P Sukhstme, JK Nayak, Solar Energy, Principles of Thermal Collection and Storage, McGraw Hill, 2009, 3rdEdn.
Reference Books	1. John Twidell & Tony Weir, Renewable Energy Resources, Taylor & Francis, 2005, 2nd Edn. 2. S.A.Abbasi and NasemaAbbasi, Renewable Energy sources and their environmental impact, PHI Learning Pvt. Ltd, 2008.
Website Link	1.https://byjus.com/physics/conventional-and-nonconventional-sources-of-energy/ 2.https://www.britannica.com/science/solar-energy/Electricity-generation
Self Study Material	https://evreporter.com/lithium-ion-battery-manufacturing-in-india/ https://batteryuniversity.com/article/bu-209-how-does-a-supercapacitor-work

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C	
23M5UPHE01	ENERGY PHYSICS	DSE THEORY-I	V	5	3	2	-	4	

CO-PO Mapping										
CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	S	M	M	S	M	M	S	M
CO2	M	S	M	S	M	M	S	M	M	S
CO3	L	M	S	M	M	S	M	S	M	M
CO4	L	M	M	S	S	M	S	M	M	S
CO5	M	S	M	M	S	M	M	S	S	M
Level of Correlation between CO and PO	L-LOW			M-MEDIUM			S-STRONG			

Tutorial Schedule	group discussions
Teaching and Learning Methods	chalk and talk , power point presentation
Assessment Methods	CIA-I, CIA-II, Assignments, ESE

Designed By	Verified By	Approved By Member secretary
V.SATHEESHKUMAR	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UPHE02	MATERIAL SCIENCE	DSE THEORY -II	V	4	2	2	-	3

Objective	To enable the students to learn about the imperfections in crystals, deformation of materials and testing of materials and behavior of a material, under the action of light and their applications.

Unit	Course Content	Knowledge Levels	Sessions
I	**CRYSTAL IMPERFECTIONS:** Introduction - Point Defects: Vacancies, Interstitials, Impurities, Electronic Defects - Equilibrium Concentration of Point Imperfections -Application of Point Defects -Line Defects: Edge Dislocation, Screw Dislocation - Surface Defects: Extrinsic Defects - Intrinsic Defects: Grain Boundaries, Tilt &Twist Boundaries, Twin Boundaries, Stacking Faults - Volume Defects - Effect of Imperfections.	K2	10
II	**MATERIAL DEFORMATION:** Introduction - Elastic Behavior of Materials - Atomic Model of Elastic Behavior -Modulus as a Parameter in Design - Rubber Like Elasticity - Inelastic Behavior of Materials - Relaxation Process - Viscoelastic Behavior of Materials - Spring- Dash Pot Models of Viscoelastic Behavior of Materials.	K3	9
III	**PERMANENT DEFORMATION AND STRENGTHENING METHODS OF MATERIALS:** Introduction - Plastic Deformation: Tensile Stress-Strain Curve - Plastic Deformation by Slip - Creep: Mechanism of Creep - Creep Resistant Materials - Strengthening Methods: Strain Hardening, Grain Refinement - Solid Solution Strengthening - Precipitation Strengthening.	K3	10

IV	**OPTICAL MATERIALS:** Introduction – Optical Absorption in Metals, Semiconductors and Insulators – NLO Materials and their Applications – Display Devices and Display Materials: Fluorescence And Phosphorescence – Light Emitting Diodes –Liquid Crystal Displays.	K4	9
V	**MECHANICAL TESTING:** Destructive Testing: Tensile Test, Compression Test, Hardness Test – Nondestructive Testing (NDT): Radiographic Methods, Ultrasonic Methods – Thermal Methods of NDT: Thermography – Equipment Used for NDT: Metallurgical Microscope. ***Current Trends -** Recent advances in non-destructive inspection.	K5	10
	***Self Study**		
Course Outcome	**CO1:** Analyze the various crystal imperfections.	K2	
	CO2: Classify the various material deformations.	K3	
	CO3: Discover the permanent deformation and strengthening methods of materials.	K3	
	CO4: Categorize the optical properties of materials and working principles of various optical devices.	K4	
	CO5: Compare the various mechanical testing methods.	K5	

Learning Resources

Text Books	1. Material science and Engineering, Raghavan V, Prentice Hall of India, Sixth Edition,(2015). 2. Materials Science, V. Rajendran, McGraw Hill Publications, (2011). 3. Testing of Metallic materials by A V K Suryanarayana , B S publications , (2003).
Reference Books	1. William D. Callister, Jr., Material Science & Engineering – An Introduction, 8th Edition, John Wiley & Sons, Inc., (2007). 2. W. Bolton, "Engineering Materials Technology", 3rd Edition, Butterworth & Heinemann, (2001). 3. Donald R. Askeland, Prade p P. Phule, "The Science and Engine ring of Materials",

	5thEdition, Thomson Learning, First Indian Reprint, (2007).			
Website Link	1. https://nptel.ac.in/courses/113107078 2. https://www.vssut.ac.in/lecture_notes/lecture1497881261.pdf 3.https://www.studocu.com/in/document/anna-university/multi-core-architectures-and-programming-mcap/unit-iv-optical-properties-of-materials/31064662			
Self study materials	https://nlist.inflibnet.ac.in/search/Record/EBC3020044			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHE02	**MATERIAL SCIENCE**	**DSE THEORY -II**	**V**	**4**	**2**	**2**	**-**	**3**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	S	S	M	M	S	S
CO2	M	M	M	S	M	M	S	M	M	M
CO3	S	M	S	M	S	M	M	S	S	S
CO4	S	S	S	S	M	S	M	M	M	M
CO5	S	M	M	S	M	S	M	S	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group discussions, Quiz
Teaching and Learning Methods	Chalk and Talk , Power Point Presentation
Assessment Methods	CIA –I, CIA-II, Assignments, ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. M.MEENACHI	Dr. M.REVATHI	Dr. S. Shahitha

B. Sc-Physics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHE03	**NANO SCIENCE AND NANO TECHNOLOGY**	**DSE THEORY-III**	**VI**	**5**	**3**	**2**	**-**	**4**
Objective	This course intends to offer students with an overview of Nano science and Nanotechnology by introducing different types of nanomaterials, their characteristics, manufacturing processes, characterization techniques, and a variety of applications.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction of Nano materials:** Nanoscale – Nature and Nanostructures – Nanostructures: 0D,1D,2D- Surface To Volume Ratio- Size Effect – Excitons – Quantum Confinement – Metal Based Nanoparticles (Metal And Metal Oxide) – Nanocomposites (Non-Polymer Based) – Carbon Nanostructures – Fullerene.	K3	12
II	**PROPERTIES OF NANOMATERIALS:** Introduction –Mechanical Behavior –Elastic Properties – Hardness and Strength – Ductility and Toughness –Super plastic Behavior – Optical Properties – Surface Plasmon Resonance – Electrical Properties – Dielectric Materials and Properties – Magnetic Properties – Super Paramagnetism – Electrochemical Properties.	K4	12
III	**FABRICATION METHODS AND VACUUM TECHNIQUES:** Top-Down and Bottom-Up Approaches – Electrochemical Method – Chemical & Physical Vapor Depositions (CVD & PVD) – Plasma Arc Discharge – Sputtering – Thermal Evaporation – Pulsed Laser Deposition – Ball Milling – Lithography: Photolithography – E-Beam Lithography – Sol- Gel Methods.	K4	12
IV	**CHARACTERIZATION TECHNIQUES:** Scanning Tunneling Microscopy – Scanning Electron Microscopy – Transmission Electron Microscopy –Powder XRD	K5	12

	Method: Determination of Structure And Grain Size Analysis – Photoluminescence Spectroscopy.		
V	**APPLICATIONS OF NANOMATERIALS:** Medicine: Drug Delivery – Photodynamic Therapy – Molecular Motors. Sensors: Nano sensors Based On Optical And Physical Properties – Electrochemical Sensors – Nanobiosensors. Nanoelectronics: CNTFET – Display Screens – GMR Read/Write Heads. ***Current Trends : Nano robots**	K5	12
	***Self Study**		
Course Outcome	**CO1:** Determining the concept of Nanomaterials, Dimensional of Nanomaterials (OD, 1D, 2D, 3D) and Metal based Nanoparticles.	K3	
	CO2: Categorized the Properties of Nanomaterials	K4	
	CO3: Discuss the preparation of two approaches and Preparation of different methods for Nanoparticles.	K4	
	CO4: Exemplifying the Characterizations analysis for Nanoparticles.	K5	
	CO5: Planning the Nanomaterials application for Industry (Energy, Environmental, Medicine, Nanorobots)	K5	

Learning Resources

Text Books	1. K.K.Chatto padhyay and A.N.Banerjee, (2012), Introduction to Nano science and Nanotechnology, PHI Learning Pvt. Ltd., 2. M.A. Shah, Tokeer Ahmad Principles of Nano science and Nanotechnology, Narosa Publishing House Pvt Ltd,(2010)
Reference Books	1. Richard Booker and Earl Boysen, (2005) Nanotechnology, Wiley Publishing Inc. USA 2. J.H.Fendler (2007) Nano particles and nano structured films; Preparation, Characterization and Applications, John Wiley & Sons.
Website Link	1. https://en.wikipedia.org/wiki/Nanotechnology 2. https://en.wikipedia.org/wiki/Nanomaterials 3. https://en.wikipedia.org/wiki/Characterization_(materials_science)
Self-Study Material	https://doi.org/10.1016/B978-0-12-823710-6.00020-0

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHE03	**NANO SCIENCE AND NANO TECHNOLOGY**	**DSE THEORY-III**	**VI**	**5**	**3**	**2**	**-**	**4**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	S	S	M	S	M	S	S
CO2	M	S	S	M	M	S	S	S	M	M
CO3	S	S	M	S	S	M	S	M	S	S
CO4	S	M	M	S	M	S	S	S	M	S
CO5	M	M	S	S	M	S	S	M	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Quiz online test and Experimentally demonstrate
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	CIA-I, CIA- II, Assignment and ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. S. MANIKANDAN	Dr. M. REVATHI	Dr. S. Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

FOUNDATION COURSE (FC)
SYLLABUS - CBCS PATTERN
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards
LIST OF FC COURSE

S.NO	SEM	COURSE_CODE	TITLE OF THE COURSE
1	I	23M1UPHFC1	INTRODUCTORY PHYSICS

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M1UPHFC1	INTRODUCTORY PHYSICS	FC THEORY -I	I	2	2	-	-	2

Objective	To help students get an overview of Physics before learning their core courses. To serve as a bridge between the school curriculum and the degree programme.

Unit	Course Content	Knowledge Levels	Sessions
I	Vectors, Scalars –Examples for Scalars and Vectors from Physical Quantities – Addition, Subtraction of Vectors – Resolution and Resultant of Vectors – Units and Dimensions- Standard Physics Constants.	K2	5
II	Different Types of Forces-Gravitational, Electrostatic, Magnetic, Electromagnetic, Nuclear –Mechanical Forces like, Centripetal, Centrifugal, Friction, Tension, Cohesive, Adhesive Forces.	K3	5
III	Different forms of Energy- Conservation Laws of Momentum, Energy – Types of Collisions –Angular Momentum- AlternateEnergy Sources- Real Life Examples.	K3	4
IV	Types of Motion- Linear, Projectile, Circular, Angular, Simple Harmonic Motions – Satellite Motion – Banking of a Curved Roads – Stream Line and Turbulent Motions – Wave Motion – Comparison of Light and Sound Waves – Free, Forced, Damped Oscillations.	K4	5
V	Surface Tension – Shape of Liquid Drop – Angle of Contact –Viscosity – Lubricants – Capillary Flow – Diffusion – Real Life Examples- Properties and Types of Materials in Daily use- Conductors, Insulators – Thermal and Electric.	K5	5
Course Outcome	**CO1:** Outline the concept of vectors to understand concepts of Physics and solve problems.	K2	
	CO2: Organize different forces present in Nature while learning about phenomena related to these different forces.	K3	
	CO3: Develop the energy in different process and relate momentum, velocity and energy.	K3	
	CO4: Inspect the different types of motions they would encounter in various courses and understand their basis.	K4	

	CO5: Decide various properties of matter with their behavior and connect them with different physical parameters involved.	K5

Learning Resources				
Text Books	1. D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand& Co. 2. BrijLal& N. Subrahmanyam, 2003, Properties of Matter, S.Chand& Co.			
Reference Books	1. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, S.Chand& Co.			
Website Link	1.http://hyperphysics.phy astr.gsu.edu/hbase/permot2.htmlhttps://science.nasa.gov/ems/ 2.https://eesc.columbia.edu/courses/ees/climate/lectures/radiation_hays			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UPHFC1	**INTRODUCTORY PHYSICS**	**FC THEORY -I**	**I**	**2**	**2**	**-**	**-**	**2**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	M	S	M
CO2	M	S	S	S	M	S	S	M	M	M
CO3	S	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	S	S	S	M	M	M
CO5	S	M	S	S	S	S	S	M	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Group Discussion, Quiz program, Model preparation and Kahoot app,
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	Assignment, CIA-I, CIA-II and ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. M.MEENACHI	Dr. M.REVATHI	Dr. S. Shahitha

SKILL ENHANCEMENT COURSE (SEC) (DISCIPLINE/SUBJECT SPECIFIC)SYLLABUS - CBCS PATTERN
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards
LIST OF SEC COURSES

S.NO	SEM	COURSE_CODE	TITLE OF THE COURSE
1	II	23M2UPHS01	INSTRUMENTATION
2	III	23M3UPHS02	HOME ELECTRICAL INSTALLATION
3	III	23M3UPHS03	COMPUTATIONAL METHODS AND PROGRAMMING IN C
4	IV	23M4UPHS04	ELECTRONIC DEVICES
5	IV	23M4UPHS05	COMMUNICATION SYSTEMS
6	IV	23M4UPHS06	DIGITAL PHOTOGRAPHY

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHS01	**INSTRUMENTATION**	**SEC THEORY - I**	**II**	**2**	**2**	**-**	**-**	**2**

Objective	To study the instrument with its principle and observe the method of their functioning. To provide a good foundation in measurements.

Unit	Course Content	Knowledge Levels	Sessions
I	**PERFORMANCE CHARACTERISTICS OF AN INSTRUMENTATION SYSTEM:** Introduction – System configuration – Problem Analysis - Basic Characteristics of measuring devices – Calibration - Generalized measurement – Zero – order system – Second order system–Dead time element – Specification and testing of dynamic response.	K2	5
II	**SENSORS AND TRANSDUCERS:** Basic principles of sensors – pressure sensor (Strain Gauge) – IR sensor - Characteristics of transducers – variable resistance transducer –variable capacitance transducer - Voltage and current transducer.	K3	5
III	**DIGITAL INSTRUMENTS:** Introduction – Digital Multimeter – Digital panel meter - Digital frequency meter – Digital measurement of time - Universal counter – Digital tachometer – Digital PH meter.	K4	4
IV	**MEDICAL INSTRUMENTATION:** ECG - EEG – Lead systems and recording methods – typical waveforms –X-ray machine – Digital Stethoscope – Computer tomography – MRI – Ultrasonography – Thermography - Pacemakers – Ventilators – Dialyzers.	k5	5
V	**GAS ANALYSERS AND POLLUTION MONITORING INSTRUMENTS:** Types of gas analysers – Oxygen, NO2 and H2S types – IR analyser– Air pollution standards – Air pollution detector - Dust and smoke detector –Radiation monitoring instruments –Area radiation dosimeter – personal radiation dosimeter - radiation warning alarm.	k5	5
Course Outcome	**CO1:** Decsribe the basic concept of characteristics of an instrumentation system.	K2	
	CO2: Execute the Basic principles of sensors.	K3	
	CO3: Apply the digital instruments, Digital Multimeter, Digital panel meter, Digital PH meter.	K4	
	CO4: Analyze the medical instrumentation of ECG – EEG, MRI	K5	

	CO5: Defend the gas analyzers and pollution monitoring instruments.	K5	
Learning Resources			
Text Books	1.E.A.Doebelin, Measurement Systems-Applications and Design, Tata McGraw Hill,(1990). 2.CS Rangan, GRSharma, V.S.V. Mani, Instrumentation Devices and Systems, Second Edition, Tata McGraw Hill, (2011). 3.R.S.Khandpur, Handbookof Analytical Instruments, Tata McGraw Hill(2003).		
Reference Books	1.D.Patranabis, Sensors and Transducers, Prentice Hallof India, (1999). 2. M. Arumugam, Bio-medical Instrumentation, Anuradha Agencies, (2002). 3. John G. Webster, Medical Instrumentation: Application and Design, John Wiley &Sons Inc (2009). 4. John P. Bentley Principles of Measurement Systems, Third Edition, Pearson Education, (2000).		
Website Link	1.https://youtu.be/M_5KYncYNyc 2.https://www.youtube.com/watch?v=4M72kQulGKk&vl=en		

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHS01	**INSTRUMENTATION**	**SEC THEORY - I**	**I**	**2**	**2**	**-**	**-**	**2**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	S	M	S	S	S
CO2	S	S	S	M	L	S	S	S	M	S
CO3	M	M	S	M	S	S	M	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	M	S	S	S	S	M	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power point presentation.
Assessment Methods	Assignment,CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Ms. L.MOHANA	Dr .M.REVATHI	Dr. S. Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UPHS02	**HOME ELECTRICAL INSTALLATION**	**SEC THEORY-II**	**III**	**2**	**2**	**-**	**-**	**2**
Objective	The students will get knowledge on electrical instruments, installations and domestic wiring techniques with safety precautions and servicing.							

Unit	Course Content	Knowledge Levels	Sessions
I	**SIMPLE ELECTRICAL CIRCUITS:** Charge, Current, Potential Difference, Resistance – DC Ammeter, Voltmeter, Ohmmeter – Ohm's Law – Difference between DC And AC – Advantages of AC Over DC – Electromagnetic Induction - Transformers – Inductors/Chokes – Capacitors/Condensers – Symbols and Nomenclature	K2	5
II	**TRANSMISSION OF ELECTRICITY:** Production and Transmission of Electricity – Concept of Power Grid – Series and Parallel Connections – Technicalities of Junctions and Loops in Circuits – Roles of Step-Up and Step Down Transformers – Quality of Connecting Wires – Characteristics of Single and Multicore Wires.	K2	5
III	**ELECTRICAL WIRING:** Different Types of Switches – Installation of Two Way Switch – Role of Sockets, Plugs, Sockets - Installation of Meters – Basic Switch Board – Electrical Bell – Indicator – Fixing of Tube Lights and Fans – Heavy Equipment Like AC, Fridge, Washing Machine and Oven.	K3	5
IV	**POWER RATING AND POWER DELIVERED:** Work Done by Electrical Energy – Power Rating of Electrical Appliances – Energy Consumption – Electrical Energy Unit in KWH – Calculation of EB Bill – Single and Three Phase Connections – Measures to Save Electrical Energy – Energy Audit.	K4	5
V	**SAFETY MEASURES:** Insulation for Wires – Colour Specification for Mains, Return and Earth – Understanding of Fuse and Circuit Breakers – Types of Fuses - Purpose of Earth Line – Lighting Arrestors – Short Circuiting and Over Loading – Electrical Safety – First	K5	4

	Aid for Electrical Shock – Fire Safety for Electric Current		
Course Outcome	**CO1:** Understanding the basic circuit and its Laws.	K2	
	CO2: Ilustrate the regulatory and policy frameworks Governing electricity transmission.	K2	
	CO3: Apply proper techniques for stripping, splicing, and Terminating electrical conductors.	K3	
	CO4: Compare power factor concepts and calculations, including leading and lagging power factors, reactive Power compensation.	K4	
	CO5: Evaluate emergency response plans, evacuation procedures, and incident management protocols to ensure readiness and effectiveness in responding to workplace accidents.	K5	

Learning Resources				
Text Books	1. Rex Cauldwell ,Wiring a House: 5th Edition (2014). 2. Black & Decker Advanced Home Wiring, 5th Edition: Backup Power - Panel Upgrades - AFCI Protection - "Smart" Thermostats, by Editors of Cool Springs Press, (2018). 3. Kevin Ryan, Complete Beginners Guide to Rough in Electrical Wiring,(2022).			
Reference Books	1. Surjit Singh , Electrical Installation and Estimating ,Dhanpatrai and sons,2016. 2. J B Gupta ,A course in Electrical Installation, Estimating and costing ,S K Kataria and Sons,2013.			
Website Link	1. https://www.youtube.com/watch?v=jSpE2xjsO-I 2. https://www.coynecollege.edu/learn-basics-of-home-electrical-wiring/ 3. https://www.electricaltechnology.org/2013/09/electrical-wiring.html#google_vignette			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UPHS02	**HOME ELECTRICAL INSTALLATION**	**SEC THEORY-II**	**III**	**2**	**2**	**-**	**-**	**2**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	M	S	M
CO2	S	S	S	S	S	S	S	M	M	S
CO3	S	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	S	S	M	M	M
CO5	S	M	S	S	S	M	S	M	M	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I, CIA-II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
Mr. A.MOHAN DASS GANDHI	Dr.M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UPHS03	**COMPUTATIONAL METHODS AND PROGRAMMING IN C**	**SEC THEORY-III**	**III**	**2**	**2**	**-**	**-**	**2**
Objective	This course will empower the students with necessary basic concepts of errors in computing and further will provide the basics of the C programming language.							

Unit	Course Content	Knowledge Levels	Sessions
I	**ERRORS IN COMPUTING:** Significant digits – Inherent Errors – Numerical Errors – Modeling Errors – Absolute and Relative Errors – Error Propagation – Conditioning and stability – Convergence of iterative process	K2	5
II	**ROOTS OF EQUATIONS:** Algebraic, Polynomial, Transcendental equations – Methods of the solution – Iterative methods – Starting and stopping iterative process – Evaluation of polynomials – Bisection method – False Position methodRelated problems	K3	5
III	**C-FUNDAMENTALS:** Character set – Keywords - data types – variable types - constants – identifiers – keywords – operators and expressions – Input and Output functions.	K4	4
IV	**CONTROL STATEMENTS** (Syntax and examples for each) If – else, Nested if-else, Switch – Case, Break, While Loop, for loop, Do-While statement, go to.	K5	5
V	**FUNCTIONS AND ARRAYS** Declaration and definition of a function– access a function – passing parameters to a function Defining an array – processing an array – single dimensional array – multidimensional array - simple programs (Addition, Subtraction, Multiplication of two matrices - Ascending and Descending order).	K5	5
	CO1: Apply numerical methods to obtain approximate solutions to mathematical problems.	K2	

Course Outcome	**CO2:** Analyze and evaluate the accuracy of common numerical methods.	K3	
	CO3: Identify and interpret the fundamental concepts of C Language	K4	
	CO4: Understand the steps needed to write and execute a program.	K5	
	CO5: Evaluate the proficient in programming using the C language, including concepts such as variables, control structures, functions, arrays, pointers.	K5	

Learning Resources				
Text Books	1. E.Balagurusamy, Numerical Methods, McGraw Hill Publishers,2017. 2. S.S.Sastry,IntroductoryMethodsofNumericalAnalysis,PrenticeHallofIndia,2012			
Reference Books	1. E.Balagurusamy, Programming in ANSIC,McGraw Hill Publishers,8thEdn, 2019. 2. B.Gottfried, "Schaum's Outline of Programming with C," McGraw-Hill Education, 2nd Edition, and Year: 2019.			
Website Link	1. https://beginnersbook.com/2014/01/c-tutorial-forbeginners-with-examples 2. https://onlinecourses.swayam2.ac.in/cec20_cs02/preview			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UPHS03	**COMPUTATIONAL METHODS AND PROGRAMMING IN C**	**SEC THEORY-III**	**III**	**2**	**2**	**-**	**-**	**2**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	S	S	M	S	M
CO2	S	S	S	L	S	S	S	S	M	S
CO3	S	S	L	S	S	S	S	S	S	S
CO4	M	S	S	S	S	S	L	M	S	M
CO5	S	M	S	M	M	M	S	M	M	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I, CIA-II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. C.INDIRA PRIYADHARSINI	Dr. M.REVATHI	Dr. S. Shahitha

B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHS04	**ELECTRONIC DEVICES**	**SEC THEORY - IV**	**IV**	**2**	**2**	**-**	**-**	**2**
Objective	Students are to provide a comprehensive understanding of electronic devices and circuits.							

Unit	Course Content	Knowledge Levels	Sessions
I	**SPECIAL DIODES:** Spectral response of human eye - Light Emitting Diode (LED)- advantages and its applications – photo transistor - characteristics and applications – Tunnel diode and its characteristics – Tunnel diode as an Oscillator.	K3	4
II	**SPECIAL TRANSISTORS:** JFET construction - JFET characteristics – parameters - Common source JFET amplifier UJT: construction - working - equivalent circuit - characteristics – Relaxation oscillator - SCR: Construction – working – equivalent circuit - V-I characteristics and their application.	K4	5
III	**OPERATIONAL AMPLIFIERS:** Op-amp - characteristics – Inverting and non - inverting amplifier - CMRR –Frequency response-Slew rate-Differential Amplifier-Applications: Sign changer and scale changer – adder – subtractor – integrator – differentiator.	K4	5
IV	**AMPLIFIERS:** Principle of Amplifier- Performance analysis of single-stage transistor amplifier-class A power amplifier- class B push pull power amplifier- characteristics of Amplifier - Application.	K5	5
V	**OSCILLATORS:** Principles of Oscillators- Types of Oscillators - Colpitt's oscillator - Hartley oscillator. Principle of multivibrator - Astable – monostable – bistable multivibrator using transistors – Applications. ***Current Trends: Embedded Systems, Internet of things, Advanced IC Packaging.**	K5	5
	*** Self Study.**		

Course Outcome	**CO1:** Identify the basics concepts of diodes.	K3	
	CO2: Compare the various applications of electronic devices like SCR, transistors, FET's etc.	K4	
	CO3: Examine the commonly used single-op amp circuits that perform useful functions.	K4	
	CO4: Determine the concept of feedback and its characteristics.	K5	
	CO5: Explain the principles of oscillation and design various oscillator circuits.	K5	

Learning Resources	
Text Books	1. Metha V. K. Principles of Electronics, New Delhi, S. Chand & Co. Ltd.,12th edition (2020). 2. Atul P. Godse, Deepali A. Godse, Electronic Circuits, Pune, Technical Publications, (2020). 3. D Leach, Albert Malvino, Digital Principles and Applications, McGraw Hill Education (2014).
Reference Books	1. Millman J. and Halkias C., Integrated Electronics, New Delhi, Tata McGraw Hill, (2017). 2. Puri V.K, Digital Electronics circuits and systems, Tata McGraw Hill Publishing Company Limited New Delhi, (2017).
Website Link	1. www.circuitstoday.com/transistor-amplifier 2.www.circuitstoday.com/ujt-uni-junction-transistors 3. http://www.electronicstutorials.ws/power/unijunction- transistor.html 4. https://www.electronics-tutorials.ws/oscillator/hartley.html 5. https://www.electronics-tutorials.ws/opamp/opamp_2.html 6. https://www.geeksforgeeks.org/silicon-controlled-rectifier/ 7. https://byjus.com/physics/light-emitting-diode/
Self Study Material	1. https://www.startus-insights.com/innovators-guide/electronics-manufacturing-trends/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHS04	**ELECTRONIC DEVICES**	**SEC THEORY -IV**	**IV**	**2**	**2**	**-**	**-**	**2**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	M	S	S	S	M	S
CO2	S	M	S	S	S	S	M	M	S	S
CO3	M	S	M	M	S	M	S	S	S	M
CO4	S	S	S	S	M	S	M	S	M	S
CO5	S	S	M	S	S	M	S	S	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method, Power point presentations, Group discussions, Interactions
Assessment Methods	Assignments, CIA – I, CIA – II ,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Ms. M.SARANYA	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHS05	**COMMUNICATION SYSTEMS**	**SEC THEORY - V**	**IV**	**2**	**2**	**-**	**-**	**2**
Objective	To enable the students are understand the different types of communications and make them appreciate the flavor of physics in communication.							

Unit	Course Content	Knowledge Levels	Sessions
I	**RADIO TRANSMISSION AND RECEPTION:** Introduction - types of modulation – comparison of FM and AM – demodulation – receivers: AM radio receivers – types of AM radio receivers – stages of super heterodyne radio receiver, advantages – disadvantages.	K4	4
II	**MOBILE COMMUNICATION:** Introduction – Concept of Cell –Basic Cellular Mobile Radio System – Cell phone – Facsimile – Important Features of Fax Machine – Application of Facsimile – VSAT (Very Small Aperture Terminals) Modem IPTV (Internet Protocol Television) -Wi-Fi-4G- 5G, Li – Fi. (Basic Ideas).	K5	5
III	**RADAR COMMUNICATION:** Introduction - Basic Radar System –Radar Range – Antenna Scanning – Pulsed Radar System – Search Radar –Tracking Radar – Moving Target Indicator Doppler Effect – MTI Principle – CW Doppler Radar.	K4	5
IV	**SATELLITE COMMUNICATION:** Introduction –History of Satellites – Satellite Communication System – Satellite Orbits – Basic Components of Satellite Communication System – Commonly used Frequency In Satellite – Communication – Multiple Access Communication – Satellite Communication in India.	K5	5
V	**ADVANCED COMMUNICATION:** Cloud Based Communications, Artificial Intelligence and chat bots, 5G and IoT, Block chain and Cryptography. ***Current Trends: Cloud Based Communications**	K5	5
	*** Self Study.**		
	CO1: Categorize various fundamental aspects of the communication systems.	K4	

Course Outcome	**CO2:** Evaluate the familiar with design consideration of fiber optic systems.	K5	
	CO3: Categorize with fundamentals of RADAR. Analyze the performance of RADAR.	K4	
	CO4: Compare various satellite subsystems and its functionality.	K5	
	CO5: Determine the basic concepts of mobile communication and different Frequency allocations for mobile services.	K5	

Learning Resources	
Text Books	1 .V.K.Metha, Principles of Electronics, S. Chand & Co Ltd., 11th edition ,(2020). 2. Anokh Singh and Chopra A.K., Principles of communication Engineering, S.Chand & Co., (2013).
Reference Books	1. J.S. Chitode, Digital Communications, Unicorn publications, (2020). 2. Senior John. M, Optical Fiber Communications: Principles and Practice, Pearson Education, (2014).
Website Link	1. https://www.geeksforgeeks.org/what-is-modulation/ 2. https://www.geeksforgeeks.org/fiber-optics-and-types/ 3. https://byjus.com/physics/satellite-communication/ 4. https://byjus.com/kids-learning/essay-on-mobile-phone/
Self Study Material	1. https://www.linkedin.com/advice/0/what-latest-trends-innovations-communication-1f?src=go-pa&trk=sem ga_campid.20316911727_asid.154319842041_crid.663989285742_kw._d.c_tid.dsa-2088399743424_n.g_mt._geo.1007809&mcid=7080236969011671041&cid=&gad_source=1&gclid=CjwKCAjwz42xBhB9EiwA48pT77VSHuyG6D8CbqJB_xkuuk5eRZyM_-OxaeK2MYbMswRWoZprhW50JBoChvsQAvD_BwE&gclsrc=aw.ds

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHS05	**COMMUNICATION SYSTEMS**	**SEC THEORY - V**	**IV**	**2**	**2**	**-**	**-**	**2**

CO - PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	M	S	M	S	S	M	S
CO2	S	M	M	S	S	S	M	S	M	M
CO3	S	S	S	S	M	S	S	S	S	S
CO4	M	S	M	S	S	M	S	M	S	S
CO5	S	S	S	M	S	M	S	S	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method ,Power point presentations, Group discussions, Interactions
Assessment Methods	Assignments, CIA – I, CIA – II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
Ms. M.SARANYA	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UPHS06	**DIGITAL PHOTOGRAPHY**	**SEC THEORY-VI**	**IV**	**2**	**2**	**-**	**-**	**2**

Objective	After completing this course students will have a basic understanding of basic digital photography theory and basic photographic design and communication principles to create a portfolio of similar images.

Unit	Course Content	Knowledge Levels	Sessions
I	**PHOTOGRAPHY AND BASIC PRINCIPLE OF IMAGE FORMATION:** Principle – Chemical Route and Digital Route – Light, Wavelengths, Colours – Shadows – Light Intensity and Distance – Making Light form Images –Pin – Hole Images – Practical Limitations to Pin-Hole Images – Lens Instead of Pin – Hole – Focal Length And Image Size – Imaging of Closer Subjects.	K2	5
II	**LENSES – CONTROLLING THE IMAGES:** Photographic Lens – Focal Length and Angle of View (Problems)– Focusing Movement – Aperture and F – Numbers (Problems) – Depth of Field– Depth of Focus – Image Stabilization – Lenses for Digital Cameras – Lens and Camera Care	K3	5
III	**CAMERA USING FILMS AND ITS TYPES:** Camera and its Essential Components– Shutter – Aperture – Light Measurement – Film Housing – Camera types: View Camera– View Finder Camera – Reflex Camera– Single Lens Reflex (SLR) Camera	K4	4
IV	**DIGITAL CAMERAS PRINCIPLE AND TYPES:** Principle of Digital Image Capturing –Comparison of Digital And Analog Picture Information – Megapixel – Grain, Noise and Pixel Density – Optical and Digital Zooming – Image Stabilizer – Bit Depth – White Balance – Colour Modes – File Formats (TIFF, RAW &JPEG) – Storage Cards and Types – Digital Cameras: Camera Phones – Compact Camera – Hybrid Camera – Digital SLR	K5	5
V	**THE DIGITAL IMAGE – POSTP RODUCTION:** Hardware: Computer and its Peripherals – Software: Saving Digital File – Basic Editing: Navigating the Image –		

	Undo/Redo/History – Crop – Rotate – Brightness &Contrast – Colour Balance – Hue/Saturation – Dodge/Burn – Cloning & Retouching – Removing An Element In An Image – Advanced Editing: Histogram/Levels – Curves – Selection Tools: Magic Wand – Printing Digital Images: Inkjet Printer – Laser Printer – Dye Sub Printer – Lambda/Light Jet Printers.	K5	5
Course Outcome	**CO1:** Understanding the basic principles and image formations.	K2	
	CO2: Identify the concept of lenses and controlling the Images.	K3	
	CO3: Examine the visual characteristics of photographs Produced using different types of films.	K4	
	CO4: Evaluate the foundational principles underlying digital Camera technology.	K5	
	CO5: Estimate the ethical considerations related to digital Image manipulation including technical and aesthetic Aspects of digital images.	K5	

Learning Resources

Text Books	1. Michel J Langford , Anna Fox & Richard Sawdon Smith, Basic photography, 9th Edition,2010-NL,Focalpress, London. 2. Henry Carroll, Read this if you want to take great photographs of people, Laurence King Publishing, 2014.
Reference Books	1. Mark Galer, Digital Photography in Available Light essential skills, 2006, Focal press, London. 2. Paul Harcourt Davies, The Photographer's practical handbook, 2005, UKPRESS.
Website Link	https://core.ac.uk/download/pdf/4395699.pdf https://study.com/academy/lesson/how-to-create-digital-images.html https://sites.psu.edu/ist130arp14/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M4UPHS06	**DIGITAL PHOTOGRAPHY**	**SEC THEORY-VI**	**IV**	**2**	**2**	**-**	**-**	**2**	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	S	M	S	S	S
CO2	S	S	M	L	S	S	M	S	S	S
CO3	S	S	M	M	S	M	L	M	S	S
CO4	S	S	S	S	S	S	M	L	S	S
CO5	S	S	M	S	S	S	M	M	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I, CIA-II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
Mr. A. MOHANDASS GANDHI	Dr. M.REVATHI	Dr. S. Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

Allied Subjects for any Degree offered by the Department of UG-PHYSICS
SYLLABUS - CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards
LIST OF ALLIED PAPERS

S.NO.	SEM	COURSE_CODE	TITLE OF THE COURSE
1	I/III	23M1UPHA01/23M3UPHA01	ALLIED: PHYSICS-I
2	II/IV	23M2UPHA02/23M4UPHA02	ALLIED: PHYSICS-II
3	II/IV	23M2UPHAP1/23M4UPHAP1	PRACTICAL : ALLIED PHYSICS

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B.Sc.-Physics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UPHA01/ 23M3UPHA01	**ALLIED PHYSICS - I**	**GEC THEORY-I**	**I/III**	**4**	**2**	**2**	**-**	**3**
Objective	To impart basic principles of Physics that which would be helpful for students who have taken programmes other than Physics.							

Unit	Course Content	Knowledge Levels	Sessions
I	**WAVES, OSCILLATIONS AND ULTRASONICS:** Simple Harmonic Motion (SHM) – Composition of two SHMs at Right Angles (Periods in the Ratio 1:1) – Lissajous Figures – Uses – Laws of Transverse Vibrations of Strings – Determination of AC Frequency using Sonometer (Steel and Brass Wires) – Ultrasound – Production – Piezoelectric Method – Application of Ultrasonics: Medical Field – Lithotripsy, Ultrasonography – Ultrasonoimaging – Ultrasonics in Dentistry – Physiotheraphy, Opthalmology – Advantages of Noninvasive Surgery – Ultrasonics in Green Chemistry.	K3	10
II	**PROPERTIES OF MATTER:** Elasticity: Elastic Constants – Bending of Beam – Theory of Non- Uniform Bending – Determination of Young's Modulus by Non- Uniform Bending – Energy Stored in A Stretched Wire – Torsion of a wire – Determination of Rigidity Modulus by Torsional Pendulum Viscosity: Streamline and Turbulent Motion – Critical Velocity – Coefficient of Viscosity – Poiseuille's Formula – Comparison of Viscosities – Burette Method, Surface Tension: Definition – Molecular Theory – Droplets Formation-Shape, Size and Lifetime – Covid Transmission Through Droplets, Saliva – Drop Weight Method – Interfacial Surface Tension.	K4	10

III	**HEAT AND THERMODYNAMICS:** Joule-Kelvin effect – Joule-Thomson porous plug experiment – theory – temperature of inversion – liquefaction of Oxygen– Linde's process of liquefaction of air– liquid Oxygen for medical purpose– importance of cryocoolers – thermodynamic system – thermodynamic equilibrium – laws of thermodynamics – heat engine – Carnot's cycle – efficiency – entropy – change of entropy in reversible and irreversible process.	K4	9
IV	**ELECTRICITY AND MAGNETISM:** Potentiometer – Principle – Measurement of Thermo EMF Using Potentiometer –Magnetic Field Due to a Current Carrying Conductor– Biot-Savart's Law – Field Along the Axis of the CoilCarrying Current – Peak, Average and RMS Values of AC Current and Voltage – Power Factor and Current Values in An Ac Circuit – Types Of Switches In Household And Factories–Smart Wifi Switches- Fuses And Circuit Breakers In Houses.	K4	9
V	**DIGITAL ELECTRONICS AND DIGITAL INDIA:** Logic Gates, OR, AND, NOT, NAND, NOR ,EXOR Logic Gates –Universal Building Blocks – Boolean Algebra – De Morgan's Theorem – Verification – Overview Of Government Initiatives: Software Technological Parks Under Meity, NIELIT Semiconductor Laboratories Under Dept. Of Space – An Introduction To Digital India.	K5	10
Course Outcome	**CO1:** Execute the simple harmonic motion and Define the ultrasonic waves	K3	
	CO2: Organize the basic concepts of elasticity, viscosity and surface tension.	K4	
	CO3: Examine the thermodynamic system and explain the different law of thermodynamics.	K4	
	CO4: Analyze the theory to design basic electrical	K4	

	circuits.		
	CO5: Weigh and construct various digital circuits	K5	

Learning Resources	
Text Books	1. R.Murugesan (2001), Allied Physics,S. Chand&Co,NewDelhi. 2.Brijlal and N.Subramanyam(1994), Waves and Oscillations,Vikas Publishing House,New Delhi. 3. BrijlalandN.Subramaniam (1994), Properties of Matter,S.Chand&Co.,New Delhi 4. J.B.Rajam and C.L.Arora (1976). Heat and Thermodynamics (8th edition), S.Chand&Co.,New delhi
Reference Books	1.Resnick Halliday and Walker (2018).Fundamental soft Physics (11thedition),John Willey and Sons, Asia Pvt.Ltd., Singapore. 2. V.R.Khanna and R.S.Bedi (1998), Textbook of Sound 1st Edn. Kedharnaath Publish & Co, Meerut.
Website Link	1. https://youtu.be/M_5KYncYNyc 2. https://youtu.be/ljJLJgIvaHY 3. https://youtu.be/7mGqd9HQ_AU 4. https://youtu.be/h5jOAw57OXM

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc-Physics Syllabus LOCF-CBCSwitheffectfrom2023-2024Onwards							
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UPHA01/ 23M3UPHA01	**ALLIED PHYSICS - I**	**GEC THEORY-I**	**I/III**	**4**	**2**	**2**	**-**	**3**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	M	S	S	S	M	S	S	S	S	M
CO3	M	S	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	M	S	S	S	S	S	S	S	S	S

Level of Correlation Between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power Point Presentation Demonstration
Assessment Methods	Assignment, CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. M.MEENACHI	Dr. M. REVATHI	Dr. S. Shahitha

B.Sc.- Physics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHA02/ 23M4UPHA02	**ALLIED PHYSICS - II**	**GEC THEORY-II**	**II/IV**	**4**	**2**	**2**	**-**	**3**
Objective	To understand the basic concepts of optics, modern Physics, concepts of Relativity and Quantum Physics, semiconductor Physics, and Electronics.							

Unit	Course Content	Knowledge Levels	Sessions
I	**OPTICS:** Interference – Interference in Thin Films –Colors of Thin Films – Air Wedge – Determination of Diameter of a Thin Wire by Air Wedge – Diffraction – Diffraction of Light Vs Sound – Normal Incidence – Experimental Determination of Wavelength using Diffraction Grating (No Theory) – Polarization – Polarization by Double Reflection – Brewster's Law – Optical Activity – Application in Sugar Industries.	K3	10
II	**ATOMIC PHYSICS:** Atom Models – Bohr Atom Model – Mass Number – Atomic Number – Nucleons – Vector Atom Model – Various Quantum Numbers – Pauli's Exclusion Principle – Electronic Configuration – Periodic Classification Of Elements – Bohr Magneton – Stark Effect –Zeeman Effect (Elementary Ideas Only) – Photo Electric Effect – Einstein's Photoelectric Equation – Applications of Photoelectric Effect: Solar Cells, Solar Panels, Optoelectric Devices.	K4	10
III	**NUCLEAR PHYSICS:** Nuclear Models – Liquid Drop Model – Magic Numbers – Shell Model – Nuclear Energy – Mass Defect – Binding Energy – Radioactivity – Uses – Half Life – Mean Life - Radio Isotopes and uses –Controlled and Uncontrolled Chain Reaction – Nuclear Fission – Energy Released In Fission – Chain Reaction	K5	10

	- Critical Reaction - Critical Size - Atom Bomb - Nuclear Reactor - Breeder Reactor - Importance of Commissioning PFBR in Our Country - Heavy Water Disposal, Safety of Reactors: Seismic and Floods -Introduction to DAE, IAEA - Nuclear Fusion - Thermonuclear Reactions - Differences between Fission and Fusion.		
IV	**INTRODUCTION TO RELATIVITY AND GRAVITATIONAL WAVES:** Frame of Reference - Postulates of Special Theory of Relativity - Galilean Transformation Equations - Lorentz Transformation Equations - Derivation - Length Contraction - Time Dilation - Twin Paradox - Mass-Energy Equivalence - Introduction on Gravitational Waves, LIGO, ICTS Opportunities at International Centre for Theoretical Sciences.	K4	9
V	**SEMICONDUCTOR PHYSICS:** P-N Junction Diode - Forward And Reverse Biasing - Characteristic of Diode - Zener Diode - Characteristic of Zener Diode - Voltage Regulator - Full Wave Bridge Rectifier - 76 Construction and Working - Advantages (No Mathematical Treatment) - USB Cell Phone Charger - Introduction to E- Vehicles and EV Charging Stations.	K5	9
Course Outcome	**CO1**: Execute the basic concepts of interference diffraction using principles of superposition of waves and explain polarization	K3	
	CO2: Compare the various atom models and Demonstrate the different phenomena.	K4	
	CO3: Illustrate the features of nuclear forces and explain fission process.	K5	
	CO4: Examine the postulates of special theory of relativity and demonstrate the length contraction and time dilation.	K4	
	CO5: Summarize the working of semiconductor devices like junction diode, Zener diode, transistors.	K5	
Learning Resources			

Text Books	1. R.Murugesan (2001), Allied Physics,S. Chand&Co,NewDelhi. 2.Brijlal and N.Subramanyam(1994), Waves and Oscillations,Vikas Publishing House,New Delhi. 3. BrijlalandN.Subramaniam (1994), Properties of Matter,S.Chand&Co.,New Delhi. 4. J.B.Rajam and C.L.Arora (1976). Heat and Thermodynamics (8th edition), S.Chand&Co.,New Delhi.			
Reference Books	1.Resnick Halliday and Walker(2018).Fundamentalsoft Physics (11thedition),JohnWilleyand Sons, Asia Pvt.Ltd., Singapore. 2. V.R.Khanna and R.S.Bedi (1998), Textbook of Sound 1st Edn. Kedharnaath Publish & Co, Meerut.			
Website Link	1. https://www.youtube.com/watch?v=JrRrp5F-Qu4 2.https://www.validyne.com/blog/leak-test-using-pressuretransducers/ 3. https://www.atoptics.co.uk/atoptics/blsky.htm			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc-Physics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHA02/ 23M4UPHA02	**ALLIED PHYSICS - II**	**GEC THEORY-II**	**II/IV**	**4**	**2**	**2**	**-**	**3**

CO-PO Mapping

Co Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	M	S	S	S	M	S	S	S	S	M
CO3	M	S	L	S	S	L	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	M	S	S	S	S	S	S	S	S	S

Level of Correlation Between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. M.MEENACHI	Dr. M.REVATHI	Dr. S. Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637 408.

B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHAP1/ 23M4UPHAP1	**PRACTICAL:ALLIED PHYSICS**	**GEC PRACTICAL - I**	**II/IV**	**2**	**-**	**-**	**2**	**2**
Objective	The Aim of the course is to develop the practical skills in mechanical, electrical, heat and optics experiments.							

S. No	List of Experiments (Any 15 Experiments)	Knowledge Levels	Sessions
1.	Young's modulus by non-uniform bending using pin and microscope.	K5	3
2.	Young's modulus by non-uniform bending using optic lever, scale and telescope	K5	3
3.	Rigidity modulus by static torsion method.	K6	3
4.	Rigidity modulus by torsional oscillations without mass.	K6	3
5.	Surface tension and interfacial Surface tension – drop weight method.	K5	3
6.	Calibration of low range voltmeter using potentiometer.	K6	3
7.	Determination of Young's modulus by cantilever – load depression graph.	K5	3
8.	Radius of curvature of lens by forming Newton's rings.	K6	3
9.	Thickness of a wire using air wedge.	K6	3
10.	Wavelength of mercury lines using spectrometer and grating.	K5	3
11.	Refractive index of liquid using liquid prism.	K6	3
12.	Determination of AC frequency using sonometer.	K5	3
13.	Thermal conductivity of poor conductor using Lee's disc.	K6	3
14.	Determination of Earth's magnetic field using field along the axis of a coil.	K5	3
15.	Characterization of Zener diode.	K5	3

16.	Construction of AND, OR, NOT gates using diodes and transistor.	K6	3
17.	NOR gate as a universal building block.	K6	3
Course Outcome	**CO1:** Evaluate the knowledge of mathematics and physics fundamentals and instrumentation to arrive solution for various problems	K5	
	CO2: Compile the usage of basic laws and theories to determine the various properties of the materials given.	K6	
	CO3: Explain standard methods to calibrate the given low range voltmeter.	K5	
	CO4: Design PN junctions in semiconductor devices under various conditions.	K6	
	CO5: Defend the application side of the Experiments	K5	

Learning Resources				
Text Books	1. S.L. Gupta and V.Kumar – Practical Physics – PragatiPrakashan – 25th Edition (2002). 2. Ouseph, Srinivasan & Vijayendran, Practical Physics. 3. M.N.Srinivasan - A text book of practical physics,New DelhiEdition (2017).			
Reference Books	1. C.C.Ourseph, C.Rangarajan, R. Balakrishnan – A Text Book of Practical Physics – S.Viswanathan Publisher – Part II (1996). 2.M.K Subramanian, S.Padmanathan, S.Somasundaram, B.Sc Physics Practical, Apsara Publications, Trichy, Revised edition 2020.			
Website Link	1.https://www.youtube.com/watch?v=dgouBFJg0kk 2.https://www.youtube.com/watch?v=OzGrf4CRVqg 3.https://www.youtube.com/watch?v=hJx_tukOpL4 4.https://www.youtube.com/watch?v=Mci8Oa_6b_E			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHAP1/ 23M4UPHAP1	**PRACTICAL:ALLIED PHYSICS**	**GEC PRACTICAL - I**	**II/IV**	**2**	**-**	**-**	**2**	**2**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	S	S	M	S	S	M
CO2	S	M	S	M	S	M	S	S	M	S
CO3	M	S	S	S	S	S	S	M	S	S
CO4	S	S	M	S	S	S	M	S	S	S
CO5	S	M	M	S	S	S	M	S	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Demonstration and practical sessions
Assessment Methods	CIA-I,CIA-II,ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. M. MEENACHI	**Dr. M. REVATHI**	Dr. S. Shahitha

S.NO	SEM	COURSE_CODE	TITLE OF THE COURSE
1	I	23M1UPHN01	PHYSICS FOR EVERYDAY LIFE-SEC 1(NME)
2	II	23M2UPHN02	ASTROPHYSICS-SEC-2 (NME)

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M1UPHN01	PHYSICS FOR EVERYDAY LIFE	NMEC-I	I	2	2	-	-	2

Objective	To provide students with a practical understanding of fundamental physics principles and their applications in everyday life.		
Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**MECHANICAL OBJECTS:** Spring Scales – Bouncing Balls –Roller Coasters – Bicycles – Rockets and Space Travel	K2	5
II	**OPTICAL INSTRUMENTS AND LASER:** Vision Corrective Lenses – Polaroid Glasses – UV Protective Glass – Polaroid Camera – Colour Photography – Holography and Laser.	K3	5
III	**PHYSICS OF HOME APPLIANCES:** Bulb – Fan – Hair Drier – Television – Air Conditioners – Microwave Ovens – Vacuum Cleaners	K3	5
IV	**SOLAR ENERGY:** Solar Constant – General Applications Of Solar Energy – Solar Water Heaters – Solar Photo – Voltaic Cells – General Applications of Solar Cells.	K4	5
V	**INDIAN PHYSICIST AND THEIR CONTRIBUTIONS:** C.V.Raman, Homi Jehangir Bhabha, Vikram Sarabhai, Subrahmanyan Chandrasekhar, Venkatraman Ramakrishnan, Dr. APJ Abdul Kalam and their contribution to science and technology.	K5	4
Course Outcome	**CO1**: Recall the elements comprising mechanical objects and the principles governing their function.	K2	
	CO2: Comprehend the functioning intricacies and procedural aspects involved in operating and maintaining optical instruments.	K3	
	CO3: Analyze the basic working principles behind Home appliances.	K3	
	CO4: Acquire foundational concepts and principles underlying solar energy, utilization, efficiency factors, and potential applications across various domains.	K4	
	CO5: Attain a deeper understanding of the contributions made by Indian physicists.	K5	
Learning Resources			

Text Books	1. UmmeAmmara, The Physics in our Daily Lives, Gugucool Publishing, Hyderabad, 2019. 2. Walter Lawin, For the love of physics, , Free Press, New York, 2011. 3. G. N. Tiwari and Swapnil Dubey "Solar Energy: Fundamentals, Design, Modeling and Applications" Publisher: CRC Press; Year: 2018 4. Rajinder Singh, Great Indian Physicists: The Life and Times of Nobel Laureates, Publisher: Rupa Publications India; Year: 2016.			
Reference Books	1. Ajay Ghatak , Optics from Tata McGraw-Hill Publishing Co. Ltd., New Delhi (2019) 2. D.S Mathur, Elements of Properties of Matter, S .Chand & Co. (2010).			
Website Link	1. https://www.jagranjosh.com/general-knowledge/list-of-indian-physicists-and-their-inventions-or-discoveries-1709098559-1 2. https://www.techtarget.com/whatis/definition/solar-constant#:~:text=A%20solar%20constant%20is%20a,such%20as%20a%20solar%20panel.			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UPHN01	**PHYSICS FOR EVERYDAY LIFE**	**NMEC-I**	**I**	**2**	**2**	**-**	**-**	**2**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	L	M	S	M
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	M	S	S	S	S	S	S	M	M	M
CO5	S	M	L	S	M	M	S	M	M	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I, CIA-II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
Dr. C.INDIRA PRIYADHARSINI	Dr. M.REVATHI	Dr. S. Shahitha

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B.Sc. - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UPHN02	**ASTROPHYSICS**	**NMEC-II**	**II**	**2**	**2**	**-**	**-**	**2**
Objective	To provide a basic knowledge of the Universe outside the Solar System, sufficient to prepare students for more advanced astronomy courses.							

Unit	Course Content	Knowledge Levels	Sessions
I	**TELESCOPES:** Optical telescopes – magnifying power, brightness, resolving power and f/a ratio – types of reflecting and refracting telescopes – detectors and image processing – radio telescopes – Hubble space telescope.	K3	5
II	**SOLAR SYSTEM:** Bode's law of planetary distances – meteors, meteorites, comets, asteroids – Kuiper belt – Oort cloud – detection of gravitational waves– recent advances in astrophysics.	K3	5
III	**ECLIPSES:** Types of eclipses – solar eclipse – total and partial solar eclipse – lunar eclipse – total and partial lunar eclipse – transits. The Sun: physical and orbital data – solar atmosphere – photosphere – chromosphere – solar corona – prominences – sunspots – 11 year solar cycle – solar flares.	K4	5
IV	**STELLAR EVOLUTION:** H-R diagram – birth & death of low mass, intermediate mass and massive stars – Chandra sekar limit – white dwarfs – neutron stars –pulsars – black holes – supernovae. Galaxies: classification of galaxies – galaxy clusters – interactions of galaxies, dark matter and super clusters – evolving universe.	K4	5
V	**ACTIVITIES IN ASTROPHYSICS:** (i) Basic construction of telescope (ii) Develop models to demonstrate eclipses/planetary motion (iii) Night sky observation (iv) Conduct case study pertaining to any topic in this paper	k5	4

	(v) Visit to any one of the National Observatories Any three Activities to be done compulsorily.		
Course Outcome	**CO1:** Applying of astronomical concepts.	K3	
	CO2: Identify the planets in the earth's solar system.	K3	
	CO3: Analyze the concept of eclipse phenomena.	K4	
	CO4: Examine the media reports of new astronomical Discoveries.	K4	
	CO5: Evaluate the planetary motion.	k5	

Learning Resources

Text Books	1. Basu Baidyanath, Sudhindra Nath Biswas , Tanuka Chattopadhyay, An Introduction To Astrophysics, Publisher: PHI ,July 11, 2013. 2.K S.Krishnaswamy, Astrophysics : A Modern Perspective Hardcover,2022. Doris Breuer, Tilman Spohn, Torrence ,Johnson, Encyclopedia of the Solar System.2014-, 30 May 2014(eBook). 3. Shylaja , B.S. & Madhusudan, H.R.,(1999), Eclipse: A Celestial Shadow Play, Orient BlackSwan. 4. K D Abhyankar, Astrophysics of the solar system, Universities press,2009.
Reference Books	1. A. Choudhuri, Astrophysics for Physicists, Arnab Rai Choudhuri, Indian Institute of Science, Published in the United States of America by Cambridge University Press, New York,2010. 2. Brussels, Astrophysics and Cosmology, Belgium, 2014. 3. Nick Kaiser, Elements of Astrophysics , 2002.
Website Link	1.https://youtu.be/vDv3iSMdYyc 2.https://www.udemy.com › ... › Science › Astronomy 3. https://www.coursera.org › courses › query=astrophysics

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc - Physics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M2UPHN02	**ASTROPHYSICS**	**NMEC-II**	**II**	**2**	**2**	**-**	**-**	**2**	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	M	S	S	M
CO2	L	S	S	M	L	S	S	M	S	S
CO3	S	M	S	M	M	S	L	M	S	S
CO4	S	S	M	S	S	M	S	S	M	S
CO5	S	S	S	S	M	S	S	S	S	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Chalk and talk method Power Point Presentation
Assessment Methods	Assignment, CIA-I, CIA-II, ESE

Designed By	**Verified By**	**Approved By** Member secretary
MOHANDASS GANDHI A	Dr. M. REVATHI	Dr. S. Shahitha

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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B. Sc Physics Syllabus for Internship
LOCF-CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UPHIS1	INTERNSHIP	INTERNSHIP	V	-	-	-	-	2

Objective	Learn to appreciate work and its function in the economy and develop work habits and attitudes.

S. No.	Guidelines for Internship Training Programme	Knowledge Levels	Sessions
1	The student should undergo **15 Days Internship** training in any individual students have to identify the Institution / Industry / University of their choice during the vacation which falls at the end of the 2nd Semester.	K1-K6	15 DAYS
2	The training bridges the gap between the theoretical knowledge gained in the college and the practical application of the same in the industry / company / stores. The student will have a better exposure about the workplace and its nuances.		
3	Schedule of visit to be made by the staff is to be prepared by the HOD / Staff-in-charge.		
4	The trainees should strictly adhere to the rules and regulations and office timings of the institutions to which they are attached.		
5	A Staff member of a Department (Guide) will be monitoring the performance of the Candidate.		
6	The students should maintain a daily logbook where the student should record his details of the training.		
7	The trainees have to obtain a certificate on successful completion of the internship from the chief executive of an organization.		
8	The student should submit an attendance certificate to the institution for 15 days internship training from an organization.		
9	Internship Training Report (30 – 50 pages) should be prepared by the student and submitted in a month's time and at the end of the semester student should present the report with a power point presentation.		

10	Industrial training reports shall be prepared by the students under the supervision of the faculty of the department.			
11	Industrial training report must contain the following: Cover page Copy of training certificate, Profile of an industry report about the work undertaken by them during the tenure of training observation about the concern findings.			
12	Practical viva – voce examination will be conducted with internal & external examiners at the end of the **3rd semester** and the credits will be awarded.			
13	Report Evaluation: External Viva-Voce examination will be conducted and the maximum mark is 100.			
Course Outcome	**CO1:** Apply new techniques and ideas in field of physics		K3	
	CO2: Analyze the results of new initiatives		K4	
	CO3: Create a new work plan with greater output		K6	
	CO4: Create a framework of work execution ideas		K6	
	CO5: Create a detailed technical work plan and terminologies to be followed in industry.		K6	
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B. Sc Physics Syllabus for Internship LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UPHIS1	**INTERNSHIP**	**INTERNSHIP**	**V**	**-**	**-**	**-**	**-**	**2**

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	M	S	S	S	S
CO2	S	M	S	S	S	S	M	S	S	S
CO3	M	S	S	M	S	M	S	S	S	S
CO4	M	M	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	M	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	-
Assessment Methods	**CIA - 100 Marks** 1. Work Log Book – 25 Marks 2. Training Report and Viva-Voce – 75 Marks

Designed By	Verified By	Approved By Member Secretary
Dr. M.REVATHI	Dr. M.REVATHI	Dr. S. SHAHITHA

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B.Sc. - Physics Syllabus for Project Work LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHPR1	PROJECT WORK	PROJECT WORK	VI	5	5	-	-	5
Objective	Demonstrate a technical knowledge in their selected project topic. Undertake problem identification, formulation and solution. Develop plans with relevant people to achieve the goals of the project.							

Details	**Course Content**	**Knowledge Levels**	**Sessions**
PROJECT PREPARATION FORMAT			
Cover Page & Title Page	**Cover Page & Title Page:** The fonts and locations of various items on this page should be exactly as shown in a specimen copy.		
Inside cover page	Inside cover page Same as cover page.		
Bonafide Certificate	**Bonafide Certificate**: The Bonafide Certificate shall be in double line spacing using Font Style Times New Roman and Font Size 14.		
Acknowledgement	**Acknowledgement:** This should not exceed one page.		
Contents	**Table of Contents:** The table of contents should list all headings, sub headings after the table of contents page, as well as any titles preceding it. The title page and Bonafide Certificate will not find a place among the items listed in the Table of Contents. One and a half spacing should be adopted for typing the matter under this head.		
Tables	**List of Tables**: The list should use exactly the same captions as they appear above the tables in the text. 1.5 spacing should be adopted for typing the matter under this head.		
Figures	**List of Figures**: The list should use exactly the same captions as they appear below the figures in the body of the text. One and a half spacing should be adopted for typing the matter under this head. All charts, graphs, maps, photographs and diagrams should be designated as figures. X and Y axes titles are mandatory for all the graphs.		

Symbols	**List of Symbols, Abbreviations and Nomenclature:** 1.5 spacing should be adopted or typing the matter under this head. Standard symbols, abbreviations etc. should be used.		
Chapters	**Chapter I - Introduction:** Statement of the Problem, Significance, Need for the study, Objectives		
	Chapter II- Review of literature		
	Chapter III- Methodology: Tools used, Procedures, Hypothesis.		
	Chapter IV- Results and Discussion: Tables and Figures, Statistical Presentations, Hypothesis Testing.		
	Chapter V- Summary and conclusion		
	Chapter VI- Scope of the Project		
	References		
Guidelines For Project Preparation			
Numbering	• Every page in the project report, except the project report title page, must be accounted for and numbered. • The page numbering, starting from acknowledgements and till the beginning of the introductory chapter, should be printed in small Roman numbers, i.e, i, ii, iii, iv.. • The page number of the first page of each chapter should not be printed (but must be accounted for). All page numbers from the second page of each chapter should be printed using Arabic numerals, i.e. 2,3,4,5.. • All printed page numbers should be located at the right corner at the bottom of the page.	K4-K6	
Chapters	• Use only Arabic numerals. Chapter numbering should be centered on the top of the page using large bold print. <Size 14><Times New Roman>	K4-K6	
TEXT			
Regular Text	**Regular Text**: Times Roman 12 pts and normal print.	K4-K6	
Chapter Heading	**Chapter Heading -** Times Roman 14 pts. Bold and capital.	K4-K6	

Section Headings	**Section Headings -** Times roman 12 pts. Bold and capital.	K4-K6	
Subsection Headings	**Subsection Headings** - times roman 12 pts. bold print and Leading capitals i.e, only first letter in each word should be in capital.	K4-K6	
Special Text	**Special Text-** Italics/Superscript /Subscript/Special symbols, etc., as per necessity. Special text may include footnotes, endnotes, physical or chemical symbols, mathematical notations, etc.	K4-K6	
Sections	**Sections:** Use only Arabic numerals with decimals. Section numbering should be left justified using bold print. Example: 1.1, 1.2, 1.3, etc.	K4-K6	
Sub Sections	**Sub Sections:** Use only Arabic numerals with two decimals. Subsection numbering should be left Justified using bold print. Example: 1.1.1, 1.1.2, 1.1.3, etc.	K4-K6	
References	Use only Arabic numerals. Serial numbering should be carried out based on Alphabetical order of surname or last name of first author. The format is written like, author name followed by year followed by title of the work followed by details of the journal. Same font as regular text, serial number and all authors names to be in bold print. Title and Journal names should be in italic. One Author: Williams, G. State and Society in. Onco State, Nigeria, Afrographika, 1980. Two Authors: Phizacklea, A & Miles, R. Labour and Racism. London, Routledge & Kegan Paul, 1980. 3+ Authors: O'Donovan, P., et al. The United States. Amsterdam, Time-Life International, 1966.	K4-K6	
Typing Instructions	**Typing Instructions:** The impression on the typed copies should be black in color. One and a half spacing should be used for typing the general text. The general text shall be typed in the Font style 'Times New Roman' and Font size 12. Use A4 (210 mm X 297 mm) bond un-ruled paper (80 gsm) for all copies submitted. Use one side of the paper for all printed/typed matter.	K4-K6	
Justification	**Justification:** The text should be fully justified	K4-K6	
Margins	**Margins:** The margins for the regular text are as follows LEFT - 1.5" RIGHT - 1" TOP - 1" BOTTOM - 1"	K4-K6	
Paragraph Spacing	Use 6 pts before & 6 pts after paragraphs. All paragraphs in the seminar/project report should be left justified completely, from the first line to the last line. Use 1.5 spacing between the regular text and quotations.	K4-K6	

	Provide double spaces between: (a) From top of page to chapter title, (b) Chapter title and first sentence of a chapter, Use single spacing (a) In footnotes and endnotes for text. (b) In explanatory notes for tables and figures. (c) In text corresponding to bullets, listings, and quotations in the main body of seminar/project report. (d) Use single space in references and double space between references.		
Tables	All tables should have sharp lines, drawn in black ink, to separate rows/columns as and when necessary. Tables should follow immediately after they are referred to for the first time in the text. Splitting of paragraphs, for including tables on a page, should be avoided. Provide double spaces on the top and the bottom of all tables to separate them from the regular text, wherever applicable. The title of the table etc. should be placed on the top of the table. The title should be centered with respect to the table. The titles must be in the same font as the regular text and should be single spaced.	K4-K6	
Figures	All figures, drawings, and graphs should be drawn in black ink with sharp lines and adequate contrast between different plots if more than one plot is present in the same graph. The title of the figure etc. should be placed on the bottom of the figure. Figures should follow immediately after they are referred to for the first time in the text. Splitting of paragraphs, for including figures on a page, should be avoided. Provide double spaces on the top and the bottom of all figures to separate them from the regular text, wherever applicable. Figures should be centered with respect to the figure. The titles must be in the same font as the regular text and should be single spaced. The title format is given below: Fig. <blank><chapter number>.<serial number><left indent><figure	K4-K6	
Page Dimension & Binding Specifications	The project report should be prepared in A4 size. The dissertation shall be properly bound; The bound front cover should indicate in Silver and embossed letter.		
Course Outcome	**CO1:** Identification of research idea	K4	
	CO2: Analyze of problem solving skills	K4	

	CO3: Analyze sources for conduct of Research	K4
	CO4: Evaluate the research report	K5
	CO5: Create the research report	K6

Learning Resources				
Text Books	**1. M.A.Shah, Principles of Nanoscience and Nanotechnology, Tokeer Ahmad.** **2. S.Chand & Company Limited,Nano Technology, Rakesh Rathi, New Delhi.**			
Reference Books	**1.De Jongh J, Kulwer Academic Publishers,Physics and Chemistry of Metal cluster components, Dordrecht.**			
Website Link	http://gen.lib.rus.ec/physics			
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B.Sc. - Physics Syllabus for Project Work LOCF - CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M6UPHPR1	**PROJECT WORK**	**PROJECT WORK**	**VI**	**5**	**5**	**-**	**-**	**5**	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	S	S	S	M	S	S	S
CO2	S	S	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	S	S	M	M
CO4	S	S	S	M	S	S	S	S	M	M
CO5	M	M	M	S	S	M	M	S	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	-
Assessment Methods	**EA - 100%** 1. Project Report - 50 Marks 2. Viva-Voce - 50 Marks 3. Total - 100 Marks

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B.Sc. Physics For Competitive Examination Syllabus LOCF - CBCS pattern with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHOE1	PHYSICS FOR COMPETITIVE EXAMINATION	PROFESSIONL COMPETENCY SKILLS	VI	2	2	-	-	2
Objective	Creating the awareness on competitive examination among students. Imparting knowledge about the appearing for Competitive Examination and it impacts and developing an attitude of appearing for such exams.							

Details	**Course Content**	**Knowledge Levels**	**Sessions**
	A fundamental/systematic or coherent understanding of the academic field of Physics, its different learning areas and applications in basic Physics like Properties Of Matter And Sound, Heat, Thermodynamics And Statistical Physics, General Mechanics And Classical Mechanics, Optics And Spectroscopy, Electronic Devices, Communication Systems, Atomic Physics And Lasers, Relativity And Quantum Mechanics, Electricity And Magnetism, Energy Physics, Material Science, Nuclear And Particle Physics, Solid State Physics, Digital Electronics And Microprocessor 8085, Nano Science&Nano-Technology,Tamil-I,Ii,Iii,Iv,English-I,Ii,Iii,Iv,Allied Maths, Allied Chemistry; This course aims to give a holistic view of all the topics which comprised of some factual text points, multiple choice questions (MCQ), it is extremely suitable for students pursuing their higher degree in University/institute for their entrance exams, students preparing for various national and state level competitive entranceexams such as ICAR-JRF/SRF/NET/ARS, IARI/NDRI Ph.D., SAUs; CSIR/UGC-NET/JRF/SRF; ICMR, DBT, GATE, BARC, IISc, JNU, BHU, etc. to get admission in Ph.D. in Physics. In addition, it is also	K1-K6	24 Hrs

	useful for UPSC and states PSC. Rules for creating MCQ pattern. 1. Objective type online examination will be conducted at the end of 4th semester. 2. Questions must be taken from all previous question papers of CSIR-NET, SET, NEET, UPSC, IBPS and Common Entrance Test for Ph.D. 3. Test critical thinking. Multiple choice questions to test the superficial knowledge. Learners to interpret facts, evaluate situations, explain cause and effect, make inferences, and predict results. 4. Emphasize Higher-Level Thinking Use memory-plus application oriented questions. These questions require students to recall principles, rules or facts in a real life context. Eg.1 Ability to Justify Methods and Procedures Which of the following measurements is not a unit of distance? (A) Ammeter (B) Cubit (C) Parsec (D) angstrom		

Eg.2

Ability to Interpret Cause-and-Effect Relationships

What happens to your weight when you are in a lift which goes down?

(A) Decreases
(B) Increases
(C) Decreases and then increases
(D) Increases and then decreases

5. Mix up the order of the correct answers

Keep correct answers in random positions and don't let them fall into a pattern that can be detected

6. Use a Question Format

Multiple-choice items to be prepared as questions (rather than incomplete statements)

Incomplete Statement Format:

The capital of California is in Direct Question Format------ Less effective.

In which of the following cities is the capital of California? - This is Best format.

7. Keep Option Lengths Similar

Avoid making your correct answer the long or short answer

8. Avoid the "All the Above" and "None of the Above"

	Options Students merely need to recognize two correct options to get the answer correct 9. HOD's instruct to the faculty to prepare minimum 500 questions booklet (cumulatively for each programme) with solutions and circulate among the students. 10. Each Department to prepare the Questions (MCQ pattern with four answers) and submit to ICT.		
Course Outcome	**CO1:** emphasis is given for in depth and quantitative understanding of physical parameters which describe behavior of the system subjected to various boundary conditions	K1	
	CO2: These physical parameters include mechanical, thermal, optical, electrical, magnetic properties.	K2	
	CO3: The system of study is from nano scale structure through micro, mesa and bulk systems.	K3	
	CO4: The prescribed course runs through various topics which include Vector integration, Gauss and Stoke's theorem, Matrices, Tensors etc.	K4	
	CO5: The special functions covered are quite useful in solving transfer of heat in different geometries.	K5	

Learning Resources	
Text books	1. Halliday & Resnick,Fundamental of physics, publishers JEARL WALKER, tenth edition,2007. 2.R.K.Gupta, Objective physics, Arihant Publications,2021 3. S.Chands, Objective physics, publishers Dr.Mahesh Jain,2014 4.Satya Prakash Arya, Objective physics,publisher MTG Learning Media,2011
Reference Books	1. sathaya prakash , objective physics, publisher A.S.Prakashan, Meerut,2010 2. Dr.M.Arumugam, Engineering physics,publisher anuradha agencies,2011
Website Link	https://testbook.com/learn/physics/

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UPHOE1	PHYSICS FOR COMPETITIVE EXAMINATION	PROFESSIONL COMPETENCYS KILLS	IV	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	M	S	S	M	M	S	M
CO2	S	S	S	M	M	S	S	S	S	S
CO3	M	L	S	S	S	S	S	S	S	M
CO4	S	M	M	S	M	M	L	S	M	S
CO5	S	M	M	M	L	M	M	S	M	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG
Tutorial Schedule	TNPSC,IBPS,UPSC,RRB,SSC,GATE,TRB old question papers-solutions-online mock test		
Teaching and Learning Methods	Self study		
Assessment Methods	100 multiple choice questions through computer based online examinations passing minimum is 50%		

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