FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A" Grade by NAAC (3rd Cycle)
74th Rank in India Ranking 2020 (NIRF) by MHRD
Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT : Research Centre of Physics

NAME OF THE PROGRAMME : B.Sc. PHYSICS

PROGRAMME CODE : UAPH

ACADEMIC YEAR : 2022-2023

Minutes of the Board of Studies Meeting

To be implemented from 2022-2023 onwards

Venue : A1

Convened on 23-03-2022 at 2pm

Members Present :

1. Dr. A. Sheela Vimala Rani — Head of the Dept
2. Dr. Basherrudin Mahmud Ahmed — University Nominee
   Asst. Prof. School of Physics
   Madurai Kamaraj University
   Madurai
3. Dr. K. Marimuthu — Subject Expert
   Asst. Prof
   Department of Physics
   Gandhigram Rural Institute – Deemed University
   Gandhigram
4. Dr. M. Umadevi — Subject Expert
   ~~Associate~~ Professor & Head
   Department of Physics
   Mother Teresa Women's University
   Kodaikanal
   23/03/22

5. Mr. Ramprakash
Industrial Electronics
Corporation No. 1,
Industrial Estate
Madurai

Industrialist

V. Ramprakash

6. Dr. R. Vishnu Priya
Asst. Prof.
Dept. of Physics
The Madura College
Madurai

Alumnae

Vishnu Priya

7. Dr. Malathi
Asst. Prof.
Dept. of Zoology
Fatima College

Dean of Academic Affairs

Malathi
23/3/2022

8. Dr. L. Caroline Sugitham
Associate Prof.

L. Caroline Sugitham

9. Mrs. R. Alphonsa Fernando
Associate Professor

R. A. Fernando

10. Dr. M. V. Leena Chandra
Asst. Prof.

M. V. Leena Chandra

11. I Jeyashealan
Asst. Prof.

I. Jeyashealan

12. Dr. Ancemma Joseph
Asst. Prof.

Ancemma Joseph

13. Dr. M. Ragam
Asst. Prof.

14. Dr. G. Jenita Rani
Asst. Prof.

15. Dr. R. Jothimani
Asst. Prof.

16. Ms. I. Janet Sherly
Asst. Prof.

17. Ms. J. R. Sofia
Asst. Prof.

18 Dr. R. Niranjana Devi
Asst. Prof.

AGENDA FOR BOARD OF STUDIES

1. Preparation of Action taken report
2. To carry out atleast 5-10% changes in a minimum - 20% or more in the courses offered (Approximately 8-10 courses minimum)
   (a) courses with revision less than 20% - same code
   (b) courses with revision more than 20% - New code - to be prefixed with 22...
3. New courses to be introduced
   • Course code to be prefixed with 22...

4. New Value-Added Courses can be introduced or the titles can be changed

5. Each department to offer atleast one Value-Added Courses per year

6. Frequency of the courses to be increased

7. Possibilities of the Credit transfer of SWAYAM MOOC Course to be explored

8. Both the Elective Courses have to be offered simultaneously.

MINUTES OF THE BOARD OF STUDIES

1. Presentation of Action taken report.

Action taken report for 2021-22
UG PHYSICS

SNo.	SUGGESTIONS IN THE PREVIOUS BOARD	ACTION TAKEN IN THE ACADEMIC YEAR 2021-22
1.	Self learning papers for all UG students namely "Amazing Universe and Indian Space Missions" (21P2SL1) offered by Physics dept.	These papers were introduced with the suggested syllabus

S.No.	SUGGESTIONS IN THE PREVIOUS BOARD	ACTION TAKEN IN THE ACADEMIC YEAR 2021-22
	Interdepartmental self learning papers "Microprocessor and Programming" (21P4SLB2) offered by Physics and Computer Science, "Space Science" (21P6SLM3) offered by Physics and Maths department were passed and syllabus were suggested	from the academic year 2021-22 onwards
2.	Reference book for Self learning paper "Microprocessor and Programming" by Ramesh Gaonkar shall be appended	The suggested book is included
3.	Board suggested to introduce "Physics for Competitive Exams" as Self Learning paper in the forth coming year	It will be introduced in the next year
4	Reference book by S.O. Pillai suggested for "Solid State Physics" paper	Reference book is included

S.No.	SUGGESTIONS IN THE PREVIOUS BOARD	ACTION TAKEN IN THE ACADEMIC YEAR 2021-22
5	Board suggested to introduce Skill embedded Certificate courses on "Non conventional energy sources"	A Skill based course "Solar cell and its applications" introduced
6	Syllabus for allied papers of BCA department on "Digital Principles and Computer Organization" (19P4AC14) and IT department on "Digital Principles and Computer Architecture" (19P3AC13) are passed	It was implemented
7	Reference book Malvino and Gates also recommended as reference book in Digital Electronics and Communication (19P5CC13)	The book is included

PG PHYSICS

S.No.	SUGGESTIONS IN THE PREVIOUS BOARD	ACTION TAKEN IN THE ACADEMIC YEAR 2021-22
1.	The title "Principles in advanced Mathematical Physics" can be changed to Advanced Mathematical Physics as the term "Principles" is a misnomer in Mathematical Physics	Title is changed
2	The following reference books were suggested for Quantum Mechanics and Advanced Quantum Mechanics (i) Principles in Quantum Mechanics - A. Shankar (ii) Introduction to Quantum Mechanics - Powell and Craftsman (iii) Quantum Mechanics: Concepts and applications - Nouredine Zettili	The books are included
3.	Industrialistic suggested to replace the currently existing self learning paper	

S.No.	SUGGESTIONS IN THE PREVIOUS BOARD	ACTION TAKEN IN THE ACADEMIC YEAR 2021-22
	for advanced learners entitled on "Instrumentation and experimental methods" by paper entitled on "Digital Signal Processing"	This paper is to be passed in this board

2. REVISION OF COURSES:

S.No.	Course Code	Units revised	% of revision	Course Title
1.	19P1ACC1/ 19M3ACP1/ 19G3ACP1	Unit II - Bernoulli's theorem, Unit III entropy, Unit IV ohms laws	15%.	Allied Physics - I
2.	19P2ACC3/ 19M4ACP2/ 19G4ACP2	Unit II - Frank-Hertz expt	18%.	Allied Physics - II
3	19P5CC14	Unit II - Lasers removed Unit-V Spectroscopy included	15%.	OPTICS
4	19P6CC17	Unit I - Work done included	5%.	Thermodynamics & Statistical Mechanics Revised
5	19P5CC16	Non-electronics Practicals	15%.	

S.No.	Course Code	Units revised	% revision	Course Title
6	19PGME2	Medical Physics - Unit V - Imaging Techniques	10%	Medical Physics
7	19PG1P2	Unit V = Semiconductor memories included	10%	Applied Electronics
8	19PG3P13	Unit V - Quantum Electrodynamics, SU3 symmetry included	10%	Nuclear and Partic Physics

3 NEW COURSES INTRODUCED:

	PROGRAM	COURSE CODE	COURSE TITLE
1.	B.Sc.	22P4CC11	Mathematical Metho
2.	B.Sc.	22P4SB2	Solar Cell and its Applications
3	M.Sc.	22PGSL2	Batteries and its Applications
4	M.Sc.	22PGSLP1	Digital Signal Processing

4. NEW VALUE ADDED COURSE:

Course Code	Course Title
22PGVAPC1	PG Diploma in Instrumentation on Electrochemical Workstation

5. Approval of Ph.D. Course Work Syllabus:

Course Work paper and Core paper for the Research Scholar are as follows:

Ph.D. Scholar	Course work paper	Core paper
P. Mohanaa Muthuselvi	22PHDCWP01 Solid State Ionics	22PHDCPP02 Materials Science

6. SUGGESTIONS GIVEN BY THE BOARD MEMBERS:

UG

* The new course Mathematical Methods can be offered as elective / skill based paper
* The nomenclature for the above paper can be changed into Numerical Methods
* A paper on Mathematical Physics can be included as core paper which will form a basis to studying papers like Mechanics, Quantum theory, Solid State Physics etc.
* "Interference" can be shifted from Allied Physics - II to Allied Physics - I to be on-par with the practicals

* The Board suggested to include "Principles of Electronics" by Mehta as one of the reference books.
* In the elective paper (19P6ME1), instead of Timer and Counter Assemblers and Compilers can be included.

PG

* The nomenclature for the New Value added course was discussed in detail.
* The above course can be offered as "certificate course".
* So the title of the New Value added course is

Certificate Course on Instrumentation on Electrochemical techniques.

* In the Nuclear and Particle Physics course, the Board

suggested to include "Nuclear Physics - Theory and Experiments" by Roy and Nigam as reference book.

* In the Applied Electronics paper, the Industrialist suggested that Pulse width Modulation and Switching regulators can be introduced instead of registers and counters.

* Mr. Ramprakash also recommended to include Assemblers and Simulators in the course "Instrumentation and Microcontroller" 21PG2P10 and to reduce the content of programming in 8051.

* The subject experts strongly recommended to specify the details of sections in the books for study in all the units of the syllabus for both UG and PG programs.

The specifications of the sections would enable the students to learn more precisely. The detailed sections in all units would feciliate the examiner also.

* CREDIT TRANSFER OF SWAYAM MOOC COURSE:

The board members suggested the credit transfer of Swayam-MOOC course is possible:

1) Both the syllabus should be same

2) Number of hours should mat

1) Dr. A. Sheela Vimala Rani

2) Dr. Basheeruddin Mahmud Ahmed

3) Dr. K. Marimuthu

4) Dr. M. Umadevi 23/03/22

5) Mr. Ramprakash

6) Dr. R. Vishnu Priya 23/03/22

7) Dr. Malathy 23/3/22

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18) Dr. R. Niranjana Devi R. N

23/3/22

VISION OF THE DEPARTMENT

Educating and empowering the youth and to let them excel in all fields of Physics.

MISSION OF THE DEPARTMENT

- To ignite the young minds and impart quality education in basic Physics
- To promote enthusiasm in the study of physics through innovative and dedicated teaching methodologies
- To discover the budding talents in theoretical and experimental physics and ensure their global competency
- To provide a stimulating environment and strengthen basic and application oriented research aptitude among the students.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

A graduate of B.Sc. Physics programme after three years will be

PEO 1	Our graduates will be academic, digital and information literates, creative, inquisitive, innovative and desirous for the "more" in all aspects
PEO 2	They will be efficient individual and team performers, exhibiting progress, flexibility, transparency and accountability in their professional work
PEO 3	The graduates will be effective managers of all sorts of real – life and professional circumstances, making ethical decisions, pursuing excellence within the time framework and demonstrating apt leadership skills
PEO 4	They will engage locally and globally evincing social and environmental stewardship demonstrating civic responsibilities and employing right skills at the right moment.

GRADUATE ATTRIBUTES (GA)

Fatima College empowers her women graduates holistically. A Fatimite achieves all-round empowerment by acquiring Social, Professional and Ethical competencies. A graduate would sustain and nurture the following attributes:

I. SOCIAL COMPETENCE

GA 1	Deep disciplinary expertise with a wide range of academic and digital literacy
GA 2	Hone creativity, passion for innovation and aspire excellence
GA 3	Enthusiasm towards emancipation and empowerment of humanity
GA 4	Potentials of being independent
GA 5	Intellectual competence and inquisitiveness with problem solving abilities befitting the field of research
GA 6	Effectiveness in different forms of communications to be employed in personal and professional environments through varied platforms
GA 7	Communicative competence with civic, professional and cyber dignity and decorum
GA 8	Integrity respecting the diversity and pluralism in societies, cultures and religions
GA 9	All – inclusive skill sets to interpret, analyse and solve social and environmental issues in diverse environments
GA 10	Self awareness that would enable them to recognise their uniqueness through continuous self-assessment in order to face and make changes building on their strengths and improving their weaknesses
GA 11	Finesse to co-operate exhibiting team-spirit while working in groups to achieve goals
GA 12	Dexterity in self-management to control their selves in attaining the kind of life that they dream for
GA 13	Resilience to rise up instantly from their intimidating setbacks
GA 14	Virtuosity to use their personal and intellectual autonomy in being life-long learners
GA 15	Digital learning and research attributes
GA 16	Cyber security competence reflecting compassion, care and concern towards the marginalized
GA 17	Rectitude to use digital technology reflecting civic and social responsibilities in local, national and global scenario

II. PROFESSIONAL COMPETENCE	
GA 18	Optimism, flexibility and diligence that would make them professionally competent
GA 19	Prowess to be successful entrepreuners and become employees of trans-national societies
GA 20	Excellence in Local and Global Job Markets
GA 21	Effectiveness in Time Management
GA 22	Efficiency in taking up Initiatives
GA 23	Eagerness to deliver excellent service
GA 24	Managerial Skills to Identify, Commend and tap Potentials
III. ETHICAL COMPETENCE	
GA 25	Integrity and be disciplined in bringing stability leading a systematic life promoting good human behaviour to build better society
GA 26	Honesty in words and deeds
GA 27	Transparency revealing one's own character as well as self-esteem to lead a genuine and authentic life
GA 28	Social and Environmental Stewardship
GA 29	Readiness to make ethical decisions consistently from the galore of conflicting choices paying heed to their conscience
GA 30	Right life skills at the right moment

PROGRAMME OUTCOMES (PO)

The learners will be able to

PO 1	Apply acquired scientific knowledge to solve complex issues.
PO 2	Attain Analytical skills to solve complex cultural, societal and environmental issues.
PO 3	Employ latest and updated tools and technologies to analyse complex issues.
PO 4	Demonstrate Professional Ethics that foster Community, Nation and Environment Building Initiatives.

PROGRAMME SPECIFIC OUTCOMES (PSO)

On completion of **B.Sc. Physics** programme, the graduates would be able to

PSO 1	Acquire thorough knowledge of the basic concepts of the frontier areas of Physics comprising Mechanics, Properties of matter, Electromagnetism, Electronics, Thermodynamics, Modern Physics, optics, Medical Physics and Opto electronics.
PSO 2	Understand and solve the physics problems in everyday life using the acquired basic knowledge.
PSO 3	Develope skills to perform experiments based on the theoretical understanding
PSO 4	Apply the knowledge acquired to analyse and design models in the versatile realm of physics.
PSO 5	• Equip with the essential foundations for higher education and research in physics.

FATIMA COLLEGE (AUTONOMOUS), MADURAI-18

DEPARTMENT OF PHYSICS

For those who joined in June 2019 onwards

PROGRAMME CODE :UAPH

PART – I – TAMIL / FRENCH / HINDI– 12 CREDITS

PART – I – TAMIL

Offered by The Research Centre of Tamil

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	21TL1C1	Language- Modern Literature	5	3	40	60	100
2.	II	21TL2C2	Language - Bakthi Literature	5	3	40	60	100
3.	III	19TL3C3	Language- Epic Literature	5	3	40	60	100
4.	IV	19TL4C4	Language-Sangam Literature	5	3	40	60	100
			Total	**20**	**12**			

PART – I – FRENCH

Offered by The Department of French

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	21RL1C1	PART 1 LANGUAGE FRENCH	5	3	40	60	100
2.	II	21RL2C2	PART 1 LANGUAGE FRENCH	5	3	40	60	100
3.	III	19RL3C3	PART 1 LANGUAGE FRENCH	5	3	40	60	100
4.	IV	19RL4C4	PART 1 LANGUAGE FRENCH	5	3	40	60	100
			Total	20	12			

PART – I – HINDI

Offered by The Department of Hindi

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	21DL1C1	PART 1 LANGUAGE HINDI	5	3	40	60	100
2.	II	21DL2C2	PART 1 LANGUAGE HINDI	5	3	40	60	100
3.	III	19DL3C3	PART 1 LANGUAGE HINDI	5	3	40	60	100
4.	IV	19DL4C4	PART 1 LANGUAGE HINDI	5	3	40	60	100
			Total	20	12			

PART – II -ENGLISH – 12 CREDITS

Offered by The Research Centre of English

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	21EL1LB	BASIC COMMUNICATIVE ENGLISH	5	3	40	60	100
2.		21EL1LI	INTERMEDIATE COMMUNICATIVE ENGLISH	5	3	40	60	100
3.		21EL1LA	ADVANCED COMMUNICATIVE ENGLISH	5	3	40	60	100
4.	II	21EL2LB	ENGLISH COMMUNICATION SKILLS (BASIC)	5	3	40	60	100
5.		21EL2LI	ENGLISH FOR EMPOWERMENT (INTERMEDIATE)	5	3	40	60	100
6.		21EL2LA	ENGLISH FOR CREATIVE WRITING (ADVANCED)	5	3	40	60	100
7.	III	19EL3LN	ENGLISH FOR DIGITAL ERA	5	3	40	60	100
8.	IV	19EL4LN	ENGLISH FOR INTEGRATED DEVELOPMENT	5	3	40	60	100
			Total	**20**	**12**			

PART – III -MAJOR, ALLIED & ELECTIVES – 95 CREDITS

MAJOR CORE COURSES INCLUDING PRACTICALS : 60 CREDITS

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19P1CC1	Mechanics and Properties of Matter	5	4	40	60	100
2.		19P1CC2	Thermal Physics	4	3	40	60	100
3.		19P1CC3	Major Practicals-I	3	2	40	60	100
4.	II	19P2CC4	Oscillations and Waves	5	4	40	60	100
5.		19P2CC5	Applied Mechanics	4	3	40	60	100
6.		19P2CC6	Major Practicals – II	3	2	40	60	100
7.	III	19P3CC7	Electromagnetism	5	4	40	60	100
8.		19P3CC8	Solid State Physics	4	3	40	60	100
9.		19P3CC9	Major Practicals – III	3	2	40	60	100
10.	IV	19P4CC10	Analog Electronics	5	4	40	60	100
11.		19P4CC11	Materials Science	4	3	40	60	100
12.		19P4CC12	Major Practicals – IV	3	2	40	60	100
13.	V	19P5CC13	Digital Electronics and Communication	6	4	40	60	100
14.		19P5CC14	Optics	6	4	40	60	100
15.		19P5CC15	Major Practicals – V (Electronics)	4	2	40	60	100
16.		19P5CC16	Major Practicals – VI (Non Electronics)	4	2	40	60	100
17.	VI	19P6CC17	Thermodynamics &Statistical Mechanics	5	4	40	60	100

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
18.		19P6CC18	Modern Physics	5	4	40	60	100
19.		19P6CC19	Major Practicals – VII(Electronics)	3	2	40	60	100
20.		19P6CC20	Major Practicals - VIII (Non Elec)	3	2	40	60	100

ALLIEDCOURSES- 20 CREDITS

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKS
1.	I	19P1ACC1	Allied Physics – I	3	3	40	60	100
2.		19P1ACB1	Digital Principles and Applications	5		40	60	100
3.		21P1ACC2	Allied Physics Practicals-I	2	2	40	60	100
4.	II	21P2ACC3	Allied Physics – II	3	3	40	60	100
5.		19P2ACC3	Allied Physics Practicals-II	2	2	40	60	100
6.	III	19M3ACP1/19G3ACP1	Allied Physics – I	3	3	40	60	100
7.		21P3ACM2/21P3ACG2	Allied Physics Practicals –I	2	2	40	60	100
8.	IV	19M4ACP3/19G4ACP3	Allied Physics –II	3	3	40	60	100
9		21P4ACM4/21P3ACG4	Allied Physics Practicals –II	2	2	40	60	100

ELECTIVES-15 CREDITS

S.No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	V	19B5MEP1 (Offered by Computer Science)	Programming With C	5	5	40	60	100
2.		19B5MEP2 (Offered by Computer Science)	Web Development	5	5	40	60	100
3.		19P6ME1/ 19P6ME2	MicroProcessor// Medical Physics	5	5	40	60	100
3.	VI	19P6ME1 / 19P6ME2	Microprocessor / Medical Physics	5	5	40	60	100
4.		19P6ME3/ 19P6ME4	Optoelectronics / Energy Physics	5	5	40	60	100

PART – IV – 20 CREDITS

- **VALUE EDUCATION**
- **ENVIRONMENTAL AWARENESS**
- **NON MAJOR ELECTIVE**
- **SKILL BASED COURSES**

S. No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	21G1VE1	Personal Values	1	1	40	60	100
2.		19P1NME	Non Major Elective – "Physics in Everyday Life"(Offered to other major Students)	2	2	40	60	100

3.	II	21G2VE2	Values for Life	1	1	40	60	100

S. No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
4.		19P2NME	Non Major Elective -- "Physics in Everyday Life"(Offered to other major Students)	2	2	40	60	100
5.	III	21G3EE1	Environmental Education	1	1	40	60	100
6.		19P3SB1	Skill based –Bio mechanics	2	2	40	60	100
7.	IV	21G4EE2	Gender Studies	1	1	40	60	100
8.		19P4SB2	Skill based – Physics of Stars	2	2	40	60	100
9.	V	19P5SB3	Skill based –Physics of measuring instruments	2	2	40	60	100
10.		19P5SB4	Skill based –Physics of medical instruments	2	2	40	60	100
11.	VI	19P6SB5	Skill based - Physics of instruments for Astronomical Measurements and Material Characterisation	2	2	40	60	100
12.		19P6SB6	Skill based -Physics of advanced Medical Instruments	2	2	40	60	100

PART – V – 1 CREDIT

OFF-CLASS PROGRAMMES - ALL PART-V

SHIFT - I

S. No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	TOT. Mks
1.	I - IV	**21A4PED**	Physical Education	30/	1	100

2.		**21A4NSS**	NSS	SEM		
3.		**21A4NCC**	NCC			
4.		**21A4WEC**	Women Empowerment Cell			
5.		**21A4ACUF**	AICUF			

ADD-ON COURSES

COURSE CODE	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
21UAD1CA	**COMPUTER APPLICATIONS (**offered by The department of PGDCA for Shift I)	40	2	I & II	40	60	100
21UADFCA	**ONLINE SELF LEARNING COURSE-** Foundation Course for Arts	40	3	I	50	-	50
21UADFCS	**ONLINE SELF LEARNING COURSE-** Foundation Course for Science	40	3	II	50	-	50
21UAD3ES & 21UAD4ES	**ETHICAL STUDIES-** Professional Ethics	15	2	III&IV	50 each Semester	-	100

COURSE CODE	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
21UAD5ES & 21UAD6ES	**ETHICAL STUDIES**	15	2	V&VI	50 each Semester	-	100
21UAD5HR	**HUMAN RIGHTS**	15	2	V	-	-	100
21UAD6RS	**OUTREACH PROGRAMME-** Reach Out to Society through Action **ROSA**	100	3	V & VI	-	-	100
21UAD6PR	**PROJECT**	30	4	VI	40	60	100
21UAD6RC	**READING CULTURE**	10/Semester	1	II-VI	-	-	-
	MOOC COURSES(Department Specific Courses) * Students can opt other than the listed course from UGC-SWAYAM UGC / CEC	-	Minimum 2 Credits	-	-	-	
	TOTAL		20 +				

EXTRA CREDIT COURSE

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
19UGSLP1	**SELF LEARNING COURSE for ADVANCE LEARNERS** **Nanoscience and Nanotechnolgy** **(offered for III UG)**	-	2	V	40	60	100
21UGSLP2	**AMAZING UNIVERSE AND INDIAN SPACE MISSIONS**	-	2	II	40	60	100
21UGIDPB1	**FUNDAMENTALS & PROGRAMMING OF MICROPROCESSOR 8085**	-	2	IV	40	60	100
21UGIDPM1	SPACE SCIENCE	-	2	VI	40	60	100

VALUE ADDED COURSES

19UGVA P1 - Crash Course on 'Digital Photography'
19UGVA CP1 - Certificate Course on 'Mobile Servicing'

I B.Sc. Chemistry&II B.Sc. Mathematics
SEMESTER I & III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAPH	19P1ACC1/19M3ACP1/19G3ACP1	ALLIED PHYSICS-I	Theory	3	3

COURSE DESCRIPTION

The course provides a conceptually based exposure to the fundamental principal and processes of significant topics of physics like Waves and Oscillations, Properties of matter, Electricity and Magnetism and Geometrical Optics.

COURSE OBJECTIVES

This course will improve the elemental concepts and enhance the intellectual, experimental, analytical skills of the students on Simple Harmonic motion, Elasticity of solid matters, viscosity of liquids and thermal properties of Gas, magnetic effect of electric current, Refraction, dispersion of optical devices.

UNITS

UNIT I: WAVES AND OSCILLATIONS [9HRS]

Simple Harmonic motion- Composition of two simple harmonic motions in a straight line-Composition of two simple harmonic motions of equal time periods at right angles-Lissajous's figures- Uses– laws of transverse vibrations of strings – Melde's string – transverse and longitudinal modes.

UNIT –II PROPERTIES OF MATTER [9HRS]

Elasticity –Different Moduli of Elasticity- Poisson's ratio.
Streamline flow and Turbulent flow–Coefficient of Viscosity-Rate of Flow of liquid in a Capillary Tube- Poiseuille's Formula (Method of dimensions) - Poiseuille's Method for determining coefficient of viscosity of liquid- Comparison of viscosities of two liquids.
Surface Tension: Molecular theory of surface tension-pressure difference across a liquid surface-Excess Pressure inside a liquid drop- Excess pressure inside a soap bubble.

UNIT –III THERMAL PHYSICS [9HRS]

Postulates of Kinetic theory of gases– Van der Waals equation of state – Derivation of Critical Constants - Joule Kelvin effect – Joule Thomson porous plug experiment –Laws of thermodynamics- Heat Engine– entropy - changes of entropy in reversible and irreversible processes.

UNIT –IV ELECTRICITY AND MAGNETISM [9HRS]

Capacitor-energy of charged capacitors-Loss of energy on sharing of charges between two capacitors- magnetic effect of electric current-Biot Savart's law-Magnetic induction at a point on the axis of a circular coil.

UNIT –V GEOMETRICAL OPTICS [9HRS]

Laws of Refraction – Refractive index by travelling microscope, Refraction through Prism - Dispersion through a prism – Expression for dispersive power of the material of a thin prism – Combination of two prisms to produce dispersion without deviation - Combination of two prisms to produce deviation without dispersion.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) [2HRS]

New droplet-based electricity generator - The impact of magnetic materials in renewable energy

REFERENCES:

1. Allied Physics by R.Murugeshan (2012- I Edition) *Allied Physics,* Ram Nagar, New Delhi: S. Chand & Company Ltd.

WEB REFERNCES :

1.https://study.com/academy/lesson/physical-property-of-matter-definition-examples- quiz.html
2.https://www.physicsforums.com

.https://www.kullabs.com/classes/subjects/units/lessons/notes/note-detail/1761

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 TITLE: WAVES AND OSCILLATIONS				
1.1	Simple Harmonic Motion	1	Chalk & Talk	Black Board
1.2	Composition of two simple	1	Chalk	LCD

	harmonic motions in a straight line		&Talk	
1.3	Composition of two simple harmonic motions of equal time periods at right angles	2	Chalk & Talk	PPT & White board
1.4	Lissajous's figures	1	Lecture	LCD
1.5	Laws of transverse vibrations of strings	1	Discussion	Black Board
1.6	Melde's string	1	Real model in Lab	Apparatus
1.7	Transverse and longitudinal modes	2	Real model in Lab	Apparatus
UNIT -2 TITLE: PROPERTIES OF MATTER				
2.1	Elasticity	1	Lecture	Green Board, Real samples
2.2	Different Moduli of Elasticity, Poisson's ratio	1	Chalk & Talk	Black Board
2.3	Streamline flow and Turbulent flow	1	Discussion	PPT & White Board
2.4	Coefficient of Viscosity-Rate of Flow of liquid in a Capillary Tube Poiseuille's Formula (Method of dimensions)	1	Lecture	PPT & White Board
2.6	Poiseuille's Method for determining coefficient of viscosity of liquid	1	Real Model in Lab	Apparatus
2.6	Comparison of viscosities of two liquids	1	Real Model in Lab	Apparatus
2.7	Surface Tension: Molecular theory of surface tension	1	Lecture	PPT & White Board
2.8	Pressure difference across a liquid surface-Pressure difference across a liquid surface	1	Chalk & Talk	Black Board
2.9	Excess pressure inside a soap bubble and drop	1	Lecture	Smart Board

UNIT -3 TITLE: THERMAL PHYSICS				
3.1	Postulates of Kinetic theory of gases, Van der Waals equation of state	1	Chalk & Talk	Black Board
3.2	Derivation of Critical Constants	1	Chalk & Talk	LCD
3.3	Joule Kelvin effect – Joule Thomson porous plug experiment	2	Chalk & Talk	PPT & White board
3.4	Laws of thermodynamics	1	Lecture	LCD
3.5	Laws of thermodynamics	1	Discussion	Black Board
3.6	Heat Engine	1	Real model in Lab	Apparatus
3.9	Entropy	1	Real model in Lab	Apparatus
3.10	Changes of entropy in reversible and irreversible processes.	1	Chalk & Talk	Black board
UNIT -4 TITLE: ELECTRICITY AND MAGNETISM				
4.1	Capacitor-energy of charged capacitors	1	Lecture	Green Board Charts
4.2	Energy of a stored capacitor	1	Lecture	White Board
4.3	Loss of energy on sharing of charges between two capacitors	2	Chalk & Talk	Black Board
4.4	Magnetic effect of electric current	2	Discussion	Google classroom
4.5	Biot Savart's law	1	Lecture	PPT
4.6	Magnetic induction at a point on the axis of a circular coil.	2	Chalk & Talk	Black Board
UNIT -5 TITLE: GEOMETRICAL OPTICS				
5.1	Laws of Refraction	1	Chalk & Talk	Black Board
5.2	Image formation by	1	Real model	Apparatus

	refraction		in Lab	
5.3	Refractive index by travelling microscope	1	Real model in Lab	Microscope
5.6	Refraction through Prism	1	Real model in Lab	Spectrometer, Prism
5.7	Dispersion through a prism – Expression for dispersive power of the material of a thin prism	1	Real model in Lab	Spectrometer, Prism
5.8	Combination of two prisms to produce dispersion without deviation	2	Chalk & Talk	Black Board
5.9	Combination of two prisms to produce deviation without dispersion	2	Chalk & Talk	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Quiz	Assignment	OBT/PPT	35 Mks.	5 Mks.	40Mks.	
K1	**2**	**2**	**-**	**-**	**-**	**4**	-	**4**	10 %
K2	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
K3	**3**	**3**	**-**	**-**	**5**	**11**	-	**11**	27.5 %
K4	**3**	**3**	**-**	**5**	**-**	**11**	-	**11**	27.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Define and discuss about the simple harmonic waves and its oscillations and laws of transverse vibrations of strings.	K1, K2	PSO1& PSO2
CO 2	Classify and describe the properties of matter such as electricity, viscosity and surface tension.	K1, K2, K3	PSO3
CO 3	Summarise the basic concepts of thermal physics and apply the laws of thermodynamics in higher learning concepts such as entropy and its reversible and irreversible process.	K1, K2	PSO3
CO 4	Explain the principles and laws used in electricity and magnetism those are useful in defining the energy of a capacitor and magnetic effect of electric current.	K1, K2	PSO4
CO 5	Demonstrate the properties of geometrical optics and explain the refraction and dispersion through a prism.	K1, K2, K3	PSO5

Mapping of C0s with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	1	2
CO2	1	2	3	1	2
CO3	1	2	3	2	1
CO4	1	2	2	3	2
CO5	2	2	2	2	3

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	1	1	1
CO2	2	1	3	1
CO3	3	2	3	1
CO4	2	3	2	3
CO5	2	3	3	2

COURSE DESIGNER:

1. **Dr. Sr. G. Jenita Rani**
2. **Dr. R. Niranjana Devi**
3. **Dr. R. Jothi Mani**

Forwarded By

Dr. A. Sheela Vimala Rani
HoD'S Signature & Name

NEW

I B.Sc. Chemistry&II B.Sc. Mathematics
SEMESTER I & III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAPH	19P1ACC1/19M3ACP1/19G3ACP1	ALLIED PHYSICS-I	Theory	3	3

COURSE DESCRIPTION

The course provides a conceptually based exposure to the fundamental principal and processes of significant topics of physics like Waves and Oscillations, Properties of matter, Electricity and Magnetism and GeometricalOptics.

COURSE OBJECTIVES

This course will improve the elemental concepts and enhance the intellectual, experimental, analytical skills of the students on Simple Harmonic motion, Elasticity of solid matters, viscosity of liquids and thermal properties of Gas, magnetic effect of electric current, Refraction, dispersion of optical devices.

UNITS

UNIT I: WAVES AND OSCILLATIONS [9HRS]

Simple Harmonic motion- Composition of two simple harmonic motions in a straight line-Composition of two simple harmonic motions of equal timeperiods at right angles-Lissajous's figures- Uses– laws of transverse vibrationsof strings – Melde's string – transverse and longitudinal modes.

Change - 5%

UNIT –II PROPERTIES OF MATTER [9HRS]

Elasticity –Different Moduli of Elasticity- Poisson's ratio.
Streamline flow and Turbulent flow–Coefficient of Viscosity-Rate of Flow of liquid in a Capillary Tube- Poiseuille's Formula (Method of dimensions) - Poiseuille's Method for determining coefficient of viscosity of liquid- Comparison of viscosities of two liquids - Bernoulli's theorem – Statement and proof
Surface Tension: Molecular theory of surface tension-pressure difference across a liquid surface-Excess Pressure inside a liquid drop- Excess pressure inside a soap bubble.

Change - 5%

UNIT –III THERMAL PHYSICS [9HRS]

Postulates of Kinetic theory of gases – Van der Waals equation of state – Derivation of Critical Constants - Laws of thermodynamics- Heat Engine– entropy - changes of entropy in reversible and irreversible processes. change in entropy of a perfect gas – change in entropy when ice is converted into steam.

Change - 5%

UNIT –IV ELECTRICITY AND MAGNETISM

Ohm's law – Law of resistance in series and parallel – Specific resistance – Capacitor- capacitors in serial and parallel -energy of charged capacitors -Loss of energy on sharing of charges between two capacitors- magnetic effect of electric current-Biot Savart's law-Magnetic induction at a point on the axis of a circular coil.

UNIT –V GEOMETRICAL OPTICS [9HRS]

Laws of Refraction – Refractive index by travelling microscope, Refraction through Prism - Dispersion through a prism – Expression for dispersive power of the material of a thin prism – Combination of two prisms to produce dispersion without deviation - Combination of two prisms to produce deviation without dispersion.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) [2HRS]

New droplet-based electricity generator - The impact of magnetic materials in renewable energy

- Allied Physics by R.Murugeshan (2012- I Edition) *Allied Physics,* Ram Nagar, New Delhi: S. Chand & Company Ltd.

WEB REFERNCES :

Total Change - 15%

1.**https://study.com/academy/lesson/physical-property-of-matter-definition-examples- quiz.html**

2.**https://www.physicsforums.com**

.**https://www.kullabs.com/classes/subjects/units/lessons/notes/note-detail/1761**

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 TITLE: WAVES AND OSCILLATIONS				
1.1	Simple Harmonic Motion	1	Chalk & Talk	Black Board
1.2	Composition of two simple harmonic motions in a straight line	1	Chalk & Talk	LCD
1.3	Composition of two simple harmonic motions of equal time periods at right angles	2	Chalk & Talk	PPT & White board
1.4	Lissajous's figures	1	Lecture	LCD
1.5	Laws of transverse vibrations of strings	1	Discussion	Black Board
1.6	Melde's string	1	Real model in Lab	Apparatus
1.7	Transverse and longitudinal modes	2	Real model in Lab	Apparatus
UNIT -2 TITLE: PROPERTIES OF MATTER				
2.1	Elasticity	1	Lecture	Green Board, Real samples
2.2	Different Moduli of Elasticity, Poisson's ratio	1	Chalk & Talk	Black Board
2.3	Streamline flow and Turbulent flow	1	Discussion	PPT & White Board
2.4	Coefficient of Viscosity-Rate of Flow of liquid in a Capillary Tube Poiseuille's Formula (Method of dimensions)	1	Lecture	PPT & White Board
2.6	Poiseuille's Method for determining coefficient of viscosity of liquid	1	Real Model in Lab	Apparatus
2.6	Comparison of viscosities of two liquids	1	Real Model in Lab	Apparatus
2.7	Surface Tension: Molecular theory of surface tension	1	Lecture	PPT & White Board
2.8	Pressure difference across a liquid surface-Pressure	1	Chalk & Talk	Black Board

	difference across a liquid surface			
2.9	Excess pressure inside a soap bubble and drop	1	Lecture	Smart Board
UNIT -3	**TITLE: THERMAL PHYSICS**			
3.1	Postulates of Kinetic theory of gases, Van der Waals equation of state	1	Chalk & Talk	Black Board
3.2	Derivation of Critical Constants	1	Chalk & Talk	LCD
3.3	Joule Kelvin effect – Joule Thomson porous plug experiment	2	Chalk & Talk	PPT & White board
3.4	Laws of thermodynamics	1	Lecture	LCD
3.5	Laws of thermodynamics	1	Discussion	Black Board
3.6	Heat Engine	1	Real model in Lab	Apparatus
3.9	Entropy	1	Real model in Lab	Apparatus
3.10	Changes of entropy in reversible and irreversible processes.	1	Chalk & Talk	Black board
UNIT -4	**TITLE: ELECTRICITY AND MAGNETISM**			
4.1	Capacitor-energy of charged capacitors	1	Lecture	Green Board Charts
4.2	Energy of a stored capacitor	1	Lecture	White Board
4.3	Loss of energy on sharing of charges between two capacitors	2	Chalk & Talk	Black Board
4.4	Magnetic effect of electric current	2	Discussion	Google classroom
4.5	Biot Savart's law	1	Lecture	PPT
4.6	Magnetic induction at a point on the axis of a circular coil.	2	Chalk & Talk	Black Board
UNIT -5	**TITLE: GEOMETRICAL OPTICS**			
5.1	Laws of Refraction	1	Chalk & Talk	Black Board
5.2	Image formation by refraction	1	Real model in Lab	Apparatus
5.3	Refractive index by travelling microscope	1	Real model in Lab	Microscope
5.6	Refraction through Prism	1	Real model in Lab	Spectrometer, Prism
5.7	Dispersion through a prism – Expression for dispersive power of the material of a thin	1	Real model in Lab	Spectrometer, Prism

	prism			
5.8	Combination of two prisms to produce dispersion without deviation	2	Chalk & Talk	Black Board
5.9	Combination of two prisms to produce deviation without dispersion	2	Chalk & Talk	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Quiz	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	**2**	**2**	**-**	**-**	**-**	**4**	-	**4**	10 %
K2	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
K3	**3**	**3**	**-**	**-**	**5**	**11**	-	**11**	27.5 %
K4	**3**	**3**	**-**	**5**	**-**	**11**	-	**11**	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Define and discuss about the simple harmonic waves and its oscillations and laws of transverse vibrations of strings.	K1, K2	PSO1& PSO2
CO 2	Classify and describe the properties of matter such as electricity, viscosity and surface tension.	K1, K2, K3	PSO3
CO 3	Summarise the basic concepts of thermal physics and apply the laws of thermodynamics in higher learning concepts such as entropy and its reversible and irreversible process.	K1, K2	PSO3
CO 4	Explain the principles and laws used in electricity and magnetism those are useful in defining the energy of a capacitor and magnetic effect of electric current.	K1, K2	PSO4
CO 5	Demonstrate the properties of geometrical optics and explain the refraction and dispersion through a prism.	K1, K2, K3	PSO5

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	2
CO2	1	2	3	1	2
CO3	1	2	3	2	1
CO4	1	2	2	3	2
CO5	2	2	2	2	3

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	1	1	1
CO2	2	1	3	1
CO3	3	2	3	1
CO4	2	3	2	3
CO5	2	3	3	2

Note: Strongly Correlated – **3** Moderately Correlated – **2**
Weakly Correlated -**1**

COURSE DESIGNER:

Dr. Sr. G. Jenita Rani

Dr. R. Niranjana Devi

Dr. R. Jothi Mani

Forwarded By

Dr. A. Sheela Vimala Rani
HoD'S Signature & Name

I B.Sc. Chemistry&II B.Sc. Mathematics
SEMESTER II & IV
For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAPH	19P2ACC3/19M4ACP3/19G4ACP3	ALLIED PHYSICS-II	Theory	3	3

COURSE DESCRIPTION

The course provides a conceptually based exposure to the fundamental principal and processes of significant topics of physics like geometrical Optics, Atomic Physics, Nuclear Physics and Electronics

COURSE OBJECTIVES

This course will improve the elemental concepts and enhance the intellectual, experimental, analytical skills of the students on Atomic Physics, Nuclear Physics, Electronics and Physical optics.

UNITS

UNIT I:PHYSICAL OPTICS (9 HRS.)

Velocity of light-Michelson's method-Interference in thin films-Production of colours in thin films-Air wedge-Diffraction- Polarisation- Polarisation by reflection-Double refraction –Nicol Prism.

UNIT II:ATOMIC PHYSICS (9 HRS.)

Introduction – Rutherford's experiments on scattering of alpha particles- Bohr atom model – Bohr formula – calculation of total energy – Bohr's Interpretation of Hydrogen spectrum – Spectral series of hydrogen atom .

UNIT III: NUCLEAR PHYSICS (9 HRS.)

Models of Nuclear Structure -The Liquid Drop Model-Mass defect-Binding energy- Nuclear fission-chain reaction - atom bomb-energy released in fission-Nuclear Reactor-Nuclear Fusion

UNIT IV: BASIC ELECTRONICS (9 HRS.)

Formation of p-n Junction Diode-Forward and Reverse Biasi ng of a Junction Diode-V-I Characteristics of a Junction Diode-The Zener Diode-Experiment to study the characteristics of Zener diode-Junction Transistor-working of NPN transistor - common emitter characteristics of a transistor.

UNIT V: DIGITAL ELECTRONICS (9 HRS)

Decimal Number system- Binary Number system-conversion of Binary number into decimal number-conversion of decimal number into binary number- Octal Number system-Hexadecimal number system – Boolean Algebra-Boolean addition and multiplication-Logic Expressions-commutative laws-associative laws-distributive law-Rules for Boolean algebra-De Morgan's Theorem

UNIT VI: DYNAMISM (Evaluation Pattern-CIA only) (2 HRS.)

Role of Michelson interferometer in Atmospheric and space applications - Working of pocket calculators, and cd players

REFERENCES

1. R.Murugesan "Allied Physics" Second Edition 2012, Ram Nagar, NewDelhi: S. Chand & Company Ltd.
2. R. Murugeshan&KiruthigaSivaprasath "Modern Physics" 2007,S.Chand & Company Ltd., 2007.

WEB REFERENCES (OPTIONAL)

1. https://www.khanacademy.org/science/physics/quantum-physics/atoms-and-electrons/v/atomic-energy-levels
2. https://www.nature.com/subjects/nuclear-physics
3. https://www.dictionary.com/browse/physical-optics

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	TeachingAids
UNIT -I PHYSICAL OPTICS				
1.1	Velocity of light- Michelson Method	1	Chalk & Talk	BlackBoard
1.2	Interference in thin films	1	Chalk & Talk	BlackBoard
1.3	Production of colours in thin films	1	Chalk & Talk	BlackBoard
1.4	Air wedge	1	Demonstration	Specimen
1.5	Diffraction	1	Chalk & Talk	BlackBoard
1.6	Polarisation	1	Lecture	BlackBoard
1.7	Polarisation by reflection	1	Discussion	Google classroom
1.8	Double refraction	1	Chalk & Talk	Black Board
1.9	Nicol Prism	1	Chalk & Talk	PPT
UNIT -II ATOMIC PHYSICS				
2.1	Introduction	1	Lecture	Black Board
2.2	Rutherford's experiments on scattering of alpha particles	2	Chalk & Talk	BlackBoard
2.3	Bohr atom model	1	Chalk & Talk	Black Board
2.4	Bohr formula	1	Chalk & Talk	Black Board
2.5	calculation of total energy	1	Chalk & Talk	Black Board
2.6	Bohr's Interpretation of Hydrogen spectrum	1	Chalk & Talk	BlackBoard

2.7	Spectral series of hydrogen atom.	2	Lecture	PPT& Black Board
UNIT - III NUCLEAR PHYSICS				
3.1	Models of Nuclear Structure	1	Lecture	Black Board
3.2	The Liquid Drop Model	1	Lecture	PPT &Black Board
3.3	Mass defect	1	Chalk & Talk	Black Board
3.4	Binding energy	1	Lecture	PPT& Black Board
3.5	Nuclear fission	1	Lecture	PPT
3.6	chain reaction	1	Lecture	PPT
3.7	Atom bomb & Energy released in fission	1	Chalk &Talk	Black Board
3.8	Nuclear reactor	1	Discussion	Google class room
3.9	Nuclear Fusion	1	Lecture	Black Board
UNIT – IV BASIC ELECTRONICS				
4.1	Formation of p-n Junction Diode	1	Chalk & Talk	Black Board
4.2	Forward and Reverse Biasing of a Junction Diode	1	Lecture	PPT
4.3	V-I Characteristics of a	2	Lecture	PPT

	Junction Diode			
4.4	The Zener Diode-Experiment to study the characteristics of Zener diode	2	Chalk & Talk	Black Board
4.5	Junction Transistor	1	Chalk & Talk	Black Board
4.6	Working of n-p-n transistor	1	Discussion	Google Class room
4.7	Common emitter characteristics of a transistor.	1	Chalk & Talk	Black Board
UNIT V DIGITAL ELECTRONICS				
5.1	Decimal Number system& Binary Number system	1	Chalk & Talk	Black Board
5.2	conversion of Binary number into decimal number	1	Chalk & Talk	Black Board
5.3	conversion of decimal number into binary number	1	Chalk & Talk	Black Board
5.4	Octal Number system& Hexadecimal number system	1	Group Discussion	Black Board
5.5	Boolean Algebra-Boolean addition and multiplication	1	Discussion	Google class room
5.6	Logic Expressions	1	Chalk & Talk	Black Board
5.7	commutative laws & associative laws	1	Chalk & Talk	Black Board
5.8	Rules for Boolean Algebara	1	Chalk & Talk	Black Board

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Quiz	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Categorize and clarify the different optical phenomena of interference, diffraction, polarization.	K1,K2	PSO1& PSO2
CO 2	Explain the atom model and calculate the total energy of an atom and account for the spectral series of hydrogen atom.	K1,K3,K4	PSO3&PSO4
CO 3	Elucidate the models of nuclear structure and to learn the principle behind atom bomb, nuclear reactors.	K3,K3	PSO1, PSO2 &PSO3
CO 4	Summarize the working principle of p-n junction diode in forward and reverse biasing, it's V-I characteristics, the Zenor Diode, n-p-n transistor in common emitter characteristics.	K2,K3,K4	PSO1& PSO2
CO 5	Classify the number system and demonstrate the skill in conversion of Number systems, Boolean algebra and its associated laws.	K2,K3	PSO1, PSO2 PSO3 & PSO4

Mapping of C0s with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	1	2
CO2	1	2	3	3	2
CO3	3	3	3	2	1
CO4	3	3	1	1	2
CO5	3	3	3	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	1	1	1
CO2	3	1	3	1
CO3	3	2	3	1
CO4	2	3	3	3
CO5	2	3	3	3

COURSE DESIGNER:

Dr. Sr. G. Jenita Rani

Dr. R. Niranjana Devi

Dr. R. Jothi Mani

Forwarded By

Dr. A. Sheela Vimala Rani

HoD'S Signature & Name

NEW

I B.Sc. Chemistry&II B.Sc. Mathematics

SEMESTER II & IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	19**P2ACC**3/**1**9 M**4ACP3/1**9G**4** ACP3	**ALLIED PHYSICS-II**	**THEORY**	**3**	**3**

COURSE DESCRIPTION

The course provides a conceptually based exposure to the fundamental principal and processes of significant topics of physics like geometrical Optics, Atomic Physics, Nuclear Physics and Electronics

COURSE OBJECTIVES

This course will improve the elemental concepts and enhance the intellectual, experimental, analytical skills of the students on Atomic Physics, Nuclear Physics, Electronics and Physical optics.

UNITS

UNIT I: PHYSICAL OPTICS (9 HRS.)

Velocity of light-Michelson's method-Interference in thin films-Production of colours in thin films-Air wedge-Diffraction- Polarisation- Polarisation by reflection-Double refraction –Nicol Prism.

UNIT II: ATOMIC PHYSICS Change - 5% **(9 HRS.)**

Introduction – Rutherford's experiments on scattering of alpha particles- Bohr atom model – Bohr formula – calculation of total energy – Atomic excitation – Ionization potential – Frank and Hertz Method – Bohr's Interpretation of Hydrogen spectrum – Spectral series of hydrogen atom .

UNIT III: NUCLEAR PHYSICS Change - 3% **(9 HRS.)**

Nucleus – Nuclear properties -Models of Nuclear Structure -The Liquid Drop Model-Mass defect-Binding energy- Nuclear fission-chain reaction - atom bomb-energy released in fission - Nuclear reactor-Nuclear Fusion.

UNIT IV: BASIC ELECTRONICS Change - 5% **(9 HRS.)**

Semiconductor- Formation of p-n Junction Diode-Forward and Reverse Biasing of a Junction Diode-V-I Characteristics of a Junction Diode-The Zener Diode-Experiment to study the characteristics of Zener diode-Transistor – Working of a transistor – CE Configuration – current gain relationship between and – Transistor Characteristics – CE Configuration only.

UNIT V: DIGITAL ELECTRONICS Change - 8% **[9 HRS]**

Decimal Number system- Binary Number system-Binary addition, subtraction and multiplication- conversion of Binary number into decimal number-conversion of decimal number into binary number- Octal Number system-Hexadecimal number system – Boolean Algebra-Boolean addition and multiplication-Logic Expressions- Logic gates – OR, AND, NOT, XOR, NAND and NOR gates – truth tables-commutative laws-associative laws-distributive law-Rules for Boolean algebra-De Morgan's Theorem

UNIT VI: DYNAMISM (Evaluation Pattern-CIA only) **(2 HRS.)**

Role of Michelson interferometer in Atmospheric and space applications - Working of pocket calculators, and cd players

REFERENCES Change - 18%

- R.Murugesan "Allied Physics" Second Edition 2012, Ram Nagar, New Delhi: S. Chand & Company Ltd.
- R. Murugeshan&KiruthigaSivaprasath "Modern Physics" 2007,S.Chand & Company Ltd., 2007.

WEB REFERENCES (OPTIONAL)

- https://www.khanacademy.org/science/physics/quantum-physics/atoms-and-electrons/v/atomic-energy-levels
- https://www.nature.com/subjects/nuclear-physics
- https://www.dictionary.com/browse/physical-optics

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -I PHYSICAL OPTICS				
1.1	Velocity of light- Michelson Method	1	Chalk & Talk	Black Board
1.2	Interference in thin films	1	Chalk & Talk	Black Board
1.3	Production of colours in thin films	1	Chalk & Talk	Black Board
1.4	Air wedge	1	Demonstration	Specimen
1.5	Diffraction	1	Chalk & Talk	Black Board
1.6	Polarisation	1	Lecture	Black Board
1.7	Polarisation by reflection	1	Discussion	Google classroom
1.8	Double refraction	1	Chalk & Talk	Black Board
1.9	Nicol Prism	1	Chalk & Talk	PPT
UNIT -II ATOMIC PHYSICS				
2.1	Introduction	1	Lecture	Black Board
2.2	Rutherford's experiments on scattering of alpha particles	2	Chalk & Talk	Black Board
2.3	Bohr atom model	1	Chalk & Talk	Black

				Board
2.4	Bohr formula	1	Chalk & Talk	Black Board
2.5	calculation of total energy	1	Chalk & Talk	Black Board
2.6	Bohr's Interpretation of Hydrogen spectrum	1	Chalk & Talk	Black Board
2.7	Spectral series of hydrogen atom.	2	Lecture	PPT& Black Board
UNIT - III NUCLEAR PHYSICS				
3.1	Models of Nuclear Structure	1	Lecture	Black Board
3.2	The Liquid Drop Model	1	Lecture	PPT &Black Board
3.3	Mass defect	1	Chalk & Talk	Black Board
3.4	Binding energy	1	Lecture	PPT& Black Board
3.5	Nuclear fission	1	Lecture	PPT
3.6	chain reaction	1	Lecture	PPT
3.7	Atom bomb & Energy released in fission	1	Chalk &Talk	Black Board
3.8	Nuclear reactor	1	Discussion	Google class room
3.9	Nuclear Fusion	1	Lecture	Black Board
UNIT – IV BASIC ELECTRONICS				
4.1	Formation of p-n	1	Chalk & Talk	Black

	Junction Diode			Board
4.2	Forward and Reverse Biasing of a Junction Diode	1	Lecture	PPT
4.3	V-I Characteristics of a Junction Diode	2	Lecture	PPT
4.4	The Zener Diode- Experiment to study the characteristics of Zener diode	2	Chalk & Talk	Black Board
4.5	Junction Transistor	1	Chalk & Talk	Black Board
4.6	Working of n-p-n transistor	1	Discussion	Google Class room
4.7	Common emitter characteristics of a transistor.	1	Chalk & Talk	Black Board
UNIT V	**DIGITAL ELECTRONICS**			
5.1	Decimal Number system& Binary Number system	1	Chalk & Talk	Black Board
5.2	conversion of Binary number into decimal number	1	Chalk & Talk	Black Board
5.3	conversion of decimal number into binary number	1	Chalk & Talk	Black Board
5.4	Octal Number system& Hexadecimal number system	1	Group Discussion	Black Board
5.5	Boolean Algebra- Boolean addition and multiplication	1	Discussion	Google class room

5.6	Logic Expressions	1	Chalk & Talk	Black Board
5.7	commutative laws & associative laws	1	Chalk & Talk	Black Board
5.8	Distributive law	1	Chalk & Talk	Black Board
5.9	Rules for Boolean algebra-De Morgan's Theorem	1	Chalk & Talk	Black Board
UNIT VI	**DYNAMISM**			
6.1	Role of Michelson interferometer in Atmospheric and space applications	1	Discussion	Google Class Room
6.2	Working of pocket calculators, and cd players	1	Discussion	Google Class Room

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Quiz	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	**2**	**2**	**-**	**-**	**-**	**4**	-	**4**	10 %
K2	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
K3	**3**	**3**	**-**	**-**	**5**	**11**	-	**11**	27.5 %
K4	**3**	**3**	**-**	**5**	**-**	**11**	-	**11**	27.5 %
Non Scholasti	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %

c									
Total	10	10	5	5	5	35	5	40	100 %

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components					
			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Categorize and clarify the different optical phenomena of interference, diffraction, polarization.	K1,K2	PSO1& PSO2
CO 2	Explain the atom model and calculate the total energy of an atom and account for the spectral series of hydrogen atom.	K1,K3,K4	PSO3&PSO4
CO 3	Elucidate the models of nuclear structure and to learn the principle behind atom bomb, nuclear reactors.	K3,K3	PSO1, PSO2 &PSO3
CO 4	Summarize the working principle of p-n junction diode in forward and reverse biasing, it's V-I characteristics, the Zenor Diode, n-p-n transistor in common emitter characteristics.	K2,K3,K4	PSO1& PSO2
CO 5	Classify the number system and demonstrate the skill in conversion of Number systems, Boolean algebra and its associated laws.	K2,K3	PSO1, PSO2 PSO3 & PSO4

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	2
CO2	1	2	3	3	2
CO3	3	3	3	2	1
CO4	3	3	1	1	2
CO5	3	3	3	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	1	1	1

CO2	**3**	**1**	**3**	**1**
CO3	**3**	**2**	**3**	**1**
CO4	**2**	**3**	**3**	**3**
CO5	**2**	**3**	**3**	**3**

COURSE DESIGNER:

Dr. Sr. G. Jenita Rani

Dr. R. Niranjana Devi

Dr. R. Jothi Mani

Forwarded By

Dr. A. Sheela Vimala Rani

HoD'S Signature & Name

SEMESTER V

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	19P5CC14	OPTICS	Theory	6	4

COURSE DESCRIPTION

This course aims at giving a detailed study of interference, diffraction, polarization, Holography, Laser and Maser.

COURSE OBJECTIVES

The course enables the students to understand and analyse the interference of light waves and to study the characteristics of Laser and the applications ofLaser. This course explains the diffraction patterns using different types of obstacles and distinguish Fresnel and Fraunhofer diffraction pattern. This course analyses the resolving power of Prism, Grating, Microscope and Telescope and explain the production and detection of polarized light.

UNIT –I INTERFERENCE OF LIGHT (division of amplitude) (18 HRS)

Change of phase on reflection- Interference by reflected light- Interference by transmitted light- **Colors of thin films**-Non-reflecting films- Interference in a wedged-shaped film- Fringes in white light- **Fringes of equal thickness and fringes of equal inclination** (**self study**)- Newton's rings by reflected light-Newton's rings by transmitted light.

UNIT –II INTERFERENCE OF LIGHT(DIVISION OF WAVEFRONT(18 HRS)

Fresnel's biprism- Interference fringes with white light- Displacement of the fringes- Fresnel's double mirror

Lasers and Holography

Introduction to Lasers: Absorption, Spontaneous emission and Stimulated emission-Relation between Einstein's A&B coefficients – Characteristics of a Laser beam-Principle of Laser action- Helium Neon Laser –Semi conductor Lasers-Applications of a Lasers: **Lasers inmedicine and surgery(self study)-** Laser in Holography.

UNIT –III DIFFRACTION OF LIGHT- FRESNEL CLASS (18 HRS)

Introduction- -Difference between Fresnel and Fraunhofer diffraction-Difference between Interference and Diffracion-Fresnel's assumptions-Fresnel's half period zones for plane waves- Explanation of rectilinear propagation of light-Zone plate - Diffraction at a circular aperture-Diffraction at an opaque disc -Diffraction at a straight edge - **Diffraction ata slit (self study)**

UNIT –IV FRAUNHOFER DIFFRACTION (18 HRS)

Fraunhofer diffraction at a single slit- Two slits – N parallel equidistant slits-plane diffraction grating- Determination of wavelength of light with a plane transmission grating- Dispersive power of a diffraction grating- Resolving power – Rayleigh's criterion for resolution- Resolving power of telescope, **Resolving power of Microscope (self study)**, Grating, Prism.

UNIT –V POLARIZATION OF LIGHT (18 HRS)

Polarized and unpolarised light – Production of plane polarised light – Polarization by reflection-Brewster's law- Polarisation by refraction throughpile of Plates- Law of Malus- **Uniaxial and biaxialcrystals(self study)** – Double refraction-Polarisation of Double Refraction-Nicol Prism- Superposition of two disturbances-Quarter wave plate-Half wave plate- Production and analysis of polarized light.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) Michelson's interferometer, Cornu's spiral

REFERENCES:

1. Satya Prakash , Optics ,12th edition 2005, Educational & university Publishers.

2) Dr.N.Subrahmanyam, Brijlal, Dr.M.N.Avadhanulu, A text book of optics-24th Revised Edition 2010, S. Chand & Company limited.

3) Ajoy Ghatak, OPTICS –4th Edition, Tata Mc Graw Hill Publishing

CompanyLtd, New Delhi.

Web References

http://igorivanov.tripod.com/physics/optics.html
https://www.asc.ohio-state.edu/schumacher.60/class/780.il/references_book.html http://www.lightandmatter.com/lm/

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 - INTERFERENCE OF LIGHT (DIVISION OF AMPLITUDE)				
1.1	Change of phase on reflection	1	Chalk & Talk	Black Board
1.2	Interference by reflected light	1	Chalk & Talk	LCD
1.3	Interference by transmitted light	4	Lecture	PPT & White board
1.4	Non-reflecting films-Interference in a wedged-shaped film	1	Lecture	Smart Board
1.5	Fringes in white light	1	Lecture	Black Board
1.6	Fringes of equal thickness and fringes of equal inclination	1	Discussion	PPT & White board
1.7	Newton's rings by reflected light	2	Chalk & Talk	Black Board
1.8	Newton's rings by transmitted light	1	Discussion	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
WAVEFRONT)				
2.1	Fresnel's biprism	1	Chalk & Talk	Black Board
2.2	Interference fringes with white light- Displacement of the fringes	1	Chalk & Talk	LCD
2.3	Fresnel's double mirror	4	Lecture	PPT & White board
2.4	Absorption, Spontaneous emission and Stimulated emission	1	Lecture	Smart Board
2.5	Relation between Einstein's A&B coefficients	1	Lecture	Black Board
2.6	Characteristics of a Laser beam-Principle of Laser action	1	Discussion	PPT & White board
2.7	Helium Neon Laser –Semi conductor Lasers	2	Chalk & Talk	Black Board
2.8	Laser in Holography.	1	Discussion	Black Board
UNIT -3 DIFFRACTION OF LIGHT- FRESNEL CLASS				
3.1	Introduction- -Difference between Fresnel and Fraunhofer diffraction	1	Chalk & Talk	Black Board
3.2	Difference between Interference and Diffracion	1	Chalk & Talk	LCD
3.3	Fresnel's assumptions- Fresnel's half period zones for	4	Lecture	PPT & White

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	plane waves			board
3.4	Explanation of rectilinear propagation of light	1	Discussion	Black Board
3.5	Zone plate	1	Lecture	Black Board
3.6	Diffraction at a circular aperture	1	Discussion	PPT & White board
3.7	Diffraction at an opaque disc	1	Discussion	Black Board
3.8	Diffraction at a straight edge	1	Lecture	PPT & White board
UNIT -4 FRAUNHOFER DIFFRACTION				
4.1	Fraunhofer diffraction at a single slit	1	Chalk & Talk	Black Board
4.2	Two slits - N parallel equidistant slit - plane diffraction grating	1	Chalk & Talk	LCD
4.3	Determination of wavelength of light with a plane transmission grating	4	Lecture	PPT & White board
4.4	Dispersive power of a diffraction grating	1	Lecture	Smart Board
4.5	Resolving power – Rayleigh's	1	Lecture	Black

	criterion for resolution			Board
4.6	Resolving power of telescope	1	Discussion	PPT & White board
4.7	Resolving power of Microscope, Grating.	2	Chalk & Talk	Black Board
4.8	Resolving power of Prism	1	Discussion	Black Board
UNIT -5 POLARIZATION OF LIGHT				
5.1	Polarized and unpolarised light – Production of plane polarised light	1	Chalk & Talk	Black Board
5.2	Polarization by reflection-Brewster's law	1	Chalk & Talk	LCD
5.3	Polarisation by refraction through pile of Plates- Law of Malus	4	Lecture	PPT & White board
5.4	Uniaxial and biaxial crystals-Double refraction-Polarisation of Double Refraction	1	Lecture	Smart Board
5.5	Nicol Prism	1	Lecture	Black Board
5.6	Production of analysis of polarised light	1	Discussion	Black

CIA	
Scholastic	35

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

SE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Gain knowledge on interference of light waves and understand the interference in a wedge shaped film, Newton's rings and Michelson's interferometer	K1	PSO1& PSO2
CO 2	describe interference of light due to division of wave front, characteristics and Principle of Laser action, different types of Lasers, Lasers in Medicine and Holography.	K1, K2,	PSO3
CO 3	Explain Diffraction of light, Diffraction at an opaque disc and the construction and working of zone plate.	K1 & K3	PSO5
CO 4	Insight of the Fraunhofer diffraction at a single slit and double slit, Resolving Power of Prism, Grating, telescope and Microscope.	K1, K2, K3	PSO4
CO 5	Deduce the concepts of Polarization, Brewster's and Malus law and explain production and analysis of polarized light.	K2 & K4	PSO4 &PSO5

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	1
CO2	2	1	3	1	2
CO3	1	2	1	1	3

CO4	**1**	**1**	**1**	**3**	**3**
CO5	**2**	**1**	**1**	**1**	**3**

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	1	1	2	1
CO2	1	2	1	1
CO3	1	2	1	1
CO4	1	1	1	1
CO5	1	1	1	2

Note: ♦ Strongly Correlated – **3** Weakly Correlated -**1**

♦ Moderately Correlated – **2**

COURSE DESIGNER:

Dr.I. JEYA SHEELA

Forwarded By

Dr.A.Sheela Vimala Rani

HOD'S Signature & Name

NEW

SEMESTER –V

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	19P5CC 14	OPTICS	Theory	6	4

COURSE DESCRIPTION

This course aims at giving a detailed study of interference, diffraction, polarization and spectroscopy.

COURSE OBJECTIVES

The course enables the students to understand and analyse the interference of light waves. This course explains the diffraction patterns using different types of obstacles and distinguish Fresnel and Fraunhofer diffraction pattern. This course analyses the resolving power of Prism, Grating, Microscope and Telescope and explain the production and detection of polarized light. This course enables the students to understand the concept of Spectroscopy also.

UNIT –I INTERFERENCE OF LIGHT (division of amplitude) (18 HRS)

Change of phase on reflection- Interference by reflected light- Interference by transmitted light- **Colors of thin films**-Non-reflecting films- Interference in a wedged-shaped film- Fringes in white light- **Fringes of equal thickness and fringes of equal inclination** (**self study**)- Newton's rings by reflected light- Newton's rings by transmitted light.

INTERFERENCE OF LIGHT(DIVISION OF WAVEFRONT

Fresnel's biprism- Interference fringes with white light- Displacement of the fringes- Fresnel's double mirror

UNIT –II DIFFRACTION OF LIGHT- FRESNEL CLASS (18 HRS)

Introduction- -Difference between Fresnel and Fraunhofer diffraction- Difference between Interference and Diffracion-Fresnel's assumptions- Fresnel's half period zones for plane waves- Explanation of rectilinear propagation of light- Zone plate - Diffraction at a circular aperture- Diffraction at an opaque disc -

Diffraction at a straight edge - **Diffraction at a slit (self study)**

UNIT –III FRAUNHOFER DIFFRACTION (18 HRS)

Fraunhofer diffraction at a single slit- Two slits – N parallel equidistant slits- plane diffraction grating- Determination of wavelength of light with a plane transmission grating- Dispersive power of a diffraction grating- Resolving power – Rayleigh's criterion for resolution- Resolving power of telescope, **Resolving power of Microscope (self study)**, Grating, Prism.

UNIT –IV POLARIZATION OF LIGHT (18 HRS)

Polarized and unpolarised light – Production of plane polarised light – Polarization by reflection-Brewster's law- Polarisation by refraction through pile of Plates- Law of Malus- **Uniaxial and biaxialcrystals(self study)** – Double refraction-Polarisation of Double Refraction-Nicol Prism-Superposition of two disturbances-Quarter wave plate-Half wave plate- Production and analysis of polarized light.

UNIT- V SPECTROSCOPY (18 HRS) Change - 15%

Infrared spectroscopy – sources and detector – uses – ultraviolet spectroscopy – sources – quartz spectrograph - applications - Raman Spectroscopy **–** Quantum theory of Raman effect – applications – Nuclear magnetic resonanceNuclear quadrupole resonance -– **Electron spin resonance spectroscopies- (Qualitative study)**

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only)

Michelson's interferometer, Cornu's spiral

Total Change - 15%

REFERENCES:

1.Satya Prakash , Optics ,12th edition 2005, Educational & university Publishers.

2) Dr.N.Subrahmanyam, Brijlal, Dr.M.N.Avadhanulu, A text book of optics- 24th

Revised Edition 2010, S. Chand & Company limited.

3) Ajoy Ghatak, OPTICS –4th Edition, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.

4.Optics and Spectroscopy – R.Murugeshan, S. Chand and co., 6th Edition, New Delhi, 2008.

5. Elements of Spectroscopy – S.L. Gupta, V.Kumar and R.C.Sharma Pragati Prakashan, 13th Edition, Meerut, 1997.

6. Molecular structure and spectroscopy – G.Aruldhass, PHI Pvt Ltd, , II Edition, New Delhi, 2007.

Web References

http://igorivanov.tripod.com/physics/optics.html
https://www.asc.ohio-state.edu/schumacher.60/class/780.il/references_book.html
http://www.lightandmatter.com/lm/

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 - INTERFERENCE OF LIGHT (DIVISION OF AMPLITUDE)				
1.1	Change of phase on reflection	1	Chalk & Talk	Black Board
1.2	Interference by reflected light	1	Chalk & Talk	LCD
1.3	Interference by transmitted light	4	Lecture	PPT & White board
1.4	Non-reflecting films-Interference in a wedged-shaped film	1	Lecture	Smart Board
1.5	Fringes in white light	1	Lecture	Black Board
1.6	Fringes of equal thickness and fringes of equal inclination	1	Discussion	PPT & White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.7	Newton's rings by reflected light	2	Chalk & Talk	Black Board
1.8	Newton's rings by transmitted light	1	Discussion	Black Board
1.9	Fresnel's biprism	1	Chalk & Talk	Black Board
1.10	Interference fringes with white light- Displacement of the fringes	1	Chalk & Talk	LCD
1.11	Fresnel's double mirror	4	Lecture	PPT & White board
UNIT -2 DIFFRACTION OF LIGHT- FRESNEL CLASS				
2.1	Introduction- -Difference between Fresnel and Fraunhofer diffraction	1	Chalk & Talk	Black Board
2.2	Difference between Interference and Diffracion	1	Chalk & Talk	LCD
2.3	Fresnel's assumptions- Fresnel's half period zones for plane waves	4	Lecture	PPT & White board
2.4	Explanation of rectilinear propagation of light	1	Discussion	Black Board
2.5	Zone plate	1	Lecture	Black Board
2.6	Diffraction at a circular aperture	1	Discussion	PPT & White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.7	Diffraction at an opaque disc	1	Discussion	Black Board
2.8	Diffraction at a straight edge	1	Lecture	PPT & White board
UNIT -3 FRAUNHOFER DIFFRACTION				
3.1	Fraunhofer diffraction at a single slit	1	Chalk & Talk	Black Board
3.2	Two slits - N parallel equidistant slit - plane diffraction grating	1	Chalk & Talk	LCD
3.3	Determination of wavelength of light with a plane transmission grating	4	Lecture	PPT & White board
3.4	Dispersive power of a diffraction grating	1	Lecture	Smart Board
3.5	Resolving power – Rayleigh's criterion for resolution	1	Lecture	Black Board
3.6	Resolving power of telescope	1	Discussion	PPT & White board
3.7	Resolving power of Microscope, Grating.	2	Chalk & Talk	Black Board
3.8	Resolving power of Prism	1	Discussion	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -4 POLARIZATION OF LIGHT				
4.1	Polarized and unpolarised light – Production of plane polarised light	1	Chalk & Talk	Black Board
4.2	Polarization by reflection-Brewster's law	1	Chalk & Talk	LCD
4.3	Polarisation by refraction through pile of Plates- Law of Malus	4	Lecture	PPT & White board
4.4	Uniaxial and biaxial crystals-Double refraction-Polarisation of Double Refraction	1	Lecture	Smart Board
4.5	Nicol Prism	1	Lecture	Black Board
4.6	Superposition of two disturbances-Quarter wave plate	1	Discussion	Black Board
4.7	Half wave plate	1	Lecture	LCD
4.8	Production and analysis of polarized light.	1	Lecture	Black Board
UNIT -5 SPECTROSCOPY				
5.1	Infrared spectroscopy- sources and detector	1	Lecture	Smart

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
				Board
5.2	Uses- Ultraviolet spectroscopy – sources	1	Lecture	Black Board
5.3	Quartz spectrograph - applications	1	Discussion	PPT & White board
5.4	Raman Spectroscopy – Quantum theory of Raman effect – applications	2	Chalk & Talk	Black Board
5.5	Nuclear magnetic resonance –Nuclear quadrupole resonance -– **Electron spin resonance spectroscopies- (Qualitative study)** Nuclear magnetic resonance – (Qualitative study)	1	Discussion	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non	-	-	-	-	-		5	5	

Scholastic									12.5 %
Total	10	10	5	5	5	35	5	40	100 %

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Gain knowledge on interference of light waves and understand the interference in a wedge shaped film, Newton's rings and describe interference of light due to division of wave front,	K1	PSO1& PSO2
CO 2	Explain Diffraction of light, Diffraction at an opaque disc and the construction and working of zone plate.	K1, K2,	PSO3
CO 3	Insight of the Fraunhofer diffraction at a single slit and double slit, Resolving Power of Prism, Grating, telescope and Microscope.	K1 & K3	PSO5
CO 4	Deduce the concepts of Polarization, Brewster's and Malus law and explain production and analysis of polarized light.	K1, K2, K3	PSO4
CO 5	Insight of the Infrared spectroscopy, ultraviolet spectroscopy, quartz spectrograph, Raman Spectroscopy, Quantum theory of Raman effect, Nuclear magnetic resonance.	K2 & K4	PSO4 &PSO5

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	1
CO2	2	1	3	1	2
CO3	1	2	1	1	3
CO4	1	1	1	3	3
CO5	2	1	1	1	3

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	1	1	2	1
CO2	1	2	1	1
CO3	1	2	1	1
CO4	1	1	1	1
CO5	1	1	1	2

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

JEYA SHEELA.I

Forwarded By

Dr.A.Sheela Vimala Rani

B.Sc. Physics

SEMESTER VI

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAPH	19P6CC17	THERMODYNAMICS &STATISTICAL MECHANICS	Theory	5	4

COURSE DESCRIPTION

The aim of this course is to deal with thermodynamics, entropy and thermodynamic potentials. This course also deals with statistical thermodynamics and applications of statistics to gases.

COURSE OBJECTIVES

This course enables the student to understand and analyze the zeroth and first law of thermodynamics. This course explains the second law thermodynamics and deduce the Tds eauations. Also deduce the thermodynamic potential, Maxwell relations, Clausius Clapeyron equation to analyse the pressure variation with temperature. This course helps the students to distinguish the three statistics and to calculate thermodynamic probability of the macrostate and also to study the applications of statistics to gases and other systems.

UNIT –I CONSEQUENCES OF THE FIRST LAW (15 HRS)

Scope of thermodynamics – Thermodynamic systems- State of a system, properties- pressure-Thermal equilibrium and temperature – the Zeroth law- Thermodynamic equilibrium- The first law of thermodynamics- the energy equation T and V independent - T and P independent- **P and V independent (self**

study).

UNIT –II ENTROPY AND THE SECOND LAW OF THERMODYNAMICS (15 HRS)

The second law of thermodynamics - Entropy – Calculations of entropy changes in reversible process - Temperature entropy diagrams-Entropy changes in irreversible processes- The Clausius and Kelvin- Plank statements of the second law.

Combined first and second laws:

Introduction- T and V independent- T and P independent- P and V independent- The T ds equations- **properties of a pure substance(self study)**- Properties of a Vander Waals gas.

UNIT –III THERMODYNAMIC POTENTIALS (15 HRS)

The Helmholtz function and the Gibbs function- Thermodynamic potentials- The Maxwell relations- **Phase transitions (self study)**- The Clausius- Clapeyron equation- The third law of thermodynamics.

UNIT –IV STATISTICAL THERMODYNAMICS (15 HRS)

Introduction- Energy states and energy levels- Macrostates and microstates- Thermodynamic probability- The Bose Einstein statistics- The Fermi-Dirac statistics- The Maxwell-Boltzmann statistics- The Bose- Einstein distribution function- The Fermi Dirac distribution function- **The Maxwell- Boltzmann distribution function(self study).**

UNIT –V APPLICATION OF STATISTICS TO GASES (15 HRS)

The Monoatomic ideal gas- The principle of equipartition of energy- The quantized linear oscillator- Specific heat capacity of a diatomic gas.

Applications of quantum statistics to other systems:

The Einstein theory of the specific heat capacity of a solid- The Debye theoryof the specific heat capacity of a solid- **Blackbody radiation (self Study)**.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (4 HRS.)

Properties of an ideal gas , Specific heat capacity of a diatomic gas.

REFERENCES:

1. Francis W.Sears & Gerhard L.Salinger,Thermodynamics, kinetic theoryand statistical thermodynamics, Narosa Publishing.
2. Agarwal, Eisner Statistical Mechanics, Wiley Eastern Ltd
3 . Reif ,Fundamentals of statistical and thermal physics,McGraw-Hill

Web References

http://igorivanov.tripod.com/physics/stat.html

http://igorivanov.tripod.com/physics/thermo.html

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 - CONSEQUENCES OF THE FIRST LAW				
1.1	Scope of thermodynamics – Thermodynamic systems	1	Chalk & Talk	Black Board
1.2	State of a system, properties-pressure	1	Chalk & Talk	LCD
1.3	Thermal equilibrium and temperature	4	Lecture	PPT & White board
1.4	The Zeroth law	1	Lecture	Smart Board
1.5	Thermodynamic equilibrium	1	Lecture	Black Board
1.6	the energy equation- T and V independent	1	Discussion	PPT & White board
1.7	T and P independent	2	Chalk & Talk	Black Board
1.8	**P and V independent (self study)**.	1	Discussion	Black Board
UNIT -2 ENTROPY AND THE SECOND LAW OF THERMODYNAMICS				
2.1	The second law of thermodynamics	1	Chalk & Talk	Black Board
2.2	Entropy – Calculations of entropy changes in reversible process -	1	Chalk & Talk	LCD

2.3	Temperature entropy diagrams-Entropy changes in irreversible processes	4	Lecture	PPT & White board
2.4	The Clausius and Kelvin-Plank statements of the second law.	1	Lecture	Smart Board
2.5	Combined first and second law- T and V independent	1	Lecture	Black Board
2.6	the energy equation- T and V independent	1	Discussion	PPT & White board
2.7	T and P independent- P and	2	Chalk & Talk	Black Board
	V independent- The T ds equations			
2.8	Properties of a Vander Waals gas.	1	Discussion	Black Board
UNIT -3 THERMODYNAMIC POTENTIALS				
3.1	The Helmholtz function and the Gibbs function	1	Chalk & Talk	Black Board
3.2	Thermodynamic potentials	1	Chalk & Talk	LCD
3.3	The Maxwell relations	4	Lecture	PPT & White board
3.4	Phase transitions	1	Discussion	Black Board

3.5	The Clausius-Clapeyron equation	1	Lecture	Black Board
3.6	The third law of thermodynamics.	1	Discussion	PPT & White board
UNIT -4 STATISTICAL THERMODYNAMICS				
4.1	Introduction- Energy states and energy levels	1	Chalk & Talk	Black Board
4.2	Macrostates and microstates- Thermodynamic probability	1	Chalk & Talk	LCD
4.3	The Bose Einstein statistics-	4	Lecture	PPT & White
4.4	The Fermi-Dirac statistics	1	Lecture	Smart Board
4.5	The Maxwell-Boltzmann statistics	1	Lecture	Black Board
4.6	The Bose- Einstein distribution function	1	Discussion	PPT & White board
4.7	The Fermi Dirac distribution function	2	Chalk & Talk	Black Board
4.8	The Maxwell- Boltzmann distribution function(self study).	1	Discussion	Black Board
UNIT -5 APPLICATION OF STATISTICS TO GASES				
5.1	The Monoatomic ideal gas	1	Chalk & Talk	Black Board
5.2	The principle of equipartition of energy	1	Chalk & Talk	LCD

5.3	The quantized linear oscillator	4	Lecture	PPT & White board
5.4	The Einstein theory of the specific heat capacity of a solid	1	Lecture	Smart Board
5.5	The Debye theory of the specific heat capacity of a solid	1	Lecture	Black Board
5.6	Blackbody radiation	1	Discussion	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

CIA

Scholastic	**35**

Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

On the Successful completionof the course, student will be

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Analyse the basics of thermodynamic systems and derive the internal energy equation as Pressure, Volume and Temperature as independent	K1	PSO1& PSO2
CO 2	Explain the entropy and the second law of thermodynamics and deduce the Tds equations and discuss the properties of an ideal gas and Vander Waals gas	K1, K2,	PSO3
CO 3	Gain knowledge on thermodynamic potentials, Helmoltz and Gibbs functions and derive Maxwell's relations..	K1 & K3	PSO5
CO4	Distinguish Bose Einstein, Fermi-Dirac statistics, Maxwell-Boltzmann Statistics and studytheir distribution functions.	K1, K2, K3	PSO4
CO 5	Demonstrate and explain the application of quantum statistics	K2 & K4	PSO5

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	1
CO2	2	1	3	1	2
CO3	1	2	1	1	3
CO4	1	1	1	3	3
CO5	2	1	1	1	3

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	1	1	2	1
CO2	1	2	1	1
CO3	1	2	1	1
CO4	1	1	1	1
CO5	1	1	1	2

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER: Dr. I JEYASHEELA

Forwarded By

Dr.A.Sheela Vimala Rani

HOD'S Signature & Name

NEW

B.Sc. Physics

SEMESTER VI

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAPH	19P6CC17	THERMODYNAMICS &STATISTICAL MECHANICS	Theory	5	4

COURSE DESCRIPTION

The aim of this course is to deal with thermodynamics, entropy and thermodynamic potentials. This course also deals with statistical thermodynamics and applications of statistics to gases.

COURSE OBJECTIVES

This course enables the student to understand and analyze the zeroth and first law of thermodynamics. This course explains the second law thermodynamics and deduce the Tds eauations. Also deduce the thermodynamic potential, Maxwell relations, Clausius Clapeyron equation to analyse the pressure variation with temperature. This course helps the students to distinguish the three statistics and to calculate thermodynamic probability of the macrostate and also to study the applications of statistics to gases and other systems.

Change - 5%

UNIT –I CONSEQUENCES OF THE FIRST LAW (15 HRS)

Scope of thermodynamics – Thermodynamic systems- State of a system, properties- pressure-Thermal equilibrium and temperature – the Zeroth law- Thermodynamic equilibrium- The

first law of thermodynamics- the energy equation T and V independent - T and P independent- P and V independent -**Work Done**

UNIT –II ENTROPY AND THE SECOND LAW OF THERMODYNAMICS (15 HRS)

The second law of thermodynamics - Entropy – Calculations of entropy changes in reversible process - Temperature entropy diagrams-Entropy changes in irreversible processes- The Clausius and Kelvin- Plank statements of the second law.

Combined first and second laws:

Introduction- T and V independent- T and P independent- P and V independent- The T ds equations- **properties of a pure substance(self study)**- Properties of a Vander Waals gas.

UNIT –III THERMODYNAMIC POTENTIALS (15 HRS)

The Helmholtz function and the Gibbs function- Thermodynamic potentials- The Maxwell relations- **Phase transitions (self study)**- The Clausius- Clapeyron equation- The third law of thermodynamics.

UNIT –IV STATISTICAL THERMODYNAMICS (15 HRS)

Introduction- Energy states and energy levels- Macrostates and microstates- Thermodynamic probability- The Bose Einstein statistics- The Fermi-Dirac statistics- The Maxwell-Boltzmann statistics- The Bose- Einstein distribution function- The Fermi Dirac distribution function- **The Maxwell- Boltzmann distribution function(self study).**

UNIT –V APPLICATION OF STATISTICS TO GASES (15 HRS)

The Monoatomic ideal gas- The principle of equipartition of

energy- The quantized linear oscillator- Specific heat capacity of a diatomic gas.

Applications of quantum statistics to other systems:

The Einstein theory of the specific heat capacity of a solid- The Debye theoryof the specific heat capacity of a solid**- Blackbody radiation (self Study)**.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (4 HRS.)

Properties of an ideal gas , Specific heat capacity of a diatomic gas.

REFERENCES:

Total Change - 5%

3. Francis W.Sears & Gerhard L.Salinger,Thermodynamics, kinetic theoryand statistical thermodynamics, Narosa Publishing.
4. Agarwal, Eisner Statistical Mechanics, Wiley Eastern Ltd
3 . Reif ,Fundamentals of statistical and thermal physics,McGraw-Hill

Web References

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http://igorivanov.tripod.com/physics/thermo.html

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 - CONSEQUENCES OF THE FIRST LAW				
1.1	Scope of thermodynamics – Thermodynamic systems	1	Chalk & Talk	Black Board
1.2	State of a system, properties-pressure	1	Chalk & Talk	LCD
1.3	Thermal equilibrium and temperature	4	Lecture	PPT & White board
1.4	The Zeroth law	1	Lecture	Smart Board
1.5	Thermodynamic equilibrium	1	Lecture	Black Board
1.6	the energy equation- T and V independent	1	Discussion	PPT & White board
1.7	T and P independent	2	Chalk & Talk	Black Board
1.8	P and V independent & Work Done	1	Discussion	Black Board
UNIT -2 ENTROPY AND THE SECOND LAW OF THERMODYNAMICS				
2.1	The second law of thermodynamics	1	Chalk & Talk	Black Board
2.2	Entropy – Calculations of entropy changes in reversible process -	1	Chalk & Talk	LCD

2.3	Temperature entropy diagrams-Entropy changes in irreversible processes	4	Lecture	PPT & White board
2.4	The Clausius and Kelvin-Plank statements of the second law.	1	Lecture	Smart Board
2.5	Combined first and second law- T and V independent	1	Lecture	Black Board
2.6	the energy equation- T and V independent	1	Discussion	PPT & White board
2.7	T and P independent- P and	2	Chalk & Talk	Black Board
	V independent- The T ds equations			
2.8	Properties of a Vander Waals gas.	1	Discussion	Black Board
UNIT -3 THERMODYNAMIC POTENTIALS				
3.1	The Helmholtz function and the Gibbs function	1	Chalk & Talk	Black Board
3.2	Thermodynamic potentials	1	Chalk & Talk	LCD
3.3	The Maxwell relations	4	Lecture	PPT & White board
3.4	Phase transitions	1	Discussion	Black Board

3.5	The Clausius-Clapeyron equation	1	Lecture	Black Board
3.6	The third law of thermodynamics.	1	Discussion	PPT & White board
UNIT -4 STATISTICAL THERMODYNAMICS				
4.1	Introduction- Energy states and energy levels	1	Chalk & Talk	Black Board
4.2	Macrostates and microstates- Thermodynamic probability	1	Chalk & Talk	LCD
4.3	The Bose Einstein statistics-	4	Lecture	PPT & White
4.4	The Fermi-Dirac statistics	1	Lecture	Smart Board
4.5	The Maxwell-Boltzmann statistics	1	Lecture	Black Board
4.6	The Bose- Einstein distribution function	1	Discussion	PPT & White board
4.7	The Fermi Dirac distribution function	2	Chalk & Talk	Black Board
4.8	The Maxwell- Boltzmann distribution function(self study).	1	Discussion	Black Board
UNIT -5 APPLICATION OF STATISTICS TO GASES				
5.1	The Monoatomic ideal gas	1	Chalk & Talk	Black Board
5.2	The principle of equipartition of energy	1	Chalk & Talk	LCD

5.3	The quantized linear oscillator	4	Lecture	PPT & White board
5.4	The Einstein theory of the specific heat capacity of a solid	1	Lecture	Smart Board
5.5	The Debye theory of the specific heat capacity of a solid	1	Lecture	Black Board
5.6	Blackbody radiation	1	Discussion	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	**2**	**2**	**-**	**-**	**-**	**4**	-	**4**	10 %
K2	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
K3	**3**	**3**	**-**	**-**	**5**	**11**	-	**11**	27.5 %
K4	**3**	**3**	**-**	**5**	**-**	**11**	-	**11**	27.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

On the Successful completionof the course, student will be

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Analyse the basics of thermodynamic systems and derive the internal energy equation as Pressure, Volume and Temperature as independent	K1	PSO1& PSO2
CO 2	Explain the entropy and the second law of thermodynamics and deduce the Tds equations and discuss the properties of an ideal gas and Vander Waals gas	K1, K2,	PSO3
CO 3	Gain knowledge on thermodynamic potentials, Helmoltz and Gibbs functions and derive Maxwell's relations..	K1 & K3	PSO5
CO4	Distinguish Bose Einstein, Fermi-Dirac statistics, Maxwell-Boltzmann Statistics and studytheir distribution functions.	K1, K2, K3	PSO4
CO 5	Demonstrate and explain the application of quantum statistics	K2 & K4	PSO5

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	1
CO2	2	1	3	1	2
CO3	1	2	1	1	3
CO4	1	1	1	3	3
CO5	2	1	1	1	3

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	1	1	2	1
CO2	1	2	1	1
CO3	1	2	1	1
CO4	1	1	1	1
CO5	1	1	1	2

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER: Dr. I JEYASHEELA

Forwarded By

Dr.A.Sheela Vimala Rani

HOD'S Signature & Name

III B.Sc.Physics

SEMESTER V

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAPH	19P5CC16	Major Practicals VI NON ELECTRONICS	Practicals	4	2

COURSE DESCRIPTION

The lab course deals with Experiments of **optics, thermal and electricity** in Physics.

COURSE OBJECTIVES

The course gives an understanding of electrical, thermal and optical measurements like Refractive index of a liquid, Determination of wavelength of Fraunhofer lines using Grating,Determination of λ using Hartmann's Interpolation Formula,determination of μ by forming Newtens rings and characteristics of a thermistor.

List of Experiments

Any six experiments

1.He-Ne LASER- Determination of Refractive index of a liquid

2. Verification ofMalus law- LASER

3. Study of the Characteristics of a Thermistor.

4.Solar Spectrum - Determination of ofFraunhofer lines using Grating

5. Air Wedge – determination of thickness of wire

6. Determination of □ -Hartmann's Interpolation Formula

7. Biprism and spectrometer - Determination of □

8. Newton's rings in liquid – determination of μ

EVALUATION PATTERN

 .

MARKS		
CIA	**ESE**	**Total**
40	**60**	**100**

COURSE DESIGNER:Dr.R. Jothimani

Forwarded By

Dr.A.Sheela Vimala Rani

HOD'S Signature & Name

III B.Sc.Physics **NEW**

SEMESTER V

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UAPH	19P5CC16	Major Practicals VI NON ELECTRONICS	Practicals	4	2

COURSE DESCRIPTION

The lab course deals with Experiments of **optics, thermal and electricity** in Physics.

COURSE OBJECTIVES

The course gives an understanding of electrical, thermal and optical measurements like Refractive index of a liquid, Determination of wavelength of Fraunhofer lines using Grating, Determination of λ using Hartmann's Interpolation Formula, and determination of μ by forming Newton's rings, determination of numerical aperture of fiber optic cable.

List of Experiments

Any six experiment Change - 15%

1. Newton's rings in air – determination of radius of curvature of lens.
2. Determination of λ -Hartmann's Interpolation Formula.
3. Solar cell Characteristics.
4. He-Ne LASER- Determination of Refractive index of a liquid.
5. Fraunhofer diffraction of a single slit- Diode Laser
6. Determination of Resolving power of a grating

7. Determination of coupling loss using optical fiber.

8..Determination of temperature coefficient of resistive coil - Carry faster bridge.

9.Verification of Malus law- LASER

10. Determination of the Numerical Aperture of a Fiber optic cable.

Total Change - 15%

EVALUATION PATTERN

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MARKS		
CIA	**ESE**	**Total**
40	**60**	**100**

COURSE DESIGNER:Dr.R. Jothimani

Forwarded By

Dr.A.Sheela Vimala Rani

HOD'S Signature & Name

III B.Sc.

SEMESTER VI

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	19P6ME2	Medical Physics	Theory	5	5

COURSE DESCRIPTION

This course introduces physics of medical instruments used for diagnosisand therapy

COURSE OBJECTIVES

The course enables the students to understand the physics principles, methods and techniques in practice and research for diagnosis and treatment of human diseases with a specific goal of improving human healthand well being

UNIT I:TERMINOLOGY, MODELING AND MEASUREMENT [15 HRS.]

Terminology, Modeling and Measurement - Applications of Electricity and Magnetism in Medicine: Electrical shock, High frequency Electricity in Medicine, Low-frequency Electricity and Magnetism in Medicine

UNIT II: LIGHT IN MEDICINE [15 HRS.]

Measurement of light and its units, Application of visible light in Medicine, Applications of Ultraviolet and Infrared Light in Medicine, Lasers in Medicine.

Physics of Diagnostic X Rays **:**Making an X-ray image, Radiation to patients from x-rays. Producing Live X-ray images-Fluoroscopy

UNIT III:RADIO ISOTOPES IN MEDICINE (NUCLEAR MEDICINE) (15 HRS.)

Sources of Radioactivity for Nuclear Medicine, Basic Instrumentation and its clinical applications, Nuclear Medicine Imaging Devices, Therapy witradioactivity, Radiation Doses in Nuclear Medicines

UNIT IV: RADIATION PROTECTION IN MEDICINE (15 HRS.)

Biological effects of Ionizing Radiation, Radiation protection in Diagnostic Radiology, Radiation protection in Radiation therapy, Radiation protection in Nuclear Medicine, Radiation Accidents

UNIT V:COMPUTERS IN MEDICINE (13 HRS.)

History taking, Laboratory Automation, Electrocardiogram Interpretation, Patient Monitoring, Drug-Test interactions, prescribing Drug Dosage, Pulmonary Function Testing, Medical Record systems, Hospitals book keeping, other uses of computers in Medicine.

UNIT VI: DYNAMISM (Evaluation Pattern-CIA only) (2 HRS.)

Adaptive radiation therapy-artificial intelligence

REFERENCES

1.John R.Cameron & James G.Skofronick "Medical Physics", Wiley-Interscience Publication,John Wiley & Sons

2.Irina Cromwell, Carol Weibell, Lianne Pfeiffer – BiomedicalInstrumentation and Measurements –Prentice Hall of India Pvt .Ltd ,New Delhi .

COURSE CONTENTS & LECTURE SCHEDULE

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -I TERMINOLOGY, MODELING AND MEASUREMENT				
1.1	Terminology, modeling	3	Chalk & Talk	Black Board

1.2	Measurements	3	Chalk & Talk	Black Board
1.3	Applications of Electricity and magnetism in medicine	3	Demonstration	PPT
1.4	Electrical shock	3	Lecture	PPT
1.5	High frequency electricity in medicine	3	Chalk & Talk	Black Board
UNIT -II LIGHT IN MEDICINE				
2.1	Measurement of light and its units	2	Lecture	Black Board
2.2	Application of visible light in Medicine	2	Chalk & Talk	PPT & Black Board
2.3	Application of UV light in Medicine	2	Discussion	Black Board
2.4	Application of IR light in Medicine	1	Discussion	Black Board
2.5	Lasers in Medicine	1	Chalk & Talk	PPT & Black Board
2.6	Physics of diagnostic x-rays	2	Lecture	PPT
2.7	Making an x-ray image	1	Lecture	PPT
2.8	Radiation to patients from x-rays	2	Lecture	PPT & Black Board
2.9	Producing Live X-ray images -Flooroscopy	2	Chalk & Talk	Black Board
UNIT - III RADIO ISOTOPES IN MEDICINE				
3.1	Sources of Radioactivity for nuclear medicine	3	Lecture	Black Board

3.2	Basic instrumentation and its clinical application	3	Lecture	Black Board
3.3	Nuclear medicine imaging	3	Discussion	PPT
	devices			
3.4	Therapy with radioactivity	3	Lecture	Black Board
3.5	Radiation Doses in nuclear medicines	3	Lecture	Black Board
UNIT – IV RADIATION PROTECTION IN MEDICINE				
4.1	Biological effects of ionizing radiation	3	Chalk & Talk	Black Board
4.2	Radiation protection in Diagnostic Radiology	3	Lecture	PPT
4.3	Radiation protection in Radiation therapy	3	Lecture	PPT
4.4	Radiation protection in Nuclear Medicine	3	Chalk & Talk	Black Board
4.5	Radiation Accidents	3	Chalk & Talk	Black Board
UNIT V COMPUTERS IN MEDICINE				
5.1	History taking	2	Lecture	PPT
5.2	Laboratory Automation	2	Chalk & Talk	Black Board
5.3	Electrocardiogram Interpretation	2	Chalk & Talk	Black Board
5.4	Patient Monitoring	1	Group Discussion	Black Board
5.5	Drug Test Interactions	1	Discussion	Google class room

5.6	Prescribing Drug Dosage	1	Discussion	Google class room
5.7	Pulmonary Function Testing	2	Discussion	Google class
5.8	Medical Record Systems	1	Discussion	Google class room
5.9	Hospital Book Keeping	1	Discussion	Google class room
5.10	Other uses of Computers in Medicine	1	Discussion	Google class room
UNIT VI Dynamism				
6.1	Adaptive Radiation Therapy	1	Discussion	Google class room
6.2	Artifical Intelligence	1	Discussion	Google class room

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Acquire knowledge of terminologies, modeling and measurements in medical physics. Also application of low frequency and high frequency electricity in medicine	K1,K2	PSO1& PSO2
CO 2	Comprehend properties of light in medicine and to study various applications of light in medicine	K1,K3	PSO3&PSO4
CO 3	Describe the role of nuclear medicine techniques for diagnosis and therapy	K3,K3	PSO1, PSO2 &PSO3

CO 4	Understand the radiation protection in medicine	K2,K4	PSO1& PSO2
CO 5	Explore the role of computers in diagnosis, testing and therapy	K2,K3	PSO1, PSO2 PSO4 & PSO5

Mapping of C0s with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	1	1
CO2	2	2	3	3	1
CO3	3	3	3	2	1
CO4	3	3	2	2	1
CO5	3	3	1	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	2	1	3	2
CO2	2	2	3	1
CO3	2	2	3	2
CO4	3	3	3	3
CO5	2	2	2	2

COURSE DESIGNER:Dr.M. Ragam & Dr. A. Sheela

Forwarded By

Dr.A.Sheela Vimala Rani

HOD'S Signature & Name

NEW

III B.Sc. Physics

SEMESTER –VI

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	19P6ME2	Medical Physics	Core	5	5

COURSE DESCRIPTION

This course introduces physics of medical instruments used for diagnosis and therapy

COURSE OBJECTIVES

The course enables the students to understand the physics principles, methods and techniques in practice and research for diagnosis and treatment of human diseases with a specific goal of improving human health and well being

UNIT I: TERMINOLOGY, MODELING AND MEASUREMENT [15 HRS.]

Terminology, Modeling and Measurement - Applications of Electricity and Magnetism in Medicine: Electrical shock, High frequency Electricity in Medicine, Low-frequency Electricity and Magnetism in Medicine

UNIT II: LIGHT IN MEDICINE [15 HRS.]

Measurement of light and its units, Application of visible light in Medicine, Applications of Ultraviolet and Infrared Light in Medicine, Lasers in Medicine.

Physics of Diagnostic X Rays **:**Making an X-ray image, Radiation to patients from x-rays. Producing Live X-ray images-Fluoroscopy

UNIT III: RADIO ISOTOPES IN MEDICINE (NUCLEAR MEDICINE)

(15 HRS.)

Sources of Radioactivity for Nuclear Medicine, Basic Instrumentation and its clinical applications, Nuclear Medicine Imaging Devices, Therapy with radioactivity, Radiation Doses in Nuclear Medicines

UNIT IV: RADIATION PROTECTION IN MEDICINE (15 HRS.)

Biological effects of Ionizing Radiation, Radiation protection in Diagnostic Radiology, Radiation protection in Radiation therapy, Radiation protection in Nuclear Medicine, Radiation Accidents

UNIT V: COMPUTERS IN MEDICINE & RECENT IMAGING TECHNICHES (13 HRS.)

Change - 10%

History taking, Laboratory Automation, Electrocardiogram Interpretation, Patient Monitoring, Drug-Test interactions, prescribing Drug Dosage, Pulmonary Function Testing, Medical Record systems, Hospitals book keeping, other uses of computers in Medicine.

Computer Aided Tomography, Magnetic Resonance Imaging, Position Emission Tomography, Ultrasonic Imaging

UNIT VI: DYNAMISM (Evaluation Pattern-CIA only) (2 HRS.)

Adaptive radiation therapy-artificial intelligence

Total Change - 10%

REFERENCES

1. John R.Cameron & James G.Skofronick "Medical Physics", A Wiley-Interscience Publication,John Wiley & Sons

2. Irina Cromwell, Carol Weibell, Lianne Pfeiffer –Biomedical Instrumentation and Measurements –Prentice Hall of India Pvt .Ltd ,New Delhi .

OURSE CONTENTS & LECTURE SCHEDULE

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
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1.3	Applications of Electricity and magnetism in medicine	3	Demonstration	PPT
1.4	Electrical shock	3	Lecture	PPT
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UNIT -II LIGHT IN MEDICINE				
2.1	Measurement of light and its units	2	Lecture	Black Board
2.2	Application of visible light in Medicine	2	Chalk & Talk	PPT & Black Board
2.3	Application of UV light in Medicine	2	Discussion	Black Board
2.4	Application of IR light in Medicine	1	Discussion	Black Board
2.5	Lasers in Medicine	1	Chalk & Talk	PPT & Black Board
2.6	Physics of diagnostic x-rays	2	Lecture	PPT
2.7	Making an x-ray image	1	Lecture	PPT

2.8	Radiation to patients from x-rays	2	Lecture	PPT & Black Board
2.9	Producing Live X-ray images -Flooroscopy	2	Chalk & Talk	Black Board
UNIT - III RADIO ISOTOPES IN MEDICINE				
3.1	Sources of Radioactivity for nuclear medicine	3	Lecture	Black Board
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4.1	Biological effects of ionizing radiation	3	Chalk & Talk	Black Board
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4.3	Radiation protection in Radiation therapy	3	Lecture	PPT
4.4	Radiation protection in Nuclear Medicine	3	Chalk & Talk	Black Board
4.5	Radiation Accidents	3	Chalk & Talk	Black Board
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5.1	History taking	2	Lecture	PPT
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K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
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			Nos		
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C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	5 Mks
C6	-	Attendance		-	5 Mks

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NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
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CO 4	Understand the radiation protection in medicine	K2,K4	PSO1& PSO2
CO 5	Explore the role of computers in diagnosis, testing and therapy	K2,K3	PSO1, PSO2 PSO4 & PSO5

Mapping of C0s with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	1	1
CO2	2	2	3	3	1
CO3	3	3	3	2	1
CO4	3	3	2	2	1
CO5	3	3	1	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	2	1	3	2
CO2	2	2	3	1
CO3	2	2	3	2
CO4	3	3	3	3
CO5	2	2	2	2

COURSE DESIGNER:Dr.M. Ragam & Dr. A. Sheela

Forwarded By

Dr.A.Sheela Vimala Rani

HOD'S Signature & Name