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 : THE RESEARCH CENTRE OF PHYSICS

NAME OF THE PROGRAMME : B.Sc. PHYSICS

PROGRAMME CODE : UAPH

ACADEMIC YEAR : 2020 - 2021

PHYSICS - BOARD OF STUDIES - 7th March 2020

Board of Studies meeting held in the dept of physics, Fatima College Madurai - 18 on 7th March 2020.

List of Board members:

1. Dr. S. Rajasekhabala
   Head, Dept of Theoritical physics
   School of Physics
   Madurai Kamaraj University - 625021
   S. Rajasekhabala

2. Dr. S. Ari Ponnammal
   Professor of physics
   Gandhigram Rural Institute (Deemed to be uty)
   Gandhigram - 624302
   [signature]

3. Dr. A. Jegatha Christy
   Asst. Professor Dept of Physics   ABSENT.
   Jeyaraj Annapackiam College
   Periyakulam

4. Dr. K. Gnanasekar
   Associate Prof, Dept of Physics
   The American College, Madurai - 625002
   [signature]

5. Ms. Malarvizhi
   Managing Director
   Veyil Sakthi Solar
   2, Sonai muthu Servai Tower
   Melur Main Road
   Y. Othakkadai, Madurai - 625107
   [signature]

6. Mrs. Arulmozhi Packiaseeli
Associate Professor

7. Dr. Mathavi Manickam
Associate Professor

8. Dr. A. Sheela Vimala Rani
Associate Professor

9. Dr. L. Caroline Sugirtham
Associate Professor

10. Dr. G. Dheva Shantha Kumari
Associate Professor

11. Mrs. R. Alphonsa Fernando
Associate Professor

12. Dr. M. V. Leena Chandra
Assistant Professor

13. Mrs. I. Jeyasheela
Assistant Professor

14. Dr. Arcanna Joseph
Assistant Professor

15. Dr. M. Ragam
Assistant Professor

16. Dr. Sr. Jenita Rani
Assistant Professor

17. Dr. Jothimani R.
Asst Professor R. Jothimani

18. Dr. Niranjana Devi R.
Asst. Professor R.N

Minutes of the meeting:

UG Papers

* Change of title for P2CC5. Advanced mechanics changed as Applied Mechanics.
* 10% Self study included in all the UG papers.
* Syllabus for Semesters III – VI are passed
* No of hours Reduced from 7 to 5 for Electromagnetism & Electronics in III & IV Sem Respectively. (19P3CC7 & 19P4CC10)
* Hence New papers Solid State Physics and Materials Science are introduced in III & IV Semester Respectively (19P3CC8, 19P4CC11)
* It is suggested to include Types of diodes in the Analog Electronics paper.
* On P4CC11 – Material Science – Suggested to include Certain Specific materials in all the units
* On P4CC12 & P3CC9 Suggested to include simulation Experiments of FET.
* On P5CC13 – Digital Electronics & Communication Suggested to include Sub titles (Uplink & Down link)
* P5CC14 – optics – Suggested to change Book for Study (Jenkins & White, Ghatak)
* P6CC19 – Suggested to include EX-OR, EX-NOR, & Non binary Counters

- PGCC20 – Suggested to include particle size determination using LASER Ultrasonic experiments, Bio mass based Experiments
- Suggested to base wind mill Construction & Study.
- Titles changed for skill based papers.
- Syllabus for Advanced learner Course (Nano Science and Nano technology) passed.
- In PGM53 unit III optical fibers and cables replaced by optical fibre Sensors.

PG Papers.

- 20% of Self Study included in all PG papers.
- Titles changed for PG1P1 – Mathematical Physics
  PG2P6 – Advanced Mathematical Physics.
  PG3P11 – Condensed matter Physics.
  PG4P16 – Advanced Condensed Matter Physics.
  PG4P17 – Spectroscopy
- Suggested to buy DIGITAL POLARIMETER for practical purpose, (19PG1P4 – Non electronics)

- PG4PE2A – certification has been changed. Suggested to include dynamic Scattering method
- Title changed for PG4PE2A – Materials Synthesis and Characterisation –
- PG4PE2B – Suggested to include X ray astronomy.
- Suggested to buy data logger for daily data Collection using astronomical Telescope. which can be used for PG experiments & Projects.
- all UG and PG practicals revised and Semester

wise practicals implemented.

- Advanced learner Course – Instrumentation and Experimental methods Syllabus passed
- ~~Ph.D~~ – Closed
- Ph.D – Course Work – Syllabus Passed.
- Syllabus for Certificate Course (Cell phone Servicing), Crash Course (Digital Photography) are passed.
- Action taken on suggestions given by BOS 2019 is discussed.

1. Dr. S. RAJASHABALA	S. Rajashabala
2. Dr. S. ARIPONNAMMAL	SRpl
3. Dr. K. GHANASEKAR.	
4. Ms. MALARVIZHI.	Devimalarvizhi
5. Mrs. S. Arulmozhi Packiaseeli	S. Arulmozhi Packiaseeli
6. Dr. A. Sheela Vimala Rani	A. Sheela Vimala Rani
7. Dr Mathavi Manisekar	Mathavi Manisekar
8. Dr. L. CAROLINE SUGIRTHAM.	L. Caroline Sugirtham
9. Dr. G. Deva Shantha Kumari.	G. Deva Shantha Kumari
10. R. ALPHONSA FERNANDO	R. Alphonsa Fernando.
11. Dr. M. V. Leena Chandra	M. V. Leena Chandra
12. T. Teja Sheela	T. Teja Sheela
13. Dr. ANCEMMA JOSEPH	Ancemma Joseph
14. Dr. M. Ragam	M. Ragam
15. Dr. Sr. G. Jenita Rani	Sr. G. Jenita Rani
16. Dr R. Jothi Mani	R. Jothi Mani
17. Dr R. Niranjana Devi	R. Niranjana Devi
18.	

7/3/2020

DEPARTMENT OF PHYSICS
2020-2021

Sem	Sub.Code	Subject Title	No.of Hours	No. of credits	CIA						End Sem	Total
					Mid	Mon	Week	Session	Nch	Total		
	19P1CC1	Mechanics and Properties of Matter	5	4	15	10	5	5	5	40	60	100
I	19P1CC2	Thermal Physics	4	3	15	10	5	5	5	40	60	100
	19P1CC3	Major practicals-I	3	2	15	10	5	5	5	40	60	100
	19C1ACP1	Allied Physics – I	3	3	-	-	-	-	-	40	60	100
	19C1ACP2	Allied Physics Practicals-I	2	2	-	-	-	-	-	40	60	100
	19P1NME	Physics in everyday life	2	2	15	10	5	5	5	40	60	100
	19B1ACP1	Digital principles and applications	5	5	15	10	5	5	5	40	60	100
II	19P2CC4	Oscillations and Waves	5	4	15	10	5	5	5	40	60	100
	19P2CC5	Applied Mechanics	4	3	15	10	5	5	5	40	60	100
	19P2CC6	Major Practicals - II	3	2	-	-	-	-	-	40	60	100
	19C2ACP3	Allied Physics – II	3	3	15	10	5	5	5	40	60	100
	19C2ACP4	Allied Physics Practicals-II	2	2	-	-	-	-	-	40	60	100
	19P2NME	Physics in everyday life	2	2	15	10	5	5	5	40	60	100
III	19P3CC7	Electromagnetism	5	4	15	10	5	5	5	40	60	100
	19P3CC8	Solid State Physics	4	3	15	10	5	5	5	40	60	100
	19P3CC9	Major Practicals - III	3	2	-	-	-	-	-	40	60	100
	19M3ACP1	Allied Physics – I	3	3	15	10	5	5	5	40	60	100
	19M3ACP2	Allied Physics Practicals -I	2	2	-	-	-	-	-	40	60	100
	19P3SB1	Biomechanics	2	2	15	10	5	5	5	40	60	100
IV	19P4CC10	Analog Electronics	5	4	15	10	5	5	5	40	60	100
	19P4CC1	Materials Science	4	3	15	10	5	5	5	40	60	100

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	19P4CC12	Major Practicals – IV	3	2	-	-	-	-	-	40	60	100
	19M4ACP3	Allied Physics –II	3	3	15	10	5	5	5	40	60	100
	19M4ACP4	Allied Physics Practicals -II	2	2	-	-	-	-	-	40	60	100
	19P4SB2	Physics of Stars	2	2	15	10	5	5	5	40	60	100

SEM	**Sub.code**	**Sub. Title**	**No. of hrs**	**No. of credits**	**CIA**				**Ext**	**Tot**
					T	**F.P**	**Q**	**Total**		
V	P5CC9	Electronics and Communication	7	6	15	5	5	25	75	100
	P5CC10	Optics	7	6	15	5	5	25	75	100
	P5MEB1	Programming with C	5	5	15	5	5	25	75	100
	P5SB3	Physics of Measuring Instruments I	2	2	-	-	-	50	-	50
	P5SB4	Physics of Medical Instruments -I	2	2	-	-	-	50	-	50
VI	P6CC11	Thermodynamics &Statistical Mechanics	5	5	25	5	5	25	75	100
	P6CC12	Modern Physics	5	5	25	5	5	25	75	100
	P6CC13	Major Practicals – III	3	5	-	-	-	40	60	100
	P6CC14	Major Practicals - IV	3	5	-	-	-	40	60	100
	P6ME1/2	Medical Physics/ Microprocessor	5	3	25	5	5	25	75	100
	P6ME3/4	Optoelectronics / Energy Physics	5	3	25	5	5	25	75	100
	P6SB5	Physics of Measuring Instruments - II	3	5	-	-	-	50	-	50
	P6SB6	Physics of Medical Instruments - II	3	4	-	-	-	50	-	50
	P6CC15	Project	2	-	-	-	-	50	-	50

II. B.Sc.

SEMESTER –II

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	**19P3CC8**	**Solid State Physics**	**Major Core**	**4**	**3**

COURSE DESCRIPTION

Aim of this course is to enable the student to understand the concepts in crystal structure and magnetic and dielectric materials which forms the basis for material world.

COURSE OBJECTIVES

Solid State Physics is basic for material fabrications for various electronic applications. This course aims at giving an idea about crystal structure and various properties of solids like magnetic and dielectric behaviours. This course also deals with the super conductors and their applications.

UNIT I: CRYSTAL STRUCTURE [12 HRS.]

Introduction – crystal lattice and translation vectors-unit cells- basis- symmetry operation-point groups-space groups-types of lattices- lattice directions and planes-interplanar spacing-simple crystal structures-structure of diamond-zinc blende structure and sodium chloride structure

UNIT II: LATTICE VIBRATIONS [14 HRS.]

Introduction-vibration of one dimensional monoatomic lattice-vibration of one dimensional diatomic lattice-phonons-momentum of phonons-inelastic scattering of

photons by phonons-specific heat-classical theory of lattice heat capacity- Einstien's theory of lattice heat capacity

UNIT III: MAGNETISM IN SOLIDS [10 HRS.]

Magnetic terminology - types of magnetism - diamagnetism, Langevin's Classical theory – paramagnetism - Langevin's Classical theory ferromagnetism- Concept of Domains an Hysteresis - antiferromagnetism - ferrimagnetism

UNIT IV: DIELECTRIC PROPERTIES OF SOLIDS [12 HRS.]

Polarization and susceptibility- the local field-dielectric constant and polarizability-sources of polarizability-Electronic Polarizability- Ionic Polarizability – Dipolar Polaizability - frequency dependence of total polarizability - ferroelectricity- Piezo electricity

UNIT V: SUPER CONDUCTIVITY [12 HRS.]

Introduction and historical development- electrical resistivity- prefect diamagnetism or meissner effect-super current and penetration depth-critical field and critical temperature-type I and II superconductor- thermo dynamical and optical properties-isotope effect-flux quantization- the Josephson effects and tunneling -additional characteristics - theoretical aspects-high temperature ceramic superconductors-applications.

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

Applications of crystals in solar cell - Application of super conductor in MRI body scanner.

REFERENCES

1) R.K.Pure and V.K.Babber "Solid State Physics" First Edition 1997, S.Chand.
2) S.O.Pillai "Solid state Physics" Second Edition 2009, New Age International Publishers.
3) Charles Kittel " Introduction to Solid state Physics" First Edition 2018, Wiley Publishers.

I B.Sc.

SEMESTER –IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UAPH	**19P4CC11**	**Materials science**	**Major Core**	**4**	**4**

COURSE DESCRIPTION

The course provides concept based exposure to conducting, dielectric, magnetic, superconducting and other emerging new materials

COURSE OBJECTIVES

This course deals with the elemental concepts of properties of various materials

UNIT –I CONDUCTING MATERIALS (12 HRS.)

Material Science-Properties of engineering materials.

Atomic interpretation of ohm's law-Relaxation time and electrical conductivity-Derivation of electrical conductivity of a metal-Electrical and thermal conductivity-Thermal conductivity-Wiedemann Franz law-Thermal expansion-Different types of conducting materials:Low resistivity materials, High resistivity materials

UNIT –II DIELECTRIC MATERIALS (12 HRS.)

Fundamental definitions in dielectrics-Determination of dielectric constant of a dielectric material- Applications of insulating and dielectric materials - Properties and different types of insulating materials

UNIT –III MAGNETIC MATERIALS (12 HRS.)

Introduction - Different types of magnetic materials- Soft Magnetic materials-Hard magnetic materials-Energy product of magnetic materials-Ferrite Core memory-

Magnetic recording materials-Magnetic storage media materials-Magnetic principle in computer data storage

UNIT –IV SUPERCONDUCTING MATERIALS (12 HRS.)

Introduction - Explanations for the occurrence of superconductivity-General properties of superconductors-Other observations-Types of superconductors-High temperature superconductors-Preparation & Characterisation of high temperature ceramic superconductors-Perovskite superconductivity- Applications of superconductors

UNIT –V NEW MATERIALS (12 HRS.)

Metallic glasses-fiber reinforced plastics- Metal matrix composites –Biomaterials-Ceramics-Cermets-High temperature materials-Thermoelectric materials-Electrets-Nanophase materials-Shape memory alloys-smart materials-conducting polymers.

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

New Materials invented in twentieth century that could change human lives

REFERENCES:

1. Dr. M. Arumugam, M. Sethuraman, *Material Science*, Anuradha publications, Reprint 2010

1. V. Rajendran, *Material science*, TATA Mc GRAW HILL EDUCATION PVT. LTD. Second Reprint 2013

2. William.D. Callister, Jr., *Materials science and Engineering* – an introduction (V edition) 2012

WEB REFERNCES :

1. https://easyengineering.net/materialssciencebooks/
2. https://electronicsforu.com/resources/16-free-ebooks-on-material-science

Signature of the HOD with Seal

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