MANONMANIAM

SUNDARANAR UNIVERSITY,

TIRUNELVELI – 627 012

B.Sc. Physics Degree
(CHOICE BASED CREDIT SYSTEM)

Learning Outcome Based Curriculum

Major & Allied Physics

(Effective from the academic year 2021-2022 onwards)

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc. PHYSICS

(Choice Based Credit System)

(With effect from the academic year 2021-2022 onwards)

1. **Vision of the University**

To provide quality education to reach the un-reached

2. **Mission of the University**

- To conduct research, teaching and outreach programmes to improve conditions of human living.
- To create an academic environment that honours women and men of all races, caste, creed, cultures and an atmosphere that values intellectual curiosity, pursuit of knowledge, academic freedom and integrity.
- To offer a wide variety of off-campus educational and training programmes including the use of information technology, to individuals and groups.
- To develop partnership with industries and government so as to improve the quality of the work place and to serve as catalyst for economic and cultural development.
- To provide quality / inclusive education especially for the rural and un-reached segments of economically downtrodden students including women, socially oppressed and differently abled.

3. **Vision of the Department**

To promote active learning, critical thinking coupled with ethical values and produce globally competent physicists.

4. **Mission of the Department**

The Department is committed to impart quality education both in theoretical as well as experimental physics with special emphasis on 'learning by doing' for socio-economic growth.

5. **Preamble**

The Department of Physics provides instructional programs in introductory Physics to a broad range of students through an understandable and effective method that enables them to integrate this knowledge into their normal thought processes. The department provides a forward-looking curriculum to undergraduate Physics Major, involving not only traditional physics topics but also state-of-the-art instruction in experimental techniques, computational physics and the use of computers in data acquisition and analysis, as well as active involvement in professional research.

6. **Programme Outcome**

Upon completion of B.Sc degree programme, the graduates will be able to

PO. 1: acquire a fundamental concepts in the field of Physics and procedural knowledge that creates different types of professionals related to the subject area of Physics, including professionals engaged in research and development, teaching and government / public service.

PO. 2: demonstrate the ability to use skills in Physics and its related areas of technologies for formulating and tackling

Physics related problems.

PO. 3: inculcate innovative skills and teamwork among students to meet societal expectations.

PO. 4: perform analysis to assess, interpret and create innovative ideas through practical experiments.

PO. 5: facilitate to enter multidisciplinary path to solve day-to-day scientific problems.

PO. 6: carry out fieldworks and projects both independently and collaboration with others and to report in a constructive way.

PO. 7: improve communication ability and knowledge transfer through ICT aided learning integrated with Library resources.

PO. 8: attain competency in job market / entrepreneurship.

7. Programme Specific Outcome (PSO)

The student graduating with the degree B.sc (Physics) should be able to

PSO1: understand and experiment the basic concepts of Properties of Matter and Mechanics, Optics and Acoustics, Heat and Thermodynamics, Electricity and Electromagnetism, Instrumentation Physics, Space Physics, Basic Electronics, Spectroscopy, Atomic and Nuclear Physics, Communication Electronics, Quantum Mechanics, Digital Electronics, Solid State Physics, Energy Physics and Medical Physics.

PSO2: develop the skills on scientific programming through programming with C++ which will make them choose their career in wide spectrum of areas.
PSO3: students will have knowledge about the working of medical instruments, laser, super conductivity, electrical appliances, wiring and nano materials.
PSO4: students utilize their laboratory skills to take measurements in Physics laboratory, analyze the measurements and draw valid conclusions.
PSO5: students will be able to compile oral and written scientific communications and will prove that they can think critically and work independently.
PSO6: harness the scientific ideas to reduce pollution by promoting non-conventional and renewable energy sources.
PSO7: students will illustrate proficiency in mathematics and the mathematical concepts needed for the proper understanding of physics and can face competitive exams with ease.
PSO8: gain confidence and move to higher studies.

8. Eligibility for admission to the course and examination

Candidate shall be admitted to the course provided he / she has passed plus two examinations of the State or Central Board with Maths / Physics / Chemisty / Biology as one of the subject or any other science subject that may be considered as equivalent by the M.S. University.

9. Duration of the course

The students shall undergo the prescribed course of study for a period of not less than three academic years (six semesters). Each semester contains 90 working days.

10. Medium of instruction and examination

The medium of instruction as well as examinations will be in English.

11. **Theory Examination**

The external evaluation will be based on the examination to be conducted by the University at the end of each semester.

12. **Practical Examination**

Practical examinations will be conducted at the end of each semester.

13. **Evaluation**

A. Each paper carries an internal component

B. There is a pass minimum of 40% for external and overall components

Theory external: Internal assessment = 75:25

Practical External: Internal assessment = 50:50

C. Internal Assessment

Internal Marks for theory shall be allocated in the following manner

The average of the best two tests from three compulsory tests	20 Marks
Assignment	05 Marks
Total	**25 Marks**

Note: Each test will be of one hour duration

D. Practical

Internal marks for Practical shall be allotted in the following manner.

Experimental	20 Marks
Record	10 Marks
Model Test	20 Marks
Total	**50 Marks**

E. Project Work

Components	Marks
Project Report	75
Viva-Voce	25
Total	**100**

Note:

i) Students should carry out group project in major subject.
ii) Project report will be evaluated by central valuation and viva-voce will be conducted by both the External Examiner and the Guide at the end of the sixth semester.

F. The overall performance level of the candidates will be assessed by the following formulae:

Cumulative weighted average of marks = $\frac{\sum(\text{marks} + \text{credits})}{\sum \text{credits}}$

Cumulative weighted average grade points = $\frac{\sum(\text{Grade points} \times \text{credits})}{\sum \text{credits}}$

14. **Grading System**

The performance of the student is indicated by the Seven Points Scale Grading System as per the UGC norms given below

Grade	Grade point	Percentage of marks	Performance
O	9.5 and above	95-100	Outstanding
E	8.5 and above	85-94	Excellent
D	7.5 and above	75-84	Distinction
A	7 and above	70-74	Very Good
B	6and above	60-69	Good
C	5 and above	50-59	Average
RA	0	Up to 49	Re-Appear

15. **The question paper pattern for all theory papers shall be as follows.**

Duration of Exam: 3Hours

Section	Type of questions	Mark
Part-A	Multiple choice question (Two question from each unit compulsory)	1×10=10 Marks
Part-B	Internal Choice questions (One question from each unit: either/or)	5×5=25 marks
Part-C	Internal Choice questions (One question from each unit: either/or)	8×5=40 marks
	Total	**75 Marks**

16. **The question paper pattern for all practical papers shall be as follows.**

Duration of Practical Exam: 3 hours

1	AIM, Formula	10
2	Knowledge of the experiment	5
3	Observation and calculation	20
4	Accuracy of the result	05
5	Record	10
	Total	**50 Marks**

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Course Structure

	Subject Part	Subject Title	Contact Hrs/week	Credits	Exam Hrs.	Marks		
						Int.	Ext.	Total
Semester – I	Part I	Tamil / Other Language	6	4	3	25	75	100
	Part II	Communicative English-I	6	4	3	25	75	100
	Part III	Core Subject 1. Properties of Matter & Mechanics	4	4	3	25	75	100
		Practical-I	2	2	3	50	50	100
		Professional English for Physical Sciences-I	4	4	3	25	75	100
		Allied Physics Paper-1	4	3	3	25	75	100
		Allied Practical-I	2	2	3	50	50	100
	Part IV	Common – Environmental Studies	2	2	3	25	75	100
		Total	30	25				
Semester – II	Part I	Tamil / Other Languages	6	4	3	25	75	100
	Part II	Communicative English-II	6	4	3	25	75	100
	Part III	Core Subject 2. Optics and Acoustics	4	4	3	25	75	100
		Practical-II	2	2	3	50	50	100
		Professional English for Physical Sciences-II	4	4	3	25	75	100
		Allied Physics Paper-2	4	3	3	25	75	100
		Allied Practical-II	2	2	3	50	50	100
	Part IV	Common – Value Based Education	2	2	3	25	75	100
		Total	30	25				

	Subject Part	Subject Title	Contact Hr / Week	Credit	Exam Hrs	Marks		
						Int	Ext	Total
Semester – III	Part I	Tamil / Other Languages	6	4	3	25	75	100
	Part II	English	6	4	3	25	75	100
	Part III	Core subject 3. Electricity & Electromagnetism	4	4	3	25	75	100
		Practical-III	2	2	3	50	50	100
		Allied Subject-I (for allied subjects With theory and practical) 1.Theory-Paper-I	4	3	3	25	75	100
		2.Practical-1	2	2	3	50	50	100
		Skill based subject (Any one) a. Maintenance of Electrical appliances b. Instrumentation Physics – I	4	4	3	25	75	100
	Part IV	Non – Major Elective (Any one) a. Basic Physics – I b. Applied Physics	2	2	3	25	75	100
		Common-Yoga*	2	2				
		Total	32	27				

	Subject Part	Subject Title	Contact Hr / Week	Credit	Exam Hrs	Marks		
						Int	Ext	Total
Semester – IV	Part I	Tamil / Other Languages	6	4	3	25	75	100
	Part II	English	6	4	3	25	75	100
	Part III	Core subject 4. Heat & Thermodynamics	4	4	3	25	75	100
		Practical-IV	2	2	3	50	50	100
		Allied Subject-II (for allied subjects with theory and practical) 1.Theory-Paper-II	4	3	3	25	75	100
		2.Practical-II	2	2	3	50	50	100
		Skill based subject (Anyone) a. Maintenance of Electronic appliances b. Instrumentation Physics – II	4	4	3	25	75	100
	Part IV	Non – Major Elective - Paper - II (Any One) a. Basic Physics – II b. Space Physics	2	2	3	25	75	100
		Common - Computer For Digital Era*	2	2	-	-	-	-
	Part V	Extension activity	-	1	-	-	-	-
		Total	32	28				

	Subject Part	Subject Title	Contact Hr / Week	Credit	Exam Hrs	Marks		
						Int	Ext	Total
Semester V	Part III	Core subject 5.Basic Electronics	6	4	3	25	75	100
		6. Spectroscopy	5	4	3	25	75	100
		7.Atomic and Nuclear Physics	6	4	3	25	75	100
		Major Elective (any one) a.Programming in C++ b.Communication Electronics	5	4	3	25	75	100
		Practical – V - General Practical	3	3	3	50	50	100
		Practical-VI Electronics	3	3	3	50	50	100
	Part IV	Skill based subject (Common) Personality development / Effective Communication / Youth Leadership	2	2	3	25	75	100
		Total	30	24				
Semester VI	Subject Part	Core Subject 9. Quantum Mechanics	5	4	3	25	75	100
		10. Digital Electronics	5	4	3	25	75	100
		11. Solid State Physics	5	4	3	25	75	100
		Major Elective (any one) a.Energy Physics b.Medical Physics	5	4	3	25	75	100
		Project	4	4	3	50	50	100
		Practical-VII General Practical	3	3	3	50	50	100
		Practical-VIII Electronics	3	3	3	50	50	100
		Total	30	26				