ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

3rd,4th and 5th floors, Neeladri Towers, Sri Ram Nagar,6th Battalion Road,
Atmakur(V), Mangalagiri(M), Guntur-522 503, Andhra Pradesh
Web: www.apsche.org **Email**: acapsche@gmail.com

REVISED SYLLABUS OF B.Sc. PHYSICS
(FOR MATHEMATICS COMBINATIONS)
UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-2021

PROGRAMME: FOUR-YEAR UG HONOURS PROGRAMME

Physics for Mathematics Combinations

(With Learning Outcomes, Unit-wise Syllabus, References, Co-curricular Activities &

Model Q.P.)

For Fifteen Courses of 1, 2, 3 & 4 Semesters)

(To be Implemented from 2020-21 Academic Year)

AP STATE COUNCIL OF HIGHER EDUCATION
B.Sc. PHYSICSSYLLABUS UNDER CBCS
[For Mathematics combinations]
w.e.f. 2020-21 (Revised in May 2020)

First Semester
Course I: Mechanics, Waves and Oscillations
Practical Course I (Lab-1)

Second Semester
Course II: Wave Optics
Practical Course II (Lab-2)

Third Semester
Course III: Heat and Thermodynamics
Practical Course III (Lab-3)

Fourth Semester
Course IV: Electricity, Magnetism and Electronics
Practical Course IV (Lab- 4)

Course V:Modern Physics
Practical Course V (Lab-V)

B.Sc. PHYSICS COURSE STRUCTURE UNDER CBCS

Year	Semester	Course	Title of the Course	Marks	No.ofHrs /Week	No.of Credits
I	I	I	Mechanics, Waves and Oscillations	100	4	03
			Practical Course- I	50	2	02
	II	II	Wave Optics	100	4	03
			Practical Course – II	50	2	02
II	III	III	Heat and Thermodynamics	100	4	03
			Practical Course – III	50	2	02
	IV	IV	Electricity, Magnetism and Electronics	100	4	03
			Practical Course – IV	50	2	02
		V	Modern Physics	100	4	03
			Practical Course –V	50	2	02
Total No. of Courses : **05 (Five)**						

Practical Course V:Modern Physics

Work load: 30 hrs   **2 hrs/week**

On successful completion of this practical course, the student will be able to;

➢ *Measure charge of an electron ande/m value of an electron by Thomson method.*

➢ *Understand how the Planck's constant can be determined using Photocell and LEDs.*

➢ *Study the absorption of α-rays and β-rays, Range of β-particles and the characteristics of GM counter*

➢ *Determine the Energy gap of a semiconductor using thermistor and junction diode.*

Minimum of 6 experiments to be done and recorded

1. e/m of an electron by Thomson method.
2. Determination of Planck's Constant (photocell).
3. Verification of inverse square law of light using photovoltaic cell.
4. Determination of the Planck's constant using LEDs of at least 4 different colours.
5. Determination of work function of material of filament of directly heated vacuum diode.
6. Study of absorption of α-rays.
7. Study of absorption of β-rays.
8. Determination of Range of β-particles.
9. Determination of M & H.
10. Analysis of powder X-ray diffraction pattern to determine properties of crystals.
11. Energy gap of a semiconductor using junction diode.
12. Energy gap of a semiconductor using thermistor
13. GM counter characteristics

RECOMMENDED CO-CURRICULAR ACTIVITIES:

MEASURABLE

❖ Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)

❖ Student seminars (on topics of the syllabus and related aspects (individual activity)

- ❖ Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
- ❖ Field studies (individual observations and recordings as per syllabus content and related areas (Individual or team activity)
- ❖ Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

GENERAL

- ❖ Group Discussion
- ❖ Visit to Research Stations/laboratories and related industries
- ❖ Others

RECOMMENDED ASSESSMENT METHODS

Some of the following suggested assessment methodologies could be adopted;

- ❖ The oral and written examinations (Scheduled and surprise tests),
- ❖ Practical assignments and laboratory reports,
- ❖ Efficient delivery using seminar presentations,
- ❖ Viva voce interviews.

***

Note:

1. The duration of the examination for each theory course is 3.00 hrs.
   The duration of each practical examination is 3 hrs with 50 marks

2. Each course in theory is of 100 marks and practical course is of 50 marks.
   - Semester End University Examination in Theory Course: 75 marks [External evaluation]
   - Mid-Semester Examination in Theory Course at the college level: 25 marks [Internal evaluation]

3. The University (external) examination for Theory and Practical shall be conducted at the end of each Semester.

4. In each semester the evaluation in Practical courses shall be done by an external examiner appointed by the University.
   There shall not be Internal valuation in any semester end practical examinations.

5. The candidate shall prepare and submit at the time of practical examination a certified Record based on the practical course with a minimum of **6** experiments from each semester.

6. Numerical Problems must be solved at the end of every chapter of all Units.

7. Numerical problems, each having a weightage of 4 marks, should be asked in the Semester end University examinations.

8. The minimum passing marks in each theory course is 40 (External:30 and Internal:10)
   The minimum passing marks in each Practical/Lab course is 20.

9. The teaching work load per week for semesters I to IV is 4 hours for theory course and 2 hours for all laboratory (practical) courses.

10. Visits to industry, national research laboratories, and scientific exhibitions should be encouraged.

11. The syllabus for Practical courses is same for both Mathematics and Non-Mathematics combinations.

12. The marks distribution for the Semester End practical examination is as follows:

    (i)   *Formula/ Principle / Statement with explanation of symbols and*   05

   (ii)   *Diagram/Circuit Diagram / Tabular Columns*   10

  (iii)   *Setting up of the experiment and taking readings/Observations*   10

   (iv)   *Calculations (explicitly shown) + Graph + Result with Units...*   10

    (v)   *Viva-voce*   05

   (vi)   *Class Records (to be valued at the time of practical*   10

                                                                           Total Marks :   50

***

B.Sc. PHYSICS

[For Mathematics combinations]

w.e.f. 2020-21 (Revised in May 2020)

MODEL QUESTION PAPER COMMON FOR ALL FIVE THEORY COURSES

Time : 3 hrs   *Max marks : 75*

SECTION-A

(Essay Type Questions)   *Marks* : 5x10M = 50M

Answer All questions with internal choice from each Unit

1. Essay type question from Unit-I

    Or

    Essay type question from Unit-I

2. Essay type question from Unit-II

    Or

    Essay type question from Unit-II

3. Essay type question from Unit-III

    Or

    Essay type question from Unit-III

4. Essay type question from Unit-IV

    Or

    Essay type question from Unit-IV

5. Essay type question from Unit-V

    Or

    Essay type question from Unit-V

SECTION-B

(Short Answer Type Questions)   *Marks* : 5x5M = 25M

Answer any five out of the following ten questions

6.   Short answer type question from Unit-I

7.   Short answer type question from Unit-I

8.   Short answer type question from Unit-II

9.   Short answer type question from Unit-II

10.   Short answer type question from Unit-III

11.   Short answer type question from Unit-III

12.   Short answer type question from Unit-IV

13.   Short answer type question from Unit-IV

14.   Short answer type question from Unit-V

15.   Short answer type question from Unit-V

[**Note:** *Question Paper setters are instructed to add Numerical Problems (each of 4 marks) with a maximum weightage of 16 marks either in Section-A or Section-B covering all the five units in the syllabus*]

***