

**J.J. College of Arts and Science (Autonomous)**  
Sivapuram Post, Pudukkottai – 622 422  
(Re-Accredited by NAAC – 4<sup>th</sup> Cycle)  
Affiliated to Bharathidasan University, Tiruchirappalli

**PG and Research Department of Physics**

**Minutes of the Board of Studies Meeting**

**Meeting No: 07**

**Date: 29.04.2023**

**Time: 11.00 a.m.**

The Meeting of the Board of Studies in Physics (U.G. and P.G.) for the sixth revision of the curricula to be implemented from 2023-2024, was conducted at 11.00 a.m. on Saturday, 29.04.2023

**Members Present**

| S.No. | Name                                                                                                                                                       | Designation                     | Signature                                  |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------|
| 1.    | <b>Dr.M.K. Murali</b><br>Assistant Professor and Head<br>Department of Physics                                                                             | Chairman                        | <i>M.K. Murali</i><br>29/4/23              |
| 2.    | <b>Dr.S. Rajasekar</b><br>Professor, School of Physics,<br>Bharathidasan University, Tiruchirappalli.                                                      | University Nominee              | <i>S.Rajasekar</i><br>29/04/2023           |
| 3.    | <b>Dr.A. Balamurugan</b><br>Assistant Professor of Physics<br>Government Arts and Science College,<br>Avinashi – 641654, Tirupur (Dt.)                     | Subject Expert                  | <i>A. Balamurugan</i><br>29/4/2023         |
| 4.    | <b>Dr.M. Karunakaran</b><br>Associate Professor of Physics<br>PG and Research Department of Physics<br>Alagappa Government College,<br>Karaikudi – 630 003 | Subject Expert                  | <i>M. Karunakaran</i><br>29/04/2023        |
| 5.    | <b>Dr. K. Dhanabalan</b><br>Assistant Professor                                                                                                            | Faculty Member                  | <i>K. Dhanabalan</i>                       |
| 6.    | <b>Ms. R. Shanthi</b><br>Assistant Professor                                                                                                               | Faculty Member                  | <i>R. Shanthi</i>                          |
| 7.    | <b>Ms. P. Parameswari</b><br>Assistant Professor                                                                                                           | Faculty Member                  | <i>P. Parameswari</i><br>29/4/23           |
| 8.    | <b>Mr. S.Dhanachayan</b><br>Assistant Professor                                                                                                            | Faculty Member                  | <i>S. Dhanachayan</i><br>29/4/23           |
| 9.    | <b>Mr. G.Senthilkumar</b><br>Assistant Professor                                                                                                           | Faculty Member                  | <i>G. Senthilkumar</i><br>29/4/23          |
| 10.   | <b>Mrs. S. Kavitha Sreetharkumar</b><br>Kumaran Scientific Co., Tiruchirappalli.                                                                           | Representative from<br>Industry | <i>S. Kavitha Sreetharkumar</i><br>29/4/23 |

|     |                                                                                                                       |        |        |
|-----|-----------------------------------------------------------------------------------------------------------------------|--------|--------|
| 11. | Ms. R. Vinitha,<br>4 <sup>th</sup> Street, Kallifulla Nagar,<br>Kallangudy (Po),<br>Alangudi ( Tk), Pudukkottai (Dt). | Alumni | ABSENT |
|-----|-----------------------------------------------------------------------------------------------------------------------|--------|--------|

The Chairman, Dr.M.K. Murali chaired the meeting and welcomed all the members to the seventh BoS Meeting. After the brief introduction, the agenda items listed were taken up for discussion and the following resolutions were passed.

It was resolved to

1. As per the instructions from TANSCHÉ and the Bharathidasan University, it is resolved to follow the model curriculum pattern and syllabi of TANSCHÉ by the Department of Physics; to preserve the equivalence in U.G. and P.G. Degree Programmes to enable student Mobility, to be implemented from the academic year 2023 – 2024 onwards. The curriculum patterns are framed and restructured following the guidelines laid down by the UGC - LOCF and Tamil Nadu State Council for Higher Education (TANSCHÉ) and the Parent University.
2. It is resolved to evaluate the Syllabus followed during the Academic Year 2022 – 2023 based on the first Semester Results.
3. Minor revision of the syllabi (less than 10% of TANSCHÉ syllabi) has been made based on the feedback received from the Teachers, Employers, Students and the Alumni on the previous year syllabi, on the three years of B.Sc. Physics and two years of M.Sc. Physics.
4. The syllabi for the various courses of first year B.Sc. Physics and M.Sc. Physics are finalized.
5. The final curriculum structure and syllabi for the first year of the programmes are enclosed.
6. The syllabi for the subsequent years of the programmes to be framed and discussed in the next meeting of BOS to be held during January 2024

R. S. Rajasekar  
29/4/23

3. S. K. Sankaranarayanan  
29/4/23

4. S. K. Sankaranarayanan  
29/4/23

5. S. K. Sankaranarayanan  
29/4/23

**The revised curriculum structure for the UG and PG programmes.**

**Distribution of Courses - UG**

| <b>Part</b>        | <b>Course</b>                                | <b>No. of. Course</b> | <b>Credit</b> | <b>Marks</b> |
|--------------------|----------------------------------------------|-----------------------|---------------|--------------|
| P – I              | Language – Tamil / Hindi / French            | 04                    | 12            | 400          |
| P – II             | Language – English                           | 04                    | 12            | 400          |
| P – III            | Core Course                                  | 15                    | 84            | 2400         |
|                    | Discipline Specific Elective (DSE)           | 03                    |               |              |
|                    | Allied Course                                | 06                    |               |              |
| P – IV             | Skill Enhancement Course (SEC)               | 08                    | 31            | 1600         |
|                    | Foundation Course (FC)                       | 01                    |               |              |
|                    | Environmental Science                        | 01                    |               |              |
|                    | Value Education                              | 01                    |               |              |
|                    | Internship                                   | 01                    |               |              |
|                    | Ability Enhancement Compulsory Course (AECC) | 04                    |               |              |
| P – V              | Extension Activity                           | -                     | 1             | -            |
| <b>Grand Total</b> |                                              | <b>48</b>             | <b>140</b>    | <b>4800</b>  |

**Distribution of Courses - PG**

| <b>Sl. No</b>      | <b>Course</b>             | <b>No. of. Course</b> | <b>Credit</b> | <b>Marks</b> |
|--------------------|---------------------------|-----------------------|---------------|--------------|
| 1.                 | Core Courses              | 16                    | 60            | 1600         |
| 2.                 | Elective Course           | 04                    | 12            | 400          |
| 3.                 | Skill Enhancement Courses | 04                    | 08            | 400          |
| 4.                 | Soft Skill & Internship   | 05                    | 10            | 500          |
| 5.                 | Extension Activity        | 01                    | 01            | 100          |
| <b>Grand Total</b> |                           | <b>30</b>             | <b>91</b>     | <b>3000</b>  |
|                    |                           |                       |               |              |

7. Allow earning Extra Credits through Courses under SWAYAM-MOOC's
8. Apply Revised Bloom's Taxonomy in spelling out Course Outcomes.
9. Change Nomenclature of Courses as shown below
  - **Discipline Specific Elective (DSE) Courses** instead of Major Based Elective Courses (MBE)
  - **Skill Enhancement Courses (SEC)** instead of Skill Based Elective Courses.
  - **Ability Enhancement Compulsory Courses (AECC)** introduced.
    - Introduction to studies skills
    - Life skills
    - Job oriented Skills
    - Computing skills
10. **Implement the following guidelines on Curriculum design given by NAAC**
  - a. Specific mention has been made of Program outcomes (POs) Program specific outcomes (PSOs), Course Outcomes (COs) Programme Educational Objectives (PEOs) and Course Objectives in the Syllabus.
  - b. Relationship Matrix for CO, PO and PSO for all courses implemented.
  - c. Curriculum addresses local, Regional, National and Global Needs
  - d. Courses focus on Employability, Entrepreneurship and Skill Development
  - e. Courses also focus on Gender, Environment and Sustainability, Human values and Professional Ethics.
11. List the Courses newly introduced in UG & PG and details of Percentage of Revision carried out as an appendix.
12. Introduce foundation course (FC) as a new course in the first semester
13. Introduce in the industrial visit as a new course in the fifth semester.
14. Environmental science and value education course to be followed as per the previous curriculum
15. **Resolved to have the following 15 Core Courses for U.G. semester wise**

### **SEMESTER - I**

1. Properties of Matter and Sound (It is the Core Course of previous curriculum but the unit contents are changed)
2. Major Practical – I ( It is the newly introduced course)

## **SEMESTER - II**

1. Heat, Thermodynamics and Statistical Physics ( It is the newly introduced course)
2. Major Practical – II ( It is the newly introduced Course)

## **SEMESTER - III**

1. General Mechanics and Classical Mechanics ( It is the newly introduced Course)
2. Major Practical-III ( It is the newly introduced Course)

## **SEMESTER - IV**

1. Optics and Spectroscopy (It is the Core Course of previous curriculum but the unit contents are changed)
2. Major Practical-IV ( It is the newly introduced Course)

## **SEMESTER - V**

1. Atomic Physics and Lasers ( It is the newly introduced Course)
2. Relativity and Quantum Mechanics ( It is the newly introduced Course)
3. Major Practical-V ( It is the newly introduced Course)

## **SEMESTER - VI**

1. Nuclear and Particle Physics ( It is the newly introduced Course)
2. Solid state Physics (It is the Core Course of previous curriculum but the unit contents are changed)
3. Major Practical-VI ( It is the newly introduced Course)
4. Project Work ( It is the newly introduced Course)

**16. Resolved to have the following 03 Discipline specific elective Courses for U.G. semester wise**

1. Electricity and Magnetism (It is the Core Course of previous curriculum but the unit contents are changed)
2. Nanoscience (It is the Core Course of previous curriculum but the unit contents are changed)
3. Digital Electronics and Microprocessor 8085 ( It is the newly introduced Course)

**17. Resolved to have the following 6 Allied Courses for U.G.**

First Allied courses in first two semester (Offered by the department of Mathematics)

1. Allied Mathematics - I (It is the course of previous curriculum retained as it is)
2. Allied Mathematics - II (It is the course of previous curriculum retained as it is)

Second Allied courses in third and fourth semester (Offered by the department of Chemistry)

1. Allied Chemistry – I (It is the course of previous curriculum retained as it is)
2. Allied Chemistry Practical – II ( It is the newly introduced Course)
3. Allied Chemistry – III (It is the course of previous curriculum retained as it is)
4. Allied Chemistry Practical – IV ( It is the newly introduced Course)

**18. Resolved to offer the following Allied courses for the Department of Mathematics and Chemistry**

1. Allied Physics - I (This Allied Course is newly introduced for Mathematics)
2. Allied Physics Practical – II (It is the Allied course of previous curriculum retained as it is)
3. Allied Physics – I (This Allied Course is newly introduced for Chemistry)
4. Allied Physics Practical – II (This Allied Course is newly introduced for Chemistry)
5. Allied Physics – III (This Allied Course is newly introduced for Chemistry)
6. Allied Physics Practical – IV (This Allied Course is newly introduced for Chemistry)

**19. Resolve to have following Eight Skill Enhancement Courses for U.G. semester wise**  
**SEMESTER - I**

**Skill Enhancement Course – I (Non Major Elective)**

1. Physics for Everyday Life ( It is the newly introduced course)

## **SEMESTER -II**

### **Skill Enhancement Course – II (Non Major Elective)**

1. Home Electrical Installation ( It is the newly introduced Course )

### **Skill Enhancement Course – III (Discipline Specific Elective)**

1. Energy Physics ( It is the newly introduced Course )

## **SEMESTER - III**

### **Skill Enhancement Course – IV (Entrepreneurial Based)**

1. Applied and Industrial Electronics ( It is the newly introduced Course )

### **Skill Enhancement Course – V (Discipline Specific Elective)**

1. Material Science ( It is the newly introduced Course )

## **SEMESTER - IV**

### **Skill Enhancement Course – VI (Discipline Specific Elective)**

1. Communication System ( It is the newly introduced Course )

### **Skill Enhancement Course – VII (Discipline Specific Elective)**

1. Numerical Methods and C Programming ( It is the newly introduced Course )

## **SEMESTER - VI**

### **Skill Enhancement Course – VIII**

1. Professional Competency Skill ( It is the newly introduced Course )

20. Resolve to have the following soft skill Courses for U.G. semester wise

## **SEMESTER - I**

1. Introduction to study skills (Syllabus is passed by the BoS in English)

## **SEMESTER - II**

1. Life Skills ( Syllabus is passed by the BoS in Management Studies)

### **SEMESTER - III**

1. Job Oriented Skills ( The courses is newly introduced)

### **SEMESTER - IV**

1. Computing Skills ( Syllabus is passed by the BoS in Computer Applications)

## **21. Resolve to have the following Courses for U.G. Semester wise**

### **SEMESTER - I**

1. Foundation Course - Introductory Physics( It is the newly introduced Course )

### **SEMESTER - IV**

1. Environmental science (Retained as it is)

### **SEMESTER - V**

1. Value Education (Retained as it is)
2. Industrial visit ( It is the newly introduced Course )

## **21. Resolved to have the following 16 Core Courses for P.G. semester wise**

### **SEMESTER I**

1. Mathematical Physics (It is the Core Course of previous curriculum but the unit contents are changed)
2. Classical Mechanics and Relativity ( It is the newly introduced Course )
3. Linear and Digital ICs and Applications ( It is the newly introduced Course )
4. Major Practical-I ( It is the newly introduced Course )

## **SEMESTER II**

1. Statistical Mechanics ( It is the newly introduced Course )
2. Quantum Mechanics – I ( It is the newly introduced Course )
3. Major Practical-II ( It is the newly introduced Course )

## **SEMESTER III**

1. Quantum Mechanics –II ( It is the newly introduced Course )
2. Condensed Matter Physics ( It is the newly introduced Course )
3. Electromagnetic Theory ( It is the newly introduced Course )
4. Practical – III ( It is the newly introduced Course )

## **SEMESTER IV**

1. Nuclear and Particle Physics ( It is the newly introduced Course )
2. Spectroscopy ( It is the newly introduced Course )
3. Numerical Methods and Computer Programming ( It is the newly introduced Course )
4. Practical – IV ( It is the newly introduced Course )
5. Project with Viva-Voce (It is the Core Course of previous curriculum)

23. Resolved to have the following Elective Courses, Skill Enhancement Courses, Professional Competency Courses and Ability Enhancement Compulsory Courses for the semester wise

## **SEMESTER - I**

1. Physics of Nanoscience & Nanotechnology and Thin Films (This Elective Course is newly introduced)
2. Professional Competency Course (This Skill Enhancement Course is newly introduced)
3. Ability Enhancement Compulsory Course (This Soft Skill Course is newly introduced)

## **SEMESTER - II**

1. Bio Physics (This Elective Courses is newly introduced)
2. Solar energy utilization (This Elective Courses is newly introduced)
3. Physics for Competitive Exam – I (This Skill Enhancement Course is newly introduced)
4. Ability Enhancement Compulsory Course - II (This Soft Skill Course is newly introduced)

## **SEMESTER - III**

1. Microprocessor 8086 and Microcontroller 8051 (This Elective Courses is newly introduced)
2. Physics for Competitive Exam – II (This Skill Enhancement Course is newly introduced)
3. Ability Enhancement Compulsory Course - III (This Soft Skill Course is newly introduced)

## **SEMESTER - IV**

1. Physics for Competitive Exam – III (This Skill Enhancement Course is newly introduced)
2. Ability Enhancement Compulsory Course - III (This Soft Skill Course is newly introduced)

**J.J. COLLEGE OF ARTS AND SCIENCE (Autonomous)****DEPARTMENT OF PHYSICS****B.Sc. PHYSICS****Proposed Course Structure based on UGC - LOCF and TANSCH****(Choice Based Credit System)****(Applicable for the candidates admitted from academic year 2023-2024 onwards)**

| Sem   | Part | Course code         | Course Title                                                                                      | Hrs/<br>Week | Credit | Exam<br>Hours | Marks<br>Int.      Ext. |     | Total Marks |
|-------|------|---------------------|---------------------------------------------------------------------------------------------------|--------------|--------|---------------|-------------------------|-----|-------------|
| I     | I    | U1R3TL1/<br>HL1/FL1 | Language Course – I                                                                               | 6            | 3      | 3             | 25                      | 75  | 100         |
|       | II   | U1R3EL1             | English Language course – I                                                                       | 4            | 3      | 3             | 25                      | 75  | 100         |
|       | III  | U1R3PHCC1           | Properties of Matter and Sound                                                                    | 6            | 3      | 3             | 25                      | 75  | 100         |
|       |      | UIR3PHCC2P          | Major Practical-I                                                                                 | 3            | 3      | 3             | 25                      | 75  | 100         |
|       |      | U1R3MTAC1           | Allied- Mathematics-1                                                                             | 5            | 5      | 3             | 25                      | 75  | 100         |
|       | IV   | U1R3PHSEC-1         | Skill Enhancement Courses - I (NME) – Physics for everyday life (to offered for other discipline) | 2            | 2      | 3             | 25                      | 75  | 100         |
|       |      | U1R3PHFC            | Foundation Course - Introductory Physics                                                          | 2            | 2      | 3             | 25                      | 75  | 100         |
|       |      | U1R3PHAECC1         | Ability Enhancement Compulsory Course – Soft Skill - 1                                            | 2            | 2      | 3             | 25                      | 75  | 100         |
| Total |      |                     |                                                                                                   | 30           | 23     |               |                         | 800 |             |
|       | I    | U2R3TL2/<br>HL2/FL2 | Language Course – II                                                                              | 6            | 3      | 3             | 25                      | 75  | 100         |
|       | II   | U23R3EL2            | English Language course – II                                                                      | 4            | 3      | 3             | 25                      | 75  | 100         |
|       |      | U2R3PHCC3           | Heat, Thermodynamics and                                                                          | 6            | 3      | 3             | 25                      | 75  | 100         |

|     |     |                     |                                                                                                             |           |           |   |    |    |            |
|-----|-----|---------------------|-------------------------------------------------------------------------------------------------------------|-----------|-----------|---|----|----|------------|
| II  | III |                     | Statistical physics                                                                                         |           |           |   |    |    |            |
|     |     | U2R3PHCC4P          | Major Practical-II                                                                                          | 3         | 3         | 3 | 25 | 75 | 100        |
|     |     | U2R3MTAC2           | Allied-Mathematics-II                                                                                       | 5         | 6         | 3 | 25 | 75 | 100        |
|     | IV  | U2R3PHSEC-2         | Skill Enhancement course-<br>SEC-2 (NME) – Home<br>Electrical Installation( to<br>offered other discipline) | 2         | 2         | 3 | 25 | 75 | 100        |
|     |     | U2R3PHSEC-3         | Skill Enhancement course-<br>SEC-3(Discipline/Subject<br>Specific) – Energy Physics                         | 2         | 2         | 3 | 25 | 75 | 100        |
|     |     | U2R3PHAEECC2        | Ability Enhancement<br>Compulsory Course<br>(AECC)Softskill-2                                               | 2         | 2         | 3 | 25 | 75 | 100        |
|     |     |                     | <b>Total</b>                                                                                                | <b>30</b> | <b>24</b> |   |    |    | <b>800</b> |
| III | I   | U3R2TL3/<br>HL3/FL3 | Language Course – III                                                                                       | 6         | 3         | 3 | 25 | 75 | 100        |
|     | II  | U3R3EL3             | English Language course – III                                                                               | 4         | 3         | 3 | 25 | 75 | 100        |
|     | III | U3R3PHCC5           | General Mechanics and<br>Classical Mechanics                                                                | 4         | 3         | 3 | 25 | 75 | 100        |
|     |     | U3R3PHCC6P          | Major Practical-III                                                                                         | 3         | 3         | 3 | 25 | 75 | 100        |
|     |     | U3R3CHAC3           | Allied-Chemistry-I                                                                                          | 3         | 3         | 3 | 25 | 75 | 100        |
|     |     | U3R2CHAC4P          | Allied –Chemistry Practical-II                                                                              | 3         | 2         | 3 | 25 | 75 | 100        |
|     | IV  | U3R3PHSEC-4         | Skill Enhancement course-<br>SEC-4(Entrepreneurial Based)<br>– Applied and Industrial<br>Electronics.       | 2         | 2         | 3 | 25 | 75 | 100        |
|     |     | U3R3PHSEC-5         | Skill Enhancement course-<br>SEC-5(Discipline/Subject<br>Specific) – Materials Science                      | 2         | 2         | 3 | 25 | 75 | 100        |
|     |     | U3R3PHAEECC3        | Ability Enhancement<br>Compulsory Course<br>(AECC)Softskill-3                                               | 2         | 2         | 3 | 25 | 75 | 100        |

|              |     |                     |                                                                          |           |           |   |    |             |            |
|--------------|-----|---------------------|--------------------------------------------------------------------------|-----------|-----------|---|----|-------------|------------|
|              |     |                     |                                                                          |           |           |   |    |             |            |
|              | IV  | U4R3PHEVS           | E.V.S                                                                    | 1         | -         |   |    |             |            |
|              |     |                     | <b>Total</b>                                                             | <b>30</b> | <b>23</b> |   |    |             | <b>900</b> |
| IV           | I   | U4R3TL4/<br>HL4/FL4 | Language Course – IV                                                     | 6         | 3         | 3 | 25 | 75          | 100        |
|              | II  | U4R3EL4             | English Language course – IV                                             | 4         | 3         | 3 | 25 | 75          | 100        |
|              | III | U4R3PHCC7           | Optics and Spectroscopy                                                  | 3         | 3         | 3 | 25 | 75          | 100        |
|              |     | U4R3PHCC8P          | Major Practical-IV                                                       | 3         | 3         | 3 | 25 | 75          | 100        |
|              |     | U4R2CHA5            | Allied – Chemistry-III                                                   | 3         | 3         | 3 | 25 | 75          | 100        |
|              |     | U4R2CHAC6P          | Allied Chemistry Practical-IV                                            | 3         | 3         | 3 | 25 | 75          | 100        |
|              | IV  | U4R3PHSEC-6         | Skill Enhancement Course – 6<br>– Communication System                   | 2         | 2         | 3 | 25 | 75          | 100        |
|              |     | U4R3PHSEC-7         | Skill Enhancement Course – 7<br>– Numerical Methods and C<br>programming | 2         | 2         | 3 | 25 | 75          | 100        |
|              |     | U4R3PHA ECC4        | Ability Enhancement<br>Compulsory Course<br>(AECC)Softskill-4            | 2         | 2         | 3 | 25 | 75          | 100        |
|              |     | U4R3PHEVS           | EVS                                                                      | 2         | 2         | 3 | 25 | 75          | 100        |
| <b>Total</b> |     |                     |                                                                          | <b>30</b> | <b>25</b> |   |    | <b>1000</b> |            |
| V            | III | U5R3PHCC9           | Atomic Physics and Lasers                                                | 5         | 5         | 3 | 25 | 75          | 100        |
|              |     | U5R3PHCC10          | Relativity and Quantum<br>Mechanics                                      | 5         | 5         | 3 | 25 | 75          | 100        |
|              |     | U5R3PHCC11P         | Major Practical-V                                                        | 6         | 3         | 3 | 25 | 75          | 100        |
|              |     | U5R3PHDSE -1        | Project Work /Elective-<br>Electricity and Magnetism                     | 5         | 4         | 3 | 25 | 75          | 100        |
|              |     | U5R3PHDSE -2        | Discipline Specific Elective –2<br>Nanoscience                           | 5         | 3         | 3 | 25 | 75          | 100        |
|              | IV  | U5R3PHVE            | Value Education                                                          | 2         | 2         | 3 | 25 | 75          | 100        |

|    |     |                  |                                                                                      |           |            |   |    |    |             |
|----|-----|------------------|--------------------------------------------------------------------------------------|-----------|------------|---|----|----|-------------|
|    |     | U5R3PHIE         | Internship / Industrial visit / Field visit                                          | 2         | 2          | 3 | 25 | 75 | 100         |
|    |     |                  | <b>Total</b>                                                                         | <b>30</b> | <b>24</b>  |   |    |    | <b>700</b>  |
| VI | III | U6R3PHCC12       | Nuclear and Particle Physics                                                         | 5         | 5          | 3 | 25 | 75 | 100         |
|    |     | U6R3PHCC13       | Solid state Physics                                                                  | 5         | 3          | 3 | 25 | 75 | 100         |
|    |     | U6R3PHCC14P      | Major Practical-VI                                                                   | 5         | 3          | 3 | 25 | 75 | 100         |
|    |     | U6R3PHCC15P<br>W | Project Work                                                                         | 8         | 3          | 3 | 25 | 75 | 100         |
|    |     | U6R2PHDSE -3     | Discipline Specific Elective –<br>2 – Digital Electronics and<br>Microprocessor 8085 | 5         | 4          | 3 | 25 | 75 | 100         |
|    | IV  |                  | Extension Activities                                                                 | -         | 1          | - | -  | -  | -           |
|    |     | U6R3PHSEC-8      | Professional competency Skill                                                        | 2         | 2          | 3 | 25 | 75 | 100         |
|    |     |                  | <b>Total</b>                                                                         | <b>30</b> | <b>21</b>  |   |    |    | <b>600</b>  |
|    |     |                  | <b>Grand Total</b>                                                                   |           | <b>140</b> |   |    |    | <b>4800</b> |

**CC**-Core Course / **AC** – Allied Course /**DSE** – Discipline Specific Elective / **SEC** – Skill Enhancement Course

**AECC** – Ability Enhancement Compulsory Course /**P** – Practical

**Total Credit – 140 / Total Marks – 4800**

**Extension activities shall be outside the instruction hours.**

**Discipline Specific Electives Courses**

1. Communication System
2. Energy Physics
3. Mathematical Physics

4. Advanced Mathematical Physics
5. Numerical Methods and C Programming
6. Material Science
7. LASERS and Fiber Optics
8. Digital Photography
9. Nano Science
10. Medical Instrumentation

**Non– Major Electives Courses**

1. Physics for Everyday Life
2. Astrophysics
3. Medical Physics
4. Home Electrical Installation
5. Physics of Music

**J.J. COLLEGE OF ARTS AND SCIENCE (Autonomous)**  
**DEPARTMENT OF PHYSICS**  
**M.Sc. PHYSICS**  
**Proposed Course Structure based on UGC - LOCF and TANSCH**  
**(Choice Based Credit System)**  
**(Applicable for the candidates admitted from academic year 2023-2024 onwards)**

**FIRST SEMESTER**

| COURSE CODE  | NAME OF THE COURSE                      | INST. HRS. | CREDITS | EXAM HRS. | MAX MARKS |      |
|--------------|-----------------------------------------|------------|---------|-----------|-----------|------|
|              |                                         |            |         |           | CIA       | EXT. |
| P1R3PHCC1    | Mathematical Physics                    | 6          | 4       | 3         | 25        | 75   |
| P1R3PHCC2    | Classical Mechanics and Relativity      | 5          | 4       | 3         | 25        | 75   |
| P1R3PHCC3    | Linear and Digital ICs and Applications | 5          | 4       | 3         | 25        | 75   |
| P1R3PHCC4P   | Practical I                             | 6          | 3       | 3         | 25        | 75   |
| P1R3PHEC 1:5 | Physics of Nano Science and Technology  | 4          | 3       | 3         | 25        | 75   |
| P1R3PHPC     | Professional Competency Course          | 2          | 2       | 3         | 25        | 75   |
| P1R3PHAEC1   | Ability Enhancement Compulsory Course   | 2          | 2       | 3         | 25        | 75   |

**SECOND SEMESTER**

| COURSE CODE  | NAME OF THE COURSE                    | INST. HRS. | CREDITS | EXAM HRS. | MAX MARKS |      |
|--------------|---------------------------------------|------------|---------|-----------|-----------|------|
|              |                                       |            |         |           | CIA       | EXT. |
| P2R3PHCC5    | Statistical Mechanics                 | 6          | 4       | 3         | 25        | 75   |
| P2R3PHCC6    | Quantum Mechanics –I                  | 6          | 4       | 3         | 25        | 75   |
| P2R3PHCC7P   | Practical – II                        | 6          | 3       | 3         | 25        | 75   |
| P2R3PHCC 2:2 | Bio Physics                           | 4          | 3       | 3         | 25        | 75   |
| P2R3PHCC 3:7 | Solar Energy Utilization              | 4          | 3       | 3         | 25        | 75   |
| P2R3PHSEC1   | Physics for competitive exam-I        | 2          | 2       | 3         | 25        | 75   |
| P2R3PHAEC2   | Ability Enhancement Compulsory Course | 2          | 2       | 3         | 25        | 75   |
|              | Internship* / Industrial Activity     | -          | -       | -         | -         | -    |

**\*\* Internship will be carried out during the summer vacation of the first year and marks will be included in the Third Semester Marks Statement.**

### THIRD SEMESTER

| COURSE CODE  | NAME OF COURSE                                                               | INST.<br>HRS. | CREDIT | EXAM<br>HRS. | MAX MARKS |      |
|--------------|------------------------------------------------------------------------------|---------------|--------|--------------|-----------|------|
|              |                                                                              |               |        |              | CIA       | EXT. |
| P3R3PHCC8    | Quantum Mechanics –II                                                        | 6             | 4      | 3            | 25        | 75   |
| P3R3PHCC9    | Condensed Matter Physics                                                     | 5             | 4      | 3            | 25        | 75   |
| P3R3PHCC10   | Electromagnetic Theory                                                       | 5             | 4      | 3            | 25        | 75   |
| P3R3PHCC11P  | Practical – III<br>Numerical Methods and Computer Programming<br>(FOTRAN/C ) | 6             | 3      | 3            | 25        | 75   |
| P3R3PHCC 3:2 | Microprocessor 8086 and Microcontroller 8051                                 | 4             | 3      | 3            | 25        | 75   |
| P3R3PHSEC2   | Physics for competitive exam-II                                              | 2             | 2      | 3            | 25        | 75   |
| P3R3PHA ECC3 | Ability Enhancement Compulsory Course                                        | 2             | 2      | 3            | 25        | 75   |
| P3R3PHIV     | Internship / Industrial Activity [Credits]                                   | -             | 2      | -            | -         | -    |

### FOURTH SEMESTER

| COURSE CODE  | NAME OF COURSE                             | INST.<br>HRS. | CREDIT<br>S | EXAM<br>HRS. | MAX MARKS |      |
|--------------|--------------------------------------------|---------------|-------------|--------------|-----------|------|
|              |                                            |               |             |              | CIA       | EXT. |
| P4R3PHCC12   | Nuclear and Particle Physics               | 6             | 4           | 3            | 25        | 75   |
| P4R3PHCC13   | Spectroscopy                               | 5             | 4           | 4            | 25        | 75   |
| P4R3PHCC14   | Numerical Methods and Computer Programming | 5             | 4           | 4            | 25        | 75   |
| P4R3PHCC15P  | Practical – IV                             | 6             | 3           | 4            | 25        | 75   |
| P4R3PHCC16PW | Project with Viva-Voce                     | 4             | 4           | -            | 25        | 75   |
| P4R3PHSEC3   | Physics for competitive exam– III          | 2             | 2           | 3            | 25        | 75   |
| P4R3PHA ECC4 | Ability Enhancement Compulsory Course      | 2             | 2           | 3            | 25        | 75   |
|              | Extension Activity                         | -             | 1           | -            | -         | -    |

**Consolidation:**

| Part  | Subject                 | Credits Distribution | Total |
|-------|-------------------------|----------------------|-------|
| A     | Core                    | 12x4                 | 48    |
| A     | Core Practical          | 4x3                  | 12    |
| A     | Elective                | 4x3                  | 12    |
| B1    | SEC                     | 4x2                  | 08    |
| B2    | Soft Skill & Internship | 5x2                  | 10    |
| C     | Extension Activity      | 1x1                  | 01    |
| TOTAL |                         |                      | 91    |

**ELECTIVE PAPERS****List 1**

1. Energy Physics
2. Crystal Growth and Thin films
3. Analysis of Crystal Structures
4. Materials Science
5. Physics of Nano Science and Technology
6. Digital Communication
7. Communication Electronics

**LIST 2**

1. Plasma Physics
2. Bio Physics
3. Non-linear Dynamics
4. Quantum Field Theory
5. General Relativity and Cosmology
6. Advanced Optics
7. Advanced Mathematical Physics

**LIST 3**  
**INDUSTRY ORIENTED ELECTIVE (IOE)**

1. Advanced Spectroscopy
2. Microprocessor 8086 and Microcontroller 8051
3. Characterization of Materials
4. Medical Physics
5. Solid Waste Management (SWM)
6. Sewage and Waste Water Treatment and Reuse
7. Solar Energy Utilization

**(Note:** Institutions can also frame such IOE courses more suitable for their locality.)