



**PERIYAR  
MANIAMMAI**  
INSTITUTE OF SCIENCE & TECHNOLOGY  
(Deemed to be University)  
Established Under Sec. 3 of UGC Act, 1956 • NAAC Accredited  
think • innovate • transform

## Criterion 1 – Curricular Aspects

|                      |       |                                                                                                                                                               |
|----------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Key Indicator</b> | 1.2   | <b>Academic Flexibility</b>                                                                                                                                   |
| <b>Metric</b>        | 1.2.2 | Percentage of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented (Data for the latest completed academic year) |

### DEPARTMENT OF PHYSICS STRUCTURE OF THE PROGRAM CLEARLY INDICATING COURSES, CREDITS/ELECTIVES

1. B.Sc Physics
2. M.Sc. Physics
3. M.Phil

**B.Sc Physics**

| <b>SEMESTER I</b> |                         |                                                  |           |          |          |           |           |           |
|-------------------|-------------------------|--------------------------------------------------|-----------|----------|----------|-----------|-----------|-----------|
| <b>Type</b>       | <b>Subject Code</b>     | <b>Subject Title</b>                             | <b>L</b>  | <b>T</b> | <b>P</b> | <b>SS</b> | <b>H</b>  | <b>C</b>  |
| AECC 1            | XGL101                  | Communication Skills in English                  | 2         | 0        | 0        | 1         | 2         | 2         |
| LAN               | XGL102A<br>/<br>XGL102B | Ariviyal Tamil / Comprehensive English           | 3         | 0        | 0        | 0         | 3         | 3         |
| CC 1              | XMG103                  | Algebra, Trigonometry and Transform              | 4         | 1        | 0        | 0         | 5         | 5         |
| CC 2<br>(DSC 2A)  | XPH104                  | Properties of Matter and Sound                   | 3         | 1        | 0        | 0         | 4         | 4         |
| CC 3<br>(DSC 3A)  | XPH105                  | Mechanics and Special Theory of Relativity       | 3         | 1        | 0        | 0         | 4         | 4         |
| UMAN 1            | XUM106                  | Human Ethics, Values, Rights and Gender Equality | 3         | 0        | 0        | 0         | 3         | 0         |
| CC 2 Lab          | XPH107                  | Physics Practical I                              | 0         | 0        | 3        | 0         | 3         | 2         |
| <b>Total</b>      |                         |                                                  | <b>18</b> | <b>3</b> | <b>3</b> | <b>1</b>  | <b>24</b> | <b>20</b> |

| <b>SEMESTER II</b> |                     |                                     |           |          |          |           |           |           |
|--------------------|---------------------|-------------------------------------|-----------|----------|----------|-----------|-----------|-----------|
| <b>Type</b>        | <b>Subject Code</b> | <b>Subject Title</b>                | <b>L</b>  | <b>T</b> | <b>P</b> | <b>SS</b> | <b>H</b>  | <b>C</b>  |
| AECC2              | XGL201              | English for Effective Communication | 2         | 0        | 0        | 2         | 2         | 2         |
| AECC 3             | XES202              | Environmental Studies               | 2         | 0        | 0        | 1         | 2         | 2         |
| CC4                | XMG203              | Calculus and Differential Equations | 4         | 1        | 0        | 0         | 5         | 5         |
| CC 5<br>(DSC 2B)   | XPH204              | Electricity and Magnetism           | 3         | 1        | 0        | 0         | 4         | 4         |
| CC 6<br>(DSC 3B)   | XPH205              | Atomic Physics                      | 3         | 1        | 0        | 0         | 4         | 4         |
| CC 5 Lab           | XPH206              | Physics Practical II                | 0         | 0        | 3        | 0         | 3         | 2         |
| <b>Total</b>       |                     |                                     | <b>14</b> | <b>3</b> | <b>3</b> | <b>3</b>  | <b>20</b> | <b>19</b> |

| <b>SEMESTER III</b> |                     |                         |          |          |          |           |          |          |
|---------------------|---------------------|-------------------------|----------|----------|----------|-----------|----------|----------|
| <b>Type</b>         | <b>Subject Code</b> | <b>Subject Title</b>    | <b>L</b> | <b>T</b> | <b>P</b> | <b>SS</b> | <b>H</b> | <b>C</b> |
| SEC 1               | XPH301              | Physics Workshop Skills | 0        | 0        | 3        | 0         | 3        | 2        |

|                                |        |                                                 |           |          |          |          |           |              |
|--------------------------------|--------|-------------------------------------------------|-----------|----------|----------|----------|-----------|--------------|
| CC7                            | XCG302 | Inorganic, Organic and Physical Chemistry I     | 3         | 1        | 0        | 0        | 4         | 4            |
| CC 8<br>(DSC 2C)               | XPH303 | Heat and Thermodynamics                         | 3         | 1        | 0        | 0        | 4         | 4            |
| CC 9<br>(DSC 3C)               | XPH304 | Basic Electronics                               | 3         | 1        | 0        | 0        | 4         | 4            |
| <b>GE 1</b>                    |        | <b>*Open Elective - To be chosen by student</b> | <b>3</b>  | <b>0</b> | <b>0</b> | <b>0</b> | <b>3</b>  | <b>3</b>     |
| CC7 Lab                        | XCG305 | Volumetric and Qualitative Analysis             | 0         | 0        | 3        | 0        | 3         | 2            |
| UMAN 2                         | XUM306 | Disaster Management                             | 1         | 0        | 0        | 2        | 1         | 0            |
| CC 8 lab                       | XPH307 | Physics Practical III                           | 0         | 0        | 3        | 0        | 3         | 2            |
| Minor Course<br>* Extra Credit |        | Office Automation (15 hours)                    |           |          |          |          |           | 1*           |
| <b>Total</b>                   |        |                                                 | <b>13</b> | <b>3</b> | <b>9</b> | <b>2</b> | <b>25</b> | <b>18+1*</b> |

| SEMESTER IV                    |              |                                                 |           |          |          |          |           |              |
|--------------------------------|--------------|-------------------------------------------------|-----------|----------|----------|----------|-----------|--------------|
| Type                           | Subject Code | Subject Title                                   | L         | T        | P        | SS       | H         | C            |
| SEC 2                          | XPH401       | Electrical Circuit Network Skills               | 0         | 0        | 3        | 0        | 3         | 2            |
| CC10                           | XCG402       | Inorganic, Organic and Physical Chemistry II    | 3         | 1        | 0        | 0        | 4         | 4            |
| CC 11<br>(DSC 2D)              | XPH403       | Waves and Optics                                | 3         | 1        | 0        | 0        | 4         | 4            |
| CC 12<br>(DSC 3D)              | XPH404       | Analog & digital electronics                    | 3         | 1        | 0        | 0        | 4         | 4            |
| <b>GE 2</b>                    |              | <b>*Open Elective - To be chosen by student</b> | <b>3</b>  | <b>0</b> | <b>0</b> | <b>0</b> | <b>3</b>  | <b>3</b>     |
| CC10 Lab                       | XCG405       | Volumetric and Qualitative Analysis             | 0         | 0        | 3        | 0        | 3         | 2            |
| CC11 Lab                       | XPH406       | Physics Practical IV                            | 0         | 0        | 3        | 0        | 3         | 2            |
| Minor Course<br>* Extra Credit |              | Animation Software I (15 hours)                 |           |          |          |          |           | 1*           |
| <b>Total</b>                   |              |                                                 | <b>12</b> | <b>3</b> | <b>9</b> | <b>0</b> | <b>24</b> | <b>21+1*</b> |

| SEMESTER V |              |                              |   |   |   |    |   |   |
|------------|--------------|------------------------------|---|---|---|----|---|---|
| Type       | Subject Code | Subject Title                | L | T | P | SS | H | C |
| SEC 3      | XPH501       | Basic Instrumentation Skills | 0 | 0 | 3 | 0  | 3 | 2 |

|                                |         |                                          |           |          |          |          |           |              |
|--------------------------------|---------|------------------------------------------|-----------|----------|----------|----------|-----------|--------------|
| DSE 1A                         | XPH502A | Solid State Physics                      | 3         | 1        | 0        | 0        | 4         | 4            |
|                                | XPH502B | Atomic & Nuclear Physics                 |           |          |          |          |           |              |
| DSE 2A                         | XPH503A | Nuclear and Particle Physics             | 3         | 1        | 0        | 0        | 4         | 4            |
|                                | XPH503B | Principles of Modern Physics             |           |          |          |          |           |              |
| DSE 3A                         | XPH504A | Microprocessor and C programming         | 3         | 1        | 0        | 0        | 4         | 4            |
|                                | XPH504B | Microprocessor and Micro controller      |           |          |          |          |           |              |
| GE 3                           |         | *Open Elective - To be chosen by student | 3         | 0        | 0        | 0        | 3         | 3            |
| DSE 1A Lab                     | XPH505  | Physics Practical V A                    | 0         | 0        | 3        | 0        | 3         | 2            |
| CC lab                         | XPH506  | Physics Practical V B                    | 0         | 0        | 3        | 0        | 3         | 2            |
| Minor Course<br>* Extra Credit |         | Animation Software II (15 hours)         |           |          |          |          |           | 1*           |
| * Extra credit                 | –       | IPT (21 days)                            |           |          |          |          |           | 2*           |
| <b>Total</b>                   |         |                                          | <b>12</b> | <b>3</b> | <b>9</b> | <b>0</b> | <b>24</b> | <b>21+3*</b> |

| SEMESTER VI  |              |                              |          |          |          |          |           |           |
|--------------|--------------|------------------------------|----------|----------|----------|----------|-----------|-----------|
| Type         | Subject Code | Subject Title                | L        | T        | P        | SS       | H         | C         |
| SEC 4        | XPH601       | Renewable Energy             | 0        | 0        | 3        | 0        | 3         | 2         |
| DSE 1B       | XPH602A      | Wave mechanics               | 3        | 1        | 0        | 0        | 4         | 4         |
|              | XPH602B      | Material Science             |          |          |          |          |           |           |
| DSE 2B       | XPH603A      | MEMS                         | 3        | 1        | 0        | 0        | 4         | 4         |
|              | XPH603B      | Numerical methods in Physics |          |          |          |          |           |           |
| DSE 2B Lab   | XPH604       | Physics Practical VI A       | 0        | 0        | 3        | 0        | 3         | 2         |
| CC lab       | XPH605       | Physics Practical VI B       | 0        | 0        | 3        | 0        | 3         | 2         |
| DSE 3 B      | XPH606       | Project                      | 0        | 0        | 0        | 0        | 8         | 6         |
|              | –            | NSS/NCC/RRC....              |          |          |          |          |           |           |
| <b>Total</b> |              |                              | <b>6</b> | <b>2</b> | <b>9</b> | <b>0</b> | <b>25</b> | <b>20</b> |

**PERIYAR MANIAMMAI INSTITUTE OF SCIENCE AND TECHNOLOGY**

(Under Section 3 of UGC Act, 1956)

**M.Sc. Physics – Curriculum (2018 Regulations)**

| SEMESTER – I |                                                     |   |   |   |         |  |
|--------------|-----------------------------------------------------|---|---|---|---------|--|
| Subject Code | Course Title                                        | L | T | P | Credits |  |
| YPH101       | Core Course I<br>Mathematical Physics               | 4 | 1 | 0 | 5       |  |
| YPH102       | Core Course II<br>Classical Dynamics and Relativity | 4 | 1 | 0 | 5       |  |
| YPH103       | Core Course III<br>Basic Electronics                | 4 | 1 | 0 | 5       |  |

|                          |                                                  |           |          |          |           |
|--------------------------|--------------------------------------------------|-----------|----------|----------|-----------|
| YPH104 Core Course IV    | Basic Practical (General & Electronics)<br>- Lab | 0         | 0        | 6        | 3         |
| <b>Elective Course I</b> |                                                  | <b>4</b>  | <b>0</b> | <b>0</b> | <b>4</b>  |
| <b>Total</b>             |                                                  | <b>16</b> | <b>3</b> | <b>6</b> | <b>22</b> |

| <b>SEMESTER – II</b>      |                                    |           |          |          |           |
|---------------------------|------------------------------------|-----------|----------|----------|-----------|
| Subject Code              | Course Title                       | L         | T        | P        | Credits   |
| YPH201 Core Course V      | Statistical Mechanics              | 4         | 1        | 0        | 5         |
| YPH202 Core Course VI     | Quantum Mechanics                  | 4         | 1        | 0        | 5         |
| YPH203 Core Course VII    | Electromagnetic Theory             | 4         | 1        | 0        | 5         |
| YPH204 Core Course VIII   | Advanced General Experiments - Lab | 0         | 0        | 6        | 3         |
| <b>Elective Course II</b> |                                    | <b>4</b>  | <b>0</b> | <b>0</b> | <b>4</b>  |
| <b>Total</b>              |                                    | <b>16</b> | <b>3</b> | <b>6</b> | <b>22</b> |

| <b>SEMESTER – III</b>      |                              |           |          |          |           |
|----------------------------|------------------------------|-----------|----------|----------|-----------|
| Subject Code               | Course Title                 | L         | T        | P        | Credits   |
| YPH301 Core Course IX      | Solid State Physics          | 4         | 1        | 0        | 5         |
| YPH302 Core Course X       | Special Electronics          | 4         | 1        | 0        | 5         |
| YPH303 Core Course XI      | Nuclear and Particle Physics | 4         | 1        | 0        | 5         |
| YPH304 Core Course XII     | Advanced Electronics         | 0         | 0        | 6        | 3         |
| <b>Elective Course III</b> |                              | <b>4</b>  | <b>0</b> | <b>0</b> | <b>4</b>  |
| <b>Total</b>               |                              | <b>16</b> | <b>3</b> | <b>6</b> | <b>22</b> |

| <b>SEMESTER – IV</b>    |                            |          |          |           |           |
|-------------------------|----------------------------|----------|----------|-----------|-----------|
| Subject Code            | Course Title               | L        | T        | P         | Credits   |
| YPH401 Core Course XIII | Spectroscopy               | 4        | 1        | 0         | 5         |
| YPH402 Core Course XIV  | High Energy Physics        | 4        | 1        | 0         | 5         |
| YPH403 Project          | Project Work and Viva voce | -        | -        | 20        | 10        |
| <b>Total</b>            |                            | <b>8</b> | <b>2</b> | <b>20</b> | <b>20</b> |

### **Elective Course - I**

| Subject Code | Course Title                                      |
|--------------|---------------------------------------------------|
| YPH105A      | Numerical Methods in Physics                      |
| YPH105B      | Geophysics                                        |
| YPH105C      | Thin film Science and Characterization Techniques |

### **Elective Course - II**

| Subject Code | Course Title                         |
|--------------|--------------------------------------|
| YPH205A      | Laser and its Applications           |
| YPH205B      | Nano Science                         |
| YPH205C      | Non – Destructive Testing Technology |

### **Elective Course - III**

| <b>Subject Code</b> | <b>Course Title</b>                            |
|---------------------|------------------------------------------------|
| <b>YPH305A</b>      | Crystal Growth and Characterization Techniques |
| <b>YPH305B</b>      | Automation Science & Techniques                |
| <b>YPH305C</b>      | Research Methodology                           |

**M.Phil. – PHYSICS Curriculum****2016 – 17 onwards****SEMESTER I**

| <b>Code No</b> | <b>Course Title</b>  | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
|----------------|----------------------|----------|----------|----------|----------|
| ZPH101         | Research Methodology | 4        | 4        | 0        | 6        |
| ZPH102         | Advanced Physics     | 4        | 4        | 0        | 6        |
| ZPH103         | Spectrophysics       | 4        | 4        | 0        | 6        |

**SEMESTER II**

| <b>Code No</b> | <b>Course Title</b>              | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b> |
|----------------|----------------------------------|----------|----------|----------|----------|
| ZPH 201        | Guide paper                      | 4        | 0        | 0        | 4        |
| ZSW202         | Teaching Learning Skills         | 1        | 2        | 0        | 2        |
| ZPH 203        | Thesis/Dissertation/Project work | 0        | 0        | 0        | 16       |

**Total credits: 40**