**Revised BS-Physics Road Map (Batch 19- Onward: Fall 2020- Onward)**

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| **Code** | **Course Title** | **CH** | **Pre-req** |  | **Code** | **Course Title** | **CH** | **Pre-req** |
| **SEMESTER 1** | | | | **SEMESTER 2** | | | |
| EN-110 | English-I | 3 | - - - - | EN-112 | English-II | 3 | EN-110 |
| MA-100 | Calculus -I | 3 | - - - - | MA-103 | Calculus-II | 3 | MA-100 |
| CS-101 | Introduction to Computing | 3 | - - - - | PH-102 | Electricity and Magnetism\* | 3 | PH-101 |
| PH-101 | Mechanics\* | 3 | - - - - | PH-102L | Electricity and Magnetism Lab\* | 1 |  |
| PH-101L | Mechanics Lab\* | 1 | ----- | PH-103 | Waves and Oscillations\* | 3 | - - - - |
| CH-101 | Principles of Chemistry-I\* | 3 | - - - - | PH-103L | Waves and Oscillations Lab\* | 1 |  |
| CH-101L | Principles of Chemistry-I Lab\* | 1 | ---- |  | Social Science Elective | 3 | - - - - |
| **Semester Credit Hours: 17** | | | | **Semester Credit Hours: 17** | | | |
| **SEMESTER 3** | | | | **SEMESTER 4** | | | |
| EN-201 | Communication Skills | 3 | EN-112 | MA-230 | Differential Equations | 3 | MA-103 |
| MA-150 | Probability and Statistics | 3 | - - - - | HM-150 | Islamic Studies | 2 | - - - - |
| PH-204 | Modern Physics\* | 3 | - - - - | PH-307 | Mathematical Methods of Physics-I | 3 | MA-103 |
| PH-204L | Modern Physics Lab\* | 1 |  | PH-308 | Quantum Mechanics-I | 3 | PH-101 |
| MA-105 | Discrete Mathematics | 3 | - - - - | CH-102 | Principles of Chemistry-II\* | 3 | - - - - |
| SS-171 | Pakistan Studies | 2 | - - - - | CH-102L | Principles of Chemistry-II Lab\* | 1 |  |
| MA-210 | Linear Algebra | 3 | - - - - |  | Humanities Elective | 3 | - - - - |
| **Semester Credit Hours: 18** | | | | **Semester Credit Hours: 18** | | | |
| **SEMESTER 5** | | | | **SEMESTER 6** | | | |
| PH-205 | Heat and Thermodynamics | 3 | - - - - | PH-206 | Optics | 3 | - - - - |
| PH-309 | Computational Physics | 3 | CS-141 | PH-310 | Thermal and Statistical Physics | 3 | - - - - |
| PH-312 | Mathematical Methods of Physics-II | 3 | PH-307 | PH-425 | Digital Electronics | 3 | - - - - |
| PH-313 | Quantum Mechanics-II | 3 | PH-308 | PH-311 | Classical Mechanics | 3 | PH-101 |
| PH-316 | Electronics | 3 | - - - - | PH-315 | Semiconductor Devices | 3 | - - - - |
| **Semester Credit Hours: 15** | | | | **Semester Credit Hours: 15** | | | |
| **SEMESTER 7** | | | | **SEMESTER 8** | | | |
| PH-416 | Electromagnetic Theory-I | 3 | PH-102 | PH-419 | Electromagnetic Theory-II | 3 | PH-416 |
| PH-417 | Nuclear Physics | 3 | - - - - | PH-421 | Solid State Physics | 3 | - - - - |
| MA-402 | Simulation and Modeling | 3 | - - - - | PH-439/PH-440 | Advanced Physics Lab/Senior Project | 3 | - - - - |
| PH-xxx | Technical Elective-I | 3 | - - - - | PH-xxx | Technical Elective-III | 3 | - - - - |
| PH-xxx | Technical Elective-II | 3 | - - - - | PH-xxx | Technical Elective-IV | 3 | - - - - |
| **Semester Credit Hours: 15** | | | | **Semester Credit Hours: 15** | | | |

**Total Credit Hours: 130**

1. \*This pair of courses theory and its associated lab (e.g. PH101 and PH101L) should be offered simultaneously.

1. A student taking the pair of courses (e.PH101 and PH101L) for the first time shall register for both course simultaneously

**BS Physics Electives**

* Plasma Physics
* Environmental Physics
* Theoretical Particle Physics
* LASERS
* Introduction to Nanoscience & Technology
* Fuel Cell Fundamentals and Applications
* Renewable Energy Resources
* Surface Physics
* Fluid Dynamics
* Experimental Nuclear Physics
* Nano Electronics
* Introduction to Medical Physics
* Relativity and Cosmology
* Introduction to Optoelectronics
* Thin Films Technology
* Atomic and Molecular Physics
* Final Project
* Final Project-I
* Final Project-II

The list of elective courses can be extended as per future needs.