**Scheme of Study**

 **M.Phil Physics Program**

**Department of Physics (ULM)**

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**University of Lakki Marwat, Lakki Marwat, KPK.**

**Scheme of Studies M.Phil Physics**

**MPhil PHYSICS PROGRAMME:**

Program Duration: 2 Years (4 Semesters)

Credit Hours: 30

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| **Semester-I** |
| **Course Code** | **Course Title** | **Marks** | **Credit Hours** |
| PHYS-611 | Advanced Electrodynamics | 100 | 3(3+0) |
| PHYS-612 | Advanced Mathematical Methods for Physics | 100 | 3(3+0) |
| PHYS-XXX | Elective-I | 100 | 3(3+0) |
| PHYS-XXX | Elective-II | 100 | 3(3+0) |
| **Total** |  | **400** | **12** |
| **Semester-II** |
| **Course Code** | **Course Title** | **Marks** | **Credit Hours** |
| PHYS-621 | Advance Statistical Mechanics | 100 | 3(3+0) |
| PHYS-622 | Advance Quantum Mechanics | 100 | 3(3+0) |
| PHYS-XXX | Elective-V | 100 | 3(3+0) |
| PHYS-XXX | Elective-VI | 100 | 3(3+0) |
| **Total** |  | **400** | **12** |
| **Semester-III & IV** |
| **Course Code** | **Course Title** |  | **Credit Hours** |
| PHYS-631 | Thesis |  | 06 |

**Note:** After successful completion of Course work, department will decide to allow the student to enroll in research work after proper evaluation.

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| **S.No.** | **Course Code** | **Course Tile**  | **(TCH LCH CrH)** |
| 1.  | PHYS-611 | Advance Electromagnetic theory  | (3 0 3) |
| 2 | PHYS-612 | Advance Mathematical Methods | (3 0 3) |
| 3 | PHYS-621 | Advance Quantum Mechanics | (3 0 3) |
| 4 | PHYS-622 | Advance Statistical Mechanics | (3 0 3) |
| **Optional / Additional Courses /Specialization** |
| 4 | PHYS-632 | Laser application | (3 0 3) |
| 5 | PHYS-633 | Advance Computational Physics | (3 0 3) |
| 6 | PHYS-634 | Advance Solid State Physics | (3 0 3) |
| 7 | PHYS-635 | Space Technology, Science and Applications | (3 0 3) |
| 8 | PHYS-636 | Nanotechnology and Nano Materials | (3 0 3) |
| 9 | PHYS-637 | Lasers Opto-acoustics Spectroscopy | (3 0 3) |
| 10 | PHYS-638 | Fundamental of Thermal Physics | (3 0 3) |
| 11 | PHYS-639 | Dielectric & Optical Properties of Materials | (3 0 3) |
| 12 | PHYS-641 | Lasers Physics | (3 0 3) |
| 13 | PHYS-642 | Advance Simulation of physics problems | (3 0 3) |
| 14 | PHYS-643 | Magnetic Properties of Materials  | (3 0 3) |
| 15 | PHYS-644 | Advance Atomic and Molecular Physics | (3 0 3) |
| 16 | PHYS-645 | The Theory of Atomic Collisions | (3 0 3) |
| 17 | PHYS-646 | The Experimental Techniques in Atomic Collisions | (3 0 3) |
| 18 | PHYS-647 | Optical Communication | (3 0 3) |
| 19 | PHYS-648 | Advance Particle Physics | (3 0 3) |
| 20 | PHYS-649 | Digital Image Processing | (3 0 3) |
| 21 | PHYS-650 | Advance Modern Optics and Laser Physics | (3 0 3) |
| 22 | PHYS-651 | Signal Processing | (3 0 3) |
| 23 | PHYS-652 | Superconductivity | (3 0 3) |
| 24 | PHYS-653 | Low Temperature Physics | (3 0 3) |
| 25 | PHYS-654 | Reactor Physics | (3 0 3) |
| 26 | PHYS-655 | Medical Physics Instrumentation | (3 0 3) |
| 27 | PHYS-656 | Satellite Orbit Determination and Simulation | (3 0 3) |
| 28 | PHYS-657 | Physics of Thin Films | (3 0 3) |
| 29 | PHYS-658 | Advance Semi-Conductor Devices  | (3 0 3) |
| 30 | PHYS-659 | Electron Microscopy-I  | (3 0 3) |
| 31 | PHYS-660 | Electron Microscopy-II  | (3 0 3) |
| 32 | PHYS-661 | Advance Material Science  | (3 0 3) |
| 33 | PHYS-662 | Magnetic Resonance (EPR/NMR)  | (3 0 3) |
| 34 | PHYS-663 | Techniques in Experimental Solid State Physics  | (3 0 3) |
| 35 | PHYS-664 | Magnetic Resonance Imaging (MRI)  | (3 0 3) |
| 36 | PHYS-665 | Satellite Imaging Processing  | (3 0 3) |
| 37 | PHYS-666 | Ion’s Sputtering  | (3 0 3) |
| 38 | PHYS-667 | Advance Plasma Physics  | (3 0 3) |
| 39 | PHYS-668 | Advance Laser Plasma Interaction  | (3 0 3) |
| 40 | PHYS-669 | Advance String Theory-I  | (3 0 3) |
| 41 | PHYS-670 | Advance String Theory-II  | (3 0 3) |
| 42 | PHYS-671 | Geometry Topology & Physics-I  | (3 0 3) |
| 43 | PHYS-672 | Geometry Topology & Physics-II  | (3 0 3) |
| 44 | PHYS-673 | Super Symmetry and Supergravity  | (3 0 3) |
| 45 | PHYS-674 | Advance Quantum Field Theory  | (3 0 3) |
| 46 | PHYS-675 | Advanced Courses in Relativity  | (3 0 3) |
| 47 | PHYS-676 | Gauge Theory Gravity Duality (Ads/CFT Correspondence)  | (3 0 3) |
| 48 | PHYS-677 | Black holes  | (3 0 3) |
| 49 | PHYS-678 | Noncommutative Field Theory  | (3 0 3) |
| 50 | PHYS-679 | Fourier optics  | (3 0 3) |
| 51 | PHYS-680 | Atomic Physics in Hot Plasmas  | (3 0 3) |
| 52 | PHYS-681 | Laser Plasma Diagnostics  | (3 0 3) |
| 53 | PHYS-682 | Project/Research  | (3 0 3) |
| 54 | PHYS-683 | General Theory of Relativity  | (3 0 3) |
| 55 | PHYS-684 | Electronic Structure Theory | (3 0 3) |
| 56 | PHYS-685 | Density Functional Theory | (3 0 3) |
| 55 | PHYS-686 | Practicum in teaching of Physics  | (3 0 3) |
| 56 | PHYS-687 | Seminars and Lectures  | (3 0 3) |
| 57 | PHYS-688 | Laboratory techniques in Physics  | (3 0 3) |
| 58 | PHYS-689 | Environmental Physics  | (3 0 3) |
| 59 | PHYS-690 | Image Processing in Electron Microscopy  | (3 0 3) |
| 60 | PHYS-691 | Practicum in teaching of Physics  | (3 0 3) |