Annexure 2

# Bachelor of Science with Physics and Chemistry

## School of Advanced Sciences

| Programme Credit Structure | Credits |
|---|---|
| **Discipline Core Courses** | 72 |
| **Discipline Elective Courses** | 30 |
| **Ability Enhancement Compulsory Courses** | 09 |
| **Skill Enhancement Elective Courses** | 10 |
| **Project** | 06 |
| **Total Graded Credit Requirement** | 127 |
| **Non-Graded Credit Requirement** | 10 |

### Discipline Core Courses 72

| | | | | | |
|---|---|---|---|---|---|
| UPHY151L | Classical Mechanics | 4 | 0 | 0 | 4 |
| UCHY151L | Structure, Bonding and Reactivity | 4 | 0 | 0 | 4 |
| UMAT151L | Calculus | 3 | 0 | 0 | 3 |
| UMAT151P | Calculus Lab | 0 | 0 | 2 | 1 |
| UBIT151L | Biological Sciences | 3 | 1 | 0 | 4 |
| UPHY152L | Electricity and Magnetism | 4 | 0 | 0 | 4 |
| UCHY152L | Physical Chemistry I | 4 | 0 | 0 | 4 |
| UCHY152P | Physical Chemistry Lab | 0 | 0 | 4 | 2 |
| UMAT155L | Differential Equations and Laplace Transforms | 3 | 0 | 0 | 3 |
| UMAT155P | Differential Equations and Laplace Transforms Lab | 0 | 0 | 2 | 1 |
| UPHY153P | Physics Lab I | 0 | 0 | 4 | 2 |
| XXXXXXXX | Physics Lab II | 0 | 0 | 4 | 2 |
| XXXXXXXX | Physics Lab III | 0 | 0 | 4 | 2 |
| XXXXXXXX | Physics Lab IV | 0 | 0 | 4 | 2 |
| XXXXXXXX | Waves and Optics | 4 | 0 | 0 | 4 |
| XXXXXXXX | Thermal Physics and Statistical Mechanics | 4 | 0 | 0 | 4 |
| XXXXXXXX | Electronics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Inorganic Chemistry I | 4 | 0 | 0 | 4 |
| XXXXXXXX | Inorganic Chemistry Lab | 0 | 0 | 4 | 2 |
| XXXXXXXX | Organic Chemistry | 4 | 0 | 0 | 4 |
| XXXXXXXX | Organic Chemistry Lab | 0 | 0 | 4 | 2 |
| XXXXXXXX | Analytical Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Analytical Chemistry Lab | 0 | 0 | 4 | 2 |
| XXXXXXXX | Physics and Chemistry of Materials | 4 | 0 | 0 | 4 |
| XXXXXXXX | Seminar I | 0 | 0 | 2 | 1 |
| XXXXXXXX | Seminar II | 0 | 0 | 2 | 1 |

### Discipline Elective Courses 30

| | | | | | |
|---|---|---|---|---|---|
| XXXXXXXX | Quantum Mechanics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Sound and Acoustics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Atomic and Nuclear Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Laser Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Medical Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Astronomy and Astrophysics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Geophysics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Solid State Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Computational Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Physical Chemistry II | 3 | 0 | 0 | 3 |
| XXXXXXXX | Quantum Chemistry and Spectroscopy | 3 | 0 | 0 | 3 |
| XXXXXXXX | Synthetic Organic Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Heterocyclic Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Inorganic Chemistry II | 3 | 0 | 0 | 3 |
| XXXXXXXX | Environmental Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Medicinal Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Polymer Chemistry | 3 | 0 | 0 | 3 |

### Ability Enhancement Compulsory Courses 9

| | | | | | |
|---|---|---|---|---|---|
| UENG101P | Effective English Communication Lab | 0 | 0 | 4 | 2 |
| UENG102L | Technical English Communication | 2 | 0 | 0 | 2 |
| UENG102P | Technical English Communication Lab | 0 | 0 | 2 | 1 |
| UENG103P | Technical Report Writing | 0 | 0 | 2 | 1 |
| XXXXXXXX | Environmental Studies | 3 | 0 | 0 | 3 |

### Skill Enhancement Elective Courses 10

| | | | | | |
|---|---|---|---|---|---|
| UCSE151E | Computer Programming: Python | 1 | 0 | 4 | 3 |
| UCSE152E | Computer Programming: Java | 1 | 0 | 4 | 3 |
| UCSE153E | Structured and Object Oriented Programming | 2 | 0 | 4 | 4 |
| UCSE154E | Database Management Systems | 3 | 0 | 2 | 4 |
| UCSE155E | Data Mining | 3 | 0 | 2 | 4 |
| UMGT151L | Lean Start-up Management | 3 | 0 | 0 | 3 |
| USTS151P | Quantitative Skills Practice | 0 | 0 | 3 | 1.5 |
| USTS152P | Qualitative Skills Practice | 0 | 0 | 3 | 1.5 |
| UFLE200L | Foreign Language | 2 | 0 | 0 | 2 |
| USSC151L | Creative Writing | 2 | 0 | 0 | 2 |
| UHUM151L | Intra and Inter Personal Skills | 2 | 0 | 0 | 2 |

### Project 6

| | | |
|---|---|---|
| XXXXXXXX | Project | 6 |

### Non-Graded Credit Requirement 10

| | | |
|---|---|---|
| USSC151N | Introduction to Science | 2 |
| UHUM151N | Ethics and Values | 2 |
| USSC152N | Indian Constitution | 2 |
| UEXC151N | Extracurricular /Co-curricular Activities | 2 |
| UEXC152N | NSS/NCC | 2 |

Annexure 3

# Bachelor of Science with Chemistry and Mathematics

**School of Advanced Sciences**

| Programme Credit Structure | Credits |
|---|---|
| **Discipline Core Courses** | 74 |
| **Discipline Elective Courses** | 30 |
| **Ability Enhancement Compulsory Courses** | 09 |
| **Skill Enhancement Elective Courses** | 10 |
| **Project** | 06 |
| **Total Graded Credit Requirement** | 129 |
| **Non-Graded Credit Requirement** | 10 |

**Discipline Core Courses** **74**

| | | | | | |
|---|---|---|---|---|---|
| UPHY151L | Classical Mechanics | 4 | 0 | 0 | 4 |
| UCHY151L | Structure, Bonding and Reactivity | 4 | 0 | 0 | 4 |
| UMAT151L | Calculus | 3 | 0 | 0 | 3 |
| UMAT151P | Calculus Lab | 0 | 0 | 2 | 1 |
| UBIT151L | Biological Sciences | 3 | 1 | 0 | 4 |
| UPHY152L | Electricity and Magnetism | 4 | 0 | 0 | 4 |
| UCHY152L | Physical Chemistry I | 4 | 0 | 0 | 4 |
| UCHY152P | Physical Chemistry Lab | 0 | 0 | 4 | 2 |
| UMAT155L | Differential Equations and Laplace Transforms | 3 | 0 | 0 | 3 |
| UMAT155P | Differential Equations and Laplace Transforms Lab | 0 | 0 | 2 | 1 |
| UPHY153P | Physics Lab I | 0 | 0 | 4 | 2 |
| XXXXXXXX | Inorganic Chemistry I | 4 | 0 | 0 | 4 |
| XXXXXXXX | Inorganic Chemistry Lab | 0 | 0 | 4 | 2 |
| XXXXXXXX | Organic Chemistry | 4 | 0 | 0 | 4 |
| XXXXXXXX | Organic Chemistry Lab | 0 | 0 | 4 | 2 |
| XXXXXXXX | Analytical Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Analytical Chemistry Lab | 0 | 0 | 4 | 2 |
| XXXXXXXX | Analytical Solid Geometry and Vector Calculus | 3 | 1 | 0 | 4 |
| XXXXXXXX | Real Analysis | 3 | 1 | 0 | 4 |
| XXXXXXXX | Complex Analysis | 3 | 1 | 0 | 4 |
| XXXXXXXX | Discrete Mathematics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Abstract Algebra and Linear Algebra | 3 | 1 | 0 | 4 |
| XXXXXXXX | Mathematical Chemistry | 4 | 0 | 0 | 4 |
| XXXXXXXX | Seminar I | 0 | 0 | 2 | 1 |
| XXXXXXXX | Seminar II | 0 | 0 | 2 | 1 |

**Discipline Elective Courses** **30**

| | | | | | |
|---|---|---|---|---|---|
| XXXXXXXX | Physical Chemistry II | 3 | 0 | 0 | 3 |
| XXXXXXXX | Quantum Chemistry and Spectroscopy | 3 | 0 | 0 | 3 |
| XXXXXXXX | Synthetic Organic Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Heterocyclic Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Inorganic Chemistry II | 3 | 0 | 0 | 3 |
| XXXXXXXX | Environmental Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Medicinal Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Polymer Chemistry | 3 | 0 | 0 | 3 |
| XXXXXXXX | Probability and Statistics | 3 | 0 | 2 | 4 |
| XXXXXXXX | Graph Theory | 3 | 1 | 0 | 4 |
| XXXXXXXX | Operations Research | 3 | 1 | 0 | 4 |
| XXXXXXXX | Statics and Dynamics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Transform Techniques | 3 | 1 | 0 | 4 |
| XXXXXXXX | Number Theory | 3 | 0 | 0 | 3 |
| XXXXXXXX | Fuzzy Set Theory | 3 | 0 | 0 | 3 |
| XXXXXXXX | Numerical Methods | 3 | 0 | 0 | 3 |
| XXXXXXXX | Mathematical Modelling | 3 | 0 | 0 | 3 |
| XXXXXXXX | AI and Machine Learning | 3 | 0 | 0 | 3 |

**Ability Enhancement Compulsory Courses** **9**

| | | | | | |
|---|---|---|---|---|---|
| UENG101P | Effective English Communication Lab | 0 | 0 | 4 | 2 |
| UENG102L | Technical English Communication | 2 | 0 | 0 | 2 |
| UENG102P | Technical English Communication Lab | 0 | 0 | 2 | 1 |
| UENG103P | Technical Report Writing | 0 | 0 | 2 | 1 |
| XXXXXXXX | Environmental Studies | 3 | 0 | 0 | 3 |

**Skill Enhancement Elective Courses** **10**

| | | | | | |
|---|---|---|---|---|---|
| UCSE151E | Computer Programming: Python | 1 | 0 | 4 | 3 |
| UCSE152E | Computer Programming: Java | 1 | 0 | 4 | 3 |
| UCSE153E | Structured and Object Oriented Programming | 2 | 0 | 4 | 4 |
| UCSE154E | Database Management Systems | 3 | 0 | 2 | 4 |
| UCSE155E | Data Mining | 3 | 0 | 2 | 4 |
| UMGT151L | Lean Start-up Management | 3 | 0 | 0 | 3 |
| USTS151P | Quantitative Skills Practice | 0 | 0 | 3 | 1.5 |
| USTS152P | Qualitative Skills Practice | 0 | 0 | 3 | 1.5 |
| UFLE200L | Foreign Language | 2 | 0 | 0 | 2 |
| USSC151L | Creative Writing | 2 | 0 | 0 | 2 |
| UHUM151L | Intra and Inter Personal Skills | 2 | 0 | 0 | 2 |

**Project** **6**

| | | |
|---|---|---|
| XXXXXXXX | Project | 6 |

**Non-Graded Credit Requirement** **10**

| | | |
|---|---|---|
| USSC151N | Introduction to Science | 2 |
| UHUM151N | Ethics and Values | 2 |
| USSC152N | Indian Constitution | 2 |
| UEXC151N | Extracurricular /Co-curricular Activities | 2 |
| UEXC152N | NSS/NCC | 2 |

Annexure 4

# Bachelor of Science with Mathematics and Physics

**School of Advanced Sciences**

| Programme Credit Structure | Credits |
|---|---|
| **Discipline Core Courses** | 74 |
| **Discipline Elective Courses** | 30 |
| **Ability Enhancement Compulsory Courses** | 09 |
| **Skill Enhancement Elective Courses** | 10 |
| **Project** | 06 |
| **Total Graded Credit Requirement** | 129 |
| **Non-Graded Credit Requirement** | 10 |

**Discipline Core Courses** **74**

| | | | | | |
|---|---|---|---|---|---|
| UPHY151L | Classical Mechanics | 4 | 0 | 0 | 4 |
| UCHY151L | Structure, Bonding and Reactivity | 4 | 0 | 0 | 4 |
| UMAT151L | Calculus | 3 | 0 | 0 | 3 |
| UMAT151P | Calculus Lab | 0 | 0 | 2 | 1 |
| UBIT151L | Biological Sciences | 3 | 1 | 0 | 4 |
| UPHY152L | Electricity and Magnetism | 4 | 0 | 0 | 4 |
| UCHY152L | Physical Chemistry I | 4 | 0 | 0 | 4 |
| UCHY152P | Physical Chemistry Lab | 0 | 0 | 4 | 2 |
| UMAT155L | Differential Equations and Laplace Transforms | 3 | 0 | 0 | 3 |
| UMAT155P | Differential Equations and Laplace Transforms Lab | 0 | 0 | 2 | 1 |
| UPHY153P | Physics Lab I | 0 | 0 | 4 | 2 |
| XXXXXXXX | Physics Lab II | 0 | 0 | 4 | 2 |
| XXXXXXXX | Physics Lab III | 0 | 0 | 4 | 2 |
| XXXXXXXX | Physics Lab IV | 0 | 0 | 4 | 2 |
| XXXXXXXX | Analytical Solid Geometry and Vector Calculus | 3 | 1 | 0 | 4 |
| XXXXXXXX | Abstract Algebra and Linear Algebra | 3 | 1 | 0 | 4 |
| XXXXXXXX | Real Analysis | 3 | 1 | 0 | 4 |
| XXXXXXXX | Complex Analysis | 3 | 1 | 0 | 4 |
| XXXXXXXX | Discrete Mathematics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Waves and Optics | 4 | 0 | 0 | 4 |
| XXXXXXXX | Thermal Physics and Statistical Mechanics | 4 | 0 | 0 | 4 |
| XXXXXXXX | Electronics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Applied Numerical Methods | 3 | 0 | 0 | 3 |
| XXXXXXXX | Applied Numerical Methods Lab | 0 | 0 | 2 | 1 |
| XXXXXXXX | Seminar I | 0 | 0 | 2 | 1 |
| XXXXXXXX | Seminar II | 0 | 0 | 2 | 1 |

**Discipline Elective Courses** **30**

| | | | | | |
|---|---|---|---|---|---|
| XXXXXXXX | Probability and Statistics | 3 | 0 | 2 | 4 |
| XXXXXXXX | Graph Theory | 3 | 1 | 0 | 4 |
| XXXXXXXX | Operations Research | 3 | 1 | 0 | 4 |
| XXXXXXXX | Transform Techniques | 3 | 1 | 0 | 4 |
| XXXXXXXX | Number Theory | 3 | 0 | 0 | 3 |
| XXXXXXXX | Fuzzy Set Theory | 3 | 0 | 0 | 3 |
| XXXXXXXX | Mathematical Modelling | 3 | 0 | 0 | 3 |
| XXXXXXXX | AI and Machine Learning | 3 | 0 | 0 | 3 |
| XXXXXXXX | Quantum Mechanics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Sound and Acoustics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Atomic and Nuclear Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Laser Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Medical Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Astronomy and Astrophysics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Geophysics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Solid State Physics | 3 | 0 | 0 | 3 |
| XXXXXXXX | Computational Physics | 3 | 0 | 0 | 3 |

**Ability Enhancement Compulsory Courses** **9**

| | | | | | |
|---|---|---|---|---|---|
| UENG101P | Effective English Communication Lab | 0 | 0 | 4 | 2 |
| UENG102L | Technical English Communication | 2 | 0 | 0 | 2 |
| UENG102P | Technical English Communication Lab | 0 | 0 | 2 | 1 |
| UENG103P | Technical Report Writing | 0 | 0 | 2 | 1 |
| XXXXXXXX | Environmental Studies | 3 | 0 | 0 | 3 |

**Skill Enhancement Elective Courses** **10**

| | | | | | |
|---|---|---|---|---|---|
| UCSE151E | Computer Programming: Python | 1 | 0 | 4 | 3 |
| UCSE152E | Computer Programming: Java | 1 | 0 | 4 | 3 |
| UCSE153E | Structured and Object Oriented Programming | 2 | 0 | 4 | 4 |
| UCSE154E | Database Management Systems | 3 | 0 | 2 | 4 |
| UCSE155E | Data Mining | 3 | 0 | 2 | 4 |
| UMGT151L | Lean Start-up Management | 3 | 0 | 0 | 3 |
| USTS151P | Quantitative Skills Practice | 0 | 0 | 3 | 1.5 |
| USTS152P | Qualitative Skills Practice | 0 | 0 | 3 | 1.5 |
| UFLE200L | Foreign Language | 2 | 0 | 0 | 2 |
| USSC151L | Creative Writing | 2 | 0 | 0 | 2 |
| UHUM151L | Intra and Inter Personal Skills | 2 | 0 | 0 | 2 |

**Project** **6**

| | | |
|---|---|---|
| XXXXXXXX | Project | 6 |

**Non-Graded Credit Requirement** **10**

| | | |
|---|---|---|
| USSC151N | Introduction to Science | 2 |
| UHUM151N | Ethics and Values | 2 |
| USSC152N | Indian Constitution | 2 |
| UEXC151N | Extracurricular /Co-curricular Activities | 2 |
| UEXC152N | NSS/NCC | 2 |