

Department of Applied Chemistry and Basic Sciences (Course Outline for Chemistry Honors' Programme)

| Type of Course | Course Code | Title of the Course | L-T- P /Week | No. of Credits | University Exam | Internal Assessment | Total |
|---|-------------|---|--------------|----------------|-----------------|---------------------|-------|
| Certificate In Basic Physics | | | | | | | |
| SEMESTER-I | | | | | | | |
| Major-1 | PHYS-111 | Mechanics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 | MATH-111 | Fundamental Mathematics | 6-0-0 | 6 | 50 | 50 | 100 |
| Major-3 | CHEM-111 | Fundamentals of Inorganic Chemistry-I | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-1 Practical | PHYS-111P | Mechanics-Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Major-3 Practical | CHEM-111P | Fundamentals of Inorganic Chemistry-I-Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Minor Elective-1 | CHEM-111 | Molecules of life | 4-0-0 | 4 | 50 | 50 | 100 |
| Vocational Minor | | SEC-1 (Choose from the list) | 3-0-0 | 3 | 50 | 50 | 100 |
| Co-Curricular Value additional Course/ Qualifying/Non Remedial | VAC-1 | Basic Communication and Skills | 3-0-0 | 3 | 50 | 50 | 100 |
| Total Credit | | | | 25 | | | |

| Type of Course | Course Code | Title of the Course | L-T- P /Week | No. of Credits | University Exam | Internal Assessment | Total |
|--|-------------|---|--------------|----------------|-----------------|---------------------|-------|
| Certificate In Basic Physics | | | | | | | |
| SEMESTER-II | | | | | | | |
| Major-1 | PHYS-121 | Electricity and Magnetism | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 | MATH-121 | Geometry | 6-0-0 | 6 | 50 | 50 | 100 |
| Major-3 | CHEM-121 | Fundamentals of Organic Chemistry-I | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-1 Practical | PHYS-121P | Electricity and Magnetism-Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Major-3 Practical | CHEM-121P | Fundamentals of Organic Chemistry-I Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Vocational Minor | | SEC-2 (Choose from the list) | 3-0-0 | 3 | 50 | 50 | 100 |
| Co-Curricular Value additional Course/ Qualifying/Non Remedial | VAC-2 | Environment Studies | 3-0-0 | 3 | 50 | 50 | 100 |
| Total Credit | | | | 21 | | | |
| <i>Exit Option with "Undergraduate Certificate" (Certificate in Basic Physics) after the first year or two semesters with the completion of the course equivalent to minimum 40 credits. Along with entry option to third semester after exit.</i> | | | | | | | |

| Type of Course | Course Code | Title of the Course | L-T- P /Week | No. of Credits | University Exam | Internal Assessment | Total |
|--|-------------|--|--------------|----------------|-----------------|---------------------|-------|
| Diploma In Applied Physics | | | | | | | |
| SEMESTER-III | | | | | | | |
| Major-1 | PHYS-231 | Thermodynamics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 | MATH-231 | Calculus | 6-0-0 | 6 | 50 | 50 | 100 |
| Major-3 | CHEM-231 | Physical Chemistry-I | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-1 Practical | PHYS-231P | Thermodynamics-Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Major-3 Practical | CHEM-231P | Physical Chemistry –I Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Vocational Minor | | SEC-3 (Choose from the list) | 3-0-0 | 3 | 50 | 50 | 100 |
| Co-Curricular Value additional Course/ Qualifying/Non Remedial | VAC-3 | Management Paradigms from Bhagavad Gita | 3-0-0 | 3 | 50 | 50 | 100 |
| Total Credit | | | | 21 | | | |

| Type of Course | Course Code | Title of the Course | L-T- P /Week | No. of Credits | University Exam | Internal Assessment | Total |
|--|-------------|----------------------------------|--------------|----------------|-----------------|---------------------|-------|
| Diploma In Applied Physics | | | | | | | |
| SEMESTER-IV | | | | | | | |
| Major-1 | PHYS-241 | Geometrical Optics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 | MATH-241 | Differential Equation | 6-0-0 | 6 | 50 | 50 | 100 |
| Major-3 | CHEM-241 | Inorganic Chemistry II | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-1 Practical | PHYS-241P | Geometrical Optics-Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Major-3 Practical | CHEM-241P | Inorganic Chemistry II-Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Minor Elective-1 | MATH-242 | -Probability and Statistics | 4-0-0 | 4 | 50 | 50 | 100 |
| Vocational Minor | | SEC-4 (Choose from the list) | 3-0-0 | 3 | 50 | 50 | 100 |
| Co-Curricular Value additional Course/ Qualifying/Non Remedial | VAC-4 | Vedic Science/ Vedic Mathematics | 3-0-0 | 3 | 50 | 50 | 100 |
| Total Credit | | | | 25 | | | |
| <i>Exit Option with "Undergraduate Diploma" (Diploma In Applied Physics) after the two years or four semesters with the completion of the course equivalent to minimum 80 credits. Along with entry option to fifth semester after exit.</i> | | | | | | | |

| Type of Course | Course Code | Title of the Course | L-T- P /Week | No. of Credits | University Exam | Internal Assessment | Total |
|--|-------------|---|--------------|----------------|-----------------|---------------------|-------|
| Degree in Bachelor of Science | | | | | | | |
| SEMESTER-V | | | | | | | |
| Major-1 | PHYS-351 | Physical Optics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 | PHYS -352 | Basic Electronics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-3 | MATH-351 | Abstract Algebra | 5-0-0 | 5 | 50 | 50 | 100 |
| Major-4 | MATH -352 | Linear Algebra | 5-0-0 | 5 | 50 | 50 | 100 |
| Major-1 Practical | PHYS-351P | Physical Optics- Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Major-2 Practical | PHYS -352P | Basic Electronics-Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Co-Curricular Value additional Course/ Qualifying/Non Remedial | VAC-5 | Meditation/PDP Through Applied Physiology of Ram Charit Manas Sports/Photography/Publication and creative writing/creative arts/NCC | 3-0-0 | 3 | 50 | 50 | 100 |
| Total Credit | | | | 20 | | | |

| Type of Course | Course Code | Title of the Course | L-T- P /Week | No. of Credits | University Exam | Internal Assessment | Total |
|--|-------------|---|--------------|----------------|-----------------|---------------------|-------|
| Degree in Bachelor of Science | | | | | | | |
| SEMESTER-V | | | | | | | |
| Major-1 | PHYS-351 | Physical Optics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 | PHYS -352 | Basic Electronics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-3 | CHEM-351 | Organic Chemistry II | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-4 | CHEM-352 | Instrumental Methods Of Chemical Analysis | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-1 Practical | PHYS-351P | Physical Optics- Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Major-2 Practical | PHYS -352P | Basic Electronics-Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Major-3 Practical | CHEM-351P | Organic Chemistry II -Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Major-4 Practical | CHEM -352P | Instrumental Methods Of Chemical Analysis -Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Co-Curricular Value additional Course/ Qualifying/Non Remedial | VAC-5 | Meditation/PDP Through Applied Physiology of Ram Charit Manas Sports/Photography/Publication and creative writing/creative arts/NCC | 3-0-0 | 3 | 50 | 50 | 100 |
| Total Credit | | | | 20 | | | |

| Type of Course | Course Code | Title of the Course | L-T- P /Week | No. of Credits | University Exam | Internal Assessment | Total |
|--|-------------|--|--------------|----------------|-----------------|---------------------|-------|
| Degree in Bachelor of Science | | | | | | | |
| SEMESTER-VI | | | | | | | |
| Major-1 | PHYS-361 | Modern Physics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 | PHYS-362 | Digital and Analog Electronics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-3 | CHEM-361 | Physical Chemistry II | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-4 | CHEM-362 | Organometallic Compounds And Bioinorganic Chemistry | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-1 Practical | PHYS-361P | Modern Physics-Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Major-2 Practical | PHYS-362P | Digital and Analog Electronics-Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Major-3 Practical | CHEM-361P | Physical Chemistry II -Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Major-4 Practical | CHEM-362P | Organometallic Compounds And Bioinorganic Chemistry -Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Co-Curricular Value additional Course/ Qualifying/Non Remedial | VAC-6 | Essence of Indian Traditional Knowledge / Vivekananda Studies/ Sports/Photography/Publication and creative writing/creative arts/NCC | 3-0-0 | 3 | 50 | 50 | 100 |
| Total Credit | | | | 20 | | | |
| <p><i>Exit Option with “Bachelor’s Degree (Bachelor of Science)” after the three years or six semesters with the completion of the course equivalent to minimum 120 credits. Along with entry option to fourth year or seventh semester for those students meeting a minimum CGPA of 7.5 in Bachelor’s Degree Examination (BDE).</i></p> | | | | | | | |

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|--|-------------|--|--------------|----------------|-----------------|---------------------|-------|
| Degree in Bachelor of Science | | | | | | | |
| SEMESTER-VI | | | | | | | |
| Major-1 | PHYS-361 | Modern Physics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 | PHYS-362 | Digital and Analog Electronics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-3 | MATH-351 | Analysis | 5-0-0 | 5 | 50 | 50 | 100 |
| Major-4 | MATH -352 | Numerical | 5-0-0 | 5 | 50 | 50 | 100 |
| Major-1 Practical | PHYS-361P | Modern Physics-Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Major-2 Practical | PHYS-362P | Digital and Analog Electronics-Lab | 0-0-1 | 1 | 50 | 50 | 100 |
| Co-Curricular Value additional Course/ Qualifying/Non Remedial | VAC-6 | Essence of Indian Traditional Knowledge / Vivekananda Studies/ Sports/Photography/Publication and creative writing/creative arts/NCC | 3-0-0 | 3 | 50 | 50 | 100 |
| Total Credit | | | | 20 | | | |
| <p><i>Exit Option with “Bachelor’s Degree (Bachelor of Science)” after the three years or six semesters with the completion of the course equivalent to minimum 120 credits. Along with entry option to fourth year or seventh semester for those students meeting a minimum CGPA of 7.5 in Bachelor’s Degree Examination (BDE).</i></p> | | | | | | | |

| Type of Course | Course Code | Title of the Course | L-T- P | No. of Credits | University Exam | Internal Assessment | Total |
|----------------|-------------|---------------------|--------|----------------|-----------------|---------------------|-------|
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|--|------------|--------------------------------|-------|-----------|----|----|-----|
| | | | /Week | | | | |
| Bachelor's Degree (Honors/Research) | | | | | | | |
| SEMESTER-VII | | | | | | | |
| Major-1 | PHYS-471 | Mathematical Physics-II | 6-0-0 | 6 | 50 | 50 | 100 |
| Major-2 | PHYS -472 | Classical Mechanics - II | 6-0-0 | 6 | 50 | 50 | 100 |
| Major-3 | PHYS -473 | Communication Electronics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-2 Practical | PHYS -473P | Communication Electronics Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Major-3 | MICR-472 | Research Methodology | 4-0-0 | 4 | 50 | 50 | 100 |
| Research Project | PHYS -474 | Project-I/ Industrial Training | 4-0-0 | 4 | 50 | 50 | 100 |
| Total Credit | | | | 26 | | | |

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|----------------|-------------|---------------------|--------|----------------|-----------------|---------------------|-------|
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|---|------------|------------------------------------|-------|-----------|----|----|-----|
| | | | /Week | | | | |
| Bachelor's Degree (Honors/Research) | | | | | | | |
| SEMESTER-VIII | | | | | | | |
| Major-1 | PHYS - 481 | Atomic and Molecular Spectra | 6-0-0 | 6 | 50 | 50 | 100 |
| Major-2 | PHYS - 482 | Electrodynamics | 6-0-0 | 6 | 50 | 50 | 100 |
| Major-3 | PHYS -483 | Condensed Matter Physics | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-1 Practical | PHYS- 483P | Condensed Matter Physics Lab | 0-0-2 | 2 | 50 | 50 | 100 |
| Research Project | PHYS -484 | Project-II /Industrial Training | 4-0-0 | 4 | 50 | 50 | 100 |
| Major-4 | BIOT-483 | Research Publication and Ethics | 4-0-0 | 4 | 50 | 50 | 100 |
| Total Credit | | | | 26 | | | |
| <i>Award of Bachelor's Degree (Honors/Research) or Bachelor of Science in Discipline with Research after the four years or eight semesters with the completion of the course equivalent to minimum 160 credits.</i> | | | | | | | |

TOTAL CREDITS = 184 (For four years)

Skill Enhancement Courses for Chemistry, Physics, Math's
(Choose Any 01 of the following may be opted in semester I, II, III, IV, V, VI, and VII semesters)

| Skill Enhancement Course (Chemistry) | Skill Enhancement Courses (Physics) | Skill Enhancement Courses (Mathematics) |
|---|---|--|
| CHEM-01: Principles of Analytical Chemistry | PHYS-01 :Basic Instrumentation Skills | MATH-01 :Logic and Sets |
| CHEM-02: Methods in Green Chemistry | PHYS-02 :Renewable Energy and Energy harvesting | MATH-02: Mathematical Modeling & Graph |
| CHEM-03: Environmental Chemistry | PHYS-03:Radiology and Safety | MATH-03: Theory of Equations |
| CHEM-04:Chemical Toxicology and Environmental Pollution | PHYS-04:Electrical circuits and Network Skills | MATH-04: Linear Programming |
| CHEM-05: Chemistry of Medicines | PHYS-05:Weather Forecasting | MATH-05: Statistics |
| CHEM-06: Chemistry of Fuel | | MATH-06: Analytical Geometry |
| CHEM-07: Electromagnetic Spectrum: UV, IR and NMR | | MATH-07: Boolean Algebra |
| CHEM-08: Chemical Materials of Industrial Importance | | |
| CHEM-09: Intellectual Property Rights (IPR) | | |
| CHEM-10: Applications of Computer in Chemistry | | |