

**BIRLA INSTITUTE OF TECHNOLOGY**  
**DEPARTMENT OF CHEMISTRY**  
**NEW COURSE STRUCTURE- To be effective from academic session 2018-19**  
**Based on CBCS & OBE model for M.Sc. Programme in Chemistry**

| <b>M.Sc. Programme in Chemistry (Semester I - IV<sup>th</sup>)</b> |       |                    |   |   |  |                     |                     |                    |
|--|-------|--------------------|---|---|--|---------------------|---------------------|--------------------|
| Semester/session of study (Recommended)                            | Level | Category of course | Code  | Subjects  | Mode of delivery & credits<br>L-lecture; T-tutorial; P-practical |                     |                     | Total credits<br>C |
|  |       |                    |   |   | L<br>(Periods/week)  | T<br>(Periods/week) | P<br>(Periods/week) |                    |
| <b>THEORY</b>  |       |                    |   |   |  |                     |                     |                    |
| <b>FIRST</b>   | 4     | PC                 | CH401   | Basic Inorganic Chemistry                                 | 3  | 1                   | 0                   | 4                  |
|  |       |                    | CH402   | Chemical Kinetics & Surface Chemistry                     | 3  | 0                   | 0                   | 3                  |
|  |       |                    | CH403   | Reactions Mechanism in Organic Chemistry                  | 3  | 0                   | 0                   | 3                  |
|  |       |                    | CH404   | Organometallic Chemistry                                  | 3  | 0                   | 0                   | 3                  |
|  |       |                    | CH405   | Principles of Organic Synthesis                           | 3  | 1                   | 0                   | 4                  |
|  | OE    | OPEN ELECTIVE-I    | 3   | 0   | 0  | 3                   |                     |                    |
| 2  | HSS   | MT204              | Constitution of India                           | 2   | 0  | 0                   | 0                   |                    |
| <b>LABORATORIES</b>  |       |                    |   |   |  |                     |                     |                    |
| 4  | PC    | CH406              | Physical Chemistry-VI Lab                       | 0   | 0  | 4                   | 2                   |                    |
|  |       | CH407              | Organic Chemistry-VI Lab                        | 0   | 0  | 4                   | 2                   |                    |
| <b>TOTAL</b>   |       |                    |   |   |  |                     | <b>24</b>           |                    |
| <b>THEORY</b>  |       |                    |   |   |  |                     |                     |                    |
| <b>SECOND</b>  | 4     | PC                 | CH408   | Advanced Inorganic Chemistry                              | 3  | 0                   | 0                   | 3                  |
|  |       |                    | CH409   | Quantum Chemistry & Group Theory                          | 3  | 1                   | 0                   | 4                  |
|  |       |                    | CH410   | Modern Organic Chemistry                                  | 3  | 0                   | 0                   | 3                  |
|  |       |                    | CH411   | Equilibrium, Non-Equilibrium & Statistical Thermodynamics | 3  | 0                   | 0                   | 3                  |
|  |       |                    | CH412   | Analytical Chemistry                                      | 3  | 1                   | 0                   | 4                  |
|  | OE    | OPEN ELECTIVE-II   | 3   | 0   | 0  | 3                   |                     |                    |
| <b>LABORATORIES</b>  |       |                    |   |   |  |                     |                     |                    |
| 4  | PC    | CH413              | Inorganic Chemistry-V Lab                       | 0   | 0  | 4                   | 2                   |                    |
|  | PC    | CH 414             | Theoretical & Computational Chemistry Lab       | 0   | 0  | 4                   | 2                   |                    |
| <b>TOTAL</b>   |       |                    |   |   |  |                     | <b>24</b>           |                    |
| <b>GRAND TOTAL FOR M.Sc. FIRST YEAR</b>                            |       |                    |   |   |  |                     | <b>48</b>           |                    |
| <b>THEORY</b>  |       |                    |   |   |  |                     |                     |                    |
| <b>THIRD</b>   | 5     | PC                 | CH501   | Spectroscopic Elucidation of Molecular Structure          | 3  | 1                   | 0                   | 4                  |
|  |       | PE                 | CH502/503/504                                   | PE-V (Inorganic/Physical/Organic) (Annexure-1)            | 3  | 1                   | 0                   | 4                  |
|  |       | PE                 | CH 505/506 /507                                 | PE-VI (Inorganic/Physical/Organic) (Annexure-1)           | 3  | 1                   | 0                   | 4                  |
| <b>LABORATORIES</b>  |       |                    |   |   |  |                     |                     |                    |
| 5  | PC    | CH508              | Advanced Characterization Lab                   | 0   | 0  | 4                   | 2                   |                    |
|  | PE    | CH509/510/511      | PE Lab (Inorganic/Physical/Organic)(Annexure-1) | 0   | 0  | 4                   | 2                   |                    |
|  | RP    | CH500              | Research Dissertation Part I                    | 0   | 0  | 4                   | 4                   |                    |
| <b>TOTAL</b>   |       |                    |   |   |  |                     | <b>20</b>           |                    |
| <b>THEORY</b>  |       |                    |   |   |  |                     |                     |                    |
| <b>FOURTH</b>  | 5     | PE                 | CH513/514/515                                   | PE-VII (Inorganic/Physical/Organic)(Annexure-1)           | 3  | 1                   | 0                   | 4                  |
|  |       | RP                 | CH550   | Research Dissertation Part II                             | 0  | 0                   | 8                   | 8                  |
| <b>TOTAL</b>   |       |                    |   |   |  |                     | <b>12</b>           |                    |
| <b>GRAND TOTAL FOR M.Sc. SECOND YEAR</b>                           |       |                    |   |   |  |                     | <b>32</b>           |                    |
| <b>GRAND TOTAL (M.Sc.) [M.Sc Sem I to Sem IV]</b>                  |       |                    |   |   |  |                     | <b>80</b>           |                    |

## ANNEXURE-I

**DEPARTMENT OF CHEMISTRY**  
**PROGRAM ELECTIVE (PE)**  
**Offered for M. Sc. Programme in Chemistry (Semester I-IV<sup>th</sup>)**

| LEVEL  | Code No. | Name of the Courses | Prerequisites                        | L               | T | P | C |   |
|--------|----------|---------------------|--------------------------------------|-----------------|---|---|---|---|
| PE-V   | 5        | CH502               | Solid State & Nuclear Chemistry      | B.Sc. Chemistry | 3 | 1 | 0 | 4 |
|        |          | CH503               | Molecular Spectroscopy               | B.Sc. Chemistry | 3 | 1 | 0 | 4 |
|        |          | CH504               | Advanced Organic Synthesis           | B.Sc. Chemistry | 3 | 1 | 0 | 4 |
| PE-VI  | 5        | CH505               | Bioinorganic Chemistry               | B.Sc. Chemistry | 3 | 1 | 0 | 4 |
|        |          | CH506               | Advanced Electrochemistry            | B.Sc. Chemistry | 3 | 1 | 0 | 4 |
|        |          | CH507               | Selected Topics in Organic Synthesis | B.Sc. Chemistry | 3 | 1 | 0 | 4 |
|        |          | CH509               | Special Lab(Inorganic)               | B.Sc. Chemistry | 0 | 0 | 4 | 2 |
|        |          | CH510               | Special Lab(Physical)                | B.Sc. Chemistry | 0 | 0 | 4 | 2 |
| PE-VII | 5        | CH511               | Special Lab(Organic)                 | B.Sc. Chemistry | 0 | 0 | 4 | 2 |
|        |          | CH513               | Inorganic Photochemistry             | B.Sc. Chemistry | 3 | 1 | 0 | 4 |
|        |          | CH514               | Chemical Application of Group Theory | B.Sc. Chemistry | 3 | 1 | 0 | 4 |
|        |          | CH515               | Interdisciplinary Organic Chemistry  | B.Sc. Chemistry | 3 | 1 | 0 | 4 |

## ANNEXURE-II

**DEPARTMENT OF CHEMISTRY**  
**OPEN ELECTIVES (OE\*)**  
**For PG Programme**

| LEVEL | Code no. | Name of the Courses | Prerequisites                          | L                    | T | P | C |     |
|-------|----------|---------------------|--|----------------------|---|---|---|-----|
| PG    | 4        | CH415               | Molecular Structure by X-ray and NMR   | BSc/B.Pharm          | 3 | 0 | 0 | 3   |
|       |          | CH416               | Electroanalytical techniques           | BSc /B.Pharm/B.TECH. | 3 | 0 | 0 | 3   |
|       |          | CH417               | Chemistry of metalloenzymes            | BSc /B.Pharm/B.TECH. | 3 | 0 | 0 | 3   |
|       |          | CH418               | Membrane science                       | BSc /B.Pharm/B.TECH. | 3 | 0 | 0 | 3   |
|       |          | CH419               | Environmental monitoring & control     | BSc /B.Pharm/B.TECH. | 3 | 0 | 0 | 3   |
|       |          | CH 420              | Research Methodology and Data Analysis | BSc /B.Pharm/B.TECH. | 3 | 0 | 0 | 3   |
|       |          | CH 421              | Nuclear and Radiation Chemistry        | BSc /B.Pharm/B.TECH. | 3 | 0 | 0 | 3   |
|       |          | CH422               | Fuel Chemistry-I                       | BSc /B.TECH          | 3 | 0 | 0 | 3   |
|       |          | CH423               | Fuel Chemistry-II                      | BSc/B. TECH.         | 3 | 0 | 0 | 3   |
|       |          | CH424               | Fuel Chemistry Lab                     | B.Sc./B.TECH.        | 0 | 0 | 3 | 1.5 |

\*OPEN ELECTIVE: To be opted students of other Department.