

| IDD Course Structure for Industrial Chemistry (2021-2022) | | | | | |
|---|------------|--|------------|------------------------|------------|
| Cat. | Deviati on | Programme Components | IC | Recommen ded (V Years) | |
| | | | | Min | Max |
| HU | 0 | Humanities and Social Science | 22 | 22 | 22 |
| IS | 0 | Science | 69 | 62 | 84 |
| IE | 0 | Institute Requirement Engineering/ Pharmacy | 59 | 41 | 60 |
| EP | 0 | Engineering Drawing (Manual and Computer Aided), Manufacturing Practices and Practice course of Department/ School | 18 | 18 | 24 |
| LM | 0 | Language and Management | 27 | 27 | 31 |
| DC/ MC | 0 | Department/Programme Core (Includes Stream Courses) | 155 | 105 | 175 |
| DE/ BE | 0 | Department/Programme Elective (Includes Stream Courses) | 63 | 60 | 105 |
| OE | -1 | Open Elective (Interdisciplinary Stream courses from Science/ Engineering/Pharmacy) | 54 | 55 | 100 |
| DP | 0 | Project/ Industrial visit/ Training | 30 | 20 | 50 |
| DT | 0 | Dissertation | 70 | 70 | 80 |
| | | Total | 567 | 540 | 570 |
| | | All Semester Total (Hons.) | 587 | 560 | 590 |

L: Lecture Hours; T: Tutorial Hours; P: Laboratory/Practical Hours; C: Credits

| Streams in IDD Industrial Chemistry | | | | | | |
|-------------------------------------|-------------|--|---|---|---|---------|
| Stream | Stream Code | Stream Title | L | T | P | Credits |
| CC | X1X | Computational Chemistry | | | | |
| IDD Pt. III (V Sem.) | CHI312 | Statistical Thermodynamics | 3 | 0 | 0 | 9 |
| IDD Pt. III (VI Sem.) | CHI411 | Molecular Simulation & Cheminformatics | 3 | 0 | 0 | 9 |
| IDD Pt. IV (VII Sem.) | CHI412 | Group Theory & Molecular Spectroscopy | 3 | 0 | 0 | 9 |
| | | | | | | |
| SC | X2X | Surface Chemistry | | | | |
| IDD Pt. III (VI Sem.) | CHI422 | Chemistry of Nanomaterials | 3 | 0 | 0 | 9 |
| IDD Pt. IV (VII Sem.) | CHI421 | Solid State Chemistry | 3 | 0 | 0 | 9 |
| IDD Pt. IV (VIII Sem.) | CHI423 | Adsorption and Heterogeneous Catalysis | 3 | 0 | 0 | 9 |
| | | | | | | |
| EC | X3X | | | | | |
| IDD Pt. III (V Sem.) | CHI331 | Environmental Chemistry | 2 | 0 | 0 | 6 |
| IDD Pt. III (VI Sem.) | CHI332 | Waste Management Technology | 3 | 0 | 0 | 9 |
| IDD Pt. IV (VII Sem.) | CHI432 | Advance Treatment Proceses for Water and Waste Water | 3 | 0 | 0 | 9 |
| IDD Pt. IV (VIII Sem.) | CHI431 | Bioremediation | 3 | 0 | 0 | 9 |

IDD Course Structure for Industrial Chemistry (2021-2022)

| UG-CRC Code | Course Code | Course Name | L-T-P | | | Credits |
|---|-------------|--|-----------|----------|-----------|-----------|
| Industrial Chemistry: 5-Year IDD I-Semester | | | | | | |
| IH.H101.14 | H101 | Universal Human Values - I: Self and Family | 2 | 0 | 0 | 6 |
| GY.PE101.14 | PE101 | Elementary Physical Education | 0 | 1 | 3 | 5 |
| GY.CP101.14 | CP101 | Creative Practices # | 0 | 1 | 3 | 5 |
| Total | | | 2 | 2 | 6 | 16 |
| LM.HL101.14 | HL101 | Basic English* | 2 | 0 | 1 | 7 |
| Total | | | 4 | 2 | 7 | 23 |
| #Creative Practices course to be announced by Dean Academic Office | | | | | | |
| *Basic English course to be taken by student as recommended after Diagnostic Test | | | | | | |
| Industrial Chemistry: 5-Year IDD I-Semester | | | | | | |
| IS.PHY101.14 | PHY101 | Physics - I: Classical, Quantum & Relativistic Mechanics | 3 | 1 | 2 | 13 |
| IS.CY101.14 | CY101 | Chemistry - I | 2 | 1 | 2 | 10 |
| IS.MA102.14 | MA102 | Engineering Mathematics - II | 3 | 1 | 0 | 11 |
| IE.ME103.14 | ME103 | Engineering Thermodynamics | 3 | 1 | 0 | 11 |
| MC.CHO103.14 | CHO103 | Process Calculation | 2 | 1 | 0 | 8 |
| EP.ME105.14 | ME105 | Manufacturing Practice - I | 0 | 0 | 3 | 3 |
| Total | | | 13 | 5 | 7 | 56 |
| Industrial Chemistry: 5-Year IDD II-Semester | | | | | | |
| IS.CY102.14 | CY102 | Chemistry - II | 3 | 1 | 2 | 13 |
| IS.MA101.14 | MA101 | Engineering Mathematics – I | 3 | 1 | 0 | 11 |
| EP.ME104.14 | ME104 | Engineering Drawing | 1 | 0 | 3 | 6 |
| DC.MS101.14 | MS101 | Introduction to Engineering Materials | 3 | 0 | 0 | 9 |
| EP.CHI101.14 | CHI101 | Industrial Chemistry Practice Course | 1 | 0 | 3 | 6 |
| EP.ME106.14 | ME106 | Manufacturing Practices - II | 0 | 0 | 3 | 3 |
| IH.H103.14 | H103 | Development of Societies # | 2 | 1 | 0 | 8 |
| IH.H104.14 | H104 | History and Civilization # | | | | |
| Total | | | 13 | 3 | 11 | 56 |
| # Student has to choose one course from H103 & H104. | | | | | | |
| Industrial Chemistry: 5-Year IDD III-Semester | | | | | | |
| IS.MA201.14 | MA201 | Numerical Techniques | 3 | 1 | 0 | 11 |
| IE.CHO101.14 | CHO101 | Heat and Mass Transfer | 3 | 1 | 0 | 11 |
| IE.CHO102.14 | CHO102 | Fluid Mechanics | 3 | 1 | 0 | 11 |
| MC.CHO201.15 | CHO201 | Chemical Reaction Engineering - I | 2 | 1 | 0 | 8 |
| DC.CHI311.15 | CHI311 | Classical Thermodynamics | 3 | 0 | 0 | 9 |
| DP.CHI291.15 | CHI291 | Exploratory Project | 0 | 0 | 5 | 5 |
| IH.H105.14 | H105 | Philosophy # | 2 | 1 | 0 | 8 |
| IH.H106.14 | H106 | Education and Self # | | | | |
| Total | | | 16 | 5 | 5 | 63 |
| # Student has to choose one course from H105 & H106. | | | | | | |
| Industrial Chemistry: 5-Year IDD IV-Semester | | | | | | |
| IE.EO102.14 | EO102 | Fundamentals of Electronics and Instrumentation | 3 | 1 | 2 | 13 |
| IE.CSO101.14 | CSO101 | Computer Programing | 3 | 1 | 2 | 13 |
| MC.CHO203.15 | CHO203 | Chemical Reaction Engineering - II | 2 | 1 | 0 | 8 |
| MC.CHO204.15 | CHO204 | Chemical Reaction Engineering Laboratory | 0 | 0 | 2 | 2 |

| | | | | | | |
|--------------|--------|--|-----------|----------|----------|-----------|
| MC.CHI313.15 | CHI313 | Quantum Chemistry, Group Theory and Molecular Spectroscopy | 3 | 0 | 0 | 9 |
| DC.CHI341.15 | CHI341 | Chemistry of Coordination Compounds | 3 | 0 | 3 | 12 |
| | | Total | 14 | 3 | 9 | 57 |

| Industrial Chemistry: 5-Year IDD V-Semester | | | | | | |
|---|---------|---|-----------|----------|-----------|-----------|
| DC.CHI342.16 | CHI342 | Chemistry of Transition and Inner Transition Elements | 2 | 1 | 3 | 11 |
| DC.CHI251.16 | CHI251 | Chemistry of Heterocyclic Compounds | 3 | 0 | 3 | 12 |
| DC.CHI321.16 | CHI321 | Reaction Kinetics | 3 | 0 | 2 | 11 |
| DE.CHI3XX.16 | CHI3XX | Departmental Elective (DE) - 1 | 3 | 0 | 0 | 9 |
| OE - 1 | OE - 1 | Open Elective - 1 | 3 | 0 | 0 | 9 |
| DC.CHI451.16 | CHI451 | Spectroscopic Identification of Organic Compounds | 3 | 0 | 0 | 9 |
| | | Total | 17 | 1 | 8 | 61 |
| DP.CHI391S.16 | CHI391S | Stream Project (Hons.) | 0 | 0 | 10 | 10 |
| | | Total | 17 | 1 | 18 | 71 |

| List of Electives DE1 | | | | | | |
|-----------------------|--------|-----------------------------|---|---|---|---|
| MC.CHO301.16 | CHO301 | Chemical Technology | 3 | 0 | 0 | 9 |
| DE.CHI301.16 | CHI301 | Petrochemicals and Polymers | 3 | 0 | 0 | 9 |
| DE.CHI312.16 | CHI312 | Statistical Thermodynamics | 3 | 0 | 0 | 9 |
| DE.CHI331.16 | CHI331 | Environmental Chemistry | 3 | 0 | 0 | 9 |

| Industrial Chemistry: 5-Year IDD VI-Semester | | | | | | |
|--|--------------------|--|-----------|----------|-----------|-----------|
| DC.CHI352.16 | CHI352 | Synthesis and Mechanism in Organic Chemistry | 2 | 1 | 3 | 11 |
| DC.CHI322.16 | CHI322 | Electro Chemistry and Surface Phenomena | 3 | 0 | 0 | 9 |
| DE.CHI3XX.16 | CHI3XX | Departmental Elective (DE) - 2 | 3 | 0 | 0 | 9 |
| OE - 2 | OE - 2 | Open Elective - 2 | 3 | 0 | 0 | 9 |
| DC.CHI411.16 | CHI411 | Molecular Simulation | 3 | 0 | 0 | 9 |
| DP.CHI392/S.16 | CHI392/ CHI392S | Stream or UG Project | 0 | 0 | 10 | 10 |
| | | Total | 14 | 1 | 13 | 57 |

| List of Electives DE-2 | | | | | | |
|------------------------|--------|-----------------------------|---|---|---|---|
| DE.CY410.18 | CY410 | Bioinorganic Chemistry | 3 | 0 | 0 | 9 |
| DE.CHI332.16 | CHI332 | Waste Management Technology | 3 | 0 | 0 | 9 |

| Industrial Chemistry: 5-Year IDD Summer - Semester | | | | | | |
|--|--------|--|----------|----------|----------|----------|
| DP.CHI393.15 | CHI393 | Project / Industrial Project / Industrial Training | 0 | 0 | 5 | 5 |
| | | Total | 0 | 0 | 5 | 5 |

| Industrial Chemistry: 5-Year IDD VII-Semester | | | | | | |
|---|--------|-----------------------------------|-----------|----------|-----------|-----------|
| DC.CHI441.16 | CHI441 | Organometallic Chemistry | 3 | 0 | 0 | 9 |
| DC.CHI421.16 | CHI421 | Solid State Chemistry | 3 | 0 | 0 | 9 |
| DE.CHI4XX | CHI4XX | Departmental Elective (DE) - 3 | 3 | 0 | 0 | 9 |
| OE - 3 | OE - 3 | Open Elective - 3 | 3 | 0 | 0 | 9 |
| LM | LM | Language and Management Course | 3 | 0 | 0 | 9 |
| DP.CHI491.15 | CHI491 | UG Project (Non-Hons. Students) | 0 | 0 | 10 | 10 |
| | | Total (Non-Hons. Students) | 15 | 0 | 10 | 55 |

| | | | | | | |
|---------------|---------|---------------------------------|-----------|----------|-----------|-----------|
| DP.CHI491S.15 | CHI491S | Stream Project (Hons. Students) | 0 | 0 | 20 | 20 |
| | | Total (Hons. Students) | 14 | 1 | 33 | 65 |

List of Electives DE3

| | | | | | | |
|--------------|--------|--|---|---|---|---|
| DE.CHI403.16 | CHI403 | Nuclear and Radiation Chemistry | 3 | 0 | 0 | 9 |
| DE.CHI412.16 | CHI412 | Group Theory & Molecular Spectroscopy | 3 | 0 | 0 | 9 |
| DE.CHI432.16 | CHI432 | Advance Treatment Proceses for Water and Waste Water | 3 | 0 | 0 | 9 |

Industrial Chemistry: 5-Year IDD VIII-Semester

| | | | | | | |
|--------------|---------|--------------------------------|-----------|----------|-----------|-----------|
| DE.CHI4XX.16 | CHI4XX | Department Electives (DE) - 4 | 3 | 0 | 0 | 9 |
| DE.CHI4XX.16 | CHI4XX | Department Electives (DE) - 5 | 3 | 0 | 0 | 9 |
| DE.CHI4XX.16 | CHI4XX | Department Electives (DE) - 6 | 3 | 0 | 0 | 9 |
| OE - 04 | OE - 04 | Open Electives - 4 | 3 | 0 | 0 | 9 |
| DT.CHI492.16 | CHI492 | Thesis | 0 | 0 | 10 | 10 |
| LM | LM | Language and Management Course | 3 | 0 | 0 | 9 |
| | | Total | 15 | 0 | 10 | 55 |

Elective / Stream DE Courses-4-6 (Any three to be selected)

| | | | | | | |
|--------------|--------|---|---|---|---|---|
| DE.CHI452.16 | CHI452 | Chemistry of Bio-molecules | 3 | 0 | 0 | 9 |
| DE.CHI442.16 | CHI442 | Bio-inorganic Chemistry | 3 | 0 | 0 | 9 |
| DE.CHI461.16 | CHI461 | Instrumental Methods of Chemical Analysis | 3 | 0 | 0 | 9 |
| DE.CHI423.16 | CHI423 | Adsorption and Heterogeneous Catalysis | 3 | 0 | 0 | 9 |
| DE.CHI431.16 | CHI431 | Bioremediation | 3 | 0 | 0 | 9 |

Industrial Chemistry: 5-Year IDD IX-Semester

| | | | | | | |
|--------------|---------|--------------------------------|-----------|----------|-----------|-----------|
| DE.CHI5XX.16 | CHI5XX | Department Elective (DE) - 7 | 3 | 0 | 0 | 9 |
| OE - 05 | OE - 05 | Open Elective - 5 | 3 | 0 | 0 | 9 |
| OE - 06 | OE - 06 | Open Elective - 6 | 3 | 0 | 0 | 9 |
| LM | LM | Language and Management Course | 3 | 0 | 0 | 9 |
| DT.CHI591.16 | CHI591 | Thesis | 0 | 0 | 10 | 10 |
| | | Total | 12 | 0 | 10 | 46 |

Elective / Stream DE Courses-7

| | | | | | | |
|--------------|--------|--|---|---|---|---|
| DE.CHI561.16 | CHI561 | Sensor Science and Technology | 3 | 0 | 0 | 9 |
| DE.CHI541.16 | CHI541 | Supramolecular Chemistry | 3 | 0 | 0 | 9 |
| DE.CY517.17 | CY517 | Lasers and their applications in Chemistry & Biology | 3 | 0 | 0 | 9 |
| DE.CY524.18 | CHI524 | Bioinspired Energy Conversion | 3 | 0 | 0 | 9 |
| DE.CHI511.19 | CHI511 | Environmental Impact and Risk Assesment Technology | 3 | 0 | 0 | 9 |
| DE.CHI501.16 | CHI501 | Green Chemistry | 3 | 0 | 0 | 9 |

Industrial Chemistry: 5-Year IDD X-Semester

| | | | | | | |
|--------------|--------|--------------|----------|----------|-----------|-----------|
| DT.CHI592.16 | CHI592 | Thesis | 0 | 0 | 50 | 50 |
| | | Total | 0 | 0 | 50 | 50 |

L: Lecture hours; T: Tutorial hours; P: Laboratory/ Practical hours; C: Credits