**Model Curriculum Scheme**

**for**

**Undergraduate Degree Course**

**in**

**Bachelor of Technology (B.Tech)**

**Chemical Engineering (CHE)**

**(Credit-Based Scheme of Studies/Examination for 3rd to 8th semester in Phased Manner)**



**KURUKSHETRA UNIVERSITY, KURUKSHETRA (K.U.K) – 136119, HARYANA, INDIA**

**Bachelor of Technology in CHEMICAL ENGINEERING**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA (K.U.K) – 136119, HARYANA, INDIA**

**A. Definition of Credit:**

|  |  |
| --- | --- |
| 1 Hour Lecture (L) per week | 1 credit |
| 1HourTutorial (T) per week | 1 credit |
| 1 HourPractical (P) per week | 0.5 credit |
| 2 Hours Practical(Lab) per week | 1 credit |

**B. Range of Credits:**

A total credit of 160is required for a student to be eligible to get Under Graduate degreein ChemicalEngineering.A student will be eligible to get Under Graduate degree with Honours or additional Minor Engineering, if he/she completes an additional 20 credits. These could be acquired through MOOCs.

**C.** **Abbreviations Used for Various Course Codes:**

BS: Basic Science Courses

ES: Engineering Science Courses

HM: Humanities and Social Sciences including Management Courses

PC: Professional Core Courses

MC: Mandatory Courses

PE: Professional Elective Courses/Program Elective Courses

OE: Open Elective Courses

PROJ: Project

CHE: Chemical Engineering

OE-CHE: Open Elective Courses-Chemical Engineering

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| **Bachelor of Technology (Chemical Engineering)** | | | | | | | | | | |
| **Credit-Based Scheme of Studies/Examination** | | | | | | | | | | |
| **Semester III (w.e.f. session 2019-2020)** | | | | | | | | | | |
| **S. No.** | **Course Code** | **Subject** | **L:T:P** | **Hours/Week** | **Credits** | **Examination Schedule (Marks)** | | | | **Duration of Exam (Hrs.)** |
|
| **Major Test** | **Minor Test** | **Practical** | **Total** |
| 1. | ES-CHE-201A | Chemical Engineering Thermodynamics-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2. | BS-CH-203A | Chemistry-II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3. | PC-CHE-203A | Chemical Engineering Process Calculations | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 4. | PC-CHE-205A | Fluid Flow | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5. | BS-205A | Advanced Engineering Mathematics | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6. | PC-CHE-207A | Unit Processes | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 7. | BS-CH-209LA | Chemistry-II (Lab) | 0:0:3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 8. | PC-CHE-211LA | Fluid Flow Lab | 0:0:3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| **Total** | | |  | **25** | **22** | **450** | **230** | **120** | **800** |  |
| 9. | SIM-201A\* | Seminar on Summer Internship | 2:0:0 | 2 | 0 | 0 | 50 | 0 | 50 |  |

**\*Note:** SIM-201A\* is a mandatory credit-less course in which the students will be evaluated for the Summer Internship (training)undergone after 2nd semester and students will be required to get passing marks to qualify.

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| **Bachelor of Technology (Chemical Engineering)** | | | | | | | | | | |
| **Credit-Based Scheme of Studies/Examination** | | | | | | | | | | |
| **Semester IV(w.e.f. session 2019-2020 )** | | | | | | | | | | |
| **S. No.** | **Course Code** | **Subject** | **L:T:P** | **Hours/Week** | **Credits** | **Examination Schedule (Marks)** | | | | **Duration of Exam (Hrs)** |
|
| **Major Test** | **Minor Test** | **Practical** | **Total** |
| 1 | HM-202A | Fundamental of management | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | PC-CHE-204A | Heat Transfer | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 3 | PC-CHE-206A | Mechanical Operations | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PC-CHE-208A | Numerical Methods in Chemical Engineering | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | ES-CHE-212A | Material Technology | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PC-CHE-214LA | Heat Transfer (Lab) | 0:0:3 | 4 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 7 | PC-CHE-216LA | Mechanical Operations (Lab) | 0:0:3 | 4 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| **Total** | | |  | **24** | **19** | **375** | **205** | **120** | **700** |  |
| 8 | MC-901A | Environmental Sciences | 3:0:0 | 3 | 0 |  | 100 | 0 | 100 | 3 |

**Note:**

1. Students be encouraged to go to 6-8 weeks summer internships mandatory during the summer break after the completion of fourth semester exams.
2. MC-901A is a mandatory credit-less course in which the students will be required to get passing marks to qualify.

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| **Bachelor of Technology (Chemical Engineering)** | | | | | | | | | | |
| **Credit-Based Scheme of Studies/Examination** | | | | | | | | | | |
| **Semester V(w.e.f. session 2020-2021 )** | | | | | | | | | | |
| **S. No.** | **Course Code** | **Subject** | **L:T:P** | **Hours/Week** | **Credits** | **Examination Schedule (Marks)** | | | | **Duration of Exam (Hrs.)** |
|
| **Major Test** | **Minor Test** | **Practical** | **Total** |
| 1 | PC-CHE-301A | Chemical Reaction Engineering-I | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 2 | PC-CHE-303A | Chemical Technology-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | PC-CHE-305A | Mass Transfer-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PC-CHE-307A | Thermodynamics-II | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 5 | PC-CHE-309A | Process Instrumentation | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PC-CHE-311LA | Chemical Reaction Engineering-I (Lab) | 0:0:3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 7 | PC-CHE-313LA | Mass Transfer-I (Lab) | 0:0:3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| **Total** | | |  | **23** | **20** | **375** | **205** | **120** | **700** |  |
| 9 | MC-904A | Energy Resources & Management | 3:0:0 | 3 | 0 | 0 | 100 | 0 | 100 | 3 |
| 10 | SIM-301A\* | Seminar on Summer Internship | 2:0:0 | 2 | 0 | 0 | 50 | 0 | 50 | 2 |

**\*Note:**

1. SIM-301A\*is a mandatory credit-less course in which the students will be evaluated for the Summer Internship undergone after 4th semester and students will be required to get passing marks to qualify.
2. MC-904A is a mandatory credit-less course in which the students will be required to get passing marks to qualify.

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| **Bachelor of Technology (Chemical Engineering)** | | | | | | | | | | |
| **Credit-Based Scheme of Studies/Examination** | | | | | | | | | | |
| **Semester VI(w.e.f. session 2020-2021)** | | | | | | | | | | |
| **S. No.** | **Course Code** | **Subject** | **L:T:P** | **Hours/Week** | **Credits** | **Examination Schedule (Marks)** | | | | **Duration of Exam (Hrs)** |
|
| **Major Test** | **Minor Test** | **Practical** | **Total** |
| 1 | PC-CHE-302A | Chemical Reaction Engineering-II | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 2 | PC-CHE-304A | Chemical Technology-II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | PC-CHE-306A | Mass Transfer-II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PC-CHE-308A | Process Dynamics Control | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | PE- | Elective-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PC-CHE-310LA | Chemical Reaction Engineering-II (Lab) | 0:0:3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| 7 | PC-CHE-312LA | Mass Transfer-II (Lab) | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 8 | PC-CHE-314LA | Process Dynamics Control (Lab) | 0:0:3 | 3 | 1.5 | 0 | 40 | 60 | 100 | 3 |
| **Total** | | |  | **25** | **20** | **375** | **245** | **180** | **800** |  |

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|  | **PEC Elective-I** | |
| **S.No.** | **Course Code** | **Subject** |
| 1. | PE-CHE-316A | Water Conservation and Management |
| 2. | PE-CHE-318A | Polymer Science and Engineering: |
| 3. | PE-CHE-320A | Nanoscience and Nanotechnology |
| 4. | PE-CHE-322A | Food Technology |

**Note: Students be encouraged to go to 6-8 weeks summer internships mandatory during the summer break after the completion of sixth semester exams.**

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| **Bachelor of Technology (Chemical Engineering)** | | | | | | | | | | |
| **Credit-Based Scheme of Studies/Examination** | | | | | | | | | | |
| **Semester VII(w.e.f. session 2021-2022 )** | | | | | | | | | | |
| **S. No.** | **Course Code** | **Subject** | **L:T:P** | **Hours/Week** | **Credits** | **Examination Schedule (Marks)** | | | | **Duration of Exam (Hrs)** |
|
| **Major Test** | **Minor Test** | **Practical** | **Total** |
| 1 | PC-CHE-401A | Process Modeling and Simulation | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 2 | PC-CHE-403A | Petroleum Processing Engineering | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | PC-CHE-405A | Process Equipment Design | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PE- | Elective-II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | OE- | Open Elective-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PC-CHE-407LA | Process Modeling and Simulation (Lab) | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| **Total** | | |  | **18** | **17** | **375** | **165** | **60** | **600** |  |
| 7 | SIM-401A\* | Seminar on Summer Internship | 2:0:0 | 2 | 0 | 0 | 50 | 0 | 50 | 3 |

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|  | **PEC Elective-II** | |
| **S.No.** | **Course Code** | **Subject** |
| 1. | PE-CHE-409A | Pulp and Paper Technology |
| 2. | PE-CHE-411A | Catalytic Processes |
| 3. | PE-CHE-413A | Novel Separation Techniques |
| 4. | PE-CHE-415A | Fermentation Technology |

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|  | **OEC Elective-I** | |
| **S.No.** | **Course Code** | **Subject** |
| 1. | OE-CHE-417A | Pollution and Control |
| 2. | OE-CHE-419A | Management Information System |
| 3. | OE-CHE-421A | Energy Audit |
| 4. | OE-CHE-423A | Bioinformatics |

**\*Note:** SIM-401A\* is a mandatory credit-less course in which the students will be evaluated for Summer Internshipundergone after 6th semester and students will be required to get passing marks to qualify.

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| **Bachelor of Technology (Chemical Engineering)** | | | | | | | | | | |
| **Credit-Based Scheme of Studies/Examination** | | | | | | | | | | |
| **Semester VIII(w.e.f. session 2021-2022 )** | | | | | | | | | | |
| **S. No.** | **Course Code** | **Subject** | **L:T:P** | **Hours/Week** | **Credits** | **Examination Schedule (Marks)** | | | | **Duration of Exam (Hrs)** |
|
| **Major Test** | **Minor Test** | **Practical** | **Total** |
| 1 | PC-CHE-402A | Process Engineering and Technology | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | PC-CHE-404A | Energy Technology | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | PC-CHE-406A | Industrial Hazards and Safety | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PE | Elective-II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | OE | Open Elective-II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PROJ-CHE-408A | Major Project | 0:0:12 | 12 | 6 | 0 | 75 | 125 | 200 | 3 |
|  |  | **Total** |  | **27** | **21** | **375** | **200** | **125** | **700** |  |

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|  | **PEC Elective-III** | |
| **S.No.** | **Course Code** | **Subject** |
| 1. | PE-CHE-410A | Introduction to Bio-chemical Engineering |
| 2. | PE-CHE-412A | Optimization Techniques in Chemical engineering |
| 3. | PE-CHE-414A | Petrochemical Engineering |
| 4. | PE-CHE-416A | Fuel Cell Technology |

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|  | **OEC Elective-II** | |
| **S.No.** | **Course Code** | **Subject** |
| 1. | OE-CHE-418A | Energy Resources & Technology |
| 2. | OE-CHE-420A | Entrepreneurship |
| 3. | OE-CHE-422A | Consumer Electronics |
| 4. | OE-CHE-424A | Modern Vehicle Technology |

**Note: The course of both PE & OE will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**