# MCKV INSTITUTE OF ENGINEERING

**NAAC Accredited "A" Grade Autonomous Institute under UGC Act 1956**
**Approved by AICTE & affiliated to Maulana Abul Kalam Azad University of Technology, West Bengal**

**243 G.T. Road (N), Liluah, Howrah- 711204, West Bengal, India**
Ph: +91 33 26549315/17   Fax +91 33 26549318   Web: www.mckvie.edu.in/

# Curriculum for Undergraduate Degree (B.Tech.) in Information Technology (w.e.f. AY: 2020-21)

## Part I: Introduction, Theme & Category wise Credit Distribution

**A. Definition of Credit**:

| Sl. No. | Description | Credit |
|---|---|---|
| 1 | 1 Hr. Lecture (L) Per Week | 1.0 |
| 2 | 1 Hr. Tutorial (T) Per Week | 1.0 |
| 3 | 1 Hr. Practical/ Lab (P) Per Week | 0.5 |
| 4 | 2 Hrs. Practical/ Lab (P) Per Week | 1.0 |

**B. Range of Credits:**

As per AICTE, a student covering 160 credits during 4 years of studies as per curriculum of the Institute will be eligible to get Under Graduate B.Tech. degree. A student will be eligible to get B.Tech. degree with Honours, if he/ she completes an additional 20 credits. These could be acquired through MOOCs prescribed by the Institute. Every student admitted to the 4 years B.Tech. programme is required to earn a minimum of 100 Activity Points under Mandatory Additional Requirement (MAR), in addition to the required academic grades, for getting B.Tech./ B.Tech. (Honours) degree.

**C. Category wise Credit Distribution:**

| Sl. No. | Category | Credit Allotted | Credit as per AICTE |
|---|---|---|---|
| 1 | Humanities and Social Sciences including Management Courses | 12 | 12 |
| 2 | Basic Science Courses | 27 | 25 |
| 3 | Engineering Science Courses including Workshop, Drawing, Basics of Electrical/ Mechanical/ Computer etc. | 24.5 | 24 |
| 4 | Professional Core Courses | 50 | 48 |
| 5 | Professional Elective Courses relevant to chosen specialization/ branch | 19.5 | 18 |
| 6 | Open Elective Courses from other technical and /or emerging subjects | 12 | 18 |
| 7 | Project Work, Seminar and Internship in Industry or elsewhere | 15 | 15 |
| 8 | Mandatory Courses [Environmental Sciences, Induction Training, Indian Constitution, Essence of Indian Traditional Knowledge, Aptitude Skill] | Non-Credit | Non-Credit |
| | Total | 160 | 160 |

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## D. Course Code and Definition:

| Sl. No. | Course Code | Definitions |
|---------|-------------|-------------|
| 1 | L | Lecture |
| 2 | T | Tutorial |
| 3 | P | Practical |
| 4 | BS | Basic Science Courses |
| 5 | ES | Engineering Science Courses |
| 6 | HM | Humanities and Social Sciences including Management Courses |
| 7 | PC | Professional Core Courses |
| 8 | PE | Professional Elective Courses |
| 9 | OE | Open Elective Courses |
| 10 | MC | Mandatory Courses |
| 11 | PW | Project/ Internships/ Sessional |

## E. Courses in different Category:

| Humanities and Social Sciences including Management Courses | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Semester | Course Code | Course Name | Contact Hours | | | Credits |
| | | | | L | T | P | |
| **Theory** | | | | | | | |
| 1 | I | HM-HU101 | English | 2 | 0 | 0 | 2 |
| 2 | III | HM-HU301 | Introduction to Industrial Management | 2 | 0 | 0 | 2 |
| 3 | V | HM-HU501 | Economics for Engineers | 3 | 0 | 0 | 3 |
| 4 | VII | HM-HU703 | Project Management and Entrepreneurship | 3 | 0 | 0 | 3 |
| | | *Total Theory* | | **10** | **0** | **0** | **10** |
| **Practical/ Sessional** | | | | | | | |
| 1 | II | HM-HU291 | Language Laboratory | 0 | 0 | 2 | 1 |
| 2 | V | HM-HU591 | Soft Skill Development Lab | 0 | 0 | 2 | 1 |
| | | *Total Practical/ Sessional* | | **0** | **0** | **4** | **2** |
| | | **Total** | | **10** | **0** | **4** | **12** |

| Basic Science Courses | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Semester | Course Code | Course Name | Contact Hours | | | Credits |
| | | | | L | T | P | |
| **Theory** | | | | | | | |
| 1 | I | BS-PH101 | Physics | 3 | 1 | 0 | 4 |
| 2 | I | BS-M101 | Mathematics-I | 3 | 1 | 0 | 4 |
| 3 | II | BS-CH201 | Chemistry | 3 | 1 | 0 | 4 |
| 4 | II | BS-M201 | Mathematics-II | 3 | 1 | 0 | 4 |

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| 5 | III | BS-M301 | Mathematics-III | 3 | 0 | 0 | 3 |
|---|-----|---------|-----------------|---|---|---|---|
| 6 | IV | BS-M404 | Numerical Methods | 2 | 0 | 0 | 2 |
| 7 | IV | BS-BIO401 | Biology | 2 | 0 | 0 | 2 |
| *Total Theory* | | | | **19** | **4** | **0** | **23** |
| **Practical/ Sessional** | | | | | | | |
| 1 | I | BS-PH191 | Physics Laboratory | 0 | 0 | 3 | 1.5 |
| 2 | II | BS-CH291 | Chemistry Laboratory | 0 | 0 | 3 | 1.5 |
| 3 | IV | BS-M494 | Numerical Methods Lab | 0 | 0 | 2 | 1 |
| *Total Practical/ Sessional* | | | | **0** | **0** | **8** | **4** |
| **Total** | | | | **19** | **4** | **8** | **27** |

| Engineering Science Courses including Workshop, Drawing, Basics of Electrical/ Mechanical/ Computer etc. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Semester | Course Code | Course Name | Contact Hours | | | Credits |
| | | | | L | T | P | |
| **Theory** | | | | | | | |
| 1 | I | ES-EE101 | Basic Electrical and Electronics Engineering | 3 | 1 | 0 | 4 |
| 2 | II | ES-CS201 | Programming for Problem Solving | 3 | 0 | 0 | 3 |
| 3 | III | ES-EC303 | Analog and Digital Electronics | 3 | 0 | 0 | 3 |
| 4 | IV | ES-IT401 | Discrete Mathematics | 3 | 0 | 0 | 3 |
| *Total Theory* | | | | **12** | **1** | **0** | **13** |
| **Practical/ Sessional** | | | | | | | |
| 1 | I | ES-EE191 | Basic Electrical and Electronics Engineering Lab | 0 | 0 | 4 | 2 |
| 2 | I | ES-ME191 | Engineering Graphics and Design Lab | 1 | 0 | 4 | 3 |
| 3 | II | ES-CS291 | Programming for Problem Solving Lab | 0 | 0 | 4 | 2 |
| 4 | II | ES-ME292 | Workshop/ Manufacturing Practices | 1 | 0 | 4 | 3 |
| 5 | III | ES-EC393 | Analog and Digital Electronics Lab | 0 | 0 | 3 | 1.5 |
| *Total Practical/ Sessional* | | | | **2** | **0** | **19** | **11.5** |
| **Total** | | | | **14** | **1** | **19** | **24.5** |

| Professional Core Courses | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Semester | Course Code | Course Name | Contact Hours | | | Credits |
| | | | | L | T | P | |

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**Theory**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | III | PC-IT301 | Data Structure and Algorithms | 3 | 1 | 0 | 4 |
| 2 | III | PC-IT302 | Computer Organization and Architecture | 3 | 0 | 0 | 3 |
| 3 | IV | PC-IT401 | Database Management System | 3 | 0 | 0 | 3 |
| 4 | IV | PC-IT402 | Design and Analysis of Algorithms | 3 | 1 | 0 | 4 |
| 5 | IV | PC-IT403 | Formal Language and Automata Theory | 3 | 0 | 0 | 3 |
| 6 | V | PC-IT501 | Compiler Design | 2 | 0 | 0 | 2 |
| 7 | V | PC-IT502 | Operating Systems | 3 | 0 | 0 | 3 |
| 8 | V | PC- IT503 | Object Oriented Programming | 3 | 0 | 0 | 3 |
| 9 | VI | PC-IT601 | Software Engineering | 3 | 0 | 0 | 3 |
| 10 | VI | PC-IT602 | Computer Networks | 3 | 0 | 0 | 3 |
| | | *Total Theory* | | **29** | **2** | **0** | **31** |

**Practical/ Sessional**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | III | PC-IT393 | IT Workshop (Sci. Lab/MATLAB/Python/R) | 0 | 0 | 4 | 2 |
| 2 | III | PC-IT391 | Data Structure and Algorithms Lab | 0 | 0 | 4 | 2 |
| 3 | III | PC-IT392 | Computer Organization and Architecture Lab | 0 | 0 | 4 | 2 |
| 4 | IV | PC-IT491 | Database Management System Lab | 0 | 0 | 4 | 2 |
| 5 | IV | PC-IT492 | Design and Analysis of Algorithms Lab | 0 | 0 | 4 | 2 |
| 6 | V | PC-IT591 | Compiler Design Lab | 0 | 0 | 3 | 1.5 |
| 7 | V | PC-IT592 | Operating Systems Lab | 0 | 0 | 4 | 2 |
| 8 | V | PC-IT593 | Object Oriented Programming Lab | 0 | 0 | 4 | 2 |
| 9 | VI | PC-IT691 | Software Engineering Lab | 0 | 0 | 3 | 1.5 |
| 10 | VI | PC-IT692 | Computer Networks Lab | 0 | 0 | 4 | 2 |
| | | *Total Practical/ Sessional* | | **0** | **0** | **38** | **19** |
| | | **Total** | | **29** | **2** | **38** | **50** |

| Professional Elective Courses relevant to chosen specialization/ branch | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Semester | Course Code | Course Name | Contact Hours | | | Credits |
| | | | | L | T | P | |
| **Theory** | | | | | | | |
| 1 | V | PE-IT501 | Professional Elective-I | 3 | 0 | 0 | 3 |
| 2 | VI | PE-IT601 | Professional Elective-II | 3 | 0 | 0 | 3 |

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| | | | | L | T | P | |
|---|---|---|---|---|---|---|---|
| 3 | VI | PE-IT602 | Professional Elective-III | 3 | 0 | 0 | 3 |
| 4 | VII | PE-IT701 | Professional Elective-IV | 3 | 0 | 0 | 3 |
| 5 | VII | PE-IT702 | Professional Elective-V | 3 | 0 | 0 | 3 |
| 6 | VIII | PE- IT801 | Professional Elective-VI | 3 | 0 | 0 | 3 |
| | | | *Total Theory* | **18** | **0** | **0** | **18** |
| **Practical/ Sessional** | | | | | | | |
| 1 | VI | PE-IT691 | Professional Elective-II Lab | 0 | 0 | 3 | 1.5 |
| | | | *Total Practical/ Sessional* | **0** | **0** | **3** | **1.5** |
| | | | **Total** | **18** | **0** | **3** | **19.5** |

| Open Elective Courses from other technical and / or emerging Subjects | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Semester | Course Code | Course Name | **Contact Hours** | | | Credits |
| | | | | L | T | P | |
| **Theory** | | | | | | | |
| 1 | VI | OE-CS/EC601 | Open Elective-I | 3 | 0 | 0 | 3 |
| 2 | VII | OE-HU/CS701 | Open Elective-II | 3 | 0 | 0 | 3 |
| 3 | VIII | OE-CS/ME801 | Open Elective-III | 3 | 0 | 0 | 3 |
| 4 | VIII | OE-HU/M801 | Open Elective-IV | 3 | 0 | 0 | 3 |
| | | | *Total Theory* | **12** | **0** | **0** | **12** |
| **Practical/ Sessional** | | | | | | | |
| | | | | | | | |
| | | | *Total Practical/Sessional* | | | | |
| | | | **Total** | **12** | **0** | **0** | **12** |

| Project Work, Seminar and Internship in Industry or elsewhere | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Semester | Course Code | Course Name | **Contact Hours** | | | Credits |
| | | | | L | T | P | |
| **Theory** | | | | | | | |
| | | | | | | | |
| | | | *Total Theory* | | | | |
| **Practical/ Sessional** | | | | | | | |
| 1 | V | PW-IT581 | Project-I | 0 | 0 | 2 | **1** |
| 2 | VI | PW-IT681 | Project-II | 0 | 0 | 2 | **1** |
| 3 | VII | PW-IT781 | Project-III | 0 | 0 | 12 | 6 |
| 4 | VII | PW-IT782 | Practical Training Evaluation | 0 | 0 | 0 | 1 |

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| 5 | VIII | PW-IT881 | Project-IV | 0 | 0 | 12 | 6 |
|---|---|---|---|---|---|---|---|
| | | | *Total Practical/ Sessional* | **0** | **0** | **28** | **15** |
| | | | **Total** | **0** | **0** | **28** | **15** |

| Mandatory Courses<br>[Environmental Sciences, Induction Training, Indian Constitution, Essence of Indian Traditional Knowledge, Aptitude Skill] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl No. | Semester | Course Code | Course Name | Contact Hours | | | Credits |
| | | | | L | T | P | |
| **Theory** | | | | | | | |
| | | | | | | | |
| | | | *Total Theory* | | | | |
| **Practical/ Sessional** | | | | | | | |
| 1 | IV | MC471 | Environmental Sciences | 2 | 0 | 0 | 0 |
| 2 | V | MC571 | Aptitude Skill Development-I | 2 | 0 | 0 | 0 |
| 3 | V | MC572 | Constitution of India | 2 | 0 | 0 | 0 |
| 4 | VI | MC671 | Aptitude Skill Development -II | 2 | 0 | 0 | 0 |
| | | | *Total Practical/ Sessional* | **8** | **0** | **0** | **0** |
| | | | **Total** | **8** | **0** | **0** | **0** |