# ADAMAS UNIVERSITY

## SCHOOL OF ENGINEERING AND TECHNOLOGY

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## UG Program: B.Tech (Artificial Intelligence and Machine Learning )

# COURSE STRUCTURE

## FIRST YEAR

(Common for all streams)

| SEMESTER I | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **H** | **C** |
| 1 | MTH11501 | Engineering Mathematics I | 4 | 0 | 0 | 4 | 4 |
| 2 | EVS11112 | Environmental Science | 3 | 0 | 0 | 3 | 3 |
| 3 | PHY13201 | Applied Science | 2 | 0 | 2 | 4 | |
| 4 | CSE11001 | Introduction to Programming | 2 | 0 | 0 | 2 | 2 |
| 5 | GEE11001 | Electrical and Electronics Technology | 2 | 0 | 0 | 2 | |
| 6 | CSE12002 | Programming Lab | 0 | 0 | 4 | 4 | 2 |
| 7 | GEE12002 | Electrical and Electronics Technology Lab | 0 | 0 | 4 | 4 | |
| 8 | ENG11053 | English Communication | 2 | 0 | 0 | 2 | 2 |
| 9 | CSE11082 | Principles and Applications of AI | 2 | 0 | 0 | 2 | |
| 10 | BIT11003 | Life Sciences | 2 | 0 | 0 | 2 | 2 |
| 11 | DGS11002 | Design Thinking & Prototyping | 3 | 0 | 0 | 3 | 3 |
| 12 | MEE11002 | Engineering Mechanics | 3 | 0 | 0 | 3 | |
| 13 | CEE12001 | Engineering Drawing and CAD | 0 | 0 | 4 | 4 | 2 |
| 14 | MEE12001 | Engineering Workshop | 0 | 0 | 4 | 4 | |
| **Total** | | | **15/16** | **0** | **8/10** | **24/25** | **20** |

| SEMESTER II | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **H** | **C** |
| 1 | MTH11502 | Engineering Mathematics II | 4 | 0 | 0 | 4 | 4 |
| 2 | EVS11112 | Environmental Science | 3 | 0 | 0 | 3 | 3 |
| 3 | PHY13201 | Applied Science | 2 | 0 | 2 | 3 | |
| 4 | CSE11001 | Introduction to Programming | 2 | 0 | 0 | 2 | 2 |
| 5 | GEE11001 | Electrical and Electronics Technology | 2 | 0 | 0 | 2 | |
| 6 | CSE12002 | Programming Lab | 0 | 0 | 4 | 2 | 2 |
| 7 | GEE12002 | Electrical and Electronics Technology Lab | 0 | 0 | 4 | 2 | |
| 8 | ENG11053 | English Communication | 2 | 0 | 0 | 2 | 2 |
| 9 | CSE11082 | Principle and Applications of AI | 2 | 0 | 0 | 2 | |
| 10 | EIC11001 | Venture Ideation | 2 | 0 | 0 | 2 | 2 |
| 11 | CLL11101 | Soft Skills and Aptitude I | 0 | 0 | 2 | 2 | 1 |
| 12 | DGS11002 | Design Thinking & Prototyping | 3 | 0 | 0 | 3 | 3 |
| 13 | MEE11002 | Engineering Mechanics | 3 | 0 | 0 | 3 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 14 | CEE12001 | Engineering Drawing and CAD | 0 | 0 | 4 | 2 | 2 |
| 15 | MEE12001 | Engineering Workshop | 0 | 0 | 4 | 2 | |
| **Total** | | | **15/ 16** | **0** | **10/ 12** | **27/ 26** | **21** |

**# Introduction To Programming / Electrical and Electronics Technology are optional papers**
**1st Year Credits = 41**

# SECOND YEAR

| **SEMESTER III** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **H** | **C** |
| 1 | SDS11510 | Engineering Mathematics – III-C | 3 | 1 | 0 | 4 | 4 |
| 2 | CSE11108 | **Database Management System** | 3 | 0 | 0 | 3 | 3 |
| 3 | CSE11103 | **Professional Core – I**<br>Principles of Programming Language | 3 | 0 | 0 | 3 | 3 |
| 4 | CSE11104 | **Professional Core – II**<br>Data Structures and Algorithms | 3 | 0 | 0 | 3 | 3 |
| 5 | CSE11105 | **Professional Core – III**<br>Switching Circuits and Logic Design | 3 | 0 | 0 | 3 | 3 |
| -6 | CSE12106 | **Professional Core Lab - I**<br>Principles of Programming Language Lab | 0 | 0 | 2 | 2 | 1 |
| 7 | CSE12107 | **Professional Core Lab - II**<br>Data Structures and Algorithms Lab | 0 | 0 | 2 | 2 | 1 |
| 8 | CSE12113 | Database Management System Lab | 0 | 0 | 2 | 2 | 1 |
| 9 | IDP14001 | Interdisciplinary Project | 0 | 0 | 5 | 5 | 3 |
| 10 | SOC14100 | Community Service # | 0 | 0 | 0 | 0 | 1 |
| 11 | CLL11102 | Soft Skills and Aptitude II | 0 | 0 | 2 | 2 | 1 |
| **Total** | | | **15** | **1** | **13** | **29** | **24** |

**#Community Service will be taken up during the summer break after 2nd semester, and will be evaluated in the 3rd semester.**

| **SEMESTER IV** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **H** | **C** |
| 1 | MTH11534 | **Professional Core**<br>Discrete Structures and Logic | 3 | 0 | 0 | 3 | 3 |
| 2 | CSE11109 | Object Oriented Programming | 3 | 0 | 0 | 3 | 3 |
| 3 | CSE11110 | Design and Analysis of Algorithms | 3 | 0 | 0 | 3 | 3 |
| 4 | CSE11111 | Formal Language and Automata | 3 | 0 | 0 | 3 | 3 |
| 5 | CSE11112 | Introduction to Artificial Intelligence | 3 | 0 | 0 | 3 | 3 |
| 6 | PSG11021 | Human Values and Professional Ethics | 2 | 0 | 0 | 2 | 2 |
| 7 | MTH12531 | Numerical Techniques Lab | 0 | 0 | 2 | 2 | 1 |
| 8 | CSE12114 | Object Oriented Programming Lab | 0 | 0 | 2 | 2 | 1 |
| 9 | CSE12166 | Design and Analysis of Algorithms Lab | 0 | 0 | 2 | 2 | 1 |
| 10 | CSE14170 | **Mini Project-I** | 0 | 0 | 3 | 3 | 2 |
| 11 | CLL11103 | Soft Skills and Aptitude III | 0 | 0 | 2 | 2 | 1 |
| 12 | CSE11204 | **Specialization Theory – I (Exploratory Data Analysis)** | 3 | 0 | 0 | 3 | 3 |
| 13 | CSE12205 | **Specialization Lab – I (Exploratory Data Analysis Lab)** | 0 | 0 | 2 | 2 | 1 |
| **Total** | | | **20** | **0** | **13** | **33** | **27** |

**2nd Year Credits : 51**

# THIRD YEAR

| SEMESTER V | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **H** | **C** |
| 1 | CSE11115 | Computer Networks | 3 | 0 | 0 | 3 | 3 |
| 2 | CSE11116 | Computer Organization and Architecture | 3 | 0 | 0 | 3 | 3 |
| 3 | CSE11117 | Software Engineering | 3 | 0 | 0 | 3 | 3 |
| 4 | CSE11167 | Competitive Programming-I | 3 | 0 | 0 | 3 | 3 |
| | | **Professional Elective - I** | | | | | |
| 5 | CSE13118 | Introduction to Python (hybrid 2-0-2) | 3 | 0 | 0 | 3 | 3 |
| | CSE11119 | Optimization and Game Theory | | | | | |
| | CSE11120 | Introduction to Data Science | | | | | |
| | CSE11121 | Distributed Systems and Cloud | | | | | |
| | CSE11122 | Introduction to Cyber Security | | | | | |
| 6 | CSE13202 | Unstructured Database (2-0-1)Hybrid | 3 | 0 | 0 | 3 | 3 |
| | CSE11124 | Pattern Recognition and Soft Computing | | | | | |
| | CSE11125 | Data Mining and Warehousing | | | | | |
| | CSE11126 | Cloud Security | | | | | |
| | CSE11127 | Cyber Law and Governance | | | | | |
| 7 | CSE12128 | Computer Networks Lab | 0 | 0 | 2 | 2 | 1 |
| 8 | CSE12129 | Computer Organization and Architecture Lab | 0 | 0 | 2 | 2 | 1 |
| 9 | CSE12168 | Software Engineering Lab | 0 | 0 | 2 | 2 | 1 |
| 10 | CSE12169 | Competitive Programming Lab | 0 | 0 | 2 | 2 | 1 |
| 11 | CSE14171 | Mini Project-II | 0 | 0 | 2 | 2 | 1 |
| 12 | CLL11104 | Soft Skills and Aptitude III | 0 | 0 | 2 | 2 | 1 |
| 13 | CSE11208 | Specialization Theory – II (Domain Specific Predictive Analytics) | 3 | 0 | 0 | 3 | 3 |
| **Total** | | | **21** | **0** | **12** | 33 | **27** |

| SEMESTER VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **H** | **C** |
| 1 | CSE11150 | **Professional Core – XIV**<br>Operating Systems | 3 | 0 | 0 | 3 | 3 |
| 2 | CSE11206 | **Professional Core – XII**<br>Introduction to Machine Learning | 3 | 0 | 0 | 3 | 3 |
| 3 | | **Professional Elective - II** | 3 | 0 | 0 | 3 | 3 |
| | CSE11025 | High Performance Computer Architecture | | | | | |
| | CSE11123 | Full Stack Software Development | | | | | |
| | CSE11027 | Computational Geometry | | | | | |
| 4 | | **Open Elective - I** | 3 | 0 | 0 | 3 | 3 |
| | ECE11028 | Internet of Things | | | | | |
| | ECE11030 | Low Power VLSI | | | | | |
| | EEE11104 | Renewable Energy Engineering | | | | | |
| | CEE11029 | Disaster Management | | | | | |
| | MEE11037 | Robotics | | | | | |
| | MEE11046 | Automobile Engineering | | | | | |
| | EEE11101 | Introduction to Electric Vehicle | | | | | |
| 5 | CSE12156 | **Professional Core Lab – X**<br>Operating System Lab | 0 | 0 | 3 | 3 | 2 |
| 6 | CSE12207 | **Professional Core Lab – XII**<br>Introduction to Machine Learning Lab | 0 | 0 | 3 | 3 | 2 |
| 7 | CSE14144 | **Mini Project III** | 0 | 0 | 5 | 5 | 3 |
| 8 | CLL11105 | Soft Skills and Aptitude V | 0 | 0 | 2 | 2 | 1 |
| 9 | | **Professional Elective Lab - II** | 0 | 0 | 3 | 3 | 2 |
| | CSE12031 | High Performance Computer Architecture Lab | | | | | |
| | CSE12224 | Full Stack Software Development Lab | | | | | |
| | CSE12033 | Computational Geometry Lab | | | | | |
| 10 | CSE11039 | **Specialization Theory – III (Artificial Neural Network and Deep Learning)** | 3 | 0 | 0 | 3 | 3 |
| 11 | CSE12048 | **Specialization Lab – III (Artificial Neural Network and Deep Learning Lab)** | 0 | 0 | 2 | 2 | 1 |
| **Total** | | | **15** | **0** | 18 | 32 | 26 |

**3rd Year Credits : 53**

# FOURTH YEAR

| SEMESTER VII | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **H** | **C** |
| 1 | MGT11402 | Industrial Management | 3 | 0 | 0 | 3 | 3 |
| 2 | XXXXXXXX | **Open Elective-III** | 3 | 0 | 0 | 3 | 3 |
| 3 | | **Professional Elective - III** | 3 | 0 | 0 | 3 | 3 |
| | CSE11035 | Image Processing | | | | | |
| | CSE11036 | Cloud Computing | | | | | |
| | CSE11038 | Computer Graphics | | | | | |
| | CSE11037 | Information Retrieval | | | | | |
| 4 | | **Professional Elective - IV** | 3 | 0 | 0 | 3 | 3 |
| | CSE11081 | Fundamentals of Quantum Computing | | | | | |
| | CSE11040 | Cryptography & Cyber Security | | | | | |
| | CSE11042 | 5G Wireless Communication Network | | | | | |
| 5 | | **Open Elective - II** | 3 | 0 | 0 | 3 | 3 |
| | MEE11060 | Computer-Aided Simulation & Analysis | | | | | |
| | ECE11049 | Microcontrollers and Interfacing | | | | | |
| | BIT11074 | Bioinformatics | | | | | |
| 6 | | **Professional Elective Lab - III** | 0 | 0 | 2 | 2 | 1 |
| | CSE12044 | Image Processing Lab | | | | | |
| | CSE12045 | Cloud Computing Lab | | | | | |
| | CSE12047 | Computer Graphics Lab | | | | | |
| | CSE12046 | Information Retrieval Lab | | | | | |
| 7 | CSE14049 | Summer Internship # | 0 | 0 | 0 | 0 | 3 |
| 8 | CSE14050 | Minor Project | 0 | 0 | 7 | 7 | 4 |
| 9 | CLL11106 | Soft Skills and Aptitude VI | 0 | 0 | 2 | 2 | 1 |
| 10 | CSE11209 | Specialization Theory – IV (Natural Language Processing) | 3 | 0 | 0 | 3 | 3 |
| 11 | CSE12210 | Specialization Lab – IV (Natural Language Processing Lab) | 0 | 0 | 2 | 2 | 1 |
| **Semester VII Total** | | | **18** | **0** | **14** | **32** | **28** |

**#Summer Internship will be taken up during the summer break after 6th semester, and will be evaluated in the 7th semester.**

| SEMESTER VIII | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **H** | **C** |
| 1 | CSE14051 | Industry Work experience/SIRE*/Major Project | 0 | 0 | 12 | 12 | 6 |
| 2 | CSE11060 | Specialization Theory – V (Overview of Recent Trends in AI/ML) | 3 | 0 | 0 | 3 | 3 |
| 3 | CSE15174 | Specialization Viva Voce | 0 | 0 | 0 | 0 | 2 |
| 4 | CSE15061 | Comprehensive Viva Voce | 0 | 0 | 0 | 0 | 2 |
| **Semester VIII Total** | | | **3** | **0** | **12** | **15** | **13** |

***SIRE: Scientific Investigation and Research Experience4th Year Credits: 41**

**CREDIT DISTRIBUTION (SEMESTER-WISE)**

| SEM I | SEM II | SEM III | SEM IV | SEM V | SEM VI | SEM VII | SEM VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **20** | **21** | **24** | **27** | **27** | **26** | **28** | **13** | **186** |

**CREDIT DISTRIBUTION(YEAR-WISE)**

| YEAR I | YEAR II | YEAR III | YEAR IV | TOTAL |
|---|---|---|---|---|
| **41** | **51** | **53** | **41** | **186** |