# STUDY & EVALUATION SCHEME
## B.TECH: COMPUTER SCIENCE AND ENGINEERING
## SPECIALIZATION: ARTIFICIAL INTELLIGENCE
## AND MACHINE LEARNING
## I YEAR: I SEMESTER

| S.No | Course Code | Course Title | L | T | P | Theory | | Practical | | Total | C |
|------|-------------|--------------|---|---|---|-----|-----|-----|-----|-------|---|
| | | | | | | CIE | ESE | CIE | ESE | | |
| 1. | UCY1801/ UPH1801 | Chemistry/ Physics | 3 | 1 | 3 | 40 | 60 | 80 | 20 | 200 | 5.5 |
| 2. | UMA1003 | Mathematics-I | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 3. | UCS1801/ UEE1801 | Programming for Problem Solving/ Basic Electrical Engineering | 3 | 1 | 2 | 40 | 60 | 80 | 20 | 200 | 5 |
| 4. | UME1802 / UME1801 | Workshop Practices/ Engineering Graphics and Design | 1 | 0 | 4 | 0 | 0 | 80 | 20 | 100 | 3 |
| 5. | | IKS*/Language* | 2 | 0 | 0 | 100 | 0 | 0 | 0 | 100 | 2* |
| 6. | UCS1803 | Python | 3 | 0 | 2 | 40 | 60 | 80 | 20 | 200 | 4 |
| | | **Total:** | **15** | **3** | **11** | **260** | **240** | **320** | **80** | **900** | **21.5** |

L       - Lecture
T       - Tutorial
P       - Practical
CIE    -Continuous Internal Evaluation
ESE    -End Semester Exam
C       - Credit/ (*Graded)
IKS* - Indian Knowledge System
Language-English, Hindi, Sanskrit, Telugu

❖ MOOCs with a minimum of 2 credit in mandatory for all students to complete during the duration of the program.

# STUDY & EVALUATION SCHEME
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## I YEAR: II SEMESTER

| S.No | Course Code | Course Title | L | T | P | Theory | | Practical | | Total | C |
|------|-------------|--------------|---|---|---|--------|-----|-----------|-----|-------|---|
| | | | | | | CIE | ESE | CIE | ESE | | |
| 1. | UPH2801/ UCY2801 | Physics/ Chemistry | 3 | 1 | 3 | 40 | 60 | 80 | 20 | 200 | 5.5 |
| 2. | UMA2003 | Mathematics-II | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 3. | UEE2801/ UCS2802 | Basic Electrical Engineering/ Programming for Problem Solving | 3 | 1 | 2 | 40 | 60 | 80 | 20 | 200 | 5 |
| 4. | UME2801/ UME2802 | Engineering Graphics and Design/ Workshop Practices | 1 | 0 | 4 | 0 | 0 | 80 | 20 | 100 | 3 |
| 5. | | IKS*/Language* | 2 | 0 | 0 | 100 | 0 | 0 | 0 | 100 | 2* |
| 6. | UCS2806 | Java Fundamental | 3 | 0 | 2 | 40 | 60 | 80 | 20 | 200 | 4 |
| | | **Total:** | **15** | **3** | **11** | **260** | **240** | **320** | **80** | **900** | **21.5** |

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CIE     -Continuous Internal Evaluation
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## II YEAR: III SEMESTER

| S.No | Course Code | Course Title | L | T | P | Theory | | Practical | | Total | C |
|------|-------------|--------------|---|---|---|--------|-----|-----------|-----|-------|---|
| | | | | | | CIE | ESE | CIE | ESE | | |
| 1. | | Data Structure using Java | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 2. | | Data Structure using Java Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 3. | | Mathematical Concepts for AI | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 4. | | Database Architecture | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 5. | | Database Architecture Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 6. | | Modern Computer Organization & Architecture | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 7. | | Statistics for Artificial Intelligence and Data Science | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 8. | | Human Values and Environmental Science | 2 | - | - | 100 | - | 0 | 0 | 100 | 2 |
| 9. | | Social Responsibility and Community Engagement | - | - | 2 | 100 | - | 0 | 0 | 100 | 1* |
| | | **Total:** | 17 | 2 | 06 | 400 | 300 | 160 | 40 | 900 | 21 |

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T        - Tutorial
P        - Practical
CIE    -Continuous Internal Evaluation
ESE    -End Semester Exam
C        - Credit/ (*Graded)

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## II YEAR: IV SEMESTER

| S.No | Course Code | Course Title | L | T | P | Theory CIE | Theory ESE | Practical CIE | Practical ESE | Total | C |
|------|-------------|--------------|---|---|---|-----|-----|-----|-----|-------|---|
| 1. | | Algorithm Analysis and Design | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 2. | | Algorithm Analysis and Design Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 3. | | Artificial Intelligence | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 4. | | Artificial Intelligence Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 5. | | Introduction to Quantum Physics | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 6. | | Machine Learning | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 7. | | Machine Learning Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 8. | | Communications Engineering | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 9. | | Operating Systems | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 10. | | IKS* | 2 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 2 |
| 11. | | Constitution of India | 2 | - | - | Satisfactory/Unsatisfactory | | | | | 0 |
| | | **Total** | **22** | **1** | **6** | **280** | **420** | **240** | **60** | **1000** | **24** |

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T      - Tutorial
P      - Practical
CIE    -Continuous Internal Evaluation
ESE    -End Semester Exam
C      - Credit

IKS* - (Indian Knowledge System)-Vedic Calculator

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# III YEAR: V SEMESTER

| S.No | Course Code | Course Title | L | T | P | Theory | | Practical | | Total | C |
|------|-------------|--------------|---|---|---|--------|-----|-----------|-----|-------|---|
| | | | | | | CIE | ESE | CIE | ESE | | |
| 1. | | Introduction to Quantum Computing | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 2. | | Natural Language Processing | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 3. | | Natural Language Processing Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 4. | | Theory of Computation | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 5. | ----- | Professional Elective-I | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 6. | ------ | Open Elective-I | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 7. | | Industrial Internship | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 100 | 2 |
| | | **Total:** | **15** | **4** | **02** | **200** | **300** | **180** | **20** | **700** | **22** |

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 T     - Tutorial
 P     - Practical
 CIE   -Continuous Internal Evaluation
 ESE   -End Semester Exam
 C     - Credit

❖ MOOCs with a minimum of 2 credit in mandatory for all students to complete during the duration of the program

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## B.TECH: COMPUTER SCIENCE AND ENGINEERING
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## AND MACHINE LEARNING
## III YEAR: VI SEMESTER

| S.No | Course Code | Course Title | L | T | P | Theory | | Practical | | Total | C |
|------|-------------|--------------|---|---|---|--------|--------|-----------|--------|-------|---|
| | | | | | | CIE | ESE | CIE | ESE | | |
| 1. | | Advanced Machine Learning | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 2. | | Advanced Machine Learning Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 3. | ------- | Professional Elective -2 | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 4. | -------- | Professional Elective -2 Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 5. | | Pattern Recognition | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 3 |
| 6. | | Software Development Engineering | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 7. | | Project – I | 0 | 0 | 8 | 0 | 0 | 30 | 70 | 100 | 4 |
| **Total:** | | | **12** | **0** | **12** | **120** | **180** | **190** | **110** | **700** | **18** |

L        - Lecture
T        - Tutorial
P        - Practical
CIE     -Continuous Internal Evaluation
ESE     -End Semester Exam
C        - Credit

❖ MOOCs with a minimum of 2 credit in mandatory for all students to complete during the duration of the program

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## B.TECH: COMPUTER SCIENCE AND ENGINEERING
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## IV YEAR: VII SEMESTER

| S.No | Course Code | Course Title | L | T | P | Theory | | Practical | | Total | C |
|------|-------------|--------------|---|---|---|--------|--------|-----------|--------|-------|---|
| | | | | | | CIE | ESE | CIE | ESE | | |
| 1. | -------- | Professional Elective -3 | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 2. | -------- | Professional Elective -3 Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 3. | | Deep Learning & Neural Networks | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 4. | | Deep Learning & Neural Networks Lab | 0 | 0 | 2 | 0 | 0 | 80 | 20 | 100 | 1 |
| 5. | | Technical Writing | 2 | 0 | 0 | 100 | 0 | 0 | 0 | 100 | 2 |
| 6. | | Project - II | 0 | 0 | 06 | 0 | 0 | 30 | 70 | 100 | 3 |
| 7. | | Predictive Analytics | 3 | 1 | 0 | 40 | 60 | 0 | 0 | 100 | 4 |
| 8. | | Network Security & Cryptography | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| | | **Total:** | **14** | **1** | **10** | **260** | **240** | **190** | **110** | **800** | **20** |

L    - Lecture
T    - Tutorial
P    - Practical
CIE    -Continuous Internal Evaluation
ESE    -End Semester Exam
C    - Credit

❖ MOOCs with a minimum of 2 credit in mandatory for all students to complete during the duration of the program

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## IV YEAR: VIII SEMESTER

| S.No | Course Code | Course Title | L | T | P | Theory | | Practical | | Total | C |
|------|-------------|--------------|---|---|---|--------|--------|-----------|-----|-------|---|
| | | | | | | CIE | ESE | CIE | ESE | | |
| 1. | | Dissertation | 0 | 0 | 18 | 0 | 0 | 200 | 300 | 500 | 9 |
| 2. | | Open Elective- 2 | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| 3. | | Professional Elective -4 | 3 | 0 | 0 | 40 | 60 | 0 | 0 | 100 | 3 |
| | | **Total:** | **6** | **0** | **18** | **80** | **120** | **200** | **300** | **700** | **15** |

L      - Lecture
T      - Tutorial
P      - Practical
CIE    -Continuous Internal Evaluation
ESE    -End Semester Exam
C      - Credit

❖ MOOCs with a minimum of 2 credit in mandatory for all students to complete during the duration of the program

# List of Departmental Electives

| Professional Elective-I | | | V Semester |
|---|---|---|---|
| 1 | | Fuzzy Logic | |
| 2 | | Computer Vision | |
| **Professional Elective-II** | | | **VI Semester** |
| 1 | | Tensor Flow and PyTorch | |
| 2 | | Microsoft Azure and PySpark | |
| **Professional Elective-III** | | | **VII Semester** |
| 1 | | Google cloud AutoML and Amazon ML | |
| 2 | | OpenNN and Github | |
| **Professional Elective-IV** | | | **VIII Semester** |
| 1 | | Eclipse Deeplearning4j and Google Colab | |
| 2 | | scikit-learn and Amazon SageMaker | |

# List of Open Electives

| Open Elective-I | | | V Semester |
|---|---|---|---|
| 1. | | Java courses (MOOCs) | |
| 2. | | Python courses (MOOCs) | |
| 3. | | Advanced Java courses (MOOCs) | |
| **Open Elective-II** | | | **VII Semester** |
| 1. | | VLSI Design | |
| 2. | | Information Retrieval | |
| 3. | | Artificial Neural Networks | |

*OE1 has to be a MOOC course certification which the student needs to clear, failing which the student shall not be awarded degree of B.Tech.

Apart from the specified MOOC courses in OE1, the student can choose any other MOOC course (Technical/Non-Technical) of his/her choice.

OE    - Open Course Elective
PE    - Professional Course Elective