**BHARATHIDASAN UNIVERSITY TIRUCHIRAPPALLI-620 024.**

## B.Sc. ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

## CHOICE BASED CREDIT SYSTEM –

## LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

**(Applicable to the candidates admitted from the academic year 2022-23 onwards)**

**(For the 2024-2025 batch, the Naan Mudhalvan scheme has been implemented in the 2nd semester)**

| Sem. | Part | Course | Title | Ins. Hrs | Credit | Exam Hours | Marks | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Int. | Ext. | |
| I | I | Language Course – I Tamil $ / Other Languages + # | | 6 | 3 | 3 | 25 | 75 | 100 |
| | II | English Course - I | | 6 | 3 | 3 | 25 | 75 | 100 |
| | III | Core Course – I (CC) | Programming in C and Data Structures | 5 | 4 | 3 | 25 | 75 | 100 |
| | | Core Practical – I (CP) | Programming in C Lab | 4 | 4 | 3 | 40 | 60 | 100 |
| | | First Allied Course – I (AC) | | 4 | 4 | 3 | 25 | 75 | 100 |
| | | First Allied Course – II (AC) | | 3 | - | - | - | - | - |
| | IV | Value Education | | 2 | 2 | 3 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **20** | **-** | **-** | **-** | **600** |
| II | I | Language Course - II Tamil $ / Other Languages + # | | 6 | 3 | 3 | 25 | 75 | 100 |
| | II | English Course- II | | 4 | 3 | 3 | 25 | 75 | 100 |
| | III | Core Course – II (CC) | Programming in Python | 5 | 4 | 3 | 25 | 75 | 100 |
| | | Core Practical – II (CP) | Programming in Python Lab | 4 | 4 | 3 | 40 | 60 | 100 |
| | | First Allied Course – II (AC) | | 3 | 2 | 3 | 25 | 75 | 100 |
| | | First Allied Course – III (AC) | | 4 | 4 | 3 | 25 | 75 | 100 |
| | | Add on Course – I ## | Professional English – I | 6* | 4 | 3 | 25 | 75 | 100 |
| | IV | Environmental Studies | | 2 | 2 | 3 | 25 | 75 | 100 |
| | VI | Naan Mudhalvan Scheme (NMS) @@ | Overview of English Language Communication | 2 | 2 | 3 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **28** | **-** | **-** | **-** | **900** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| III | I | Language Course – III<br>Tamil $ / Other Languages + # | | 6 | 3 | 3 | 25 | 75 | 100 |
| | II | English Course -III | | 6 | 3 | 3 | 25 | 75 | 100 |
| | III | Core Course – III (CC) | RDBMS and NoSQL | 5 | 4 | 3 | 25 | 75 | 100 |
| | | Core Practical – III (CP) | RDBMS and NoSQL Lab | 4 | 4 | 3 | 40 | 60 | 100 |
| | | Second Allied Course – I (AC) | | 4 | 4 | 3 | 25 | 75 | 100 |
| | | Second Allied Practical (AP) | | 3 | - | - | - | - | - |
| | | Add on Course – II ## | Professional English - II | 6* | 4 | 3 | 25 | 75 | 100 |
| | IV | Non-Major Elective I @ - Those who choose Tamil in Part I can choose a non-major elective course offered by other departments.<br>Those who do not choose Tamil in Part I must choose either<br>a) Basic Tamil if Tamil language was not studied in school level **or**<br>b) Special Tamil if Tamil language was studied upto $10^{th}$ & $12^{th}$ std. | | 2 | 2 | 3 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **24** | **-** | **-** | **-** | **700** |
| IV | I | Language Course –IV<br>Tamil $ / Other Languages + # | | 6 | 3 | 3 | 25 | 75 | 100 |
| | II | English Course – IV | | 6 | 3 | 3 | 25 | 75 | 100 |
| | III | Core Course -IV (CC) | Artificial Intelligence | 5 | 4 | 3 | 25 | 75 | 100 |
| | | Core Practical - IV (CP) | Artificial Intelligence Lab | 4 | 4 | 3 | 40 | 60 | 100 |
| | | Second Allied Practical (AP) | | 3 | 2 | 3 | 40 | 60 | 100 |
| | | Second Allied Course – II (AC) | | 4 | 4 | 3 | 25 | 75 | 100 |
| | IV | Non-Major Elective II @ - Those who choose Tamil in Part I can choose a non-major elective course offered by other departments.<br>Those who do not choose Tamil in Part I must choose either<br>a) Basic Tamil if Tamil language was not studied in school level **or**<br>b) Special Tamil if Tamil language was studied upto $10^{th}$ & $12^{th}$ std. | | 2 | 2 | 3 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **22** | **-** | **-** | **-** | **700** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| V | III | Core Course -V (CC) | Embedded Systems and IoT | 5 | 5 | 3 | 25 | 75 | 100 |
| | | Core Course - VI(CC) | Open Source Software | 5 | 5 | 3 | 25 | 75 | 100 |
| | | Core Course - VII(CC) | Robotics | 5 | 5 | 3 | 25 | 75 | 100 |
| | | Core Practical -V (CP) | Robotics Lab | 4 | 4 | 3 | 40 | 60 | 100 |
| | | Major Based Elective – I (Any one) | 1. Virtual Reality and Augmented Reality<br>2. Fuzzy Logic and Neural Networks | 5 | 5 | 3 | 25 | 75 | 100 |
| | IV | Skill Based Elective I | Mobile Application Development | 4 | 2 | 3 | 25 | 75 | 100 |
| | | Soft Skills Development | | 2 | 2 | 3 | 25 | 75 | 100 |
| | **TOTAL** | | | **30** | **28** | **-** | **-** | **-** | **700** |
| VI | III | Core Course - VIII (CC) | Human Computer Interaction | 6 | 6 | 3 | 25 | 75 | 100 |
| | | Core Course -IX (CC) | Machine Learning | 6 | 6 | 3 | 25 | 75 | 100 |
| | | Core Practical - VI(CP) | Machine Learning Techniques Lab | 4 | 4 | 3 | 40 | 60 | 100 |
| | | Major Based Elective - II (Any one) | 1. Natural Language Processing<br>2. Deep Learning | 5 | 5 | 3 | 25 | 75 | 100 |
| | | Project | | 4 | 3 | - | 20 | 80 | 100 |
| | IV | Skill Based Elective – II | Cloud Computing | 4 | 2 | 3 | 25 | 75 | 100 |
| | V | Gender Studies | | 1 | 1 | 3 | 25 | 75 | 100 |
| | | Extension Activities ** | | - | 1 | - | - | - | - |
| | | **TOTAL** | | **30** | **28** | **-** | **-** | **-** | **700** |
| **GRAND TOTAL** | | | | **180** | **150** | | | | **4300** |

## List of Allied Courses

| First Allied Course | Second Allied Course |
|---|---|
| Mathematics | Applied Physics |

$ For those who studied Tamil upto 10th +2 (Regular Stream).

+ Syllabus for other Languages should be on par with Tamil at degree level.

# Those who studied Tamil upto 10th +2 but opt for other languages in degree level under Part- I should study special Tamil in Part – IV.

## The Professional English – Four Streams Course is offered in the 2nd and 3rd Semester (only for 2022-2023 Batch) in all UG Courses. It will be taught apart from the Existing hours of teaching / additional hours of teaching (1 hour /day) as a 4 credit paper as an add on course on par with Major Paper and completion of the paper is must to continue his / her studies further. (As per G.O. No. 76, Higher Education (K2) Department dated: 18.07.2020).

* The Extra 6 hrs / cycle as per the G.O. 76/2020 will be utilized for the Add on Professional English Course.

@ NCC Course is one of the Choices in Non-Major Elective Course. Only the NCC cadets are eligible to choose this course. However, NCC Course is not a Compulsory Course for the NCC Cadets.

** Extension Activities shall be outside instruction hours.

@@ Naan Mudhalvan Scheme.

**SUMMARY OF CURRICULUM STRUCTURE OF UG PROGRAMMES**

| Sl. No. | Part | Types of the Courses | No. of Courses | No. of Credits | Marks |
|---|---|---|---|---|---|
| 1. | I | Language Courses | 4 | 12 | 400 |
| 2. | II | English Courses | 4 | 12 | 400 |
| 3. | III | Core Courses | 8 | 40 | 800 |
| 4. | | Core Practical | 7 | 29 | 700 |
| 5. | | Allied Courses I & II | 4 | 16 | 400 |
| 6. | | Allied Practical | 2 | 4 | 200 |
| 7. | | Major Based Elective Courses | 2 | 8 | 200 |
| 8. | | Add on Courses | 2 | 8 | 200 |
| 9. | | Project | 1 | 3 | 100 |
| 10. | IV | Non-Major Elective Courses (Practical) | 2 | 4 | 200 |
| 11. | | Skill Based Elective Courses | 2 | 4 | 200 |
| 12. | | Soft Skills Development | 1 | 2 | 100 |
| 13. | | Value Education | 1 | 2 | 100 |
| 14. | | Environmental Studies | 1 | 2 | 100 |
| 15. | V | Gender Studies | 1 | 1 | 100 |
| 16. | | Extension Activities | 1 | 1 | -- |
| 17. | VI | Naan Mudhalvan Scheme | 3 | 6 | 300 |
| | **Total** | | **46** | **154** | **4500** |

**PROGRAM OBJECTIVES:**

- Upon completion of this undergraduate programme on B.Sc. Artificial Intelligence and Machine Learning, the students will be able to
- Exhibit good domain knowledge and completes the tasks with expected quality standards.
- To be capable of modelling, designing, implementing and verifying a computing system to meet specified requirements for the benefit of society.
- Design and develop research based solutions for complex problems.
- To possess critical thinking, communication skills, teamwork, leadership skills and ethical behaviour necessary to function productively and professionally.
- Able to apply analytical and critical thinking to identify, formulate and analyse complex problems
- Establish the ability to listen, read, proficiently communicate and articulate complex ideas.

**PROGRAM OUTCOMES:**

After successful completion of B.Sc. AI &ML program the students are expected to

- Apply the concepts and practical knowledge in analysis, design and development of computing systems and applications to multi-disciplinary problems.
- Provide a concrete foundation and enrich their abilities to qualify for Employment, Higher studies and Research in Artificial Intelligence and Machine Learning with ethical values
- Understand, analyze and develop essential proficiency in the areas related to artificial intelligence and machine learning in terms of underlying statistical and computational principles.
- Learn the basic concepts of AI & ML and apply in various research areas like image processing, speech recognition and Medical diagnostics etc.,
- Find solutions to complex AI problems using various AI tools

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