

Programme	B. Sc. Computer Science				
Course Title	Introduction to Artificial Intelligence				
Type of Course	<b>Minor</b>				
Semester	III				
Academic Level	200 - 299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75
Pre-requisites	1. Fundamental Mathematics Concepts: Sets 2. Fundamentals of Python Programming				
Course Summary	This course provides an introduction to the ideas, techniques, and applications of artificial intelligence (AI) is given in this course. The fundamentals of knowledge representation, machine learning, and problem solving will be taught to the students.				

**Course Outcomes (CO):**

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Explain the basic concepts of Artificial Intelligence	U	C	Instructor-created exams / Quiz
CO2	Explain standard problem-solving techniques used in AI and their application	U	C	Instructor-created exams / Quiz / Short analytical questions
CO3	Explain the purpose and functionality of packages used in AI and ML applications	U	C	Instructor-created exams / Quiz / Seminar presentation
CO4	Describe fundamental concepts of Machine Learning and Deep Learning	U	C	Instructor-created exams /

	techniques and their applications			Quiz / Case-based questions
CO5	Implement and analyse machine learning algorithms and apply them to real-world problems	C	M	Mini Project / Case Study / Practical Assignment / Demonstration
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C)				
# - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)				

### Detailed Syllabus:

Module	Unit	Content	Hrs	Marks(70)
<b>I</b>	<b>Introduction to Artificial Intelligence &amp; Problem Solving</b>		<b>15</b>	<b>20</b>
	1	Introduction to AI –Evolution of AI, AI problems, AI Techniques, AI Applications	4	
	2	Various AI Domains (Introduction only)	2	
	3	Problem Solving Techniques - Search Algorithms, Knowledge representation and reasoning (Concepts only)	3	
	4	Problem Solving Techniques - constraint satisfaction problems, Game playing (Concepts only)	3	
	5	Problem Solving Techniques - Machine learning, Simulated Annealing (Concepts only)	3	
<b>II</b>	<b>Introduction to Neural Networks</b>		<b>8</b>	<b>15</b>
	6	Introduction to Artificial Neural Network	2	
	7	Understanding Brain & Perceptron Model	2	
	8	Single Layer Perceptron Model & Learning in Single layer Perceptron Model	2	
	9	Multi-Layer Perceptron Model & Learning in Multi-layer Perceptron Model	2	
<b>III</b>	<b>Python Packages for AI</b>		<b>15</b>	<b>20</b>
	10	Pandas	3	

	11	Matplotlib	3	
	12	Keras	3	
	13	Scikit-learn:	3	
<b>IV</b>		<b>Machine Learning Fundamentals</b>	<b>7</b>	<b>15</b>
	15	Introduction to Machine learning-	1	
	16	Applications of Machine Learning	1	
	17	Supervised machine learning-Classification, regression (concepts only)	2	
	18	Unsupervised machine learning	1	
	19	clustering, Dimensionality Reduction (concepts only)	1	
	20	Basics of reinforcement learning	1	
	21	Definition and history of deep learning	1	
	22	Key differences between traditional machine learning and deep learning	1	
<b>V</b>		<b>Hands-on Artificial Intelligence &amp; Machine Learning using Python: Practical Applications, Case Study and Course Project</b>	<b>30</b>	
	1	<b>1. Neural Network</b> Building a single layer perceptron using Keras <b>2. Multi-layer Neural Network</b> Setting up a multi-layer perceptron model <b>4. Supervised machine learning</b> Linear regression Decision tree <b>5. Unsupervised machine learning</b> K means clustering	20	

	PCA <b>6. Feature Engineering</b> Feature selection from a dataset		
2	Case study – AI tools / Use of AI in any movie	3	
3	<b>Implementation of Comparison of any two machine learning algorithms on a dataset</b>	7	

#### References

- Elaine Rich, Kevin Knight, Shivsankar B Nair, “Artificial Intelligence”, Third Edition, Tata McGraw Hill Publisher
- Tom M. Mitchell, Machine Learning, McGraw-Hill, 1st Ed.
- Ethem Alpaydin, Introduction to Machine Learning- 3rd Edition, PHI.

#### Mapping of COs with PSOs and POs :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	-	-	-	-	2	1	1	1	1	-	1
CO2	-	-	-	-	-	-	3	1	1	2	2	-	2
CO3	-	-	-	-	-	-	3	1	1	2	2	-	2
CO4	-	-	-	-	-	-	3	3	3	3	3	3	3
CO5	-	-	-	-	-	-	3	3	3	3	3	3	3

#### Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

#### Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments (20%)
- Final Exam (70%)

**Mapping of COs to Assessment Rubrics :**

	Internal Exam	Assignment	Practical Evaluation	End Semester Examinations
CO1	✓			✓
CO2	✓			✓
CO3	✓			✓
CO4	✓			✓
CO5		✓	✓	

