ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ
ವಿಟಿಯು ಅಧಿನಿಯಮ ೧೯೯೪ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯವಿಶ್ವವಿದ್ಯಾಲಯ
VISVESVARAYA TECHNOLOGICAL UNIVERSITY
State University of Government of Karnataka Established as per the VTU Act, 1994"JnanaSangama" Belagavi-590018

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REF: VTU/BGM/BoS/MCS101/690/2024-25/5584 DATE: 28 JAN 2025

CIRCULAR

Subject: MCS101- Artificial Intelligence - book title addition to syllabus copy regarding...

Reference: Chairperson BoS in CSE VTU for PG programs email dated; 27.01.2025

This refers to the subject mentioned above. The book title has been added to the syllabus of the course/subject MCS101 - Artificial Intelligence for PG programs under the CSE stream, based on the feedback received.

All Principals are requested to ensure that the contents of this circular are brought to the attention of all concerned.

Thank you.

Sd/-
REGISTRAR

Copy to,

- The Registrar (Evaluation) VTU Belagavi for information
- The Director, ITI SMU, VTU Belagavi for information and post the circular and brochure on VTU web portal
- Office copy

28/01/25
REGISTRAR

ncw.

Semester- 1

Artificial Intelligence			
Course Code	MCS101	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	50
Total Hours of Pedagogy	50	Total Marks	100
Credits	03	Exam Hours	03

Course Learning objectives:

- Define the foundational concepts of artificial intelligence and key problem-solving techniques.
- Explain the knowledge representation and reasoning techniques to solve complex problems in AI systems.
- Use machine learning algorithms to evaluate their performance in real-world applications.
- Build the applications of natural language processing and robotics to enhance human-computer interaction.
- Explore the ethical considerations and societal implications of AI technologies

Module-1

Module 1: Introduction to Artificial Intelligence and Problem Solving, Definition and scope of AI, History and evolution of AI, Types of AI: Narrow AI vs. General AI, Problem formulation and problem-solving techniques, Search algorithms: Uninformed and informed search strategies, Heuristic search and constraint satisfaction problems.

Module-2

Module 2: Knowledge Representation and Reasoning, Types of knowledge representation, Propositional logic and first-order logic ,Semantic networks and frames, Ontologies and their applications, Deductive and inductive reasoning, Rule-based systems and non-monotonic reasoning, Probabilistic reasoning and Bayesian networks.

Module-3

Module 3: Machine Learning, Introduction to machine learning, Supervised, unsupervised, and reinforcement learning, Common algorithms: Decision trees, SVM, neural networks Evaluation metrics for machine learning models ,Practical applications of machine learning in AI systems.

Module-4

Module 4: Natural Language Processing and Robotics, Basics of natural language processing (NLP), Text processing and language models, Sentiment analysis and language generation, Robotics fundamentals and sensor technologies, Robot kinematics, control, and applications of AI in robotics.

Module-5

Module 5: **Ethical and Societal Implications of AI,** Ethical considerations in AI development ,AI and job displacement ,Privacy concerns and data security, Bias and fairness in AI algorithms, Accountability and transparency in AI systems, The role of government and regulation in AI, Public perception and trust in AI technologies, Future of AI and its impact on society.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Two Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 50 marks** to attain the COs and POs

The sum of two tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the

outcome defined for the course.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

Suggested Learning Resources:

Books

1. Artificial Intelligence by Saroj Kaushik CENGAGE Learning 2014
2. Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig, 4th Edition (2021)
3. Deep Learning by Ian Goodfellow, Yoshua Bengio, and Aaron Courville third Edition.

Reference Books:

1. "Pattern Recognition and Machine Learning" by Christopher M. Bishop Edition: fourth Edition (2020)
   "Artificial Intelligence: Foundations of Computational Agents" by David L. Poole and Alan K. Mackworth Edition: third Edition (2021).

Web links and Video Lectures (e-Resources):

- https://cs221.stanford.edu
- https://www.kaggle.com/learn/machine-learning
- https://www.youtube.com/playlist?list=PLkDaE6sXhPqQ5s2cW2g1iGgC4eD9W6xZ2
- https://www.youtube.com/playlist?list=PLD6B6F0A3B1D4D3D8A7E3C5E8A7B2E0C

Skill Development Activities Suggested

- The students with the help of the course teacher can take up relevant technical activities which will enhance their skill. The prepared report shall be evaluated for CIE marks.

Course outcome (Course Skill Set)

At the end of the course the student will be able to :

Sl. No.	Description	Blooms Level
CO1	Explain the foundational concepts of artificial intelligence, including its history, types, and key problem-solving techniques.	L2
CO2	Apply knowledge representation and reasoning techniques to solve complex problems in AI systems.	L3
CO3	Implement machine learning algorithms and evaluate their performance in real-world applications.	L2
CO4	Explore the principles and applications of natural language processing and robotics to enhance human-computer interaction.	L4

Program Outcome of this course

Sl. No.	Description	POs
1	Demonstrate the ability to independently conduct research and development work to address practical engineering problems.	PO1
2	Develop and deliver comprehensive technical presentations that effectively convey complex information to diverse audiences.	PO2
3	Exhibit mastery in the specialized study area, surpassing the requirements of a relevant bachelor's program.	PO3
4	Analyse engineering problems critically and apply appropriate techniques, skills, and modern tools to develop innovative solutions.	PO4

5	Collaborate effectively in teams while also functioning independently, recognizing opportunities for career advancement and research.	PO5
6	Cultivate a proactive approach to continuous learning and professional development in response to evolving technological landscapes.	PO6

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	x			x		x
CO2			x		x	
CO3		x				
CO4	x					x