Karmaveer Bhaurao Patil University, Satara

Syllabus for

Diploma-II (Artificial Intelligence with Python)

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2025-2026

Department of Computer Science (Entire)
Revised Syllabus of Diploma Program (UG) (2025-2026)

Preamble:

Artificial Intelligence is one of the most advanced fields of computer science which involves use of Mathematics, Statistics, Information Technology and Information Sciences in discovering new information and knowledge from large databases and optimize Human effort overall. It is a new emerging interdisciplinary area of research and development which has created interest among scientists of various disciplines like Computer Science, Mathematics, Statistics, Information Technology

Program Objectives

1. To create a skilled workforce to match the requirements of the society.
2. To impart knowledge of Science is the basic objective of this Program
3. To develop scientific attitude is the major objective so as to make the students open minded, critical and curious

Program Outcomes:

1. The students will be able to develop software.
2. To acquire programming skills in core Python.
3. To acquire Object Oriented Skills in Python

II Year Diploma Program

1. Title: Artificial Intelligence with Python
2. Year of Implementation: 2025-2026
3. Duration: One Year
4. Pattern: Semester
5. Medium of Instruction: English
6. Contact hours: 7 hours/Week
8. Structure of Course:

Syllabus Structure (UG):

Year	Semester	Course No.	Course Code	Content Hours	Credits (1 Credit = 15H)	Marks
1	I	CTI	DCSET101	30	2	75
		CLI	DCSEL101	60	2	75
	II	CTII	DCSET202	30	2	75
		CLII	DCSEL202	60	2	75
	Annual	CPI	DCSEP101	30	1	50
			Total	210	9	350
2	III	CTIII	DCSET303	30	2	75
		CLIII	DCSEL303	60	2	75
	IV	CTIV	DCSET404	30	2	75
		CLIV	DCSEL404	60	2	75
	Annual	CPII	DCSEP202	30	1	50
	Industrial and or Incubation and or Research or Field Training			30	1	-
			Total	240	10	350
3	V	CTV	DCSET505	30	2	75
		CLV	DCSEL505	60	2	75
	VI	CTVI	DCSET606	30	2	75
		CLVI	DCSEL606	60	2	75
	Annual	CPIII	DCSEP303	60	2	100
	Industrial and or Incubation and or Research or Field Training			30	1	-
			Total	270	11	400
Total				**720**	**30**	**1100**

D: Diploma, CSE: Departmental Code (C: Chemistry, MI: Microbiology, CSE: Computer Science (Entire), etc.)

C: Course, T: Theory, L: Lab (Practical), P: Project

Total No. of Courses: 10 (Theory: 06, Practical: 06, Project: 03) Theory and Practical: Semester, Project: Annual

Semester-I
DCSET 303: Techniques of AI
(Content Hrs. 30 Credits: 2)

Course Objectives:

Students will be able to

1. Learn various types of algorithms useful in Artificial Intelligence (AI)
2. Convey the ideas in Al research and programming language.
3. Understand the numerous applications and huge possibilities in the field of AI that goes beyond the normal human imagination

Unit I: Searching Techniques

Defining AI problems as a State Space Search: example, Search and Control Strategies, Problem Characteristics, Issues in Design of Search Programs, Production System, Blind Search Techniques:-BFS, DFS, DLS, Iterative Deepening Search, Bidirectional Search, Uniform cost Search.
Heuristic search techniques-Generate and test, Hill Climbing, Best First search, Constraint Satisfaction, Mean-End Analysis, A*, AO*.

Unit II: Knowledge Representation

Representations and Mappings, Approaches to Knowledge Representation, Knowledge representation method, Propositional Logic, Predicate logic, Representing Simple facts in Logic, Resolution, Forward and backward chaining .Game Playing-Minimax Search Procedures, Adding alpha-beta cutoffs.

Course Outcomes:

1. Students will understand Knowledge representation
2. Students should get knowledge about Searching Techniques

References:

1. Stuart Russell and Peter Norvig (1995), Artificial Intelligence: A Modern Approach, Third edition, Pearson 2003.
2. Shai shalev-shwartz, Shai Ben-David: Understanding Machine Learning from Theory to algorithms, Cambridge University Press
3. Artificial Intelligence by Elaine Rich, Kevin Knight and Nair, TMH

DCSEL 303:(Practical)

Course Objectives:

Students will be able to

1. Understand Searching Techniques with programming
2. Learn the concept of forward and backward chaining.
3. Learn to create small game application

List of Practical

1. Write a program to implement simple Chatbot.
2. Write a program to implement Breadth First Search Traversal.
3. Write a program to implement Depth First Search Traversal
4. Write a program to implement Water jug Problem.
5. Write a program to implement Bidirectional Search.
6. Write a program to implement Heuristic Search.
7. Write a Program to implement a* algorithm.
8. Write a program to implement tic tac toe game for O and X.
9. Write a program to implement Uniform cost Search.
10. Write a program to implement Forward and backward chaining

Course Outcomes:

Student should get knowledge about-

1. How to use different control structures
2. How to implement Depth First Search.
3. How to implement heuristic search
4. How to implement a* algorithm

References:

1. Stuart Russell and Peter Norvig (1995), Artificial Intelligence: A Modern Approach, Third edition, Pearson 2003.
2. Shai shalev-shwartz, Shai Ben-David: Understanding Machine Learning from Theory to algorithms, Cambridge University Press
3. Artificial Intelligence by Elaine Rich, Kevin Knight and Nair, TMH

Semester-IV

DCSET 404: Python Programming
(Content Hrs. 30 Credits:2)

Course Objectives:
Students will be able to
1. Learn advanced modules and packages of AI.
2. Learn Symbolic and Statistical Reasoning.

UNIT I: AI with Python
Introduction to Python, why python with AI, Basic and advanced modules &Packages, Python Decorators and generators, Advanced Objects & Data structures.
Start coding with Python, drawing upon libraries and automation scripts to solve complex problems quickly.

Unit II: Symbolic Reasoning under uncertainty and Statistical Reasoning

Introduction to non-monotonic reasoning, logic for non-monotonic reasoning, implementation issues, probability and Baye's Theorem in certainty factor and Rule - Based systems, Bayesian Networks, Demster Shafer Theory, Fuzzy logic

Course Outcomes:
1. Student should get Knowledge of Advanced Objects & Data Structures of AI.
2. Student should get Knowledge of Non-Monotonic Reasoning.

References:

1. Stuart Russell and Peter Norvig (1995), Artificial Intelligence: A Modern Approach, Third edition, Pearson 2003.
2. Shai shalev-shwartz, Shai Ben-David: Understanding Machine Learning from Theory to algorithms, Cambridge University Press
3. Artificial Intelligence by Elaine Rich, Kevin Knight and Nair, TMH

DCSEL 404:(Practical)

Course Objectives:

Students will be able to

1. Learn the concept of Modules and Packages.
2. Learn the concept of Module as a Script.
3. Learn Artificial Intelligence problems and techniques

List of Practical

1. Write a program to use Math module.
2. Write a program to use OS module.
3. Write a program to use different packages.
4. Write a program to use sub packages
5. Write a program to Executing a module as a Script.
6. Write a Case study on Al with Python.
7. Write a Case study on Al in Medicine.
8. Write a Case study on Al in Agriculture.
9. Write a Case study on Al in Education.
10. Write a Case study on Al in Manufacturing.

Course Outcomes:

1. Student should get Knowledge about Modules and Packages.
2. Student should get Knowledge of various fields of Al

References:

1. Stuart Russell and Peter Norvig (1995), Artificial Intelligence: A Modern Approach, Third edition, Pearson 2003.
2. Shai shalev-shwartz, Shai Ben-David: Understanding Machine Learning from Theory to algorithms, Cambridge University Press
3. Artificial Intelligence by Elaine Rich, Kevin Knight and Nair, TMH

DCSEP202 (Project):
(Contact Hrs. 30/60, Credits: 1/2)

BOS Sub-Committee		**Expert Committee**
1 . Mr.R.P. Waghamare	Chairman	1.M.r Mayur More (Academic Expert) (S.G.M College, Karad)
2.Miss N.V. Lasure	Coordinator	2. Santosh Kapase (Industrial Expert) (Capgemini India)