

Python Programming for Machine Learning Applications		Semester	6
Course Code	BEC657D	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2:0	SEE Marks	50
Credits	01	Exam Hours	3
Examination type (SEE)	Practical		
Course Objectives: This course will enable students to <ul style="list-style-type: none">To impart necessary and practical knowledge Machine Learning AlgorithmsTo develop skills required to build real-life ML Algorithm projects.			
Sl.No.	Experiments		
1	Solve the Tic-Tac-Toe problem using the Depth First Search technique.		
2	Show that the 8-puzzle states are divided into two disjoint sets, such that any state is reachable from any other state in the same set, while no state is reachable from any state in the other set.		
3	To represent and evaluate different scenarios using predicate logic and knowledge rules.		
4	To apply the Find-S and Candidate Elimination algorithms to a concept learning task and compare their inductive biases and outputs.		
5	To construct a decision tree using the ID3 algorithm on a simple classification dataset		
6	To assess how the ID3 algorithm performs on datasets with varying characteristics and complexity, examining overfitting, underfitting, and decision tree depth.		
7	To examine different types of machine learning approaches (Supervised, Unsupervised, Semi-supervised, and Reinforcement Learning) by setting up a basic classification problem and exploring how each type applies differently		
8	To understand how Find-S and Candidate Elimination algorithms search through the hypothesis space in concept learning tasks, and to observe the role of inductive bias in shaping the learned concept.		
9	To go through all stages of a real-life machine learning project, from data collection to model fine-tuning, using a regression dataset like the "California Housing Prices."		
10	To perform binary and multiclass classification on the MNIST dataset, analyze performance metrics, and perform error analysis.		
11	Demo experiments		
12	Demo experiments		

<p>Course outcomes (Course Skill Set): At the end of the course, the student will be able to:</p> <ul style="list-style-type: none"> • Apply machine learning algorithms to real life problems. • Able to make use of different machine learning approaches. 	
<p>Assessment Details (both CIE and SEE)</p> <p>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 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p>Continuous Internal Evaluation (CIE): CIE marks for the practical course are 50 Marks. The split-up of CIE marks for record/ journal and test are in the ratio 60:40.</p> <ul style="list-style-type: none"> • Each experiment will be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session. • The record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks. • The total marks scored by the students are scaled down to 30 marks (60% of maximum marks). • Weightage is to be given for neatness and submission of record/write-up on time. • The department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus. • In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce. • The suitable rubrics can be designed to evaluate each student's performance and learning ability. • The marks scored shall be scaled down to 20 marks (40% of the maximum marks). <p>The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.</p>	
<p>Semester End Evaluation (SEE):</p> <ul style="list-style-type: none"> • SEE marks for the practical course are 50 Marks. • SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the Head of the Institute. • The examination schedule and names of examiners are informed to the university before the conduction of the examination. These practical examinations are to be conducted within the schedule mentioned in the university's academic calendar. • All laboratory experiments are to be included for practical examination. • (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. OR based on the course requirement evaluation rubrics shall be decided jointly by examiners. • Students can pick one question (experiment) from the questions lot prepared by the examiners jointly. • Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners. <p>General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%,</p>	

Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.

The minimum duration of SEE is 02 hours

Suggested Learning Resources:

Text Book:

1. Stuart J. Russell and Peter Norvig , Artificial Intelligence, 3rd Edition, Pearson,2015
2. Elaine Rich, Kevin Knight, Artificial Intelligence, 3rd Edition,Tata McGraw Hill,2013.
3. Tom M. Mitchell, Machine Learning, McGraw-Hill Education, 2013
4. AurelienGeron, Hands-on Machine Learning with Scikit-Learn &Tensor Flow , O'Reilly, Shroff Publishers and Distributors Pvt. Ltd 2019.