Course Title	**Artificial Intelligence (Lab)**		
Course Code	**CC-310L**		
Credit Hours	3 (2,1)		
Category	Computing core		
Prerequisite	None		
Co-Requisite	None		
Follow-up	None		
Course Introduction	Artificial Intelligence has emerged as one of the most significant and promising areas of computing. This course focuses on the foundations of AI and its basic techniques like Symbolic manipulations, Pattern Matching, Knowledge Representation, Decision Making and Appreciating the differences between Knowledge, Data and Code. AI programming language Python has been proposed for the practical work of this course.		
Course Learning Outcomes (CLOs)	At the end of the course, the students will be able to:	**BT**	**PLO**
	CLO2: Understand the fundamental concepts in the field of artificial intelligence	C2 (Understand)	1,2
	CLO3: Implement artificial intelligence techniques and case studies	C3 (Apply)	3,4,5
	CLO3: Understand and apply the Object-oriented concepts in the programming languages.	C4 (Identify)	1,2,3
Syllabus	An Introduction to Artificial Intelligence and its applications towards Knowledge Based Systems; Symbolic AI: the physical symbol system hypothesis. Search: exhaustive & heuristic search techniques. Introduction to Reasoning and Knowledge Representation, Problem Solving by Searching (Informed searching, Uninformed searching, Heuristics, Local searching, Minmax algorithm, Alpha beta pruning, Game-playing); Case Studies: General Problem Solver, Eliza, Student, Macsyma; Learning from examples; ANN and Natural Language Processing; Recent trends in AI and applications of AI algorithms, Game playing, Genetic algorithms, Introduction to Machine Learning for AI, Decision Trees, Bayesian classification, Artificial Neural Networks, Computer Vision. Introduction to Python programming, variables, expressions, operands and operators, loops, control structures, debugging, error messages, functions, strings, lists, object-oriented constructs and basic graphics in the languages. Logic programming: knowledge representation & search in the context of logic programming. Reasoning in logic programming: unification, horn clause logic, and resolution, Knowledge Representation Schemas: Logic, frames, semantic nets, scripts; problems in knowledge representation. Expert systems.		
Suggested Instructional/ Reading Material	1. Stuart Russell and Peter Norvig, Artificial Intelligence. A Modern Approach, 3rd edition, Prentice Hall, Inc., 2015. 2. Luger, G.F. and Stubblefield, W.A., 2009. AI algorithms, data structures, and idioms in Prolog, Lisp, and Java. Pearson Addison-Wesley. 3. George F. Luger, Artificial Intelligence - Structures and Strategies for Complex Problem Solving, 6th Edition, Pearson, 2008, ISBN-13: 978-0321545893. 4. Hart, P.E., Stork, D.G. and Duda, R.O., Pattern classification. John Willey & Sons, 2001. 5. P. Winston, Artificial Intelligence, 3rd Edition, Pearson, 1992, ISBN-13: 978- 0201533774. 6. Tony Gaddis, “Starting out with Python”, 4th Edition, Pearson Education, 2017. 7. McKinney, W., “Python for data analysis: Data wrangling with Pandas, NumPy, and IPython.”, 2nd Edition O'Reilly Media, Inc., 2023. 8. Luger, G.F. and Stubblefield, W.A., “AI algorithms, data structures, and idioms in Prolog, Lisp, and Java”, Pearson Addison-Wesley. 2009. 9. Russell, S. and Norvig, P. “Artificial Intelligence. A Modern Approach”, 3rd ed, Prentice Hall, Inc., 2015. 10. Handouts and Internet references		