

Academic Course Description

BHARATH UNIVERSITY Faculty of Engineering and Technology Department of Electronics and Communication Engineering BCS603- Artificial Intelligence& Expert System SEVENTH Semester, 2017-18 (Odd Semester)

Course (catalog) description

The purpose of this course is to impart concepts of Artificial Intelligence and Expert System.

Compulsory/Elective course : Elective for ECE students
Credit & Contact hours : 3 & 45
Course Coordinator : Ms. R.Priya , Asst.Professor

Instructors :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@bharathuniv.ac.in)	Consultation
Ms. R.Priya	III year	SA019			12.30-1.30 pm

Relationship to other courses:

Pre –requisites : Nil

Assumed knowledge : The students will have a basic knowledge in the study of agents that receive percepts from the Environment and perform actions.

Following courses : BCS002- Neural Networks

Syllabus Contents

UNIT- I

PROBLEMS AND SEARCH

9

Searching strategies- Uninformed Search- breadth first search, depth first search, uniform cost search, depth limited search, iterative deepening search, bidirectional search - Informed Search- Best first search ,Greedy Best first search , A* search – Constraint satisfaction problem , Local searching strategies.

UNIT II

9

REASONING

Symbolic Reasoning Under Uncertainty- Statistical Reasoning - Weak Slot-And-Filler-Structure - Semantic nets – Frames- Strong Slot-And-Filler Structure-Conceptual Dependency-Scripts- CYC.

UNIT III**9****KNOWLEDGE REPRESENTATION**

Knowledge Representation - Knowledge representation issues - Using predicate logic - Representing Knowledge Using Rules. Syntactic- Semantic of Representation – Logic & slot and filler - Game Playing – Minimal search- Alpha beta cutoffs –Iteratic deepening planning – component of planning system – Goal stack planning.

UNIT IV**9****NATURAL LANGUAGE PROCESSING**

Natural Language Processing –Syntactic processing, semantic analysis-Parallel and Distributed AI-Psychological modeling- parallelism and distributed in reasoning systems – Learning -Connectionist Models – Hopfield networks, neural networks

UNIT V**EXPERT SYSTEMS****9**

Common Sense –qualitative physics, commonsense ontologies- memory organization -Expert systems –Expert system shells- explanation – Knowledge acquisition -Perception and Action – Real time search- robot architecture.

TOTAL NO OF PERIODS: 45**TEXT BOOKS**

1. Elaine Rich Kevin Knight, “Artificial Intelligence”, 3/e, Tata McGraw Hill, 2009.
2. Russell , “ Artificial intelligence :A modern Approach , Pearson Education ,3rd edition,2013

REFERENCE BOOKS

1. Artificial Intelligence and Expert system by V.Daniel hunt, Springer press,2011.
2. Nilsson N.J., ”Principles of Artificial Intelligence”, Morgan Kaufmann.1998.
- 3.[http://www.ggu.ac.in/download/Class-Note13/Artificial%20Intelligence %20and%20Expert%20System24.10.13.pdf](http://www.ggu.ac.in/download/Class-Note13/Artificial%20Intelligence%20and%20Expert%20System24.10.13.pdf)

Computer usage: Nil**Professional component**

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

Broad area : Communication | Signal Processing | Electronics | VLSI | Embedded | Computer

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	February 2 nd week	Session 1 to 14	2 Periods
2	Cycle Test-2	March 2 nd week	Session 15 to 28	2 Periods
3	Model Test	April 3 rd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

This course is to expose basics of Microwave components. To introduce the students to a few microwave measurements.	Correlates to program outcome		
	H	M	L
Describe the modern view of AI as the study of agents that receive percepts from the Environment and perform actions.	b	d, e	a
Demonstrate awareness of informed search and exploration methods.	d	e	c
Explain about AI techniques for knowledge representation, planning and uncertainty Management.	b	c	a
Develop knowledge of decision making and learning methods.	e	c	a
Describe the use of AI to solve English Communication problems.	e	c	a
Explain the concept Knowledge Representation.	d	b	a

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I PROBLEMS AND SEARCH			
1.	Searching strategies-, bi ,Greedy Best first search	No	[T1] Chapter -1
2.	Uninformed Search- breadth first search	No	
3.	depth first search, uniform cost search	No	
4.	depth limited search, iterative deepening search	No	
5.	directional search - Informed Search- Best first search	No	
6.	A* search – Constraint satisfaction problem ,	No	
7.	Local searching strategies	No	
UNIT II REASONING			
8.	Symbolic Reasoning Under Uncertainty	No	[T1] Chapter -2
9.	Statistical Reasoning	No	
10.	Weak Slot	No	
11.	Filler-Structure	No	
12.	Frames	No	
13.	-Filler Structure- -Scripts- CY .	No	
14.	Conceptual Dependency .	No	
15.	Scripts- CY	No	
16.	Strong Slot-AndC	No	
UNIT III KNOWLEDGE REPRESENTATION			
17.	Knowledge Representation	No	[T1] Chapter -3
18.	Knowledge representation issues -	No	
19.	Representing Knowledge Using Rules.	No	
20.	Syntactic- Semantic of Representation	No	
21.	Logic & slot and filler	No	
22.	Game Playing – Minimal search	No	
23.	Alpha beta cutoffs	No	
24.	Iterative deepening planning	No	
25.	component of planning system	No	
26.	Goal stack planning and mode of operation	No	
UNIT IV NATURAL LANGUAGE PROCESSING			
27.	Natural Language Processing	No	[T1] Chapter -4
28.	Syntactic processing	No	
29.	semantic analysis	No	
30.	Parallel and Distributed AI-Psychological modeling	No	
31.	parallelism and distributed in reasoning systems	No	
32.	Learning	No	
33.	Connectionist Models	No	
34.	Hopfield networks	No	
35.	Neural networks	No	

UNIT V EXPERT SYSTEMS			
36.	Common Sense	No	[T1] Chapter -5
37.	qualitative physics	No	
38.	commonsense ontologies	No	
39.	memory organization	No	
40.	Expert systems	No	
41.	Expert system shells	No	
43.	explanation – Knowledge acquisition	No	
44.	Perception and Action	No	
45.	Real time search- robot architecture.	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	10%
Assignment /Seminar/online test/quiz	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by: Ms. R.Priya, Assistant professor .

Dated :

Addendum**ABET Outcomes expected of graduates of B.Tech / ECE / program by the time that they graduate:**

- a. An ability to apply knowledge of mathematics, science, and engineering
- b. An ability to design and conduct experiments, as well as to analyze and interpret data
- c. An ability to design a hardware and software system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d. An ability to function on multidisciplinary teams
- e. An ability to identify, formulate, and solve engineering problems
- f. An understanding of professional and ethical responsibility
- g. An ability to communicate effectively
- h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- i. A recognition of the need for, and an ability to engage in life-long learning
- j. A knowledge of contemporary issues
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Educational Objectives**PEO1: PREPARATION**

Electronics Engineering graduates are provided with a strong foundation to passionately apply the fundamental principles of mathematics, science, and engineering knowledge to solve technical problems and also to combine fundamental knowledge of engineering principles with modern techniques to solve realistic, unstructured problems that arise in the field of Engineering and non-engineering efficiently and cost effectively.

PEO2: CORE COMPETENCE

Electronics engineering graduates have proficiency to enhance the skills and experience to apply their engineering knowledge, critical thinking and problem solving abilities in professional engineering practice for a wide variety of technical applications, including the design and usage of modern tools for improvement in the field of Electronics and Communication Engineering.

PEO3: PROFESSIONALISM

Electronics Engineering Graduates will be expected to pursue life-long learning by successfully participating in post graduate or any other professional program for continuous improvement which is a requisite for a successful engineer to become a leader in the work force or educational sector.

PEO4: SKILL

Electronics Engineering Graduates will become skilled in soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, interpersonal relationship, group discussion and leadership ability to become a better professional.

PEO5: ETHICS

Electronics Engineering Graduates are morally boosted to make decisions that are ethical, safe and environmentally-responsible and also to innovate continuously for societal improvement.

Course Teacher	Signature
Ms. R.Priya	

Course Coordinator

HOD/ECE