

Academic Course Description

BHARATH UNIVERSITY Faculty of Engineering and Technology Department of Electronics and Communication Engineering BCS603- Artificial Intelligence& Expert System Sixth Semester, 2016-17 (Even 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 hours : 3 credits
Course Coordinator : Ms. G.Kanagavalli Asst.Professor

Instructors :

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

Relationship to other courses:

Pre –requisites : BEC001- Advanced Computer Architecture

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 Schedul

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 searc	No	
3.	depth first search, uniform cost seart	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.	Iteratic 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	-	10%
Cycle Test – II	-	10%
Model Test	-	25%
Attendance	-	5%
Final exam	-	50%

Prepared by: G.Kanagavalli Assistant professor , Department of ECE

Dated : 10 -7-2017

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

Engineering Graduate will have

- a) an ability to apply knowledge of mathematics, science, and engineering fundamentals.
- b) an ability to identify, formulate, and solve engineering problems
- c) an ability to design a 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 design and conduct experiments, as well as to analyze and interpret data
- e) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- f) an ability to apply reasoning informed by a knowledge of contemporary issues
- g) an ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- h) an ability in understanding of professional and ethical responsibility and apply them in engineering practices
- i) an ability to function on multidisciplinary teams
- j) an ability to communicate effectively with the engineering community and with society at large
- k) an ability in understanding of the engineering and management principles and apply them in Project and finance management as a leader and a member in a team.

Program Educational Objectives**PEO1: PREPARATION:**

To provide strong foundation in mathematical, scientific and engineering fundamentals necessary to analyze, formulate and solve engineering problems in the field of Electronics And Communication Engineering.

PEO2: CORE COMPETENCE:

To enhance the skills and experience in defining problems in Electronics And Communication Engineering design and implement, analyzing the experimental evaluations, and finally making appropriate decisions.

PEO3: PROFESSIONALISM:

To enhance their skills and embrace new Electronics And Communication Engineering Technologies through self-directed professional development and post-graduate training or education

PEO4: SKILL:

To provide training for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

PEO5: ETHICS:

Apply the ethical and social aspects of modern communication technologies to the design, development, and usage of electronics engineering.

Course Teacher	Signature
Ms.G.KANAGAVALLI	

Course Coordinator

(Ms.G.Kanagavalli)

Academic Coordinator

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Professor In-Charge

(Dr.)

HOD/ECE

(Dr.M.Sangeetha)