



Course Specification

(Bachelor)

Course Title: **Intelligent Systems**

Course Code: **CENX 454**

Program: **B.S. in Computer Engineering**

Department: **Department of Computer Engineering**

College: **College of Computer and Information Sciences**

Institution: **King Saud University**

Version: *Course Specification Version Number*

Last Revision Date: *Pick Revision Date.*

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A. General information about the course:

1. Course Identification

1. Credit hours: (1 hours)

2. Course type

A. ☐ University ☐ College ☒ Department ☐ Track ☐ Others
B. ☐ Required ☒ Elective

3. Level/year at which this course is offered: (Level 9 and 10)

4. Course general Description:

Applications of intelligent systems in computer engineering field: artificial intelligence (AI) definitions, knowledge representation, rule-based and fuzzy-based expert systems, evolutionary computation, and deep neural networks. Use AI methods for solving computer engineering problems such as image/video analysis, speech processing and analysis, robotics, and computer networks.

5. Pre-requirements for this course (if any):

CEN453-Digital control and robotics

6. Co-requirements for this course (if any):

7. Course Main Objective(s):

The main objective of this course to equip students with sufficient knowledge about AI, and develop their skills to solve various computer engineering problems using AI methods.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4 hours per week	100%
2	E-learning		
3	Hybrid - Traditional classroom - E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)





No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	15
5.	Others (specify)	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Explain knowledge representation and reasoning	1	Lectures and Tutorials	Exams and Homework
1.2	Explain rule-based fuzzy logic systems	1	Lectures and Tutorials	Exams and Homework
2.0	Skills			
2.1	Apply evolutionary algorithms to solve mono/multi-objective optimization problems	2	Lectures and Tutorials	Exams and Homework
2.2	Apply neural networks for learning from data	2	Lectures and Tutorials	Exams and Homework
3.0	Values, autonomy, and responsibility			
3.1	Design and implement AI solutions to computer engineering problems such as image/video analysis, speech processing and analysis, robotics and computer networks	6	Lectures and Tutorials and Project	Exams and Homework

C. Course Content

No	List of Topics	Contact Hours
1.	AI definitions, knowledge representation and reasoning	4
2.	Fuzzy set and fuzzy logic theory	12





3.	Evolutionary computation	12
4.	Neural Networks	16
5.	Applications of AI methods to computer engineering problems	8
6.	Review and evaluation	8
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Examination (1)	6	20%
2.	Midterm Examination (2)	12	20%
3.	Assignments and Quizzes	Weekly	20%
4.	Final Exam	End	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Computer Organization and Design: The Hardware/Software Interface (5th Edition), Hennessy and Patterson, 2014.
Supportive References	Haykin, S., Neural Networks and learning machine, 3rd Ed., 2009, Prentice-Hall. Russell, S. and Norvig, P., Artificial Intelligence -A Modern Approach, 3rd Ed., 2009, Prentice-Hall.
Electronic Materials	https://lms.ksu.edu.sa
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room with number of seats enough to accommodate enrolled students.
Technology equipment (projector, smart board, software)	Overhead projector with required software to facilitate presentations on smart board.
Other equipment (depending on the nature of the specialty)	



F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Department Council	Course reports are evaluated by the Department Council.
Effectiveness of Students assessment	Faculty-Peer Review	Final examination is moderated.
Quality of learning resources	Students	Indirect – Edu-gate survey.
The extent to which CLOs have been achieved	Students	Attainment level of every CLO is measured directly.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	