55. Course Specification of Power System Protection

I. Course Identification and General Information:

1.	Course Title:	Power System Protection				
2.	Course Code & Number:	PME436				
3.	Credit hours:	C.H.				Total
		Th.	Tu.	Pr	Tr.	
		2	2	2	-	4
4.	Study level/ semester at which this course is offered:	Fifth Year/ Second Semester				
5.	Pre –requisite (if any):	Power System Analysis 2 (PME333), Substation Design (PME428)				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered:	Power System and Electrical Machines Engineering				
8.	Language of teaching the course:	English Language.				
9.	Location of teaching the course:	Faculty of Engineering, Sana'a University.				
10.	Prepared By:	Asst. Prof. Dr. Muhammad Al-yadoumi				
11.	Date of Approval:					

II. Course Description:

This course provides students with the basic protection schemes that are used to detect and interrupt the faults in a power system. A properly designed protection can ensure power supply cut to minimum users yet continue supply power to other end users in case that a fault occurs in the system and save electrical equipment from any destruction. The topics of the course include:
Philosophy of protection: Definitions, Protection Requirements, Zones of Protection, Zones Overlap, Over reach and Under reach, Primary and Backup Protection.
Protection System Components: Construction and principle of operation of Protection transducers (CT and PT), Construction and Principle of operation of Different types of Protective Relays: Electromagnetic, Static, and Microprocessor-Based Relays.
Different relaying schemes: Overcurrent, Differential, Directional, Distance, pilot, Earth Leakage, and Percentage Protections schemes will be discussed. The applications of these schemes will be explored

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in the protection of transformers, bus-bars, rotating electrical machines, transmission lines, and Feeders in Distribution power systems.
During the lab sessions, students will have an opportunity to model and implement (simulate) protection schemes application using Matlab/Simulink and/ or ETAP. This provide the students with hands-on experience and help them become familiar with engineering tools used for power system protection analysis and design.
In addition, the course includes a group-based term project in which each team have to choose a small power system and apply the knowledge acquired throughout the course to design, simulate, and analyze different protection schemes on such system.

III. Course Intended learning outcomes (CILOs) of the course		**Referenced PILOs**
a1.	Demonstrate knowledge and understanding of the theoretical and mathematical aspects of power systems protection.	A1 (A)
a2.	Demonstrate knowledge and understanding of the effect of design parameters on the power system protection performance.	A2 (A)
b1..	Study, analyze, interpretation, and assess the behavior of power system protection components during normal and up-normal operating conditions.	B1, B2 (A)
b2.	Compare between alternative protection schemes used in power system protection to select the appropriate one according to the needed specifications.	B2 (A)
c1.	Design, simulate, and analyze feasible protection scheme needed for each main part of a power system.	, C4 (A)
c2.	Apply the alternative protection components to construct the desired protection scheme	C2 (A)
d1.	Develop student's cooperative work though efficient team works, through projects work.	D1 (A)
d2.	Communicate effectively to professionals and non-specialists alike through reports and presentations	D4 (A)

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Demonstrate knowledge and understanding of the theoretical	▪ Active Lectures. ▪ Tutorials. ▪ Computer Analysis	▪ Written Exams ▪ Homework

	and mathematical aspects of power systems protection.	▪ Discussion	▪ Computer Analysis Results
a2.	Demonstrate knowledge and understanding of the effect of design parameters on the power system protection performance.	▪ Active Lectures. ▪ Tutorials. ▪ Computer Analysis ▪ Discussion	▪ Written Exams ▪ Homework ▪ Class activities. ▪ Computer Analysis Results

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
b1.	Study, analyze, interpretation, and assess the behavior of power system protection components during normal and up-normal operating conditions.	▪ Active Lectures. ▪ Tutorials. ▪ Brainstorming ▪ Computer Analysis	▪ Written Exams ▪ Homework ▪ Class activities. ▪ Computer Analysis Results
b2.	Compare between alternative protection schemes used in power system protection and select the appropriate one according to the needed specifications.	▪ Active Lectures. ▪ Tutorials. ▪ Computer Analysis ▪ Discussion	▪ Written Exams ▪ Homework ▪ Class activities. ▪ Computer Analysis Results

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes		Teaching strategies	Assessment Strategies
c1.	Design, simulate, and analyze feasible protection scheme needed for each main part of a power system.	▪ Active Lectures. ▪ Problem solving ▪ Computer Analysis	▪ Written Exams ▪ Homework ▪ Class activities. ▪ Computer Analysis Results
c3.	Apply the alternative protection components to construct the desired protection scheme	▪ Active Lectures. ▪ Problem solving ▪ Computer Analysis	▪ Homework ▪ Simulations reports ▪ Class activities.

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(D) Alignment Course Intended Learning Outcomes of Transferable Skillsto Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Develop student's cooperative work though efficient team works, through labs and projects work.	▪ Group works ▪ Projects ▪ Laboratory Works	▪ Project reports ▪ Presentation ▪ Lab Reports
d2. Communicate effectively to professionals and non-specialists alike through reports and presentations	▪ Group works ▪ Projects	▪ Presentations ▪ Project reports ▪ Homwork reports

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1.	Philosophy of protection	a1, b1, b2	• Introduction • Definitions, • Need of Protection System • Protection Requirements: Selectivity or discrimination, Reliability, Sensitivity, Stability, Fast Operation, and Economic • Zones of Protection, • Zones Overlap, • Zone Over reach and Under reach, • Primary Protection. • Backup Protection: Remote Buckup Local Buckup; Relay Buckup, Breaker Buckup	1	2
2.	Protection Transducers	a1, a2, b1, b2, c1, c2	• Current Transformers (CT): Types, Construction, Schematic Representation, Equivalent Circuit, Phasor Diagram. Burden Analysis of CT operation,	1	2

			Magnetization Curve Transient Response of CT • Protection CT versus Measurements CT • Voltage Transformers (VT): Schematic Representation , Equivalent Circuit, Analysis of VT operation, Capacitive VT, Transient Response of VT • Optical Instrument Transducer		
3.	Protective Relays:	a1, a2, b1, b2, c1, c2	• Definition, classification: Electromagnetic Relays, Auxiliary relay, Thermal Relay, Static (Electronic) Relays, Digital Relay, and Numerical relay. • Electromagnetic Relays versus Numerical relay.	2	4
4.	Over current and Earth Fault Protection	a1, a2, b1, b2, c1, c2	• Over Current (OC) Protection Schemes • Required data for relay setting • Types of Overcurrent relay: Definite-time, Definite-current (High Set Instantaneous O.C. Protection) • Time Graded O.C. protection: Inverse Definite Minimum Tim (IDMT) O.C. Protection, IDMT standard characteristic , IDMT Grading calculations, Normal Inverse, Very Inverse and extreme Inverse characteristics. • Relay Time Grading Margin • Earth Fault protection Using IDMT	2	4
5.	Fuses relays Co-ordination	a1, a2, b1, b2, c1, c2	• Fuse principle of operation • Fuse characteristics • Low voltage fuses • High Voltage Fuses	1	2

			• Fuses relays Co-ordination		
6.	Directional Protection	a1, a2, b1, b2, c1, c2	• Necessity of Directional Protection • Principle of Directional Protection • Phase Fault Protection • Protection of Parallel Power Lines. • Closed Ring Protection • Directional Earth Fault Protection	2	4
7.	Differential Protection (DP)	a1, a2, b1, b2, c1, c2	• Unit protection schemes: Differential protection; Current balanced differential Protection, Voltage balanced differential • Percentage biased differential relays.	1	2
8.	Distance Protection	a1, b2, c1, d1, d2	• Basic Principle. • Operation conditions of Distance Relay • Amplitude Comparator • Phase Comparator • General Characteristic of Distance Relay • Special cases : MHO, Impedance, and Reactance, • Distance Relay, Application of Distance Protection to Transmission line, (3 zones of Graded Protection), Distance protection Setting Calculations.	2	4
9.	Protection System Applications	a1, a2, b1, b2, c1, c2	• Generator Protection, Transformer Protection, Feeder Protection Bus-bar Protection Motor Protection	2	4
Number of Weeks /and Units Per Semester				**14**	**28**

B - Tutorial Aspect:

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Order	Tutorial	Learning Outcomes	Number of Weeks	Contact Hours
1.	**Zones of Protection,** Zones of Protection, Zones Overlap, Zone Over reach and Under reach, Primary Protection. Backup Protection: Remote Buckup	a1, b1, b2	1	2
2.	**Current Transformers (CT):** Equivalent Circuit, Phasor Diagram. Burden Transient Response of CT Magnetization Curve Ratio Error	a1, a2, b1, b2, c1, c2	1	2
3.	**Voltage Transformers (VT):** Voltage Transformers (VT): Schematic Representation , Equivalent Circuit, Analysis of VT operation, Capacitive VT, Transient Response of VT Ratio Error Optical Instrument Transducer,	a1, a2, b1, b2, c1, c2	1	2
4.	**Protective Relays** Time Overcurrent Relays Overcurrent Relay Setting PSM (plug setting multiplier) TMS (Time multiplier setting) Curve Equations	a1, a2, b1, b2, c1, c2	1	2
5.	**Over current and Earth Fault Protection**	a1, a2, b1, b2, c1, c2	1	2
6.	**Fuses relays Co-ordination** Fuse characteristics Fuse Selection Fuses relays Co-ordination calculations	a1, a2, b1, b2, c1, c2	1	2
7.	**Directional Protection** Protection of Parallel Power Lines. Closed Ring Protection Directional Earth Fault Protection	a1, a2, b1, b2, c1, c2	1	2

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9.	**Project Discussion**	a1, a2, b1, b2, c1,c2, d1, d2	1	2
10.	**Differential Protection (DP)** Current balanced differential Protection, Voltage balanced differential Percentage biased differential relays.	a1,a2, b1, b2, c2	1	2
11.	**Distance Protection** MHO, Impedance, and Reactance, Application of Distance Protection to Transmission line, (3 zones of Graded Protection), Distance protection Setting Calculations	a1, a2, b1, b2, c2	2	4
12.	**Protection System Applications** Generator Protection Transformer Protection, Feeder Protection Bus-bar Protection Motor Protection	a1,a2,b1,b 2,,c1, c2.	2	4
13.	**Projects presentation and discussion**	a1,a2,b1,b 2,c1 , c2, d1, d2	1	2
Number of Weeks /and Units Per Semester			**14**	**28**

C- Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1.	Introduction to Simulink., Electrical Transients Analyzer Program (ETAP)	1	2	b1, c2
2.	Simulation of an Over-Current Relay using ETAP	1	2	a1, a2, b1, b2, c1, c2, d2
3.	Simulation of Single-Phase Definite Time Over-Current Relay using MATLAB	1	2	a1, a2, b1, b2, c1, c2, d2
4.	Simulation of a Three Phase Instantaneous Over-Current Relay using MATLAB	1	2	a1, a2, b1, b2, c1, c2, d2

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5.	Modeling of Single-Phase Instantaneous Over-Current Relay using MATLAB	1	2	a1, a2, b1, b2, c1, c2, d2
6.	Simulation of Delay Time over current relay in Matlab.	1	2	a1, a2, b1, b2, c1, c2, d2
7.	Simulation of over current relay by using Matlab function.	1	2	a1, a2, b1, b2, c1, c2, d2
8.	Relay Coordination using Matlab function.	1	2	a1, a2, b1, b2, c1, c2, d2
9.	Simulation of over voltage and under voltage relay by using Matlab function.	1	2	a1, a2, b1, b2, c1, c2, d2
10.	Simulation of distance protection relay for transmission lines in Matlab	1	2	a1, a2, b1, b2, c1, c2, d2
11.	Simulation of differential relay for power transformer in Matlab/ ETAP	1	2	a1, a2, b1, b2, c1, c2, d2
12.	Visit local substation	1	2	A1, d1, d2
13.	Rotating machinery protection scheme implementation in Matlab	1	2	a1, a2, b1, b2, c1, c2, d2
14.	Selection Of Circuit Breaker For Different Branches Of A Given Power System Using Etap	1	2	a1, a2, b1, b2, c1, c2, d2
Number of Weeks /and Units Per Semester		**14**	**28**	

V. Teaching strategies of the course:

- Active Lectures.1
- Tutorials.1
- Computer Analysis1
- Group Works.
- laboratory works
- Discussion1
- Problem solving.
- Project
- Brainstorming1

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark

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Academic Development Center & Quality Assurance
Assoc. Prof. Dr. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas

1.	Problem set NO. 1 Zones of Protection,	a1, b2, d1	Third Week.	Left for the lecturer
2.	Problem set NO. 2 Current Transformers (CT):	a1, a2, b1, b2, c2, d1, d2	Fourth Week.	Left for the lecturer
3.	Problem set NO. 3 Voltage Transformers (VT):	a1, a2, b1, b2, c2, d1, d2	Fifth Week.	Left for the lecturer
4.	Problem set NO. 4 Protective Relays	a1, a2, b1, b2, c2, d1, d2	Sixth Week.	Left for the lecturer
5.	Problem set NO. 5 Over current and Earth Fault Protection	a1, a2, b1, b2, c2, d1, d2	Seventh Week.	Left for the lecturer
6.	Problem set NO. 6 Fuses relays Co-ordination	a1, a2, b1, b2, c2, d1, d2	Eight Week.	Left for the lecturer
7.	Problem set NO. 7 Directional Protection	a1, a2, b1, b2, c2, d1, d2	Tenth Week.	Left for the lecturer
8.	Problem set NO. 8 Differential Protection (DP)	a1,a2, b1, b2, c2, d1, d2	Eleventh Week.	Left for the lecturer
9.	Problem set NO.9 Distance Protection	a1, a2, b1, b2, c2, d1, d2	Fourteenth Week.	Left for the lecturer
10.	Protection System Applications Generator Protection Transformer Protection, Feeder Protection Bus-bar Protection Motor Protection	a1, a2, b1, b2, c2, d1, d2	Fifteenth Weeks	Left for the lecturer
11.	Project	a1,a2,b1,b2,,c1, c2, d1, d1	Fifteenth Weeks.	Left for the lecturer
	Total			

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1.	Class activities	Every Class	10	5%	a1, b1, b2, c1, d1, d2.
2.	Assignments	Weekly	20	10 %	a1, a2, b1,b2, c1, d1,d2.
3.	Lab Work and reports	Weekly	20	10%	
4.	Course Project	15	20	10%	a1, b1,b2, c1, c2, d1,d2.

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5.	Midterm exam	8	30	15%	a1, b1, b2, d2.
7.	Final Exam	16	100	50%	a1, b1, b2, c1, c2, d2.
	Total		**200**	**100**	

VIII. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1- "Protective Relaying" J.L. Blackburn, Marcel Dekker, Inc.,3rd edition.2004.
2- "Power System Relaying" by S. H. Horowitz and A. G. Phadke, 4th Edition, Wiley, 2014.

2- Essential References.

1- A.G. Phadke and J.S. Thorp, "Computer Relaying for Power Systems", John Wiley and Sons, 1994
2- Protective relaying principles and applications , Lewis Blackburn, third edition, marceldekker, 2006

3- Electronic Materials and Web Sites *etc*.

1. All About: Matlab Package
2. www.mathworks.com

IX. Course Policies:

1.	**Class Attendance:** A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic
2.	**Tardy:** For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
3.	**Exam Attendance/Punctuality:** A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam-
4.	**Assignments & Projects:** The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time-
5.	**Cheating:**

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	For cheating in exam, a student will be considered as failure. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty-
6.	**Plagiarism:** Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7.	**Other policies:** - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy

Reviewed By	**Vice Dean for Academic Affairs and Post Graduate Studies: Asst. Prof. Dr. Tarek A. Barakat** **President of Quality Assurance Unit: Assoc. Prof. Dr. Mohammed Algorafi** **Name of Reviewer from the Department: Asst. Prof. Dr. Adel Ahmed Al-Shakiri**
	Deputy Rector for Academic Affairs Asst. Prof. Dr. Ibrahim AlMutaa **Assoc. Prof. Dr. Ahmed Mujahed** **Asst. Prof. Dr. Munasar Alsubri**

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55. Template for Course Plan of Power System Protection

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Muhammad Al-yadoumi	**Office Hours**					
Location& Telephone No.	**Electrical Engineering** Department 777811668	**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail	Alyadoumi@hotmail.com	8-10					

II. Course Identification and General Information:						
1.	Course Title:	Power System Protection				
2.	Course Number & Code:	PME436				
3.	Credit hours:	C.H				Total
		Th.	Tut	Pr.	Tr.	
		2	2	2	-	4
4.	Study level/year at which this course is offered:	Fifth Year/ Second Semester				
5.	Pre –requisite (if any):	Power System Analysis 2 (PME333), Substation Design (PME428)				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered	Power System and Electrical Machines Engineering				
8.	Language of teaching the course:	English Language.				
9.	System of Study:	Semesters.				
10.	Mode of delivery:	Lectures, Tutorials, and Labs				
11.	Location of teaching the course:	To be specified by the Academic Affair				

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III. Course Description:

This course provides students with the basic protection schemes that are used to detect and interrupt the faults in a power system. A properly designed protection can ensure power supply cut to minimum users yet continue supply power to other end users in case that a fault occurs in the system and save electrical equipment from any destruction. The topics of the course include:

Philosophy of protection: Definitions, Protection Requirements, Zones of Protection, Zones Overlap, Over reach and Under reach, Primary and Backup Protection.

Protection System Components: Construction and principle of operation of Protection transducers (CT and PT), Construction and Principle of operation of Different types of Protective Relays: Electromagnetic, Static, and Microprocessor-Based Relays.

Different relaying schemes: Overcurrent, Differential, Directional, Distance, pilot, Earth Leakage, and Percentage Protections schemes will be discussed. The applications of these schemes will be explored in the protection of transformers, bus-bars, rotating electrical machines, transmission lines, and Feeders in Distribution power systems.

During the lab sessions, students will have an opportunity to model and implement (simulate) protection schemes application using Matlab/Simulink and/ or ETAP. This provide the students with hands-on experience and help them become familiar with engineering tools used for power system protection analysis and design.

In addition, the course includes a group-based term project in which each team have to choose a small power system and apply the knowledge acquired throughout the course to design, simulate, and analyze different protection schemes on such system.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop**:**

1. Demonstrate knowledge and understanding of the theoretical and mathematical aspects of power systems protection.
2. Demonstrate knowledge and understanding of the effect of design parameters on the power system protection performance.
3. Study, analyze, interpretation, and assess the behavior of power system protection components during normal and up-normal operating conditions.
4. Compare between alternative protection schemes used in power system protection to select the appropriate one according to the needed specifications.
5. Design, simulate, and analyze feasible protection scheme needed for each main part of a power system.

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6. Apply the alternative protection components to construct the desired protection scheme
7. Develop student's cooperative work though efficient team works, through projects work.
8. Communicate effectively to professionals and non-specialists alike through reports and presentations

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	Contact Hours
1.	Philosophy of protection	• Introduction • Definitions, • Need of Protection System • Protection Requirements: Selectivity or discrimination, Reliability, Sensitivity, Stability, Fast Operation, and Economic • Zones of Protection, • Zones Overlap, • Zone Over reach and Under reach, • Primary Protection. • Backup Protection: Remote Buckup Local Buckup; Relay Buckup, Breaker Buckup	1st	2
2.	Protection Transducers	• Current Transformers (CT): Types, Construction, Schematic Representation, Equivalent Circuit, Phasor Diagram. Burden Analysis of CT operation, Magnetization Curve Transient Response of CT • Protection CT versus Measurements CT • Voltage Transformers (VT): Schematic Representation , Equivalent Circuit, Analysis of VT operation, Capacitive VT, Transient Response of VT	2nd	2

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		• Optical Instrument Transducer		
3.	Protective Relays:	• Definition, classification: Electromagnetic Relays, Auxiliary relay, Thermal Relay, Static (Electronic) Relays, Digital Relay, and Numerical relay. • Electromagnetic Relays versus Numerical relay.	3rd , 4th	4
4.	Over current and Earth Fault Protection	• Over Current (OC) Protection Schemes • Required data for relay setting • Types of Overcurrent relay: Definite-time, Definite-current (High Set Instantaneous O.C. Protection) • Time Graded O.C. protection: Inverse Definite Minimum Tim (IDMT) O.C. Protection, IDMT standard characteristic , IDMT Grading calculations, Normal Inverse, Very Inverse and extreme Inverse characteristics. • Relay Time Grading Margin • Earth Fault protection Using IDMT	5th , 6th	4
5.	Fuses relays Co-ordination	• Fuse principle of operation • Fuse characteristics • Low voltage fuses • High Voltage Fuses • Fuses relays Co-ordination	7th	2
6.	Midterm Exam	•	8th	2
7.	Directional Protection	• Necessity of Directional Protection • Principle of Directional Protection • Phase Fault Protection • Protection of Parallel Power Lines. • Closed Ring Protection • Directional Earth Fault Protection	9th ,10th	4
8.	Differential Protection (DP)	• Unit protection schemes: Differential protection; Current balanced differential Protection, Voltage balanced differential • Percentage biased differential relays.	11th	2

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9.	Distance Protection	• Basic Principle. • Operation conditions of Distance Relay • Amplitude Comparator • Phase Comparator • General Characteristic of Distance Relay • Special cases : MHO, Impedance, and Reactance, • Distance Relay, Application of Distance Protection to Transmission line, (3 zones of Graded Protection), Distance protection Setting Calculations.	12th ,13th	4
10.	Protection System Applications	• Generator Protection, Transformer Protection, Feeder Protection Bus-bar Protection Motor Protection	14th ,15th	2
11.		•	16th	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Tutorial Aspect:

Order	Tutorial	Number of Weeks	Contact Hours
1.	**Zones of Protection,** Zones of Protection, Zones Overlap, Zone Over reach and Under reach, Primary Protection. Backup Protection: Remote Buckup	1st	2
2.	**Current Transformers (CT):** Equivalent Circuit, Phasor Diagram. Burden Transient Response of CT Magnetization Curve Ratio Error	2nd	2
3.	**Voltage Transformers (VT):** Voltage Transformers (VT): Schematic Representation , Equivalent Circuit, Analysis of VT operation, Capacitive VT, Transient Response of VT Ratio Error	3rd	2

	Optical Instrument Transducer,		
4.	**Protective Relays** Time Overcurrent Relays Overcurrent Relay Setting PSM (plug setting multiplier) TMS (Time multiplier setting) Curve Equations	4th	2
5.	**Over current and Earth Fault Protection**	5th	2
6.	**Fuses relays Co-ordination** Fuse characteristics Fuse Selection Fuses relays Co-ordination calculations	6th	2
7.	**Directional Protection** Protection of Parallel Power Lines. Closed Ring Protection Directional Earth Fault Protection	7th	2
9.	**Project Discussion**	8th	2
10.	**Differential Protection (DP)** Current balanced differential Protection, Voltage balanced differential Percentage biased differential relays.	9th	2
11.	**Distance Protection** MHO, Impedance, and Reactance, Application of Distance Protection to Transmission line, (3 zones of Graded Protection), Distance protection Setting Calculations	10th ,11th	4
12.	**Protection System Applications** Generator Protection Transformer Protection, Feeder Protection Bus-bar Protection Motor Protection	12th ,13th	4
13.	**Projects presentation and discussion**	14th	2
Number of Weeks /and Units Per Semester		**14**	**28**

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C- Practical Aspect:			
Order	**Tasks/ Experiments**	**Number of Weeks**	**Contact hours**
1.	Introduction to Simulink., Electrical Transients Analyzer Program (ETAP)	1st	2
2.	Simulation of an Over-Current Relay using ETAP	2nd	2
3.	Simulation of Single-Phase Definite Time Over-Current Relay using MATLAB	3rd	2
4.	Simulation of a Three Phase Instantaneous Over-Current Relay using MATLAB	4th	2
5.	Modeling of Single-Phase Instantaneous Over-Current Relay using MATLAB	5th	2
6.	Simulation of Delay Time over current relay in Matlab.	6th	2
7.	Simulation of over current relay by using Matlab function.	7th	2
8.	Relay Coordination using Matlab function.	8th	2
9.	Simulation of over voltage and under voltage relay by using Matlab function.	9th	2
10.	Simulation of distance protection relay for transmission lines in Matlab	10th	2
11.	Simulation of differential relay for power transformer in Matlab/ ETAP	11th	2
12.	Visit local substation	12th	2
13.	Rotating machinery protection scheme implementation in Matlab	13th	2
14.	Selection Of Circuit Breaker For Different Branches Of A Given Power System Using Etap	14th	2
Number of Weeks /and Units Per Semester		**14**	**28**

VI. Teaching strategies of the course:

- Active Lectures.1
- Tutorials.1
- Computer Analysis1
- Group Works.

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- laboratory works
- Discussion1
- Problem solving.
- Project
- Brainstorming1

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1.	Problem set NO. 1 Zones of Protection,	a1, b2, d1	Third Week.	Left for the lecturer
2.	Problem set NO. 2 Current Transformers (CT):	a1, a2, b1, b2, c2, d1, d2	Fourth Week.	Left for the lecturer
3.	Problem set NO. 3 Voltage Transformers (VT):	a1, a2, b1, b2, c2, d1, d2	Fifth Week.	Left for the lecturer
4.	Problem set NO. 4 Protective Relays	a1, a2, b1, b2, c2, d1, d2	Sixth Week.	Left for the lecturer
5.	Problem set NO. 5 Over current and Earth Fault Protection	a1, a2, b1, b2, c2, d1, d2	Seventh Week.	Left for the lecturer
6.	Problem set NO. 6 Fuses relays Co-ordination	a1, a2, b1, b2, c2, d1, d2	Eight Week.	Left for the lecturer
7.	Problem set NO. 7 Directional Protection	a1, a2, b1, b2, c2, d1, d2	Tenth Week.	Left for the lecturer
8.	Problem set NO. 8 Differential Protection (DP)	a1,a2, b1, b2, c2, d1, d2	Eleventh Week.	Left for the lecturer
9.	Problem set NO.9 Distance Protection	a1, a2, b1, b2, c2, d1, d2	Fourteenth Week.	Left for the lecturer
10.	Protection System Applications Generator Protection Transformer Protection, Feeder Protection Bus-bar Protection Motor Protection	a1, a2, b1, b2, c2, d1, d2	Fifteenth Weeks	Left for the lecturer
11.	Project	a1,a2,b1,b2,,c1, c2, d1, d1	Fifteenth Weeks.	Left for the lecturer

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	Total			

Head of Department Asst. Prof. Dr. Adel Ahmed Al-Shakiri	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad	Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1.	Class activities	Every Class	10	5%
2.	Assignments	Weekly	20	10 %
3.	Lab Work and reports	Weekly	20	10%
4.	Course Project	15	20	10%
5.	Midterm exam	8	30	15%
7.	Final Exam	16	100	50%
	Total		**200**	**100**

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1. "Protective Relaying" J.L. Blackburn, Marcel Dekker, Inc.,3rd edition.2004.
2. "Power System Relaying" by S. H. Horowitz and A. G. Phadke, 4th Edition, Wiley, 2014.

2- Essential References.

1. A.G. Phadke and J.S. Thorp, "Computer Relaying for Power Systems", John Wiley and Sons, 1994
2. Protective relaying principles and applications , Lewis Blackburn, third edition, marceldekker, 2006

3- Electronic Materials and Web Sites *etc*.

1. All About: Matlab Package
2. www.mathworks.com

X. Course Policies:

1. **Class Attendance:**
A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic

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2.	**Tardy:** For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
3.	**Exam Attendance/Punctuality:** A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam-
4.	**Assignments & Projects:** The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time-
5.	**Cheating:** For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty-
6.	**Plagiarism:** Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7.	**Other policies:** - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy

56. Elective 1

Course Specification of Artificial Intelligence

I. Course Identification and General Information		
1.	Course Title:	Artificial Intelligence

2.	Course Code &Number:	CCE326				
3.	Credit hours:	C.H				Total
		Th.	Tu.	Pr.	Tr.	
		2	-	2	-	3
4.	Study level/ semester at which this course is offered:	Level 4- Semester 2				
5.	Pre –requisite (if any):	Data Structure and Algorithms (CCE246)				
6.	Co –requisite (if any):	None.				
8.	Program (s) in which the course is offered:	B.Sc. of Computer and Control Engineering				
9.	Language of teaching the course:	Arabic & English				
10.	Location of teaching the course:	Class Room (Faculty of Engineering)				
11.	Prepared By:	Prof. Abdul Raqib Abdo Asaad				
12.	Date of Approval					

II. Course Description

This course aims to provide students with basic principles and problem-solving techniques in Artificial Intelligence (AI), which become the dominant branch in information technology field with its wide applications. Course topics cover the foundation of AI, AI programming language, AI problems, problem solving and searching algorithms, knowledge representation, reasoning, planning, and applications. This course depends on lectures and computer-based lab. In addition, it depends on Data Structure and Algorithms as prerequisite which expected to develop student's problem-solving skills related to AI and its wide applications in IT field.

III. Course Intended learning outcomes (CILOs) of the course		Referenced PILOs
a1	Explain the concepts and problem-solving techniques in AI.	A1, A2, A3, A4
a2	Recognize the connection between problem solving and searching algorithms.	
b1	Solve problems using AI techniques.	B1, B2, B3, B4
b2	Justify the problems solve according to the demand requirements.	
c1	Familiar with AI software and AI programming languages	C1, C2, C4

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c2	Write AI programs using AI programing languages for different applications in the field of AI.	
d1	Work in a group to achieve final course's project or during laboratory activities.	D1
d2	Follow the standards to achieve his reports and presentations.	D4

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Explain the concepts and problem-solving techniques in AI.	• Active Lectures, • Interactive class discussions, • Laboratory, • Assignments.	• Examinations, • Reports, • Presentations.
a2- Recognize the connection between problem solving and searching algorithms.	• Active Lectures, • Interactive class discussions, • Laboratory, • Assignments.	• Examinations, • Reports, • Presentations.

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Solve IT-based problems using AI techniques.	• Active Lectures, • Laboratory, • Assignments, • Project.	• Examinations, • Reports, • Presentations.
b2- Justify the problems solve according to the demand requirements.	• Active Lectures, • Laboratory, • Assignments, • Project.	• Examinations, • Reports, • Presentations.

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(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Apply AI software & programming languages in solving problems related to AI applications.	• Laboratory, • Assignments, • Project.	• Lab Reports, • Project Reports, • Presentations.
c2- Write AI programs using AI programing languages to different applications in the field of AI.	• Laboratory, • Assignments, • Project.	• Lab Reports, • Project Reports, • Presentations.

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1- Work in a group to achieve final course's project or during laboratory activities.	• Laboratory • Project	• Observation, • Reports, • Presentations.
d2- Follow the standards to achieve his reports and presentations.	• Use of Information Technology Tools, • Assignments, • Project.	• Reports, • Presentations.

IV. Course Content

A – Theoretical Aspect

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact hours
1.	AI Overview	a1, c1	• What is AI? • Foundations of AI • AI problems • Introduction to AI languages • AI techniques • Intelligent agents • Agent structure • Nature of environment	2	4
2.	Problem-Solving & Search	a1, a2, b1, b2	• Problem-solving (with example problems) • Searching for solution • uninformed search strategies • Heuristic search strategies • Heuristic functions	5	10

			• Local search algorithms and optimization problems • Searching with nondeterministic action • Searching with partial observation		
3.	Game Playing Overview	a1, b1, b2	• Optimal decisions in games (the minimax algorithm, optimal decision in multiplayer games) • Alpha-beta pruning	2	4
4.	Knowledge, Reasoning, and Planning	a1, b1, b2	• Logical agents • First-order logic • Inference in first-order logic • Planning and acting in the real world • Classical planning • Knowledge structure • Knowledge representation paradigms	5	10
Number of Weeks /and Units Per Semester				**14**	**28**

B - Practical Aspect

Order	Topics List	Number of Weeks	Contact hours	Learning Outcomes
1.	AI programming language: Basic concepts	1	2	a1, c1
2.	AI programming language (cont.)	2	4	a1, c1, c2
3.	Using the AI prog. language in Machine Learning	2	4	a1, b1, b2, c1, c2, d1
4.	Using the AI prog. language in Logic Programming	2	4	a1, b1, b2, c1, c2, d1

5.	Using the AI prog. language in Heuristic Search	2	4	a1, b1, b2, c1, c2, d1
6.	Using the AI prog. language in Gaming	2	4	a1, b1, b2, c1, c2, d1
7.	Review	1	2	a1, b1, b2, c1, c2, d1, d2
8.	AI Projects Presentations	2	4	a1, b1, b2, c1, c2, d1
Number of Weeks /and Units Per Semester		**14**	**28**	

V. Teaching strategies of the course

- Active Lectures,
- Interactive class discussions,
- Laboratory,
- Assignments,
- Use of Information Technology Tools
- Projects.

VI. Assignments & Reports:

No	Assignments	Aligned CILOs	Week Due	Mark
1.	• Homework on Problem Solving and AI Searching Techniques, • Searching web and prepare short report on AI's Problem-solving.	a1, a2, b1, b2, d2	3rd to 5th	3
2.	• Homework and Report on Game Playing, Knowledge Reasoning & Planning	a1, b1, b2, c1, d2	9th to 14th	3
3.	• Laboratory Reports	a1, b1, b2, c1, c2, d1	2nd to 11th	9
	Total			**15**

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VII. Schedule of Assessment Tasks for Students during the Semester

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1.	Assignments & Reports	3rd to 14th	15	10%	a1, a2, b1, b2, c1, c2, d1, d2
2.	Quizzes	5th, 10th & 14th	7.5	5%	a1, a2, b1, b2, c2
3.	Midterm Exam (Theory)	8th	18.75	12.5%	a1, a2, b1, b2
4.	Final Lab. Exam (including Course Project Evaluation)	13th, 14th & 15th	33.75	22.5%	a1, a2, b1, b2, c1, c2, d1, d2
5.	Final Exam (Theory)	16th	75	50%	a1, a2, b1, b2
Total			**150**	**100%**	

VIII. Learning Resources

Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two)

1) Stuart Russell and Peter Norvig (2009), "Artificial Intelligence: A Modern Approach", Third Edition, Pearson.
2) Elaine Rich and Kevin Knight (2010), "Artificial Intelligence", Third Edition, McGraw-Hill.

2- Essential References

1) Zsolt Nagy (2018), "Artificial Intelligence and Machine Learning Fundamentals", Packt Publishing, ISBN 978-1-78980-165-1.
2) Winston (1992), "Artificial Intelligence", Third Edition, Pearson.
3) George F. Luger (2008), "Artificial Intelligence: Structures and Strategies for Complex Problem Solving", Sixth Edition, Pearson.

3- Electronic Materials and Web Sites etc.

IX. Course Policies:

1. Class Attendance:

Head of Department	Quality Assurance Unit	Dean of the Faculty	Academic Development Center & Quality Assurance	Rector of Sana'a University
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	-A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic
2.	**Tardy:** - For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
3.	**Exam Attendance/Punctuality:** - A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.
4.	**Assignments & Projects:** - The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.
5.	**Cheating**: - For cheating in exam, a student will be considered as failure. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.
6.	**Plagiarism**: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7.	**Other policies:** - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy

Reviewed By	**Vice Dean for Academic Affairs and Post Graduate Studies: Asst. Prof. Dr. Tarek A. Barakat** **President of Quality Assurance Unit: Assoc. Prof. Dr. Mohammed Algorafi** **Name of Reviewer from the Department: Assoc. Prof. Dr. Farouk Al-Fuhaidy**

Head of Department Asst. Prof. Dr. Adel Ahmed Al-Shakiri	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad	Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas

	Deputy Rector for Academic Affairs Asst. Prof. Dr. Ibrahim AlMutaa **Assoc. Prof. Dr. Ahmed Mujahed** **Asst. Prof. Dr. Munasar Alsubri**

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Course Plan of Artificial Intelligence

I. Information about Faculty Member Responsible for the Course

Name of Faculty Member	Prof. Dr. Abdul Raqib Abdo Asaad	Office Hours					
Location&Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information

1-	Course Title:	Artificial Intelligence				
2-	Course Number & Code:	CCE326				
3-	Credit hours:	C.H				Total
		Th.	Tu.	Pr.	Tr.	
		2	-	2	-	3
4-	Study level/year at which this course is offered:	Level 4- Semester 2				
5-	Pre –requisite (if any):	Data Structure and Algorithms (CCE246)				
6-	Co –requisite (if any):	None.				
7-	Program (s) in which the course is offered	B.Sc. of Computer and Control Engineering				
8-	Language of teaching the course:	Arabic & English				
9-	System of Study:	Semesters				
10-	Mode of delivery:	Collective and individual learning				
11-	Location of teaching the course:	Class Room (Faculty of Engineering)				

III. Course Description

This course aims to provide students with basic principles and problem-solving techniques in Artificial Intelligence (AI), which become the dominant branch in information technology field with its wide applications. Course topics cover the foundation of AI, AI programming language, AI problems, problem solving and searching algorithms, knowledge representation, reasoning, planning, and applications. This course depends on lectures and computer-based

lab. In addition, it depends on Data Structure and Algorithms as prerequisite which expected to develop student's problem-solving skills related to AI and its wide applications in IT field.This course depends on lectures and practical parts. In addition, it depends on Data Structure and Algorithms as prerequisite.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop**:**

1. Explain the concepts and problem-solving techniques in AI.
2. Recognize the connection between problem solving and searching algorithms.
3. Solve IT-based problems using AI techniques.
4. Justify the problems solve according to the demand requirements.
5. Apply AI software & programming languages in solving problems related to AI applications.
6. Write AI programs using AI programing languages to different applications in the field of AI.
7. Work in a group to achieve final course's project or during laboratory activities.
8. Follow the standards to achieve his reports and presentations.

V. Course Content:

- Distribution of Semester Weekly Plan Of course Topics/Items and Activities

A – Theoretical Aspect:

Order	Topics List	Sub Topics List	Week Due	Contact Hours
1.	AI Overview	• What is AI? • Foundations of AI • AI problems • Introduction to AI languages • AI techniques • Intelligent agents • Agent structure • Nature of environment	1st, 2nd	4
2.	Problem-Solving & Search	• Problem-solving (with example problems)	3rd, 4th, 5th, 6th, 7th	10

		• Searching for solution • uninformed search strategies • Heuristic search strategies • Heuristic functions • Local search algorithms and optimization problems • Searching with nondeterministic action • Searching with partial observation		
3.	Midterm Exam	• All previous topics	8th	2
4.	Game Playing Overview	• Optimal decisions in games (the minimax algorithm, optimal decision in multiplayer games) • Alpha-beta pruning	9th, 10th	4
5.	Knowledge, Reasoning, and Planning	• Logical agents • First-order logic • Inference in first-order logic • Planning and acting in the real world • Classical planning • Knowledge structure • Knowledge representation paradigms	11th, 12th, 13th, 14th, 15th	10
6.	Final Exam	• All topics	16th	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect

Order	Topics List	Number of Weeks	Contact hours
1.	AI programming language: Basic concepts	1st	2
2.	AI programming language (cont.)	2nd, 3rd	4
3.	Using the AI prog. language in Machine Learning	4th, 5th	4

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4.	Using the AI prog. language in Logic Programming	6th, 7th	4
5.	Using the AI prog. language in Heuristic Search	8th, 9th	4
6.	Using the AI prog. language in Gaming	10th, 11th	4
7.	Review	12th	
8.	AI Projects Presentations	13th, 14th	4
9.	Final Lab. Exam	15th	2
Number of Weeks /and Units Per Semester		**15**	**30**

VI. Teaching strategies of the course:

- Active Lectures,
- Interactive class discussions,
- Laboratory,
- Assignments,
- Use of Information Technology Tools
- Projects.

VII. Assignments & Reports:

No.	Assignments	Week Due	Mark
1.	• Homework on Problem Solving and AI Searching Techniques, • Searching web and prepare short report on AI's Problem-solving.	3rd to 5th	3
2.	• Homework and Report on Game Playing, Knowledge Reasoning & Planning	9th to 14th	3
3.	• Laboratory Reports	2nd to 11th	9
	Total		**15**

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VIII. Schedule of Assessment Tasks for Students during the Semester:

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1.	Assignments & Reports	3rd to 14th	15	10%
2.	Quizzes	5th, 10th & 14th	7.5	5%
3.	Midterm Exam (Theory)	8th	18.75	12.5%
4.	Final Lab. Exam (including Course Project Evaluation)	13th, 14th & 15th	33.75	22.5%
5.	Final Exam (Theory)	16th	75	50%
Total			**150**	**100%**

IX. Learning Resources:

1- Required Textbook(s)

1) Stuart Russell and Peter Norvig (2009), "Artificial Intelligence: A Modern Approach", Third Edition, Pearson.
2) Elaine Rich and Kevin Knight (2010), "Artificial Intelligence", Third Edition, McGraw-Hill.

2- Essential References

1) Zsolt Nagy (2018), "Artificial Intelligence and Machine Learning Fundamentals", Packt Publishing, ISBN 978-1-78980-165-1.
2) Winston (1992), "Artificial Intelligence", Third Edition, Pearson.
3) George F. Luger (2008), "Artificial Intelligence: Structures and Strategies for Complex Problem Solving", Sixth Edition, Pearson.

3- Electronic Materials and Web Sites *etc*.

X. Course Policies:

1.	**Class Attendance:** -A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic
2.	**Tardy:** - For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
3.	**Exam Attendance/Punctuality:** - A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.
4.	**Assignments & Projects:** - The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.
5.	**Cheating**:

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	- For cheating in exam, a student will be considered as failure. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.
6.	**Plagiarism**: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7.	**Other policies:** - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy

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