Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation

Academic Program Specification Form for the Academic

University: Middle Technical University
College : Technical Kut Institute
Department : Renewable Energy Technologies
Date of form completion : 06/10/2022

Dean's Name
Dr. Mahdi Farhan
Date : / /
Signature

Dean's Assistant For Scientific Affairs
Dr. Adil Sabir
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Head of Department
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Quality Assurance And University Performance Manager
Date : / /
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TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the programme.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies/Solar cell Branch
3. Programmer Title	Diploma in Renewable Energy Technologies
4. Title of Final Award	Technical Diploma
5. Modes of Attendance offered	Semester first and second for the academic year 2020-2021
6. Accreditation	Global accounting standards Almndmat
7. Other external influences	The views of experts in the corresponding foreign universities Sectional
8. Date of production/revision of this specification	6/10/2020
9. Aims of the Programme	
• The student with the most important definition of the foundations and Technological renewable energy.	
• introduce students to the functions of Technological renewable energy.	
• A statement of accounting evolution of science and historical sequence.	
• explain the importance of science and its role in Renewable Energy Technologies organizations and the labor market	
• provide students with various Renewable Energy Technologies issues and the formation of a knowledge base about accounting and its applications.	

• rehabilitation of the student to get a technical diploma in Renewable Energy Technologies science being able to work in the public and private sector as an Renewable Energy Technologies accountant.

• Preparation of research and studies within the jurisdiction

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. A1- To know the most important principles and basic technical concepts in the installation and operation of solar energy systems.
B. A2- Determine the main functions of renewable energy and the secondary functions.
C. A3- Explain the concepts of energy technologies.
D. A4- To apply technical concepts with real examples and case studies.
E. A 5 - Analyze the validity of renewable energy theories with practical reality.
F. A 6- To express his opinion in technical terms.

B. Subject-specific skills

B1. Interaction skills: having the ability to communicate with the professor and colleagues.
B2. Diagnostic skills: the ability to diagnose accounting theories of realism and applications
B3. Analytical skills: the ability to analyze accounting concepts and relationships between them.

Teaching and Learning Methods

1 - lectures.
2 - discussion and dialogue.
3 - Questions enrichment.
4 - direct questioning.

Assessment methods

1 - questions of right and wrong.
2 - multiple choice questions
3 - questions clarifications.
4 - duties.
5 - self-assessment.
6 - tests (monthly, quarterly, and the final).

C. Thinking Skills

C1. Put forward new ideas on the subject by the student and provide the subject and give solutions.

C2. Differentiate between the problems and explains and analyzes the phenomena and problems.

C3. Simple thinking (the ability to examine and assess the topics).

C4 Critical thinking: (the ability to critique and highlight topics and test them).

C5. Creative thinking (the ability to produce new accounting ideas).

Teaching and Learning Methods

1 - Using the method of lecture and active participation of the students.

2 - Use the style of question and answer and form working groups to resolve accounting problems.

3 - student participation in the presentation of ideas for cases of accounting and develop solutions to them.

Assessment methods

1 - a variety of tests (daily, monthly, quarterly, final)

2 - oral tests.

3 - Duties.

4 - graduation projects.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. The use of references and terminology skills.

D2. Skills in data on the subject collection and analysis.

D3- Skills of collecting and analyzing data on concepts of renewable energy .and how to use it in organizations

D4 - Training and personal development skills on how to apply renewable energy concepts in various fields.

AD5 - Skills of preparing concepts of renewable energy suitable for use in different fields.

Teaching and Learning Methods

1 -Use the direct method of lecture and discussion.

2 -Use the style of question and answer.

3 -Specialized reports through electronic accounting (online)

Assessment Methods

1 - Questions of objectivity and are divided into: a multi-test questions or questions of right and wrong and the interview questions.
2 - self-assessment and evaluation of the colleague.
3 - tests include:
A - achievement tests associated with the structural plans and teaching.
B - Final achievement tests include:
• Final monthly tests at the end of each month semester.
• Final tests quarterly end of the semester.
• Final final tests at the end of the school year.

11. Programme Structure				
Level/Year	Course or Module Code	Course or Module Title	Credit Rating	
first		Human rights	4	Bachelor Degree Requires (x) credits
first		Computr principle	6	
first		mathematic	4	
first		Workshop	6	
first		engineering drawing	6	
first		English language	2	
first		Renewable energy sources	6	
first		Solar Energy technologies and Systems	8	
first		electronics	6	
first		Solar energy workshop	6	
second		Photovoltaic panels manufacturing	2	
second		Photovoltaic power systems design & operation	10	
second		Power inverter and batteries	8	
second		programmable logic control	4	

second		Power and electrical machines	8	
second		Ethics& safety of Occupations	4	
second		English Language	2	
second		Graduation projct	4	
second		Photovoltaic energy workshop	6	
second		Power Electronic E	4	

12. Awards and Credits
1 - Use of references and terminology skills. 2 - skills in data collection and analysis on topics. 3 - skills to exploit the available potential. 4 - skills make comparisons on the subject. 5 - skills to prepare own concepts on the subject. 6 - Students get Aladaoualozivi skills.
13. Personal Development Planning
1 - a central through User Acceptance issued by the Ministry of Higher Education and Scientific Research. 2 - direct submission through the presentation evening for the study.
14. Admission criteria .
-scientific department . -Register - Instructor

Curriculum Skills Map																			
please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed																			
				Programme Learning Outcomes															
Year / Level	Course Code	Course Title	Core (C) Title or Option (O**)**	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**D1**	**D2**	**D3**	**D4**
first		**Account**	**Accounting**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**	**/**

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies techniques
3. Course title/code	**Electrons**
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Semester first and second for the academic year 2022-2023
6. Semester/Year	(180) credit hours of 6 hours per week
7. Number of hours tuition (total)	06/10/2022
8. Date of production/revision of this specification	1 - Understand the theoretical framework of the principles of electronics. 2 - Introduce students to electronic methods and theories. 3 - Know of electronic components. 4 Knowledge of planning for input and output waves 5 - the Student's knowledge of electronic

	circuits and their operation.
9. Aims of the Course	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1- Knows the concept of the history of **electronic** elements and their structures . A2- Explain to the student the properties of electronic elements A3. Shows the student how to create electronic circuits A4. Explains to the student the development of electronic elements. A5 - Explains to the student the development that the world of electronics has reached. A6 . The student gives practical examples of electronics.
B. Subject-specific skills B1- Collects information on phenomena and problems in the formation of electronic circuits . B 2 - analyzes the causes of these problems. B 3 - compares the experiences of the past and present. B4- communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly

- Quarterly
- final

C. Thinking Skills

C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Semiconductor Materials	conductor, insulator and semiconductor	lecture	Written and oral exams
2	3	Energy and conductivity levels	Crystal and energy electron gap	lecture	Written and oral exams
3	3	The current of the gaps and the movement of electrons	Gap current and electron transfer	lecture	Written and oral exams
4	3	Vaccination and obtaining the P and N type	How to graft and add impurities	lecture	Written and oral exams
5	3	P-N Junction	Diode configuration and bulkhead voltage	lecture	Written and oral exams
6	3	Diode applications in DC circuits	First, second and third approximation	lecture	Written and oral exams
7	3	Diode applications in AC circuits	Converting from alternating to continuous	lecture	Written and oral exams
8	3	full-wave Rectifier_ Bridge Network	Conversion and to continuous issues and the benefit of them	lecture	Written and oral exams
9	3	full-wave Rectifier _Center-tapped	Conversion and to continuous issues and the benefit of them	lecture	Written and oral exams
10	3	Filters	LC ,RC LCL	Lecture	Written and oral exams
11	3	Voltage-Multiplier Circuits	Types and stages of planning	Lecture	Written and oral exams
12	3	Clippers and Clampers	Organization	Lecture	Written and oral exams
13	3	Zener Diode	definition of voltage regulator	Lecture	Written and oral exams
14	3	Light-Emitting Diodes (LEDs)	Explanation of the remote control	Lecture	Written and oral exams
15	3	Schottky Diode	Definition and use	Lecture	Written and oral exams
16	3	Bipolar Junction Transistors	composition and its areas composition and its areas	Lecture	Written and oral exams
17	3	transistor currents	How to calculate IC,IB and IE	Lecture	Written and oral exams
18	3	Transistor Bias	Common emitter	Lecture	Written and oral exams

		Circuits	and voltage divider and common collector		
19	3	transistor as a switch	IC sat and VCC	Lecture	Written and oral exams
20	3	Q - point	How to get the stationary point in the middle	Lecture	Written and oral exams
21	3	Transistor as a signal amplifier	operation amplifier	Lecture	Written and oral exams
22	3	power Amplifier	In the amplification of the signal ac	Lecture	Written and oral exams
23	3	Class A, Class B and Class C	How do families deal with increasing the signal?	Lecture	Written and oral exams
24	3	JEFT	Composition and working principle	Lecture	Written and oral exams
25	3	JEFT Bias Circuits	Composition and working principle	Lecture	Written and oral exams
26	3	FET Bias Circuits	Composition and working principle	Lecture	Written and oral exams
27	3	MOSFET Bias Circuits	Composition and working principle	Lecture	Written and oral exams
28	3	Comparison of the transistor	In terms of frequency, frequency, temperature, etc	Lecture	Written and oral exams
29	3	Transistor defects	How to overcome some disadvantages	Lecture	Written and oral exams
30	3	Photo transistor	Composition and working principle	Lecture	Written and oral exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	ELECTRONIC DEVICES AND CIRCUIT THEORY
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies techniques
3. Course title/code	**Power Electrons**
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(120) credit hours of 4 hours per week
8. Date of production/revision of this specification	6/10/2022
9. Aims of the Course	
1 - Understand the theoretical framework of the principles of electronics. 2 - Introduce students to electronic methods and theories. 3 - Know of electronic components. 4 Knowledge of planning for input and output waves	

5 - the Student's knowledge of electronic 5 - the student's knowledge management and organizational structure of government accounting.

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1- Knows the concept of the history of **electronic** elements and their structures . A2- Explain to the student the properties of electronic elements A3. Shows the student how to create electronic circuits A4. Explains to the student the development of electronic elements. A5 - Explains to the student the development that the world of electronics has reached
B. Subject-specific skills B1- Collects information on phenomena and problems in the formation of electronic circuits . B 2 - analyzes the causes of these problems. B 3 - compares the experiences of the past and present. B4- communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly • Quarterly • final
C. Thinking Skills C1. Put forward new ideas on the subject by the student. C 2-Thread student's ability to evaluate and give solutions. C 3-differentiate between the problems. C4. explains and analyzes the phenomena and problems.
Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	POWR electronic	Definition of	lecture	Written and oral exams
2	3	Single phase rectifier	HWR & FHR	lecture	Written and oral exams
3	3	Three phase rectifier	HWR & FHR	lecture	Written and oral exams
4	3	Types of transistors PJT, JEFT, MOSFET , UJT	Installation, work and bias circuits	lecture	Written and oral exams
5	3			lecture	Written and oral exams
6	3			lecture	Written and oral exams
7	3	Conversion AC to DC	How to build a circuit and the type of conversion from alternating to continuous	lecture	Written and oral exams
8	3	Inverter DC to AC	How to build a circuit and the type of conversion from continuous to alternating	lecture	Written and oral exams
9	3	Thyristor	The composition and how to coin a circle mug	lecture	Written and oral exams
10	3	0p-amp	small input signal amplifier	Lecture	Written and oral exams
11	3	Zener Diode	How to work as a voltage regulator	Lecture	Written and oral exams
12	3	Double transistors	What is the benefit of it and its working circles	Lecture	Written and oral exams
13	3	Photo transistor	Composition and how to feel	Lecture	Written and oral exams
14	3	POWR transistor	The difference between small capacity and high endurance	Lecture	Written and oral exams
15	3	Types Inverter	Types of reflectors and the difference between them according to the output wave	Lecture	Written and oral exams

12. Infrastructure

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	POWR electronic
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	human rights
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(60) credit hours of 2 hours per week
8. Date of production/revision of this specification	6/10/2022
9. Aims of the Course	
1 - understanding of the theoretical framework of human rights. 2 - introduce students to the methods and theories of human thought Huq. 3 - Knowledge of human rights in the socialist and developing countries and Iraq. 4 - Know the planning of human rights and the foundations and principles and its	

importance

5 - the student's knowledge management and organizational structure of the human rights.

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1- defines the concept of the history of thought to human rights. A2-explains to the student intellectual properties for Human Rights A3- shows the student the content of the intellectual history of human rights A4- explains to students the evolution of human rights frame of mind. A5- shows the evolution of the student, which link human rights machinery.
B. Subject-specific skills B 1 - collects information on phenomena and problems of human rights. B 2 - analyzes the causes of these problems. B 3 - compares the experiences of the past and present. B4- communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly • Quarterly • final
C. Thinking Skills C1. Put forward new ideas on the subject by the student. C 2-Thread student's ability to evaluate and give solutions. C 3-differentiate between the problems. C4. explains and analyzes the phenomena and problems.
Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Human needs and means to satisfy them	Human needs and means to satisfy them	lecture	Oral tests
2	2	The nature of the economic problem	The nature of the economic problem	Discussion and dialogue	Self-evaluation and evaluation of colleague
3	2	Patterns of solving the economic problem	Patterns of solving the economic problem	Discussion and dialogue	Self-evaluation and evaluation of colleague
4	2	The concept of demand	The concept of demand	Discussion and dialogue	Self-evaluation and evaluation of colleague
5	2	How to calculate demand	How to calculate demand	Lecture	Oral tests
6	2	The price elasticity of demand internal intersecting	The price elasticity of demand internal intersecting	Discussion and dialogue	Self-evaluation and evaluation of colleague
7	2	Display concept	Display concept	Discussion and dialogue	Self-evaluation and evaluation of colleague
8	2	Price equilibrium	Price equilibrium	Discussion and dialogue	Self-evaluation and evaluation of colleague
9	2	The concept of production	The concept of production	Lecture	Oral tests
10	2	Division of labor	Division of labor	Lecture	Oral tests
11	2	The concept of production	The concept of production	Lecture	Oral tests
12	2	College costs average costs	College costs average costs	Lecture	Oral tests
13	2	TTM total and average and marginal	TTM total and average and marginal	Lecture	Oral and written tests
14	2	Forms and characteristics	Forms and characteristics	Lecture	Oral tests
15	2	Full monopoly market	Full monopoly market	Discussion and dialogue	Self-evaluation and evaluation of colleague
16	2	National income	National income	Discussion and dialogue	Self-evaluation and evaluation of colleague
17	2	Barter	Barter	The lecture, discussion and dialogue	Self-evaluation and evaluation of colleague
18	2	Inflation	Inflation	Discussion and dialogue	Self-evaluation and evaluation of colleague
19	2	Public needs	Public needs	The debate shall, dialogue	Self-evaluation and evaluation of colleague
20	2	Elements of public expenditure	Elements of public expenditure	Discussion and dialogue	Self-evaluation and evaluation of colleague

21	2	Examples of public expenditure	Examples of public expenditure	Discussion and dialogue	Self-evaluation and evaluation of colleague
22	2	The impact of expenditures on production	The impact of expenditures on production	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
23	2	State revenues from its property	State revenues from its property	Discussion and dialogue	Self-evaluation and evaluation of colleague
24	2	Tax elements	Tax elements	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
25	2	Economic purposes, social purposes	Economic purposes, social purposes	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
26	2	Direct and indirect taxes	Direct and indirect taxes	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
27	2	Price relative price ascending and descending	Price relative price ascending and descending	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
28	2	Practical cases on the types of taxes	Practical cases on the types of taxes	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
29	2	Examples of the Tax Justice	Examples of the Tax Justice	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
30	2	Economic impact of public loans	Economic impact of public loans	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

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COURSE SPECIFICATION

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1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	research project and democracy
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	**Abet**
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(60) credit hours of 2 hours per week
8. Date of production/revision of this specification	6/10/2022
9. Aims of the Course	

1 - understand the theoretical framework for research projects.
2 - Definition of the students on the methods of intellectual theories of the research project.
3 - Knowledge of the research project in the socialist and developing countries and

Iraq.
4 - Know the planning of research projects and founded, principles and importance
5 - the student's knowledge management and organizational structure of the research project.

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1- defines the concept of the history of thought to the research project. A2-explains to the student thought the characteristics of the research project. A3- shows the student the content of the history of thought to the research project A4- explains to students the evolution of the intellectual framework for the research project A5- explains to students that evolution and related to him the research project. A6- give the student practical examples of cases in the work of the research project.
B. Subject-specific skills B 1 - collects information on phenomena and research problems. B 2 - analyzes the causes of these problems. B 3 - compares the experiences of the past and present. B4- communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly • Quarterly • final

C. Thinking Skills

C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Learn the history of accounting	Origins and evolution of accounting	Lecture	Oral tests
2	2	Types of accounting books used	Journal _ ledger	Discussion and dialogue	Self-evaluation and evaluation of colleague
3	2	How to configure capital	The account debtor and creditor account	Discussion and dialogue	Self-evaluation and evaluation of colleague
4	2	Journal and how the journal Planning	Types of accounting entries	Discussion and dialogue	Self-evaluation and evaluation of colleague
5	2	Business operations and how to prove in the accounting books	Initial enrollment	Lecture	Oral tests
6	2	Purchases Purchases Returns	Sales and sales returns	Discussion and dialogue	Self-evaluation and evaluation of colleague
7	2	Fixed assets and types of insurance	Insurance for others	Discussion and dialogue	Self-evaluation and evaluation of colleague
8	2	Expenses and types of expenses or resource and capitalism	Allowances sales	Discussion and dialogue	Self-evaluation and evaluation of colleague
9	2	Loans and kinds of debit and credit	Planning	Lecture	Oral tests
10	2	Planning professor notebook ledger	Bases and Principles of planning	Lecture	Oral tests
11	2	Audit Trial Balance Balance Planning	Types of planning and stages	Lecture	Oral tests
12	2	Types of trial balance review balances and totals Balance	Organization	Lecture	Oral tests
13	2	Merchant process with the bank	Definition of the check	Lecture	Oral and written tests
14	2	How to open a current account	An endorsement of imminent	Lecture	Oral tests
15	2	Discount	Commercial discount and singular and procession	Discussion and dialogue	Self-evaluation and evaluation of colleague

16	2	Types of discount	Cash discount	Discussion and dialogue	Self-evaluation and evaluation of colleague
17	2	Commercial paper bills	Notes receivable notes payable	The lecture, discussion and dialogue	Self-evaluation and evaluation of colleague
18	2	Justifications commercial paper withdrawn	Cases act leaves arrested	Discussion and dialogue	Self-evaluation and evaluation of colleague
19	2	Daily multiple columns	Accounts opened in the daily	The debate shall, dialogue	Self-evaluation and evaluation of colleague
20	2	Correct mistakes	The importance of the trial balance	Discussion and dialogue	Self-evaluation and evaluation of colleague
21	2	Final Accounts	Capital account	Discussion and dialogue	Self-evaluation and evaluation of colleague
22	2	Find the cost of sales	Balance Sheet	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
23	2	The difference between the balance sheet, trial balance	Method of closing the final accounts	Discussion and dialogue	Self-evaluation and evaluation of colleague
24	2	Inventory	Accrued expenses	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
25	2	Definition of extinction and extinction purposes	How to discount allowable treatment	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
26	2	Debtors	Types of debt	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
27	2	Inventory notes receivable	Securities inventory	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
28	2	Fund inventory (how to address the shortage)	How to address the shortage	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
29	2	Fund Inventory (treatment differences)	How to organize inventory revealed	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
30	2	Applied Cases	The accounting treatment of the suspended account	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

Texture rendering

COURSE SPECIFICATION

Gain the knowledge to read technical drawings, see icons and engineering terminology, standards and draw simple and complex engineering parts and most encountered in life work

1. Teaching Institution	**Central Technical Institute Technical University Alcott**
2. University Department/Centre	**Department of Renewable Energy Technologies**
3. Course title/code	**Engineering drawing**
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	**Abet**
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(90) credit hours of 3 hours per week
8. Date of production/revision of this specification	6/10/2022
9. Aims of the Course	

ıce students to engineering drawing by compu
2- How to use Auto CAD and computer applications
3- How to print and pull graphics

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Knowledge and Understanding

A1. Fundamentals of engineering drawing Auto CAD program
A2. How to draw geometric shapes and perspective and floor plans
A3.How to use applications available within the Auto CAD program on a computer to draw geometric shapes

B. Subject-specific skills

B1. **A detailed study of the engineering drawing and tapes and tools used in Auto CAD program**
B2. Conducting practical applications on how to use the program to draw shapes of geometry

Teaching and Learning Methods

.View photos of Auto CAD software components and tools used
. Lectures on engineering drawing and how to use it in the program

Assessment methods

.The student assessment through implementation of computer exercises
.Assess student through mid-terms.
.Assess student through final exams

C. Thinking Skills

C1. Student guidance on how to apply the exercises and computer graphics

C2. Guide the student to acquire skills on how to make use of tapes and tools used in the programme Auto cad

Teaching and Learning Methods

Define student to use drawing in Auto CAD electronic computer and how to use applications available

Assessment methods

.My first chapter 15 exam

.Second semester exam 15 job.

.20% year work

.Final practical examination 50

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Enables the student to use the software on the computer and work on it

D2. Students gain skills in working on Auto CAD engineering drawing software and printing

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3p	The student understands the lesson	The importance of engineering drawing and the importance of using a computer to implement engineering drawing sizes standard painting – about AutoCAD program.	Practical lecture	Diseussion and solving exercises – quiz-homework
2	3p	The student understands the lesson	Font types in engineering drawing using the fall	Practical lecture	Diseussion and solving exercises – quiz-homework
3,4	6p	The student understands the lesson	Basic shapes	Practical lecture	Diseussion and solving exercises – quiz-homework
5,6	6p	The student understands the lesson	Drawing drawing aid adjustments	Practical lecture	Diseussion and solving exercises – quiz-homework
7,8,9	9p	The student understands the lesson	Engineering operations put previous concepts applications dimensions	Practical lecture	Diseussion and solving exercises – quiz-homework
10-11-12-13	12p	The student understands the lesson	Perspective drawing rectangular chamber contains a perspective drawing a triangle, polygon	Practical lecture	Diseussion and solving exercises – quiz-homework
14-15	6p	The student understands the lesson	Theory of projection – draw a simple house plans	Practical lecture	Diseussion and solving exercises – quiz-homework
16-17	6p	The student understand	Placing dimensions on perspective and floor plans	Practical lecture	Diseussion and solving exercises – quiz-homework

		s the lesson			
18-19-20	9p	The student understands the lesson	The projected drop third conclusion	Practical lecture	Diseussion and solving exercises – quiz-homework
21	3p	The student understands the lesson	Cutting theory – shapes pieces by material type draw broken catchment Muscat selector	Practical lecture	Diseussion and solving exercises – quiz-homework
22-23	6p	The student understands the lesson	Cutting theory – shapes pieces by material type draw broken catchment	Practical lecture	Diseussion and solving exercises – quiz-homework
24-25-26	9p	The student understands the lesson	Draw a catchment cut off from Muscat selector	Practical lecture	Diseussion and solving exercises – quiz-homework
27-28	6p	The student understands the lesson	Draw a catchment is broken partly	Practical lecture	Diseussion and solving exercises – quiz-homework
29-30	6p	The student understands the lesson	Applications and projects	Practical lecture	Diseussion and solving exercises – quiz-homework

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	Electrical circuits and measurements
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(90) credit hours of 3hours per week
8. Date of production/revision of this specification	06/10/2022
9. Aims of the Course	
1 - Understand the theoretical and practical framework of electrical circuits. 2- Introducing students to the theories and analysis of electrical circuits 3 - Knowledge of the basic principles of electrical circuits. 4 - Know how to analyze electrical circuits	

5 - The student's knowledge of how to apply theories and analysis in practice

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
B- Knowledge and Understanding A1- Understand the concept of electrical energy. A2- Explain to the student the importance of electrical energy. A3- Shows the student the theories of electrical circuit analysis A4- Explains to the student the development of electrical energy sources. A 5 - Explains to the student the development reached in the production of electrical energy. A6- It gives the student practical examples of analyzing electrical circuits.
B. Subject-specific skills B1 - Gather information on the basics of electricity and the theories used in the analysis of electrical circuits. B2 - Analyze the reasons for the emergence of these theories. B3 - Compare past and present experiences. B4 - Communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly • Quarterly • final
C. Thinking Skills C1. Put forward new ideas on the subject by the student. C 2-Thread student's ability to evaluate and give solutions. C 3-differentiate between the problems. C4. explains and analyzes the phenomena and problems.
Teaching and Learning Methods
1 - The use of supply and presentations method.

2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Know the types of unit's system	International unit system	lecture	Oral tests
2	3	Series, parallel and combined	DC electric circuits	lecture	Self-evaluation and evaluation of colleague
3	3	How to apply the types of connections	Applications of series, parallel, mixed, star and trigonometric circuits	lecture	Self-evaluation and evaluation of colleague
4	3	Knowing the current and voltage laws	Kirchhoff,s laws	lecture	Self-evaluation and evaluation of colleague
5	3	Definition of Thevenin and Norton's theorems	Thevenin's theorem Norton's theorem	lecture	Oral tests
6	3	Examples about Thevenin and Norton theorems	Application on Thevenin and Norton theorems	lecture	Self-evaluation and evaluation of colleague
7	3	Examples about Superposition theorem ,voltage and current sources	-Superposition -Voltage and current sources -Maximum power transfer	lecture	Self-evaluation and evaluation of colleague
8	3	-Define the properties of the alternating current How to generate the alternating current	Alternating quantities	lecture	Self-evaluation and evaluation of colleague
9	3	Definition of vector quantities -Phasor diagram -Phase angle	Alternating Vector Quantities	Lecture	Oral tests
10	3	Purely circuits	-Purely resistive Purely inductive Purely capacitive	Lecture	Oral tests
11	3	The effect of alternating current on a circuit containing resistance and inductance in series, resistance and capacitance, and resistance+inductance +capacitance	Circuits that containing many elements in series	Lecture	Oral tests
12	3	The effect of alternating current on a circuit containing resistance and	Circuits that containing many elements in parallel	Lecture	Oral tests

		inductance in parallel, resistance and capacitance, and resistance +inductance +capacitance			
13	3	To find total impedance, total admittance, current, voltage and phase angle	J-Operator	Lecture	Oral and written tests
14	3	Series resonance -Definition -calculation of current, voltage and impedance	Resonance circuits	Lecture	Oral tests
15	3	Parallel resonance -Definition -calculation of current, voltage and impedance	Resonance circuits	Lecture	Self-evaluation and evaluation of colleague
16	3	How to apply Thevenin and Norton and Superposition theorem in ac circuits and with examples	-Thevenin's theorem -Norton's theorem -Superposition theorem in ac circuits	Lecture	Self-evaluation and evaluation of colleague
17	3	How to calculate the power in different ac circuits Types of powers	Power in ac circuits	Lecture	Self-evaluation and evaluation of colleague
18	3	-Definition of apparent power and calculation -Definition of power factor and calculation With examples	-Apparent power -Power factor	Lecture	Self-evaluation and evaluation of colleague
19	3	Derivation of relations for maximum power in ac circuits - with examples	Maximum power transfer in ac circuits	Lecture	Self-evaluation and evaluation of colleague
20	3	The use of an ohmmeter in series and parallel The ammeter and – voltmeter method - Method of compensation	Practical methods for measuring high, medium and small resistors	Lecture	Self-evaluation and evaluation of colleague
21	3	Definition of three-phase alternating current circuits and how to generate alternating current	Three phase ac circuits	Lecture	Self-evaluation and evaluation of colleague

		one phase - two phases - three phases Draw each circuit of the star and trigonometric connections in alternating current circuits			
22	3	Solve practical examples of triangle and star connections with balanced and unbalanced loads	Examples about three phase ac circuits	Lecture	Self-evaluation and evaluation of the dialogue
23	3	A wattmeter how to connect it to the circuit to measure the effective power Calculating the reactive power and the apparent power with an example solution	Type of measuring power for three phase loads	Lecture	Self-evaluation and evaluation of colleague
24	3	Introduction to magnetism, the north and south poles - types of magnetic materials - basic properties of magnetic materials and their definition, including magnetic field - magnetic flux - magnetic driving force - magnetic flux density	Magnetism - the magnetic circuit	Lecture	Self-evaluation and evaluation of the dialogue
25	3	Solve practical examples of magnetism	Solve practical examples of magnetism	Lecture	Self-evaluation and evaluation of the dialogue
26	3	Definition of self-induction of a coil - special relationships to find self-induction of a coil - mutual induction between two coils	Self-induction of coil (electromagnetic induction)	Lecture	Self-evaluation and evaluation of the dialogue
27	3	Current growth and decay curves of an inductive circuit receivable	Explanation of the inductive circuit and its effect on direct current - the general relationship of the growth and decay of current in the coil - drawing the current and calculating the	Lecture	Self-evaluation and evaluation of the dialogue

			time constant - solving examples		
28	3	Types of measuring devices - nature of their work - their uses - advantages and disadvantages of each device	Measuring devices	Lecture	Self-evaluation and evaluation of the dialogue
29		Installation of the iron core device and how to use it for measurement - its advantages, disadvantages and device diagram	Iron core device	Lecture	Self-evaluation and evaluation of the dialogue
30	3	Installing a wattmeter – Drawing the device's diagram – Arranging it in the electrical circuit to measure power – Moment equations – Advantages – Disadvantages Drawing of the oscilloscope - its installation - how to operate and use it	Wattmeter device - - an oscilloscope	Lecture	Self-evaluation and evaluation of the dialogue

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Introduction to electric circuits By James A. Svoboda Richard C. Dorf
Special requirements (include for example workshops, periodicals, IT software, websites)	FUNDAMENTAL CONCEPTS OF ELECTRIC CIRCUITS By Sudha Balagopalan https://www.britannica.com/technology/electric-circuit
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	

Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy techniques
3. Course title/code	Photovoltaic panels Manufacturing
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(30) credit hours of 2 hours per week
8. Date of production/revision of this specification	6/10/2022
9. Aims of the Course	

1 - Understand the theoretical framework of the olfactory plates.
2 - Introducing students to the methods and theories of manufacturing solar panels.
3 -Knowing the types of solar cells in developing countries and Iraq.
4 - Knowledge of solar panels manufacturing, basics and importance

5 - The student's knowledge of the organization and organizational structure of manufacturing..
4 - knowledge of government accounting and planning foundations and principles and its importance
5 - the student's knowledge management and organizational structure of government accounting.

10· Learning Outcomes, Teaching ,Learning and Assessment Method
A- Knowledge and Understanding A1- Know the concept of the history of the manufacture of solar panels. A2- Explain to the student the characteristics of solar cells A3- Shows the student the stages of manufacturing solar panels A4- Explains to the student the difference between the old and modern methods of making solar panels. A 5 - Explains to the student the development in the manufacture of solar panels. A6- It gives the student practical examples of the methods used in the manufacture of solar panels.
B. Subject-specific skills B1 - Gathering information about the phenomena and problems in the manufacture of solar panels B 2 - analyzes the causes of these problems. B 3 - compares the experiences of the past and present. B4- communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly • Quarterly • final

C. Thinking Skills

C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Introduction and history of solar cell	Introduction	lecture	Oral tests
2	2	Introduction about solar panels	Solar Panels	lecture	Self-evaluation and evaluation of colleague
3	2	Methods to construct the solar panels	Construction and Orientation	lecture	Self-evaluation and evaluation of colleague
4	2	Mono-crystalline Silicon	Types of Solar Panel	lecture	Self-evaluation and evaluation of colleague
5	2	Poly-crystalline Silicon	Types of Solar Panel	lecture	Oral tests
6	2	Thin film	Types of Solar Panel	lecture	Self-evaluation and evaluation of colleague
7	2	Definition of smart solar modules	Smart solar modules	lecture	Self-evaluation and evaluation of colleague
8	2	Fixed Solar Panel Mounts	Mounting System Types	lecture	Self-evaluation and evaluation of colleague
9	2	Adjustable solar panel mounts	Mounting System Types	Lecture	Oral tests
10	2	Definition and types of tracking system	Tracking solar panel mounts	Lecture	Oral tests
11	2	Performance and Efficiencies	Factors affecting performance and and efficiency calculate the efficiency	Lecture	Oral tests
12	2	Study the factors affecting the life span of solar cells	Cost and expected Life-Span of solar panels	Lecture	Oral tests
13	2	Identify the stages used to build and produce solar cells	Stages of solar cell production	Lecture	Oral and written tests
14	2	Knowing the application the solar cells practically	Applications of solar cells	Lecture	Oral tests

15	2	Study advantage and disadvantages of solar cells	Limitations	Discussion and dialogue	Self-evaluation and evaluation of colleague

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Principles ,Fundamental Properties of Solar Cells and Varieties of Solar Energy The University of Toledo, Department of Physics and Astronomy
Special requirements (include for example workshops, periodicals, IT software, websites)	https://www.britannica.com/technology/solar-cell
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	electrical installations
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(120) credit hours of 4 hours per week
8. Date of production/revision of this specification	06/10/2022

Assessment methods
1 - The use of achievement tests: • daily • Monthly

• Quarterly
• final

C. Thinking Skills

C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	An overview of the curriculum vocabulary for the material and scientific sources from methodological and auxiliary books	An overview of the curriculum vocabulary for the material and scientific sources from methodological and auxiliary books	lecture	Oral tests
2	4	Classify the materials into:	Classify the materials into:	Discussion and dialogue	Self-evaluation and evaluation of colleague
3	4	• Conductors . Electrical Conductive Materials	• Conductors . Electrical Conductive Materials	Discussion and dialogue	Self-evaluation and evaluation of colleague
4	4	• Semiconductors	• Semiconductors	Discussion and dialogue	Self-evaluation and evaluation of colleague
5	4	• Insulators	• Insulators	Lecture	Oral tests
6	4	Principles of electricity	Principles of electricity	Discussion and dialogue	Self-evaluation and evaluation of colleague
7	4	- Voltage difference, current strength, electric current (amperes), factors affecting the intensity of electric current, resistance, factors affecting resistance.	- Voltage difference, current strength, electric current (amperes), factors affecting the intensity of electric current, resistance, factors affecting resistance.	Discussion and dialogue	Self-evaluation and evaluation of colleague
8	4	electrical circuit components	electrical circuit components	Discussion and dialogue	Self-evaluation and evaluation of colleague
9	4	Source, types of electrical sockets, wires and their types, electrical loads of all kinds	Source, types of electrical sockets, wires and their types, electrical loads of all kinds	Lecture	Oral tests
10	4	- Switches and their types, protective equipment, junction boxes	- Switches and their types, protective equipment, junction boxes	Lecture	Oral tests
11	4	Light bulbs, types and uses	Light bulbs, types and uses	Lecture	Oral tests
12	4	Conductive electrical materials.	Conductive electrical materials.	Lecture	Oral tests
13	4	Copper Cupper -	Copper Cupper -	Lecture	Oral and written tests

		Electrical Properties of Copper - Mechanical Properties of Copper	Electrical Properties of Copper - Mechanical Properties of Copper		
14	4	Aluminum Aluminum Electrical properties of aluminum Mechanical properties of aluminum	Aluminum Aluminum Electrical properties of aluminum Mechanical properties of aluminum	Lecture	Oral tests
15	4	Precautions and precautions to be taken while working in workshops and factories, as well as training on how to first aid for electric shock and how to warn against fire	Precautions and precautions to be taken while working in workshops and factories, as well as training on how to first aid for electric shock and how to warn against fire	Discussion and dialogue	Self-evaluation and evaluation of colleague
16	4	Knowing the symbols for devices, tools and all necessary suspensions used in electrical installations	Knowing the symbols for devices, tools and all necessary suspensions used in electrical installations	Discussion and dialogue	Self-evaluation and evaluation of colleague
17	4	Making a (Twist) connection as well as a (T) connection for a wire of the (VIR) type	Making a (Twist) connection as well as a (T) connection for a wire of the (VIR) type	The lecture, discussion and dialogue	Self-evaluation and evaluation of colleague
18	4	Married Joint	Married Joint	Discussion and dialogue	Self-evaluation and evaluation of colleague
19	4	Making a straight link (Straight) as well as a link of the type (T) the wire of the type (CTS), then weld the link	Making a straight link (Straight) as well as a link of the type (T) the wire of the type (CTS), then weld the link	The debate shall, dialogue	Self-evaluation and evaluation of colleague
20	4	Connecting aluminum conductors and paper insulated cables, then how to weld them	Connecting aluminum conductors and paper insulated cables, then how to weld them	Discussion and dialogue	Self-evaluation and evaluation of colleague
21	4	Making a circuit containing a switch and one	Making a circuit containing a switch and one	Discussion and dialogue	Self-evaluation and evaluation of colleague

		lamp with a wiring system of the type (Cleat) Making a circuit containing two lamps in a row with a switch with a wiring system of a type (Cleat)	lamp with a wiring system of the type (Cleat) Making a circuit containing two lamps in a row with a switch with a wiring system of a type (Cleat)		
22	4	Making a simple circuit on two lamps in parallel with a switch with the (Cleat) system	Making a simple circuit on two lamps in parallel with a switch with the (Cleat) system	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
23	4	Wiring a lighting point, a ceiling fan point, and a socket, and it has a separate control for each point with a wiring system of the type (cleat).	Wiring a lighting point, a ceiling fan point, and a socket, and it has a separate control for each point with a wiring system of the type (cleat).	Discussion and dialogue	Self-evaluation and evaluation of colleague
24	4	A wiring to control one lamp from two places (the wiring used in the ladder)	A wiring to control one lamp from two places (the wiring used in the ladder)	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
25	4	Making a circuit to control a lamp from three places using a two-pole follower (Two Pole Relay) as well as using a middle switch (Intermediate Switch)	Making a circuit to control a lamp from three places using a two-pole follower (Two Pole Relay) as well as using a middle switch (Intermediate Switch)	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
26	4	Establishing a circuit to control multiple lamps using a two way switch	Establishing a circuit to control multiple lamps using a two way switch	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
27	4	Examination and establishment of a fluorescent lamp operating on alternating current using a thermal starter (Thermal Relay) with its examination	Examination and establishment of a fluorescent lamp operating on alternating current using a thermal starter (Thermal Relay) with its examination	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
28	4	Setting up two	Setting up two 20-	Discussion and	Self-evaluation and

		20-watt fluorescent lamps in series with a 40-watt chook and then checking them	watt fluorescent lamps in series with a 40-watt chook and then checking them	dialogue	evaluation of the dialogue
29	4	Establishment of a high pressure mercury vapor lamp, as well as a Sodiuin vapor lamp	Establishment of a high pressure mercury vapor lamp, as well as a Sodiuin vapor lamp	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
30	4	Precautions and precautions to be taken while working in workshops and factories, as well as training on how to first aid for electric shock and how to warn against fire	Precautions and precautions to be taken while working in workshops and factories, as well as training on how to first aid for electric shock and how to warn against fire	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Electrical installations
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	Solar energy technologies and systems
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(120) credit hours of 4 hours per week
8. Date of production/revision of this specification	06/10/2022

Assessment methods
1 - The use of achievement tests: • daily • Monthly

- Quarterly
- final

C. Thinking Skills

C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	Principles of solar energy, solar radiation, types of electric power plants, solar power plants	Principles of solar energy, solar radiation, types of electric power plants, solar power plants	lecture	Oral tests
2	4	Photovoltaic cell, its components, manufacturing the positive plate, the manufacture of the negative plate, the atomic structure of the added elements of silicon, the working principle of the cell	Photovoltaic cell, its components, manufacturing the positive plate, the manufacture of the negative plate, the atomic structure of the added elements of silicon, the working principle of the cell	Discussion and dialogue	Self-evaluation and evaluation of colleague
3	4	The effect of temperature on the photovoltaic cell, cell temperature calculations, the working temperature of the cell	The effect of temperature on the photovoltaic cell, cell temperature calculations, the working temperature of the cell	Discussion and dialogue	Self-evaluation and evaluation of colleague
4	4	Effect of dust on cell efficiency, effect of wind, effect of other pollutants	Effect of dust on cell efficiency, effect of wind, effect of other pollutants	Discussion and dialogue	Self-evaluation and evaluation of colleague
5	4	Examples of photovoltaic panel temperature calculations, calculations of power losses due to heat	Examples of photovoltaic panel temperature calculations, calculations of power losses due to heat	Lecture	Oral tests
6	4	Methods of installing panels in open areas, roofs, wooden and tile roofs, metal roofs, mathematical examples	Methods of installing panels in open areas, roofs, wooden and tile roofs, metal roofs, mathematical examples	Discussion and dialogue	Self-evaluation and evaluation of colleague
7	4	Reading the nameplate	Reading the nameplate	Discussion and dialogue	Self-evaluation and evaluation of colleague

		(information card) of the photovoltaic panel and determining the advantages and disadvantages of the panel, choosing the appropriate panel for the generation system	(information card) of the photovoltaic panel and determining the advantages and disadvantages of the panel, choosing the appropriate panel for the generation system		
8	4	Open circuit properties, Calculation of the effect of solar radiation on the generated voltage, the curve of the relationship between voltage and radiation, the angle of inclination of the panel	Open circuit properties, Calculation of the effect of solar radiation on the generated voltage, the curve of the relationship between voltage and radiation, the angle of inclination of the panel	Discussion and dialogue	Self-evaluation and evaluation of colleague
9	4	Short-circuit properties, curve of the short-circuit current and radiation, inclination angle of the plate	Short-circuit properties, curve of the short-circuit current and radiation, inclination angle of the plate	Lecture	Oral tests
10	4	Characteristics of the plate at full load, the curve of the relationship between current and voltage, the effect of the angle of inclination of the plate on the generated power	Characteristics of the plate at full load, the curve of the relationship between current and voltage, the effect of the angle of inclination of the plate on the generated power	Lecture	Oral tests
11	4	Types of panels used in the generation system, monocrystalline panels, its characteristics, applications	Types of panels used in the generation system, monocrystalline panels, its characteristics, applications	Lecture	Oral tests
12	4	Polycrystalline Sheets, Characteristics, Applications	Polycrystalline Sheets, Characteristics, Applications	Lecture	Oral tests
13	4	Introduction to	Introduction to the	Lecture	Oral and written tests

		the components of the photovoltaic generation system, site selection, installation, ...	components of the photovoltaic generation system, site selection, installation, ...		
14	4	Electrical connection of the system, OFF GRID, ON GRID	Electrical connection of the system, OFF GRID, ON GRID	Lecture	Oral tests
15	4	Measurement of solar radiation for different light sources	Measurement of solar radiation for different light sources	Discussion and dialogue	Self-evaluation and evaluation of colleague
16	4	Energy conversion in a photocell	Energy conversion in a photocell	Discussion and dialogue	Self-evaluation and evaluation of colleague
17	4	Diode properties (combined) for a photovoltaic cell	Diode properties (combined) for a photovoltaic cell	The lecture, discussion and dialogue	Self-evaluation and evaluation of colleague
18	4	Effect of the photosensitive area on the open circuit voltage	Effect of the photosensitive area on the open circuit voltage	Discussion and dialogue	Self-evaluation and evaluation of colleague
19	4	The effect of the photosensitive area on the short-circuit current of the photovoltaic cellخلي	The effect of the photosensitive area on the short-circuit current of the photovoltaic cellخلي	The debate shall, dialogue	Self-evaluation and evaluation of colleague
20	4	Effect of radiation on open circuit voltage and short current	Effect of radiation on open circuit voltage and short current	Discussion and dialogue	Self-evaluation and evaluation of colleague
21	4	The relationship between radiation angle and short current	The relationship between radiation angle and short current	Discussion and dialogue	Self-evaluation and evaluation of colleague
22	4	Characteristics of open circuit and short current of series-connected cells with shadowing effect	Characteristics of open circuit and short current of series-connected cells with shadowing effect	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
23	4	The properties of the open circuit and short current of cells connected in parallel with the effect of shadows	The properties of the open circuit and short current of cells connected in parallel with the effect of shadows	Discussion and dialogue	Self-evaluation and evaluation of colleague
24	4	The voltage-current curve of the cell	The voltage-current curve of the cell	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

25	4	Finding the point of greatest ability, efficiency	Finding the point of greatest ability, efficiency	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
26	4	Full day sunlight simulation	Full day sunlight simulation	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
27	4	Charging the expanders with the cell	Charging the expanders with the cell	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
28	4	Emptying the expansions, installing a generation system	Emptying the expansions, installing a generation system	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
29	4	INVERTER . inverter	INVERTER . inverter	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
30	4	Measurement of solar radiation for different light sources	Measurement of solar radiation for different light sources	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Solar technologies and systems
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	English Language
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(30) credit hours of 1 hours per week
8. Date of production/revision of this specification	06/10/2022

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	1	Unit one: hello Am/are/is, my/your This is with practice in work	Unit one: hello Am/are/is, my/your This is with practice in work	lecture	Oral tests
2	1	Unit two: your world He/she/they, his/her Questions	Unit two: your world He/she/they, his/her Questions	Discussion and dialogue	Self-evaluation and evaluation of colleague
3	1	Unit three: all about	Unit three: all about	Discussion and dialogue	Self-evaluation and evaluation of colleague
4	1	Unit four: family and friends Possessive adjectives Possessive's Has/ have Adjective + noun	Unit four: family and friends Possessive adjectives Possessive's Has/ have Adjective + noun	Discussion and dialogue	Self-evaluation and evaluation of colleague
5	1	Unit five: the way I live Present simple (I/ you/ we/ they) A and an Adjective + noun	Unit five: the way I live Present simple (I/ you/ we/ they) A and an Adjective + noun	Lecture	Oral tests
6	1	Unit six: every day Present	Unit six: every day Present	Discussion and dialogue	Self-evaluation and evaluation of colleague

		simple (he/she) Questions and negatives Adverbs of frequency	simple (he/she) Questions and negatives Adverbs of frequency		
7	1	Unit seven: my favorites Question words Pronouns This and that	Unit seven: my favorites Question words Pronouns This and that	Discussion and dialogue	Self-evaluation and evaluation of colleague
8	1	Unit eight: where I live There is/are….. Prepositions	Unit eight: where I live There is/are….. Prepositions	Discussion and dialogue	Self-evaluation and evaluation of colleague
9	1	Unit nine: times past Was/ were born Past simple- irregular verbs	Unit nine: times past Was/ were born Past simple- irregular verbs	Lecture	Oral tests
10	1	Unit ten: we had a great time! Past simple- regular and irregular Question Negatives Ago	Unit ten: we had a great time! Past simple- regular and irregular Question Negatives Ago	Lecture	Oral tests
11	1	Unit eleven: I can do that Can/ can't Adverbs Requests	Unit eleven: I can do that Can/ can't Adverbs Requests	Lecture	Oral tests

12	1	Unit twelve: please and thank you I'd like Some and any Like and would like	Unit twelve: please and thank you I'd like Some and any Like and would like	Lecture	Oral tests
13	1	Unit thirteen: here and now Present continuous Present simple and present continuous	Unit thirteen: here and now Present continuous Present simple and present continuous	Lecture	Oral and written tests
14	1	Unit fourteen: it's time to go! Future plans Revision writing email and informant letter	Unit fourteen: it's time to go! Future plans Revision writing email and informant letter	Lecture	Oral tests
15	1	Unit one: hello Am/are/is, my/your This is with practice in work	Unit one: hello Am/are/is, my/your This is with practice in work	Discussion and dialogue	Self-evaluation and evaluation of colleague
16	1	Unit two: your world He/she/they, his/her Questions	Unit two: your world He/she/they, his/her Questions	Discussion and dialogue	Self-evaluation and evaluation of colleague
17	1	Unit three:	Unit three:	The lecture, discussion and	Self-evaluation and evaluation of colleague

		all about	all about	dialogue	
18	1	Unit four: family and friends Possessive adjectives Possessive's Has/ have Adjective + noun	Unit four: family and friends Possessive adjectives Possessive's Has/ have Adjective + noun	Discussion and dialogue	Self-evaluation and evaluation of colleague
19	1	Unit five: the way I live Present simple (I/ you/ we/ they) A and an Adjective + noun	Unit five: the way I live Present simple (I/ you/ we/ they) A and an Adjective + noun	The debate shall, dialogue	Self-evaluation and evaluation of colleague
20	1	Unit six: every day Present simple (he/she) Questions and negatives Adverbs of frequency	Unit six: every day Present simple (he/she) Questions and negatives Adverbs of frequency	Discussion and dialogue	Self-evaluation and evaluation of colleague
21	1	Unit seven: my favorites Question words Pronouns This and that	Unit seven: my favorites Question words Pronouns This and that	Discussion and dialogue	Self-evaluation and evaluation of colleague
22	1	Unit eight: where I live There	Unit eight: where I live There	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

		is/are….. Prepositions	is/are….. Prepositions		
23	1	Unit nine: times past Was/ were born Past simple- irregular verbs	Unit nine: times past Was/ were born Past simple- irregular verbs	Discussion and dialogue	Self-evaluation and evaluation of colleague
24	1	Unit ten: we had a great time! Past simple- regular and irregular Question Negatives Ago	Unit ten: we had a great time! Past simple- regular and irregular Question Negatives Ago	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
25	1	Unit ten: we had a great time! Past simple- regular and irregular Question Negatives Ago	Unit ten: we had a great time! Past simple- regular and irregular Question Negatives Ago	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
26	1	Unit eleven: I can do that Can/ can't Adverbs Requests	Unit eleven: I can do that Can/ can't Adverbs Requests	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
27	1	Unit twelve: please and thank you I'd like Some and any Like and would like	Unit twelve: please and thank you I'd like Some and any Like and would like	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

28	4	Unit thirteen: here and now Present continuous Present simple and present continuous	Unit thirteen: here and now Present continuous Present simple and present continuous	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
29	4	Unit fourteen: it's time to go! Future plans Revision writing email and informant letter	Unit fourteen: it's time to go! Future plans Revision writing email and informant letter	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
30	4	Unit one: hello Am/are/is, my/your This is with practice in work	Unit one: hello Am/are/is, my/your This is with practice in work	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	English
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	Power inverter and storage Batteries
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(90) credit hours of 3hours per week
8. Date of production/revision of this specification	06/10/2022
9. Aims of the Course	
1 - Understand the theoretical and practical framework of electrical circuits. 2- Introducing students to the theories and analysis of electrical circuits 3 - Knowledge of the basic principles of electrical circuits. 4 - Know how to analyze electrical circuits	

5 - The student's knowledge of how to apply theories and analysis in practice

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1- Understand the concept of electrical energy. A2- Explain to the student the importance of electrical energy. A3- Shows the student the theories of electrical circuit analysis A4- Explains to the student the development of electrical energy sources. A 5 - Explains to the student the development reached in the production of electrical energy. A6- It gives the student practical examples of analyzing electrical circuits.
B. Subject-specific skills B1 - Gather information on the basics of electricity and the theories used in the analysis of electrical circuits. B2 - Analyze the reasons for the emergence of these theories. B3 - Compare past and present experiences. B4 - Communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly • Quarterly • final
C. Thinking Skills C1. Put forward new ideas on the subject by the student. C 2-Thread student's ability to evaluate and give solutions. C 3-differentiate between the problems. C4. explains and analyzes the phenomena and problems.
Teaching and Learning Methods
1 - The use of supply and presentations method.

2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Study of characteristics of SCR,MOSFET,IGBT	Introduction Symbols and Factors Used in FFT-Fast Fourier Transform DC/AC Inverters	lecture	Oral tests
2	3	Study of Gate firing circuits	Pulse width-modulated DC/AC Inverters Introduction Parameters Used in PWM Operation Typical PWM Inverters	lecture	Self-evaluation and evaluation of colleague
3	3	Pulse Width Modulation technique	Voltage source inverters	lecture	Self-evaluation and evaluation of colleague
4	3	Single Phase Half wave controlled converter with R,RL&RLE	Current source inverters	lecture	Self-evaluation and evaluation of colleague
5	3	Load (for firing angles 30,60,90)with/without FD.	Current source inverters	lecture	Oral tests
6	3	.6-Single Phase Half controlled converter with R,RL&RLE Load	Quasi-impedance source inverters Introduction to ZSI and Basic Topologies Extended Boost qZSI	lecture	Self-evaluation and evaluation of colleague
7	3	(for firing angles 30,60,90)with/without FD	Soft-switching DC/AC Inverters Notched DC Link Inverters for Brushless DC Motor Drive Resonant Pole Inverter Transformer-Based Resonant DC Link	lecture	Self-evaluation and evaluation of colleague
8	3	.Single Phase Full controlled converter with R,RL&RLE Load	Multilevel DC/AC inverters Multilevel Inverters Capacitor-Clamped Multilevel Inverters (Flying Capacitor Inverters)	lecture	Self-evaluation and evaluation of colleague

			Multilevel Inverters Using H-Bridges (HBs) Converters Other Kinds of Multilevel Inverters		
9	3	(for firing angles 30,60,90)with/without FD	Trinary hybrid multilevel inverter (THMI) Multilevel Inverters Trinary Hybrid Multilevel Inverter (THMI)Topology and Operation Proof of Greatest Number of Output Voltage Levels Experimental Results Trinary Hybrid 81-Level Multilevel Inverter	Lecture	Oral tests
10	3	Three Phase semi controlled converter with R,RL&RLE Load	Laddered multilevel DC/AC inverters used in solar panel energy systems Introduction Progressions (Series) Laddered Multilevel DC/AC Inverters Comparison of All Laddered Inverters Solar Panel Energy Systems Simulation and Experimental Results	Lecture	Oral tests
11	3	.Three Phase full controlled converter with R,RL&RLE Load	Super-lift converter multilevel DC/AC inverters used in solar panel energy systems Introduction Super-Lift Converter Used in Multilevel DC/AC Inverters Simulation and Experimental Results	Lecture	Oral tests
12	3	.Single phase AC Voltage Controller with R&RL Loads	Switched-capacitor multilevel DC/AC inverters in solar panel energy systems Introduction Switched Capacitor Used in Multilevel DC/AC Inverters Simulation and Experimental	Lecture	Oral tests

			Results Switched Inductor Multilevel DC/AC Inverters Used in Solar Panel Energy Systems Introduction		
13	3	.Boost converter and buck converter with open loop and closed	Switched inductor multilevel DC/AC inverters used in solar panel energy systems, Introduction Switched Inductor Used in Multilevel DC/AC Inverters Simulation and Experimental Results Best	Lecture	Oral and written tests
14	3	loop operations	Best switching angles to obtain lowest THD for multilevel DC/AC inverters Introduction Methods for Determination of Switching Angle Best Switching Angles Design	Lecture	Oral tests
15	3	.Single Phase inverter	Design examples for wind turbine and solar panel energy systems. Introduction Wind Turbine Energy Systems Solar Panel Energy Systems Index	Lecture	Self-evaluation and evaluation of colleague
16	3	.Single Phase inverter	**Introduction to the electrical energy system, Introduction to Electric Load Management, definition of peak load, Discussing Methods for Maximizing Available Energy.**	Lecture	Self-evaluation and evaluation of colleague
17	3	Single Phase cyclo converter	**Energy Conversion. Advances in Energy Conversion from a Wide Variety of Currently Available Energy Sources.**	Lecture	Self-evaluation and evaluation of colleague

18	3	Single Phase cyclo converter	**Describes Energy Sources Such as Fossil Fuels, Biomass including refuse-derived biomass Fuels, nuclear, solar radiation, wind, Geothermal, and Ocean.**	Lecture	Self-evaluation and evaluation of colleague
19	3	Energy storage lab, be familiar with various instrument and equipment.	**Explain and Provides the Terminology and Units Used for Each Energy Resource and Their Equivalence.**	Lecture	Self-evaluation and evaluation of colleague
20	3	Energy Conversion from a Currently Available Energy Source to one type of energy that can be stored.	**A Comprehensive Description of the Direct Energy Conversion Methods, Including, Photovoltaics, Fuel Cells, Thermoelectric Conversion, Thermionic and MHD.**	Lecture	Self-evaluation and evaluation of colleague
21	3	Introduce the students to Fossil Fuels, and Biomass Fuels and their impacts on environment.	**It Briefly reviews the physics of PV Electrical Generation. Discusses the PV System Design Process.**	Lecture	Self-evaluation and evaluation of colleague
22	3	Introduce the students to solar radiation, and wind generations' parts.	**Discusses Five Energy Storage Categories: Electrical, Electromechanical, Mechanical, Direct Thermal, and Thermochemical.**	Lecture	Self-evaluation and evaluation of the dialogue
23	3	Photovoltaics (PV), Fuel Cells, and Thermoelectric Conversion.	**The Storage Methods That Can Store and Deliver Energy. Energy storage technologies and their role in renewable integration**	Lecture	Self-evaluation and evaluation of colleague
24	3	PV Electrical Generation. Perform of the PV System Design Process.	**Utility scale energy storage systems benefits, applications, and technologies. Applications of storage systems in the electrical system, long-term discharge**	Lecture	Self-evaluation and evaluation of the dialogue

			applications, short-term discharge applications, repeated and non-repeated discharge applications.		
25	3	Introduce the student to the Energy Storage Categories.	**Depth of discharge or power transmission rate, Discharge time, Efficiency, Durability (cycling capacity), Storage capacity, Available power**	Lecture	Self-evaluation and evaluation of the dialogue
26	3	Energy storage technologies and their role in renewable integration	**Chemical energy storage: (i) Electrochemical energy storage (conventional batteries), explain the life cycle and the depth of charging batteries.**	Lecture	Self-evaluation and evaluation of the dialogue
27	3	Applications of storage systems in the electrical system, long-term discharge applications, short-term discharge applications, repeated and non-repeated discharge applications.	**Lead acid batteries (types, advantages and disadvantages, efficiency and life cycle), nickel metal hydride (advantages and disadvantages, efficiency and life cycle)**	Lecture	Self-evaluation and evaluation of the dialogue
28	3	Test	**Lithium-ion (Li-ion) batteries, Sodium–sulfur (NaS) batteries, Nickel–cadmium (NiCd) batteries. Advantages and disadvantages. Other candidates of battery energy storage**	Lecture	Self-evaluation and evaluation of the dialogue
29		Depth of discharge, Discharge time, Efficiency, and Storage capacity.	**Flow-cell batteries such as Zinc Bromine (ZnBr) flow battery, and Vanadium Redox Flow Battery (VRB), (advantages and disadvantages, efficiency and life cycle)**	Lecture	Self-evaluation and evaluation of the dialogue
30	3	Introduce the student to conventional batteries, explain the main parts of the potteries.	**Flow Battery Energy Storage (FBES), Polysulfide Bromine (PSB) flow battery**	Lecture	Self-evaluation and evaluation of the dialogue

12. Infrastructure					
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER			Introduction to electric circuits By James A. Svoboda Richard C. Dorf		
Special requirements (include for example workshops, periodicals, IT software, websites)			FUNDAMENTAL CONCEPTS OF ELECTRIC CIRCUITS By Sudha Balagopalan https://www.britannica.com/technology/electric-circuit		
Community-based facilities (include for example, guest Lectures , internship , field studies)					

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Renewable Energy Department
3. Course title/code	safety of occupation and ethics
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Abet
6. Semester/Year	Semester first and second for the academic year 2022-2023
7. Number of hours tuition (total)	(60) credit hours of 2 hours per week
8. Date of production/revision of this specification	06/10/2022

9. Aims of the Course
.Understand the theoretical framework of safety and ethics of the profession - 1 .Introducing students to practical and practical safety methods - 2 Knowledge of the principles of safety and ethics of the profession in the socialist - 3 .and developing countries and Iraq Knowledge of accounting planning, its foundations and principles, and its - 4 importance 5 - The student's knowledge of the organization and organizational structure for safety and ethics of the profession.

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
C- Cognitive goals D- A1- Know the concept of safety history and professional ethics. E- A2- Explains to the student the characteristics of safety thought and professional ethics F- A3- Shows the student the content of the history of thought, safety and ethics of the profession G- A4- Explains to the student the development of the intellectual framework and energy technologies. H- A 5 - Explains to the student the development reached by double enrollment. I- A6- It gives the student practical examples of safety and professional ethics cases.
. B - the skill objectives of the course B1 - Gathering information on phenomena and problems, safety and ethics of the profession. .B2 - Analyze the causes of these problems B3 - Compare past and present experiences B4 - Communication and delivery skills
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests:

- daily
- Monthly
- Quarterly
- final

C. Thinking Skills

C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	The concept of ethics and its origins	Origins and evolution of accounting	lecture	Oral tests
2	3	Sources of Ethics	Journal _ ledger	Discussion and dialogue	Self-evaluation and evaluation of colleague
3	3	Work and its importance	The account debtor and creditor account	Discussion and dialogue	Self-evaluation and evaluation of colleague
4	3	The difference between the concept of work, profession and craft	Types of accounting entries	Discussion and dialogue	Self-evaluation and evaluation of colleague
5	6	Business operations and how to prove in the accounting books	Initial enrollment	Lecture	Oral tests
6	6	What is the ethics of the profession?	Sales and sales returns	Discussion and dialogue	Self-evaluation and evaluation of colleague
7	6	Fixed assets and types of insurance	Insurance for others	Discussion and dialogue	Self-evaluation and evaluation of colleague
8	3	Positive returns for adhering to professional ethics	Allowances sales	Discussion and dialogue	Self-evaluation and evaluation of colleague
9	6	Characteristics of professional ethics	Planning	Lecture	Oral tests
10	6	Planning professor notebook ledger	Bases and Principles of planning	Lecture	Oral tests
11	6	Audit Trial Balance Balance Planning	Types of planning and stages	Lecture	Oral tests
12	6	.honesty .Honesty • • advice	Organization	Lecture	Oral tests
13	6	Administrative corruption	Definition of the check	Lecture	Oral and written tests
14	6	Types of administrative corruption	An endorsement of imminent	Lecture	Oral tests
15	6	Discount	Commercial discount and singular and procession	Discussion and dialogue	Self-evaluation and evaluation of colleague

16	6	Types of discount	Cash discount	Discussion and dialogue	Self-evaluation and evaluation of colleague
17	6	bribery	Notes receivable notes payable	The lecture, discussion and dialogue	Self-evaluation and evaluation of colleague
18	6	Manifestations of fraud in the performance of the job	Cases act leaves arrested	Discussion and dialogue	Self-evaluation and evaluation of colleague
19	6	Daily multiple columns	Accounts opened in the daily	The debate shall, dialogue	Self-evaluation and evaluation of colleague
20	6	Causes of electric current injury	The importance of the trial balance	Discussion and dialogue	Self-evaluation and evaluation of colleague
21	6	Types of electrical injuries	Capital account	Discussion and dialogue	Self-evaluation and evaluation of colleague
22	6	Relief of the injured with electric current - ridding the injured	Balance Sheet	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
23	6	artificial respiration process	Method of closing the final accounts	Discussion and dialogue	Self-evaluation and evaluation of colleague
24	6	burn treatment	Accrued expenses	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
25	6	Effects caused by the passage of electric current to the ground	How to discount allowable treatment	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
26	6	Debtors	Types of debt	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
27	6	fire alarm systems	Securities inventory	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
28	6	fire detectors	How to address the shortage	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
29	6	Fund Inventory (treatment differences)	How to organize inventory revealed	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
30	6	Applied Cases	The accounting treatment of the suspended account	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Any book on safety and ethics of the profession
Special requirements (include for example workshops, periodicals, IT software, websites)	Any book on safety and ethics of the profession

Community-based facilities (include for example, guest Lectures , internship , field studies)	Any book on safety and ethics of the profession

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Renewable Energy Department
3. Course title/code	Solar energy workshop first stage
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Semester first and second for the academic year 2020-2021
6. Semester/Year	(120) credit hours of 4 hours per week
7. Number of hours tuition (total)	10/11/2020
8. Date of production/revision of this specification	Understand the theoretical framework - 1 .of government energy Introducing students to the methods - 2 and theories of government energy .thought Knowledge of government energy in - 3

	the socialist and developing countries and Iraq. Knowledge of government energy - 4 planning, its foundations, principles and importance 5 - The student's knowledge of the organization and organizational structure of government energy.
9. Aims of the Course	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
B- Cognitive goals A1- Defines the concept of the history of thought solar energy. A2- Explains to the student the characteristics of solar energy thought A3- Shows the student the content of the history of solar energy thought A4 - Explains to the student the development of the intellectual framework of solar energy. A 5 - Explain to the student the development that solar energy has reached. A6- It gives the student examples of applied solar energy in the government sector.
B - the skill objectives of the course. B1 - Gathering information on governmental solar energy phenomena and problems. B2 - Analyze the causes of these problems. B3 - Compare past and present experiences. B - Communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans.

B - Final achievement tests include:
• Final monthly tests at the end of each month semester.
• Final quarterly tests at the end of the semester.
• Final final tests at the end of the school year.

Assessment methods

1 - The use of achievement tests:
• daily
• Monthly
• Quarterly
• final

C. Thinking Skills
C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	Government accounting definition	The purpose of government accounting	lecture	Oral tests
2	4	The importance of government accounting	Characteristics	Discussion and dialogue	Self-evaluation and evaluation of colleague
3	4	Ability agreement for government units source	The comparison between the financial and government accounting	Discussion and dialogue	Self-evaluation and evaluation of colleague
4	4	General budget Alth	Definition of the budget	Discussion and dialogue	Self-evaluation and evaluation of colleague
5	4	Subdivisions budget	Budget calculations guide	Lecture	Oral tests
6	4	The stages of the budget	The rules of budget preparation	Discussion and dialogue	Self-evaluation and evaluation of colleague
7	4	Implementation of the budget and the importance of commitment	Applied in the case of how to prepare and implement the budget	Discussion and dialogue	Self-evaluation and evaluation of colleague
8	4	Administrative formations	The concept of the public treasury	Discussion and dialogue	Self-evaluation and evaluation of colleague
9	4	Duties of the Treasury	The public treasury formations	Lecture	Oral tests
10	4	Central Accounting System	Types of central system	Lecture	Oral tests
11	4	The style of the unit financing	Style control over units	Lecture	Oral tests
12	4	Decentralized accounting system	Decentralized system definition	Lecture	Oral tests
13	4	Elements of the decentralized system	Accounting unit responsibilities	Lecture	Oral and written tests
14	4	Style accounting unit financing	Style accounting oversight	Lecture	Oral tests
15	4	Records used in accounting work	Tables and trial balances	Discussion and dialogue	Self-evaluation and evaluation of colleague
16	4	Budget	Style Agaydah	Discussion and	Self-evaluation and

		classification accounts	treatment	dialogue	evaluation of colleague
17	4	Budget classification accounts	Style Agaydah treatment	The lecture, discussion and dialogue	Self-evaluation and evaluation of colleague
18	4	Definition of revenue	Practical exercises on the First Section / revenue	Discussion and dialogue	Self-evaluation and evaluation of colleague
19	4	Definition of revenue	Practical exercises on the First Section / revenue	The debate shall, dialogue	Self-evaluation and evaluation of colleague
20	4	The definition of expenses	Practical exercises on the second section / expenses	Discussion and dialogue	Self-evaluation and evaluation of colleague
21	4	The definition of expenses	Practical exercises on the second section / expenses	Discussion and dialogue	Self-evaluation and evaluation of colleague
22	4	Financial assets	Non-financial assets	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
23	4	Almjodat systemic	Concepts and classification	Discussion and dialogue	Self-evaluation and evaluation of colleague
24	4	Practical exercises on financial assets	Non-financial	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
25	4	Financial liabilities	Statutory liabilities	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
26	4	Transfer of funds	And financial powers	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
27	4	Contracting	General Conditions	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
28	4	Technical and accounting aspects	Agaydah processors	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
29	4	Budget transactions	Financial Center account	Discussion and dialogue	Self-evaluation and evaluation of the dialogue
30	4	Budget transactions	Financial Center account	Discussion and dialogue	Self-evaluation and evaluation of the dialogue

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	

Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	Programmable Logic Controller (PLC)
4. Programme(s) to which it contributes	Is mandatory

5. Modes of Attendance offered	Semester first for the academic year 2020-2021
6. Semester/Year	(90) credit hours of 3hours per week
7. Number of hours tuition (total)	06/12/2020
8. Date of production/revision of this specification	1 - Understand the theoretical and practical framework of electrical circuits. 2- Introducing students to the theories and analysis of electrical circuits 3 - Knowledge of the basic principles of electrical circuits. 4 - Know how to analyze electrical circuits 5 - The student's knowledge of how to apply theories and analysis in practice
9. Aims of the Course	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1- Understand the concept of electrical energy. A2- Explain to the student the importance of electrical energy. A3- Shows the student the theories of electrical circuit analysis A4- Explains to the student the development of electrical energy sources. A 5 - Explains to the student the development reached in the production of electrical energy. A6- It gives the student practical examples of analyzing electrical circuits.
B. Subject-specific skills B1 - Gather information on the basics of electricity and the theories used in the analysis of electrical circuits. B2 - Analyze the reasons for the emergence of these theories. B3 - Compare past and present experiences. B4 - Communication and delivery skills.

Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly • Quarterly • final
C. Thinking Skills C1. Put forward new ideas on the subject by the student. C 2-Thread student's ability to evaluate and give solutions. C 3-differentiate between the problems. C4. explains and analyzes the phenomena and problems.
Teaching and Learning Methods
1 - The use of supply and presentations method. 2 - drawing diagrams. 3 - Method of brainstorming.
Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	Unit/Module or Topic Title	ILOs	Teaching Method	Assessment Method
1	3	Definition A Historical Backgro und Principles of Operatio n PLCs Versus Other T ypes of Controls . PLC Product Applicat ion Ranges . Ladder Diagrams and the PLC Advantages of PLCs	Introduction to Programmable Controllers	lecture	Oral tests
2	3	1 Number Systems 2- 2 Number Conversion s 2- 3 One's and Two's Co mplement 2-4 Binary Codes 2- 5 Register Word Form ats ..	Number Systems	lecture	Self-evaluation and evaluation of colleague
3	3	3- 1 The Binary Concept 3-2 Logic Functions 3- 3 Principles of Boolea n Algebra and Logic 3- 4 PLC Circuits and L ogic Contact Symbolo gy	Logic Concepts	lecture	Self-evaluation and evaluation of colleague
4	3	4-1 Introduction 4-2 Processors 4-3 Processor Scan 4- 4 Error Checking and	Processors, the Po wer Supply, and Pr ogramming Devic es	lecture	Self-evaluation and evaluation of colleague

		Diagnostics 4- 5 The System Power Supply 4- 6 Programming Devices			
5	3	5- 1 Memory Overview 5-2 Memory Types 5- 3 Memory Structure and Capacity 5- 4 Memory Organization and I/O Interaction	The Memory System and I/O Interaction	lecture	Oral tests
6	3	5- 6 Summary of Memory, Scanning, and I/O Interaction 5- 7 Memory Considerations.	Configuring the PLC Memory—I/O Addressing	lecture	Self-evaluation and evaluation of colleague
7	3	7- 1 Introduction to Discrete I/O Systems 7- 2 I/O Rack Enclosures and Table Mapping 7- 3 Remote I/O Systems. 7- 4 PLC Instructions for Discrete Inputs 7- 5 Types of Discrete Inputs .	The Discrete Input/Output System	lecture	Self-evaluation and evaluation of colleague
8	3	8-1 Discrete Outputs 8- 2 Discrete Bypass/Control Stations 8- 3 Interpreting I/O Specifications	PLC Instructions for Discrete Outputs	lecture	Self-evaluation and evaluation of colleague

		8- 4 Summary of Discrete I/O			
9	3	9- 1 Overview of Analog Input Signals 9- 2 Instructions for Anal og Input Modules . 9- 3 Analog Input Data Representation . 9- 4 Analog Input Data Handling 9- 5 Analog Input Conne ctions . 9- 6 Overview of Analo g Output Signals	The Analog Input/ Output System	Lecture	Oral tests
10	3	10- 8 Analog Output Data Representation 10- 9 Analog Output Data Handling 10- 10 Analog Output Co nnections 10- 11 Analog Output By pass/Control Stations	Instructions for An alog Output Modul es	Lecture	Oral tests
11	3	11- 1 Introduction to Spec ial I/O Modules 11- 2 Special Discrete Inte rfaces 11- 3 Special Analog, Te mperature, and PID In terfaces 11- 4 Positioning Interfac es .	Special Function I/ O and Serial Com munication Interfa cing	Lecture	Oral tests

		11- 5 ASCII, Computer, a nd Network Interfaces 11- 6 Fuzzy Logic Interfa ces .. 8- 7 Peripheral Interfacing			
12	3	12- 1 Introduction to Prog ramming Languages 12- 2 Types of PLC Lang uages . 12- 3 Ladder Diagram For mat 12- 4 Ladder Relay Instru ctions 12- 5 Ladder Relay Progr amming 12- 6 Timers and Counter s 12- 7 Timer Instructions	Programming Lan guages	Lecture	Oral tests
13	3	13- 9 Program/Flow Contr ol Instructions 13- 10 Arithmetic Instruct ions 13- 11 Data Manipulation Instructions . 13- 12 Data Transfer Instr uctions . 13- 13 Special Function I nstructions 13-	Counter Instructio ns	Lecture	Oral and written tests

		14 Network Communication Instructions 13-15 Boolean Mne.			
14	3	14-1 Introduction to Documentation 14-2 Steps for Documentation 14-3 PLC Documentation Systems 14-4 Conclusion .	PLC System Documentation	Lecture	Oral tests
15	3	15-1 PLC System Layout 15-2 Power Requirements and Safety Circuitry 15-3 Noise, Heat, and Voltage Considerations 15-4 I/O Installation, Wiring, and Precautions	PLC Start-Up and Maintenance	Lecture	Self-evaluation and evaluation of colleague

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Introduction to PLC
Special requirements (include for example workshops, periodicals, IT software, websites)	FUNDAMENTAL CONCEPTS OF PLC
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	

Minimum number of students	
Maximum number of students	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title/code	computer principles
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Semester first and second for the academic year 2020-2021
6. Semester/Year	(180) credit hours of 3 hours per week
7. Number of hours tuition (total)	06/12/2020
8. Date of production/revision of this specification	1 - Understand the theoretical framework, computer principles and professional ethics 2 - Introduce students to the practical and applied methods of computers 3 - Knowledge of computer principles and professional ethics in socialist and developing countries and Iraq 4 - knowledge of accounting and planning foundations and principles and its importance 5 - The student's knowledge of the organization and organizational structure of the principles of computers
9. Aims of the Course	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1- Knows the concept of the history of accounting and professional ethics A2- Explains to the student the characteristics of thought, computers and ethics of the profession A3. Shows the student the content of the history of computers and the ethics of the profession A4. O4- explains to students the evolution of the intellectual framework for accounting. A5 - shows the evolution of the student reached by double entry. A6 . It gives the student practical examples of computers and professional ethics.
B. Subject-specific skills B1 - Gathers information on phenomena and problems, computers and professional ethics B 2 - analyzes the causes of these problems. B 3 - compares the experiences of the past and present. B4- communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly

• Quarterly • final
C. Thinking Skills C1. Put forward new ideas on the subject by the student. C 2-Thread student's ability to evaluate and give solutions. C 3-differentiate between the problems. C4. explains and analyzes the phenomena and problems.
Teaching and Learning Methods
1 - The use of supply and presentations method. 2 - drawing diagrams. 3 - Method of brainstorming.
Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development) D1- use references and terminology skills. D2- skills in data on the subject collection and analysis. D3- exploit the available potential skills. D4- hold Almgaranat subject skills D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Computer Components - Introduction to the computer/computer system/information technology/types of computers/input units/central processing unit/output units/main memory and its types/data storage in memory/factors that affect computer performance	Computer's components	lecture + practical	Oral exams + practical application
2	3	Software - definition and types of software/system software: operating systems/programming languages and programming systems/application software	Software definition	lecture + practical	Oral exams + practical application
3	3	Windows - Introduction to windows / its advantages / turning on the device / shutting down the device / using the mouse / components of the windows screen: taskbar: icons: types (standard and general)	Introduction to Windows	lecture + practical	Oral exams + practical application
4	3	Control panal -	Settings in Control	lecture + practical	Oral exams + practical

		control panel / desktop control / screen saver / window colors and fonts / screen settings / adjust screen colors / adjust time and date / volume / change between mouse sounds / control double-click speed / change the mouse pointer / install and uninstall programs	panel		application
5	3	start menu (START) Minimize and maximize window/final close/pause/move window/capacity control	start menu (START)	lecture + practical	Oral exams + practical application
6	3	Window/ways to run applications and programs. Sort START menu items/Delete START menu items/Add submenu to START menus/Add new button to START menu. Basic system info/disable unwanted apps	Methods of operating programs and knowledge of the basics of the system	lecture + practical	Oral exams + practical application
7	3	WINDOWS EXPLORER /MY COMPUTER icon /MY COMPUTER window panes. Recycle bin (delete, retrieve and empty the basket) / MY DOCUMENT icon	Parts of the MY COMPUTER window and methods for recovering data upon deletion	lecture + practical	Oral exams + practical application

8	3	FILE & FOLDER Define files and folders / select files and folders / properties of files / define folders / create files and folders / copy a file or folder / search for a file and folder / create a shortcut icon for an application or a file.	Define files and folders / select files in addition to creating files	lecture + practical	Oral exams + practical application
9,10,11	3	ACCESSORIES Calculator/Notepad/Notepad/Use memo to edit and create file Paint/ Screen Components/ Create graphics/ Set foreground and background colors/ Choose brush stroke size/ Select and select the drawing tool/ Save drawing/ Make drawing as desktop background/ Finish Paint MEDIA PLAYER ENTERTAINMENT PROGRAMS	ACCESSORIES, Monitor and Paint Components	lecture + practical	Oral exams + practical application
12,13	3	Computer Ethics - Viruses / Reason for naming / Definition / Ways of spreading the virus / Symptoms of virus infection / Methods of protection / Types of viruses Computer Crimes / Theft / Hackers	Viruses, how viruses spread, types of viruses	lecture + practical	Oral exams + practical application
14	3	MICROSOFT WORD معالج word processor	word processor basics word processor	lecture + practical	Oral exams + practical application

		Word processor features/WORD operation/Basic elements of a WORD window/Inverting language/Paragraph definition/Merge and split paragraph/Select (shading) text. OFFICE key			
15	3	New/Open stock file/Close document/Save new document/Save an existing document/Print preview/Close document/Exit Word. (HOME) Clipboard: cut/copy/paste/copy formatting. Font: change the font / font size / increase and decrease the font / erase formatting / change font color / highlight color / Text: subscript / superscript / change case / underline style / effects / character spacing	Word processor tabs dealing with texts and ways to save them	lecture + practical	Oral exams + practical application
16	3	Paragraph: Numbering / Bullets / Create a bulleted list to existing text / Eliminate bullets / Indentation / Paragraph spacing / Line spacing / Text direction / Alignment / Borders and	Paragraph tab and how to deal and execute tab orders	lecture + practical	Oral exams + practical application

		shading. Styles: Normal / No Spacing / Heading 1 / Heading 2 / Subtitle / Change Styles / Show Preview / Disable Arranged Styles / Options. Edit: Find / Move to / Replace / Select			
17	3	insert Pages: blank page / cover page / page break. Table: insert table / draw table / convert text to table / spreadsheet / excel / quick table / table styles / draw table borders Illustrations: photo/clip art// prepared shapes / smart art drawing / outline	Inclusion List	lecture + practical	Oral exams + practical application
18	3	Header and footer: header / footer / page number Text: text box / decorative text / word art / signature line / date and time / object / equation / symbol page layout	Tab header and footer pages and page layout	lecture + practical	Oral exams + practical application
19,20	3	Features: Themes / Colors / Fonts / Effects Page Setup: Margins / Page Size / Orientation Page background: watermark / page color / page borders Sort: position /	Page background and how to implement it	lecture + practical	Oral exams + practical application

		bring to front / send to background / text wrap / align / group / rotate			
21	3	Table of Contents / Add Text / Update Table Footnotes: Insert Footnote / Insert Endnote / Next Footnote / Show Notes References	References, insert footnotes	lecture + practical	Oral exams + practical application
22	3	References and Citations: Citation Inserts/Source Management/Style Captions: Caption inserts Index : inserts index / mark entry / update index Mailings- Create: Envelopes/Labels	Insert quotes, captions, index	lecture + practical	Oral exams + practical application
23	3	Review Check: Spelling & Grammar / Research / Thesaurus / Translation / Hint / Translation Screen / Set Language / Word Count Comments: New Comment / Delete / Previous / Next Tracking: track changes / balloons / final appearance tag / show tags / revision pane	Review Review , Comments , Tracker	lecture + practical	Oral exams + practical application
24	3	Changes: accept / reject / previous / next / Protect: protect the document View - View	Display tab	lecture + practical	Oral exams + practical application

		Document views: print layout / full screen reading / web layout / outline / draft			
25,26	3	Show and hide: Ruler / Gridlines / Document map / Thumbnail Zoom in and out: 100% / one page / two pages / page width Frame: New Frame / Arrange All / Split / Switch Frames Microsoft Office Word Help	Show tab, Zoom tab	lecture + practical	Oral exams + practical application
27,28,29,30	3	Presentations Definition of Point Point Presentation Program/Requirements of PowerPoint Presentation/Uses of Presentation Program in Education/Principles of Point Presentation and Slides Design/PowerPoint Interface Components	Presentations, and the definition of ways to deal with the program	lecture + practical	Oral exams + practical application

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Which computer applications book?
Special requirements (include for example workshops, periodicals, IT software, websites)	The Computer and Informatics Center of the University of Technology and the Al-Noor Library

Community-based facilities (include for example, guest Lectures , internship , field studies)	E-book library website

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	

COURSE SPECIFICATION

This course aims to show the importance of studying math and spherical triangles The process of life , and take advantage of the relationships and mathematical Formulas that govem their application in their own space technologies and Services as well as in the practical side in the field.

1. Teaching Institution	Middle Technical University Technical Institute / kut
2. University Department/Centre	Department of Renewable Energy Technologies
3. Course title / code	Mathematics
4. Program me(s)to which it contributes	Department
5. Modes of Attendance offered	Attend mandatory weekly
6. Semester / Year	Academic year 2020- 2021
7. Number of hours tuition(total)	**2theory * 30 weeks = 60 hours Faculty**
8. Date of production/revision of this specification	**2/ 5 / 2021**
9. Aims of the Course	
1) understand the key concepts and knowledge of the rules and the laws of Mathematics applied	
2) illustrate mathematical ideas through the representation of geometric shapes in both The level and the leisure and study some of the algebraic structure **3) the subject of mathematics that are designed to clarify the practical and philosophical Challenges of the current engineering and mathematics that**	

spurred this constant evolution , as well as providing basic concepts of differentiation and integration useful for further study of the science of engineering and applied mathematics in the scientific and practical field

4) students acquire the skills to resolve issues.

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. <u>Knowledge and Understanding</u>

A1.recgnize the fundamental concepts of mathematics and application
A2.expand the perceptions of students and promote concept of mathematics by giving them general principles and concepts of matrices second degree equation differentiation integration drawing curves area
A3.recognizes the application of the concepts of mathematics applied

B. <u>Subject-specific skills</u>

B1.Adetailed study of mathematics .
B2.knowledge of mathematical relationships that represent types of algebraic functions and painted
B3.knowledge of the laws of finding the derivative with the profile and return to the basic function of the impact drone ties of integration
B4. Technical preparation to be successful art by learning the correct principles to allocate cars and the application of mathematical relationships solving problems

Teaching and Learning Methods

.The teaching lectured detailed theory.
.The teaching request periodic reports for the international information network (the internet) to get extra knowledge for subjects

Assessment methods

.Assess students individually by giving the opportunity to participate through classroom answering questions.

.Student Assessment collectively through daily exams quizzed process and theory

. Student Assessment collectively by giving extra – curricular duties such writing reports or those that concerning

. The end of the first semester exams (half a year) and the second chapter and final exams for the first round and the second

C. Thinking Skills

C1.Urged the students to think of ways to solve simultaneous equations and drawing functions of all kinds.

C2. Urged the students to think about the importance of the derivative and integration applications in slaying engineering problems .

C3. Urged students to integrate the know edge of where to take advantage of sports information in the fiends other study theory and practice and the adoption of subjects on each other

C4. Urged the students to gain a glowing skills for mathematics in terms of language and symbols information and ways of thinking analysis of the results of resolving issues and compare them with the reality and extent of the mentally make them match

Teaching and Learning Methods

.The definition of teaching students the most important key applications mathematical equations in various space technologies in theory and practice .

. Give students and duties do not require them to make descriptive skills and subjective interpretations of test methods

. Questioning the student through panel discussions by asking questions the thinking (how, why, when, where,) for specific topics

. Using the style – minded brainstorming and feedback in order to activate

the accumulated experiences of the students by linking what was taken from subjects in the previous academic stages and linked to new

Assessment methods

Assessment is based on

1.The first chapter exam (20% Theory)

2. Chapter H exam (20% Theory)

3. Acts of the year (10%) is taken into account attendance attendance and participation

4- Final exam (50% T) first – round and second round .

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Enable students to writing duties on special topics textured mathematics

D2. Enable students to solve algebraic equations in eluding matching can practice for communication systems

D3. Enable students to pass the professional tests organized by local or international destinations

D4. Enable students of continuous self- development of the post – graduation

D5. Develop the students ability to analyze the information and interpret the data obtained by conducting practical experiments

D6. Enable the student to hold identify problems that lies on the shoulders of art in the field survey

Teaching and Learning

- **Preparation and implementation of research projects by students within the automotive technology department vocabulary enter math applications and display in the student center**
- **Math vocabulary development and updating to keep up with the evolution to achieve personal development level of students**

Assessment Methods

- **Discuss research and projects by the scientific committees in the department**
- **Written tests**
- **Direct observations**

14 + 15	2T	The student understands the lesson	Derivatives of higher echelons and partial derivatives	Lecture theory	Discuss and solve exercises, fast exam and homework
16 + 17	2T	The student understands the lesson	Applications of the derivative ,equation of the straight line , the slope of the tangent line and column , speed and acceleration	Lecture theory	Discuss and solve exercises, fast exam and homework
18 + 19 +20	2T	The student understands the lesson	Integration (indefinite integral) integration of algebraic functions exponential and logarithmic functions trigonometric functions	Lecture theory	Discuss and solve exercises, fast exam and homework
21 + 22	2T	The student understands the lesson	Integration methods , (retail method and method of partial fractions	Lecture theory	Discuss and solve exercises, fast exam and homework
23 + 24 +25	2T	The student understands the lesson	Indefinite integral , the specified integration applications , the area between curve and axes , area between two curves	Lecture theory	Discuss and solve exercises, fast exam and homework
26	2T	The student understands the lesson	Differential equations of the first order and first class reunions	Lecture theory	Discuss and solve exercises, fast exam and homework
27 + 28	2T	The student understands the lesson	Census , statistical processes and frequency distributions , histogram frequency curve arithmetic mean and geometric mean	Lecture theory	Discuss and solve exercises, fast exam and homework
29 + 30	2T	The student understands the lesson		Lecture theory	Discuss and solve exercises, fast exam and homework

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2T	The student understands the lesson	Matrices, defined kinds, operations on matrices , adding and subtracting and multiplication	Lecture theory	Discuss and solve exercises, fast exam and homework
2 + 3	2T	The student understands the lesson	Determinants ,defined, How to calculate specified bilateral , tripartite, Solving linear equations(The way Kramer)	Lecture theory	Discuss and solve exercises, fast exam and homework
4 + 5	2T	The student understands the lesson	Vector , vector analysis and vector quantities , calculations on vectors, scalar multiplication and cross product	Lecture theory	Discuss and solve exercises, fast exam and homework
6 + 7	2T	The student understands the lesson	Logarithms, define logarithm , the laws of logarithms , how to use laws in logarithmic equations solution , solving exponential equations	Lecture theory	Discuss and solve exercises, fast exam and homework
8 + 9	2T	The student understands the lesson	Function , the meaning of the function , the independent variable and adopted, The clear function and implicit function , trigonometry and the relationship between them , very very odd functions and trigonometric	Lecture theory	Discuss and solve exercises, fast exam and homework

12. Infrastructure

The required textbooks	**Institute library for additional sources**
Main references(Sources)	**George B. Thomas , Jr., Thomas Calculus , 12 th edition ,Addison Wesley , Pearson Education , Inc , 2010**
Recommended reference books (Scientific magazines reports)	**All sound scientific journals related to applied mathematics**
Electronic references and internet sites	**Web sites pertaining to mathematics**

13. Curriculum development plan

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies techniques
3. Course title/code	**Renewable energy sources**
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Semester first and second for the academic year 2020-2021
6. Semester/Year	(180) credit hours of 6 hours per week
7. Number of hours tuition (total)	06/12/2020
8. Date of production/revision of this specification	1 - Understand the theoretical framework of the principles ofRenewable energy scources 2 - Introduce students to Renewable energy scources 3 - Know of Renewable energy scources. 4 Knowledge Renewable energy scources 5 - the Student's knowledgeRenewable energy scources.
9. Aims of the Course	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1- Knows the concept of the history of **Renewable energy scources**and their structures . A2- Explain to the student the properties of Renewable energy scources A3. Shows the student how to create Renewable energy scources A4. Explains to the student the development of plc elements. A5 - Explains to the student the development that the world of Renewable energy scources Renewable energy sources has reached. A6 . The student gives practical examples of Renewable energy scources.
B. Subject-specific skills B1- Collects information on phenomena and problems in the formation of plc . B 2 - analyzes the causes of these problems. B 3 - compares the experiences of the past and present. B4- communication and delivery skills.
Teaching and Learning Methods
1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh 2 - self-assessment and evaluation of the colleague. 3 - tests include: A - achievement tests associated with the constructivist teaching plans. B - Final achievement tests include: • Final monthly tests at the end of each month semester. • Final quarterly tests at the end of the semester. • Final final tests at the end of the school year.
Assessment methods
1 - The use of achievement tests: • daily • Monthly • Quarterly • final
C. Thinking Skills C1. Put forward new ideas on the subject by the student. C 2-Thread student's ability to evaluate and give solutions. C 3-differentiate between the problems. C4. explains and analyzes the phenomena and problems.
Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	Solar energy, a history of the first solar cell in the world, the physical concepts of converting solar energy into electrical energy	Solar energy, a history of the first solar cell in the world, the physical concepts of converting solar energy into electrical energy	lecture	Written and oral exams
2	4	The physical structure of the solar cell, the layers that make up the solar cell and the benefits of each layer of	The physical structure of the solar cell, the layers that make up the solar cell and the benefits of each layer of	lecture	Written and oral exams
3	4	These layers	These layers	lecture	Written and oral exams
4	4	Types of solar cells and the efficiency of each type	Types of solar cells and the efficiency of each type	lecture	Written and oral exams
5	4	Features that manufacturers add to increase the efficiency of solar cells	Features that manufacturers add to increase the efficiency of solar cells	lecture	Written and oral exams
6	4	Solar radiation, the difference in the intensity of solar radiation in countries according to their position from the equator	Solar radiation, the difference in the intensity of solar radiation in countries according to their position from the equator	lecture	Written and oral exams
7	4	The basic components of a solar cell system	The basic components of a solar cell system	lecture	Written and oral exams
8	4	Types of solar cell systems	Types of solar cell systems	lecture	Written and oral exams
9	4	Wind energy, where it is available, a brief history of the use of wind energy to generate electric power	Wind energy, where it is available, a brief history of the use of wind energy to generate electric power	lecture	Written and oral exams
10	4	The use of wind energy around the world and its positive impact on the environment	The use of wind energy around the world and its positive impact on the environment	Lecture	Written and oral exams
11	4	Wind energy	Wind energy	Lecture	Written and oral exams

		working principle and types of wind turbines	working principle and types of wind turbines		
12	4	Factors that affect the amount of electrical energy produced from wind energy	Factors that affect the amount of electrical energy produced from wind energy	Lecture	Written and oral exams
13	4	Wind farm design on land	Wind farm design on land	Lecture	Written and oral exams
14	4	wind farm design in water	wind farm design in water	Lecture	Written and oral exams
15	4	The ten largest wind farms in the world	The ten largest wind farms in the world	Lecture	Written and oral exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	Renewable energy sources
Community-based facilities (include for example, guest Lectures , internship , field studies)	

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme

specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies techniques
3. Course title/code	workshop
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Semester first and second for the academic year 2020-2021
6. Semester/Year	(45) credit hours of3 hours per week
7. Number of hours tuition (total)	10/11/2020
8. Date of production/revision of this specification	
9. Aims of the Course	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

Teaching and Learning Methods

1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh
2 - self-assessment and evaluation of the colleague.
3 - tests include:
A - achievement tests associated with the constructivist teaching plans.
B - Final achievement tests include:
• Final monthly tests at the end of each month semester.
• Final quarterly tests at the end of the semester.
• Final final tests at the end of the school year.

Assessment methods

1 - The use of achievement tests:
• daily
• Monthly
• Quarterly
• final

C. Thinking Skills
C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.
D2- skills in data on the subject collection and analysis.
D3- exploit the available potential skills.
D4- hold Almgaranat subject skills
D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Refrigeration	Refrigeration	workshop	Written and oral exams
2	3	welding	welding	workshop	Written and oral exams
3	3	plumbing	plumbing	workshop	Written and oral exams
4	3	lathe Refrigeration	lathe	workshop	Written and oral exams
5	3			workshop	Written and oral exams
6	3			workshop	Written and oral exams
7	3	welding	Refrigeration	workshop	Written and oral exams
8	3	plumbing	welding	workshop	Written and oral exams
9	3	lathe	plumbing	workshop	Written and oral exams
10	3	carpentry	lathe	workshop	Written and oral exams
11	3	Refrigeration	Refrigeration	workshop	Written and oral exams
12	3	welding	welding	workshop	Written and oral exams
13	3	plumbing	plumbing	workshop	Written and oral exams
14	3	lathe	lathe	workshop	Written and oral exams
15	3	carpentry	carpentry	workshop	Written and oral exams

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	Work shop

Community-based facilities (include for example, guest Lectures , internship , field studies)	

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Central Technical University - Technical Institute Cote
2. University Department/Centre	Department of Renewable Energy Technologies techniques
3. Course title/code	Power and electrical machines
4. Programme(s) to which it contributes	Is mandatory
5. Modes of Attendance offered	Semester first and second for the academic year 2020-2021
6. Semester/Year	(60) credit hours of4 hours per week
7. Number of hours tuition (total)	10/11/2020
8. Date of production/revision of this specification	
9. Aims of the Course	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Knowledge and Understanding

A1- Knows the concept of the history of **electronic** elements and their structures .
A2- Explain to the student the properties of electronic elements
A3. Shows the student how to create electronic circuits
A4. Explains to the student the development of electronic elements.
A5 - Explains to the student the development that the world of electronics has reached

B. Subject-specific skills

B1- Collects information on phenomena and problems in the formation of electronic circuits .
B 2 - analyzes the causes of these problems.
B 3 - compares the experiences of the past and present.
B4- communication and delivery skills.

Teaching and Learning Methods

1 - Questions of objectivity and divided into: multiple choice questions or questions of right and wrong or questions Almqarplh
2 - self-assessment and evaluation of the colleague.
3 - tests include:
A - achievement tests associated with the constructivist teaching plans.
B - Final achievement tests include:
• Final monthly tests at the end of each month semester.
• Final quarterly tests at the end of the semester.
• Final final tests at the end of the school year.

Assessment methods

1 - The use of achievement tests:
• daily
• Monthly
• Quarterly
• final

C. Thinking Skills

C1. Put forward new ideas on the subject by the student.
C 2-Thread student's ability to evaluate and give solutions.
C 3-differentiate between the problems.
C4. explains and analyzes the phenomena and problems.

Teaching and Learning Methods

1 - The use of supply and presentations method.
2 - drawing diagrams.
3 - Method of brainstorming.

Assessment methods

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- use references and terminology skills.

D2- skills in data on the subject collection and analysis.

D3- exploit the available potential skills.

D4- hold Almgaranat subject skills

D5- preparing concepts on the subject skills..

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Sustainable energy, its sources, power and electric energy	Sustainable energy, its sources, power and electric energy	launcher	Written and oral exams
2	3	Electric power system, generation, transmission, distribution	Electric power system, generation, transmission, distribution	launcher	Written and oral exams
3	3	Types of electrical generating stations	Types of electrical generating stations	launcher	Written and oral exams
4	3	vertical bars overhead transmission lines secondary stations	vertical bars overhead transmission lines secondary stations	launcher	Written and oral exams
5	3			launcher	Written and oral exams
6	3			launcher	Written and oral exams
7	3	Underground transmission lines (midwives)	Underground transmission lines (midwives)	launcher	Written and oral exams
8	3	Calculations of resistance, inductance, capacitance of transmission lines	Calculations of resistance, inductance, capacitance of transmission lines	launcher	Written and oral exams
9	3	Types and basic components of distribution networks	Types and basic components of distribution networks	launcher	Written and oral exams
10	3	aerial distribution networks	aerial distribution networks	launcher	Written and oral exams
11	3	Ground Distribution Networks	Ground Distribution Networks	launcher	Written and oral exams
12	3	Types of fastening for solar panels	Types of fastening for solar panels	launcher	Written and oral exams
13	3	Practical applications of a solar power plant	Practical applications of a solar power plant	launcher	Written and oral exams
14	3	Calculations of losses for the transfer of power	Calculations of losses for the transfer of power	launcher	Written and oral exams
15	3	Design of	Design of solar power	launcher	Written and oral exams

		solar power generation systems	generation systems		

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	Power and electrical machines
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	
Maximum number of students	