Curriculum Description Form

1. Curriculum Name:
Democracy and Human Rights
2. Curriculum Code:
(NTU 100)
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Assist.lec.Hassan Muhammed Hassan Email: hasan.aljbory@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectives	-The student learns about the principles and values of human rights, introduces them, and educates generations to respect and adhere to them. -Learn about public freedoms, what these freedoms are in their details, and the relationship between them and democracy.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	2	The roots Of human rights	The roots of human rights and their development in human history. Human rights in ancient and medieval times	Theoretical lectures	Daily tests

٤+٣	2	Agreements and charters	The first requirement: human rights in ancient civilizations, with a focus on the Mesopotamian civilization. The second requirement: Human ights in divine laws, with a focus on human rights in Islam.	Theoretical lectures	Daily tests
٦+	2	Charters and constitutions	Third requirement: Human rights in the Middle Ages	Theoretical lectures	Daily tests
٨+	2	Public freedoms and equality	a. Human rights in doctrines, schools and political theories.	Theoretical lectures	Daily tests
١٠+٩	2	Classification n of freedoms	B. Human rights in corporations, rights And their declarations, revolutions And constitutions (English documents)	Theoretical lectures	Daily tests
11+12	2	Simplify the freedoms briefly	American Revolution, French Revolution, Russian Revolution	Theoretical lectures	Daily tests

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports…)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
English Language
2. Curriculum Code:
(NTU 101)
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Nawras khaleel Ibraheem Email: nawras.khalil@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectiv	Getting to know the basics of the English language, as well as speaking and getting to know the terminology that enables the student to understand and know the language.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
٢+١	2	**Pronouns**	**Unit one :hello Am/are/is, my/your This is with practice in work**	**-listening to recorder conversations - practicing in groups with teacher/each other**	Daily tests

٣	2	**Pronouns**	**Unit two :your world He/she /they, his/her Questions**	-listening to recorder conversations -practicing in groups with teacher/each other	Daily tests
٤	2	**Pronouns**	**Unit four: family and friends Possessive adjectives Possessive's Has/have Adjective+ noun**	Theoretical lectures	Daily tests
٥	2	**present tense**	**Unit Five :the way I live Present simple l/you /we /they A and an Adjective + noun**	-listening to recorder conversations -practicing in groups with teacher/each other	Daily tests
٦	2	**Adjective**	**Unit six : every day Present simple he/she Questions and negatives Adverbs of frequency**	-listening to recorder conversations -practicing in groups with teacher/each other s	Daily tests
٧	2	**Negation and affirmation**	**Unit seven :my favorites Question words Pronouns This and hat**	-listening to recorder conversations -practicing in groups with teacher/each other	Daily tests
٨	٢	**Prepositions**	**Unit eight :where I live There is /are. Prepositions**	listening to recorder conversations -practicing in groups with teacher/ each other	Daily tests
٩	٢	**times past**	**Unit nine :times past Was / Were born Past simple -irregular verbs**	listening to recorder conversations -practicing in Groups with teacher/ each other	Daily tests
١٠	٢	**Question Negatives**	**Unit ten: we had a great time! Past simple -regular & irregular Question Negatives Ago**	listening to recorder conversations practicing in groups with teacher/ each other	Daily tests
١١	٢	**Can /can't Adverbs**	**Unit eleven :Can /can't Adverbs Requests I can do That**	listening to recorder conversations -practicing in groups with teacher/ each other	Daily tests
١٢	٢	**Some and any**	**Unit twelve: please I'd like... Some and any Like and Would like and thank you**	**listening to recorder conversations -practicing in groups with teacher/ each other**	Daily tests

١٣	٢	**Present simple**	**Unit thirteen: here and now Present continuous Present simple & present continuous**	**listening to recorder conversations -practicing in groups with teacher/ each other**	Daily tests
١٤	٢	**writing email**	**Unit fourteen: it's time to go ! Future plans Revision writing email and informant letter**	**listening to recorder conversations -practicing in groups with teacher/ each other**	Daily tests
١٥	٢	**Revision**	**Unit fifteen : revision**		

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 40 % and final mark 60% summation at last to get the final mark

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Computer
2. Curriculum Code:
(NTU 102)
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Ass.Lec.Nida muhsin ali Email: nida.ali@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objecti	Teaching students the skills of computer applications and their use in the field of specialization.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	2	Practical + theoretical	Introduction to computer / computer system / information technology / types of computers / input units / central processing unit / output units / main memory and its types / storing data in memory / factors affecting computer performance Definition of software and its types / System software: operating systems / Programming languages and programming systems / Application software	Knowledge and practical application	Tests and reports

3	2	Practical and theoretical	Introduction to Windows / its advantages / turning on the device / shutting down the device / using the mouse / components of the windows screen: the taskbar: icons: and their.) types (standard and general	Knowledge and practical application	Daily tests
4	2	Practical and theoretical	Control panel / desktop control / screensaver / windows colors and fonts / screen settings / adjust screen colors / adjust the time and date / volume / change between mouse buttons / double-click speed control / change the mouse cursor / mouse speed control / install and uninstall programs	Knowledge and practical application	Daily tests
5	2	Practical and theoretical	Minimize and enlarge the window / permanently close / temporarily close / move the window / control the window size / ways to run applications and programs	Knowledge and practical application	Daily tests+ reports
6	2	Practical and theoretical	Arranging start menu items / deleting start menu items / adding a submenu to the start menu / adding a new button to the start menu	Knowledge and practical application	Daily tests
7	2	Practical and theoretical	Basic system information / Turn off unwanted apps Windows explorer / My computer icon / My computer window panes	Knowledge and practical application	Daily tests
9+8			Recycle Bin (delete, restore and empty the basket) / my document icon	Knowledge practical application	Tests and reports
10+11	2	Practical and theoretical	Defining files and folders / Defining files and folders / Defining files and folders properties / Creating files and folders / Changing the name of files and folders / Moving a file or folder / Copying a file or folder / Searching for a file or folder / Creating a shortcut icon for an application or file	Knowledge practical application	Tests and reports

13+12	2	Practical and theoretical	Calculator / notepad / notebook / using the note to edit and create the paint file / screen components / creating graphics / specifying the foreground and background colors / choosing the size of the brush line / defining and selecting the drawing tool / saving the drawing / making the drawing a desktop background	Knowledge practical application	Tests and reports
14+15	2	Practical and theoretical	Viruses / the reason for the name / definition / ways of spreading the virus / symptoms of infection with the virus / methods of protection / types of viruses computer crimes / theft / hackers	Knowledge practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Arabic Language
2. Curriculum Code:
(NTU 103)
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
٢٠٢٤-٩-٨
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Mohammed abed al-Qadir hamd Email: Mohamed.qader77@gmail.com
8. Curriculum Objectives

Curriculum Objective	Teaching the student to use the Arabic language in administrative and accounting correspondence and developing his skills in this field.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Practical	An introduction to linguistic errors - the tied and long ta'a and the open ta'a	Knowledge and application	Tests and reports
2	2	Practical and l	Rules for writing the extended and reduced alif - the solar and lunar letters	Knowledge and application	Daily tests

3	2	Practical and	The opposite and the light	Knowledge and application	Daily tests
4	2	Practical and	Humza writing	Knowledge and application	Daily tests+ reports
5	2	Practical and	punctuation marks	Knowledge and application	Daily tests
6	2	Practical and theoretical	Noun and verb and differentiate between them	Knowledge and application	Daily tests
7	2	Theoretical	Reactants	Knowledge and practical application	Tests And reports
8	2	Theoretical	The number	Knowledge and practical application	Tests and reports
9+10	2	Theoretical	Common language errors applications	Knowledge and practical application	Tests and reports
11	2	Theoretical	Noon and Tanween – meanings of prepositions	Knowledge and practical application	Tests And reports
12	2	Theoretical	Formal aspects of administrative discurriculum	Knowledge	Tests
13+14	2	Theoretical	Administrative discurriculum langua	Knowledge	Daily tests
15	2	Theoretical	Forms of administrative corresponde	Knowledge	Daily tests

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 40 % and final mark 60% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Sport
2. Curriculum Code:
((NTU 104)
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Ali Yahya Ahmed Email: alialiyahya140@gmail.com
8. Curriculum Objectives

Curriculum Objectiv	The student should be able to recognize the most important types of sports and what are the laws and skills specific to some sports..
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Practical + theoretical	Sports definition, importance and types	Knowledge and practical application	Tests and reports
2	2	Practical and theoretical	Human body movement mechanism	Knowledge and practical application	Daily tests
3	2	Practical and theoretical	Common sports injuries	Knowledge and practical application	Daily tests

4	2	Practical and theoretical	Basic skills of the game of basketball	Knowledge and practical application	Daily tests+ reports
5	2	Practical and theoretical	International law of the game of basketball	Knowledge and practical application	Daily tests
6	2	Practical and theoretical	Basic skills of table tennis and its international computer window panes	Knowledge and practical application	Daily tests
7	2	Practical and theoretical	Basic skills of volleyball and its international law	Knowledge and practical application	Tests And reports
8	2	Practical and theoretical	swimming sport	Knowledge and practical application	Tests and reports
9	2	Practical and theoretical	Basic skills of tennis and international law	Knowledge and practical application	Tests and reports
10	2	Practical and theoretical	Basic handball skills	Knowledge and practical application	Tests and reports
11	2	Practical and theoretical	International law of handball	Knowledge and practical application	Tests and reports
12	2	Practical and theoretical	Arena and field games (types, international law of)the game	Knowledge and practical application	Tests And reports
13	2	Practical and theoretical	Basic soccer skills	Knowledge and practical application	Tests and reports
14	2	Practical and theoretical	Management of competitions and sports competitions	Knowledge and practical application	Tests And reports
15	2	Practical and theoretical	Sports laws and legislation	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Mathematics Foundation
2. Curriculum Code:
(TIDO100)
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Assist. Lec. Mohammed Ali Mahmood Email: mohammed.am@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectives	Teaching the student to use mathematics in scientific subjects and developing his skills in his field of specialization
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	2	Theoretical	Matrices - determinants – Electrical applications	Knowledge and application	Tests and reports
3	2	Theoretical and tutorial	Trigonometric identities and trigonometric equations.	Knowledge and application	Daily tests

4+5	2	Theoretical and tutorial	Complex numbers - the geometric representation of a complex number - the relationship of electrical units to the complex number - Find the roots of the complex number.	Knowledge and application	Daily tests
6+7	2	Theoretical and tutorial	Foundations and logarithms and their laws	Knowledge and application	Daily tests +reports
8	2	Theoretical and tutorial	Differentiation – Algebra of Derivatives – Polynomial Functions and Their Derivatives – Chain Base - Complex Function - Parametric Function.	Knowledge and application	Daily tests
9	2	Practical and theoretical+ tutorial l	Applications of differentiation maximum and minimum values - distance, velocity, and acceleration. General physical and engineering applications	Knowledge and application	Daily tests
11+10		Practical and theoretical	Finding the length of a curved arc - different applications	Knowledge and practical application	Tests and reports
13+12	2	Theoretical and tutorial	Tutorial	Knowledge And practical application	Tests and reports
15+14	2	Theoretical and tutorial	Tangent and column equation – velocity and	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 40 % and final mark 60% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Differentiation and Integration
2. Curriculum Code:
TIDO101
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Assist. Lec. Mohammed Ali Mahmood Email: mohammed.am@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectives	Teaching the student to use Differentiation and Integration subjects and developing his skills in his field of specialization

9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	2	Theoretical	Drawing Functions - Drawing the Trigonometric Function and Inverse, Exponential and Logarithmic Functions and Their Relationship with Each Other - Maximum and Minor Limits and Inflection Points - Alignments	Knowledge and application	Tests and reports
3	2	Theoretical and tutorial	Ends - the goal of algebraic and trigonometric functions - applications to ends.	Knowledge and application	Daily tests

4+5	2	Theoretical and tutorial	Integration - laws and its relationship to differentiation - definite and indefinite complementarity	Knowledge and application	Daily tests
6+7	2	Theoretical and tutorial	Applications of integration – the area under the two curves and between two curves - the approximate area using the trapezoidal rule and Simpson - rotational volumes with interest in drawing according to the coordinate system	Knowledge and application	Daily tests +reports
8	2	Theoretical and tutorial	Differentiation – Algebra of Derivatives – Polynomial Functions and Their Derivatives - Chain Base – Complex Function - Parametric Function.	Knowledge and application	Daily tests
9	2	Practical and theoretical+ tutorial l	General methods of integration include substitution,	Knowledge and application	Daily tests
11+10	2	Practical and theoretical	Finding the length of a curved arc - different applications	Knowledge a practical application	Tests and reports
13+12	2	Theoretical and tutorial	Tutorial	Knowledge a practical application	Tests and reports
15+14	2	Theoretical and tutorial	Tangent and column equation - velocity and	Knowledge a practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 40 % and final mark 60% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Mechanical Workshop
2. Curriculum Code:
TIDO102
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8/9/2025
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: staff of mechanical department of workshops Email:
8. Curriculum Objectives

Curriculum Objectiv	Teaching the student the principles and basics of mechanical workshops to develop his skills in his field of specialization..

9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits, in workshops of institute , welding , casting , machining workshops / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Practical + theoretical	-Welding (6 weeks) Occupational safety and security precautions: gas welding, the equipment used and how to install and adjust it, other auxiliary tools and gases used and their specifications, welding wires, their types and measurements, other auxiliary materials, welding equipment, types of flames and the method of igniting and adjusting the required flame, artifacts, rinsing and cleaning the edges to be ended.	Knowledge and practical application	Tests and reports

2	2	Practical and theoretical	Practical exercises: Welding opposite surfaces, perpendicular surfaces, inclined surfaces, circle welding, longitudinal and transverse cutting	Knowledge and practical application	Daily tests
3	2	Practical and theoretical	Welding equipment, practical training on using the electric arc to weld various surfaces, equipment used, electrodes and how to install them, practical training.	Knowledge and practical application	Daily tests
4	2	Practical and theoretical	Gas welding and gas co2 cutting processes, equipment used and precautions to be taken Doing exercises on welding items using gas co2	Knowledge and practical application	Daily tests+ reports
5	2	Practical and theoretical	Training in gas-shielded arc welding (Tig, Mig).	Knowledge and practical application	Daily tests
6	2	Practical and theoretical	Assembly exercises using various cutting and welding processes.	Knowledge and practical application	Daily tests
7	2	Practical and theoretical	-Plumbing and blacksmithing (3 weeks) Equipment for cutting and bending billets, rolling machine, grooving machine and manual tools, using and bending the billet manually, regular thruster, list and drawing method, simple discretization's, calculating the discreteness of the cut and missing actuators.	Knowledge And practical application	Tests and reports
8	2	Practical and theoretical	Training on calculating the individual intersecting works, performing an exercise for two intersecting cylinders.	Knowledge And practical application	Tests and reports
9	2	Practical and theoretical	Singular cones and conic ellipses.	Knowledge and practical application	Tests And reports
10	2	Practical and theoretical	Lathing (6 weeks) The lathe, its specifications, Uses, accessories, installation methods, operating the lathe, types of lathe pens using each of them	Knowledge and practical application	Tests And reports
11	2	Practical and theoretical	Lathing operations: Plane lathe, tool, center work, simple step drill, use of measuring tools.	Knowledge and practical application	Tests And reports

12	2	Practical and theoretical	Mapping the external looting in different ways, explaining the laws for each method, and doing an exercise specifically for the external looting.	Knowledge and practical application	Tests and reports
13	2	Practical and theoretical	1- Working out the different teeth externally (the triangle). Doing an exercise that includes the triangle tooth Make the tooth an outer square and make an exercise.	Knowledge and practical application	Tests and reports
14	2	Practical and theoretical	Cutting speeds, selecting them, and using their tables.	Knowledge and practical application	Tests and reports
15	2	Practical and theoretical	Implementing training on decentralized turning and using quadrilateral sampling.	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark it valuated continually.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Principles of Electronics
2. Curriculum Code:
EOTO100
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Riyadh Rajab Muhammad Email: riyadhrajabmm@gmail.com
8. Curriculum Objectives

Curriculum Objectiv	Introducing the basic scientific concepts related to engineering and harnessing them in the field of electronics and electricity..

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Semiconductor theory - atomic structure - energy levels - crystals – conduction in crystals / gap current - how gaps move	Knowledge and practical application	Tests and reports
2	4	Practical and theoretical	Inoculation - P-type positive crystal – negative N-type crystal, electron current and gap current - total resistance.	Knowledge and practical application	Daily tests+ reports

3	4	Practical and theoretical	Semiconductor diodes - PN connection - evacuation zone configuration - diaphragm voltage - power hill - thermal effects - diode bias - forward bias - reverse bias - forward and reverse characteristic curves - fleeting current - minority carriers current - permissible leakage current - refraction voltage - Breakdown voltage - Greatest forward current - Greatest Reverse current - Equivalent circuit of the diode.	Knowledge and practical application	Daily tests reports
4+5	4	Practical and theoretical	Binary as current-uniform half-wave-value-constant value and calculation- effective-output frequency	Knowledge and practical application	Daily tests +reports
6	4	Practical and theoretical	Filters - capacitive filtration – LC and RC filters - output voltages – ripple - voltage multipliers - trim circuits - positive trim – negative trim - composite trim - peak-to-peak detector - positive and .negative clamps	Knowledge and practical application	Daily tests
8+7	4	Practical and theoretical	Zener diode - structure - symbol – forward and reverse properties - breakdown and refraction potentials - zener impedance - power tolerance - temperature effects – zener approximation – constant voltage regulation - constant voltage source circuit - variable capacitance diode and its applications.	Knowledge and practical application	Daily tests
10+9	4	Practical and theoretical	Bipolar transistor - combination – symbol - properties - regions – definition (Bdc) - definition (Cdc) - relationship between them - definition of important regions on characteristic curves – transistor bias circuits - base bias – emitter bias - collector bias - approximation in transistor and circuit Equivalency	Knowledge and practical applicat	Tests and reports
11	4	Practical and theoretical	Transistor characteristic curves - Work areas - Icbo definition, Iceo - Current gain curve - Relationship between Ic, Icbo.	Knowledge and practical applicat	Tests and reports

12	4	Practical and theoretical	Transistor bias - base bias – emitter bias circuits.	Knowledge and practical application	Tests And reports
13	4	Practical and theoretical	Collector bias, , voltage divider bias, practical examples	Knowledge and practical application	Tests and reports
14	4	Practical and theoretical	self-bias, feed- back bias	Knowledge and practical application	Tests and reports
15	4	Practical and theoretical	Action points, sleep points, practical examples	Knowledge and practical application	Tests And reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
DC Electrical circuits
2. Curriculum Code:
EOTO101
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Amir Mahmoud Amir Email: Amer.m78@gmail.com
8. Curriculum Objectives

Curriculum Objectiv	The student's ability to scientifically connect electrical circuits in the laboratory and identify errors

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Electric units system- Mathematic applications- definition of basic units of voltage, current and resistance- electric circuit components- ohm's law- factors effecting on resistance- resistivity of conductors and insulators- effect of temp. on resistance- temp. Coeff. Of resistance- Examples	Knowledge and practical application	Tests and reports

1	4	Practical and theoretical	DC current circuits includes: -Series connection of resistances and examples -Parallel connection of resistances and examples -Combined connection of resistances and examples -Star and delta connection of resistances, conversion between star and delta with Examples	Knowledge and practical application	Daily tests+ reports
2	4	Practical and theoretical	Applications on series, parallel, combined and star- delta connections	Knowledge and practical application	Daily tests reports
3	4	Practical and theoretical	Kirchoff Laws- Kirchoff current and voltage laws with examples	Knowledge and practical application	Daily tests +reports
4	4	Practical and theoretical	Maxwell's law with examples	Knowledge and practical application	Daily tests
5	4	Practical and theoretical	Definition of Thevenin's theorem- How apply in dc current.	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	Definition of Norton's theorem- How to ap in dc current	Knowledge and practical application	Tests And reports
7	4	Practical and theoretical	Examples on Thevinin's and Norton's theorems	Knowledge and practical application	Tests and reports
8	4	Practical and theoretical	Definition of Supper position theorem- application of it in dc current-examples- Max. power transfer theorem with examples.	Knowledge a practical application	Tests and reports
9	4	Practical and theoretical	AC quantities- definition of AC current characteristics – generation of AC current with waveform drawing- RMS value-Form factor – examples	Knowledge a practical application	Tests And reports
10	4	Practical and theoretical	Vector of AC quantities-definition of it – Phasor representation of its- phase angle- resultant of vector AC add., Subt., multiply, division with examples	Knowledge And practical application	Tests And reports

11	4	Practical and theoretical	Effect of AC current on only resistance circuit-only inductance circuit- only capacitor circuit- phase angle between voltage and current with examples	Knowledge And Practical application	Tests and reports
12	4	Practical and theoretical	Effect of AC current on resistance and inductance in series circuit- resistance and capacitor in series - resistance and inductance and capacitor in series- phase angle- total impedance with examples	Knowledge And Practical application	Tests and reports
13	4	Practical and theoretical	Effect of AC current on resistance and inductance in parallel circuit-resistance and capacitor in series- resistance and inductance and	Knowledge And Practical application	Tests and reports
14	4	Practical and theoretical	capacitor in series- phase angle- total impedance with examples	Knowledge And Practical application	Tests and reports
15	4	Acknowledgment and Practical application	Using j-operator to find total impedance - total admittance- current, voltage and phase angle for impedances in series and parallel with examples	Practical+ Theoretical	Quizzes+ Reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Principles of digital circuits
2. Curriculum Code:
EOTO102
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Ahmed Nazir Hammadi Email: ahmed.nther@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectiv	Teaching the student the basics of the binary system and building logical and digital circuits

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Acknowledgment and Practical application	A general idea of numerical systems (types and details	Knowledge and practical application	Tests and reports
1	4	Acknowledgment and Practical application	Transfers between the numerical systems	Knowledge and practical application	Daily tests+ reports

2	4	Practical and theoretical	Logic gates (types, working principle, truth tables, logical symbol)	Knowledge and practical application	Daily tests reports
3	4	Practical and theoretical	Kirchoff Laws- Kirchoff current and voltage laws with examples	Knowledge and practical application	Daily tests +reports
4	4	Practical and theoretical	How to connect the logic gates to form logic circuits	Knowledge and practical application	Daily tests
5	4	Practical and theoretical	Boolean algebra and the rule of de-Morgan.	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	Simplification of logical equations using Boolean algebra and the laws of De Morgan's laws	Knowledge and practical application	Tests And reports
7	4	Practical and theoretical	The design of the logical gates using NOR and NAND circuits,	Knowledge And practical application	Tests and reports
8	4	Practical and theoretical	Ways of writing the equation from truth table (POS, SOP)..	Knowledge and practical application	Tests and reports
9	4	Practical and theoretical	Karnaugh Map (for two variables, the three variables, the four variables)	Knowledge and practical application	Tests and reports
10	4	Practical and theoretical	Simplification of logical equations using Karnaugh Map	Knowledge and practical application	Tests and reports
11	4	Acknowledgment and Practical application	Calculations in the binary system (addition, subtraction, subtraction using complements	Knowledge and practical application	Tests and reports
12	4	Acknowledgment and Practical application	Logic circuit applications (half adder, full adder, parallel adder circuits)	Practical +Theoretical	Quizzes+ Reports
13	4	Acknowledgment and Practical application	Binary subtractor circuits (half subtractor ,full Subtractor parallel	Practical +Theoretical	Quizzes+ Reports

14	4	Acknowledgment and Practical application	subtractor) circuit using the adder circuit by method of 1s complements The circuit of digital comparator (one stage and two stages)	Practical +Theoretical	Quizzes+ Reports
15	4	Acknowledgment and Practical application	The circuit of decoder size of 2:4 ,3:8 and 4:10	Practical+ Theoretical	Quizzes+ Reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:

Electronic workshop

2. Curriculum Code:

EOTO103

3. Semester / Year:

Curriculum (15 weeks)\ First Level.

4. Description Preparation Date:

8-9-2024

5. Available Attendance Forms:

Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments

6. Number of Credit Hours (Total) / Number of Units (Total)

2 hours per week (30 hours).

7. Curriculum administrator's name (mention all, if more than one name)

Name: Assist.Lec. Omar Hassan Mahmoud
Email: Eng.omarhasan94@ntu.edu.iq

8. Curriculum Objectives

Curriculum Objectives	Identifying and dealing with electronic boards and giving the student experience and proficiency in working with them

9.Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits, in workshops of institute , electronic boards, manage electrical projects workshops / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10.Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acknowledgment and Practical application	How to use the different measuring devices in the workshop such as (Avometer, oscilloscope, power .supply, ...)	Knowledge and practical application	Tests and reports

2	2	Acknowledgment and Practical application	How to use caustics - Types of irons used in the workshop - Training in caustic .welding	Knowledge and practical application	Quizzes+ Reports
3	2	Acknowledgment and Practical application	How to use soldering absorbent caustics - the number of soldering removers such as solder sucker, older remover, training on some electronic components and placing them in the printed plate, caustics used in welding integrated electronic circuits - the correct method for welding ICs - How to remove solder from the terminals of an electronic circuit and remove it from the .circuit.	Knowledge and practical application	Daily tests Quizzes+ Reports
4	2	Acknowledgment and Practical application	Different printed electronic circuits - Learn how to perforate them and attach the various electronic. components to them	Knowledge and practical application	Daily tests +reports
5	2	Acknowledgment and Practical application	The different types of resistors in terms of the material of the resistors - the power that each resistance bears - How to read the values of the resistors in different ways - The variable and special resistors (VDR, PTC, NTC) and .how to check it	Knowledge and practical application	Daily tests
6	2	Acknowledgment and Practical application	Make a circuit to connect the resistors in series /.	Knowledge and practical application	Daily tests
7	2	Acknowledgment and Practical application	- The different types of capacitors in terms of the type of dielectric used between their panels and the voltage they bear – reading the values of capacitors in different ways - how to check capacitors and methods of switching them - making circuits to connect the capacitors in series, parallel and mixed connection on the printed plate with. Examination	Knowledge and practical application	Tests and reports
8	2	Practical and theoretical	The different types of capacitors in terms of the type of dielectric used between their panels and the voltage they bear - reading the values of capacitors in different ways - how to check capacitors and methods of switching them - making circuits to connect the capacitors in series, parallel and mixed connection on the printed plate with .examination	Knowledge and practical application	Tests and reports
9	2	Practical and theoretical	Singular cones and conic ellipses.	Knowledge and practical application	Tests And reports

10	2	Practical and theoretical	Files - their types - methods of checking them - their uses – identifying faults and reading file types that use color coding and .numbering Electrical transformers -types-methods of examination -determination of the type of transformer autotransformer – the difference between autotransformers and ordinary transformers The different types of semiconductors (diode, transistor, etc.) in terms of how they are manufactured, the materials used in their manufacture , the methods of numbering them and finding their. Equivalents	Knowledge and practical application	Tests And reports
11	2	Practical and theoretical	Checking semiconductors (diode, transistor, etc.) that are idle and valid for a .group of them.	Knowledge and practical application	Tests And reports
12	2	Practical and theoretical	Integrated Circuits – Identifying the numbering of the terminals for several types of these circuits – How to manufacture these circuits – The components involved in manufacturing	Knowledge and practical application	Tests and reports
13	2	Practical and theoretical	A scientific film about how electronic components are made (resistors, capacitors , .transistors, ... etc).	Knowledge and practical application	Tests And reports
14	2	Practical and theoretical	How to read electronic maps and follow circuits to determine the location of the malfunction and its .causes.	Knowledge and practical application	Tests and reports
15	2	Practical and theoretical	The student learned how to design electronic circuits on the board and install electronic components on it - how to solder these components on the board (simple .circuit.	Knowledge and practical application	Tests And reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark it valuated continually.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1.Curriculum Name:
Engineering Drawing
2. Curriculum Code:
EOTO104
3.Semester / Year:
Curriculum (15 weeks)\ First Level.
4.Description Preparation Date:
8-9-2024
5.Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6.Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7.Curriculum administrator's name (mention all, if more than one name)
Name: Assist. Lec. Mohammed Ali Mahmood Email: mohammed.am@ntu.edu.iq
8.Curriculum Objectives

Curriculum Objective	Introducing the student to using the AutoCAD system with applications in his field of specialization
9.Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits, in workshops of institute , electronic boards, manage electrical projects workshops / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10.Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acknowledgment and Practical application	How to use the computer in AutoCAD	Knowledge and practical application	Tests and reports
2	2	Acknowledgment and Practical application	Introduction to AutoCAD	Knowledge and practical application	Quizzes+ Reports

3	2	Acknowledgment and Practical application	Scientific concepts related to the field	Knowledge and practical application	Daily tests Quizzes+ Reports
4	2	Acknowledgment and Practical application	Examples explanations of the field	Knowledge and practical application	Daily tests +reports
5	2	Acknowledgment and Practical application	Apply the program	Knowledge and practical application	Daily tests
6	2	Practical and theoretical	Solve examples of the related field /.	Knowledge and practical application	Daily tests
7	2	Practical and theoretical	Quiz and discussions	Knowledge and practical application	Tests and reports
8	2	Practical and theoretical	electronics and electricity and harnessing them in this field	Knowledge and practical application	Tests and reports
9	2	Practical and theoretical	electronics and electricity harnessing them in this field examples to apply	Knowledge and practical application	Tests and reports
10	2	Practical and theoretical	Explain main problems and solve of electronics and electricity	Knowledge and practical application	Tests and reports
11	2	Practical and theoretical	Solve example of electric circuits	Knowledge and practical application	Tests and reports
12	2	Practical and theoretical	AutoCAD system with applications in his field of specialization	Knowledge And practical application	Tests and reports
13	2	Practical and theoretical	More application applied with AutoCAD	Knowledge And practical application	Tests and reports
14	2	Practical and theoretical	electronics and electricity harnessing them in this field applications with AutoCAD	Knowledge and practical application	Tests and reports
15	2	Practical and theoretical	Final Exam of the Curriculum	Knowledge And practical application	Tests and reports

11.Curriculum Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark it valuated continually.	
12.Learning and Teaching Resources	
Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:

Electronics

2. Curriculum Code:

EOTO105

3. Semester / Year:

Curriculum (15 weeks)\ First Level.

4. Description Preparation Date:

8-9-2024

5. Available Attendance Forms:

Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, a Assignments

6. Number of Credit Hours (Total) / Number of Units (Total)

4 hours per week (60 hours).

7. Curriculum administrator's name (mention all, if more than one name)

Name: Riyadh Rajab Muhammad
Email: riyadhrajabmm@gmail.com

8. Curriculum Objectives

Curriculum Objectiv	Introducing the basic scientific concepts related to the field of electronics and electricity and harnessing them in this field..

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Transistor continuous equivalent circuit-constant load line-.	Knowledge and practical application	Tests and reports

2	4	Practical and theoretical	Using the transistor to amplify small signals - AC circuit - Current gain - Voltage gain - Power gain - Perfect approximation - Hybrid constants – Equivalent circuit using h coefficients - Voltage gain - Current gain - Power gain - Input and output resistors - Small signal amplifiers - Al- Qaeda Market - Al-Ba`ith Market.	Knowledge and practical application	Daily tests+ reports
3	4	Practical and theoretical	The use of the transistor in voltage regulation - series regulator - parallel regulator - DC voltage source circuit.	Knowledge and practical application	Daily tests reports
4+5	4	Practical and theoretical	Field Effect Transistor - Structure - Curved MOSFET-E-MOSFETD-MOSFET -Wicker Curve - Tight Strength Curves Vgs, Idss, Vp - Comparison of BJT, JFET-theoretical Work	Knowledge and practical application	Daily tests+ reports
6	4	Practical and theoretical	Light Dependent Resistor – Light Emitting Diode - Photodiode Phototransistor- Seven Pieces Board - Structure and Applications.)	Knowledge and practical application	Daily tests
8+7	4	Practical and theoretical	Light Dependent Resistor - Light Emitting Diode – Photodiode - Phototransistor- Seven Pieces Board -Structure and Applications.	Knowledge and practical application	Daily tests
10+9	4	Practical and theoretical	Bipolar transistor - combination – symbol - properties - regions – definition (Bdc) - definition (Cdc) - relationship between them - definition of important regions on characteristic curves – transistor bias circuits - base bias – emitter bias - collector bias - approximation in transistor and circuit Equivalency	Knowledge And practical application	Tests And reports
11	4	Practical and theoretical	Operations amplifier 741 - its symbol - its connection terminals - its uses.	Knowledge and practical application	Tests and reports

15	4	Practical and theoretical	Integrated circuits - meaning - their advantages and disadvantages - a comparison between them and the separate components - an idea of their manufacture – operations amplifier 741 - its symbol – its connection terminal - its uses – operations amplifier applications – small signal amplification – signal collection - signal subtraction - examples. Operations amplifier applications: differential, comparative, integrator, template, etc.	Knowledge and practical application	Tests And reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
AC electrical circuits
2. Curriculum Code:
EOTO106
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Riyadh Rajab Muhammad Email: riyadhrajabmm@gmail.com
8. Curriculum Objectives

Curriculum Objectiv	The student's ability to connect electrical circuits scientifically in the laboratory and identify errors in connecting electrical circuits

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Series and Parallel resonance circuits- calculation of voltage, current, impedance, phase angle and frequency at resonance with Examples	Knowledge and practical application	Tests and reports
1	4	Practical and theoretical	Applications of Thevenin's, Norton's and supper position theorems with examples	Knowledge and practical application	Daily tests+ reports

2	4	Practical and theoretical	Calculation of power in AC circuits-only resistance circuit-only inductance circuit-only capacitor circuit- resistance, inductance and capacitor in series and parallel-active and reactive power	Knowledge and practical application	Daily tests reports
3	4	Practical and theoretical	Apparent power- power triangle drawing- power factor correction	Knowledge and practical application	Daily tests +reports
4	4	Practical and theoretical	Max. power transfer in AC circuits- with examples	Knowledge and practical application	Daily tests
5	4	Practical and theoretical	Networks analysis using Nodal analysis- number of nodal equations.	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	Examples on Networks analysis using Nodal analysis	Knowledge And practical application	Tests And reports
7	4	Practical and theoretical	Examples on AC three phase circuits-generation of 1-phase, 2-phase and three phase current- star delta connection- phase power-line power- total power	Knowledge and practical application	Tests and reports
8	4	Practical and theoretical	AC three phase circuits-generation of 1-phase, 2-phase and three phase current- star delta connection- phase power-line power- total power	Knowledge and practical application	Tests And reports
9	4	Practical and theoretical	Examples on AC three phase circuits with star delta connections	Knowledge and practical application	Tests and reports
10	4	Practical and theoretical	Methods of power measurement for three phase loads-wattmeter- two wattmeter-three	Knowledge and practical application	Tests And reports
11	4	Practical and theoretical	Transient cases in circuits-transient – RL-RC-RLC Transient	Knowledge and practical application	Tests and reports

12	٤	Practical and theoretical	Effect of AC current on resistance and inductance in series circuit-resistance and capacitor in series- resistance and inductance and capacitor in series- phase angle- total impedance with examples	Knowledge and practical application	Tests And reports
13	٤	Acknowledgment and Practical application	Transient AC currents– Sinusoidal Transient currents in RL-RC-RLC circuits	Knowledge and practical application	Tests And reports
14	٤	Acknowledgment and Practical application	Self induction of coil- equation of self induction- mutual induction between two coils : Progressive - Series connection Revers Series Curves of current in induction circuit- current drawing and calculation of time constant- charge, discharge the capacitors- time constant effect- examples.	Knowledge and practical application	Tests And reports
15	4	Acknowledgment and Practical application	Transformers- structure- drawing- characteristics- its operation and relationships- types of its-examples	Practical+ Theoretical	Quizzes+ Reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Digital circuits applications
2. Curriculum Code:
EOTO107
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Ahmed Nazir Hammadi Email: ahmed.nther@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectives	Building logical and digital circuits and teaching the student the basics of the binary system
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Acknowledgment and Practical Application	The circuit of encoder size of 4:2, 8:3 and 10:4	Knowledge and practical application	Tests and reports
1	4	Acknowledgment and Practical Application	Introduction to sequential logic circuits, a general idea of the Flip Flop, flip flop type (S-R).	Knowledge and practical application	Daily tests+ reports

2	4	Practical and theoretical	The flip flop type J- K and master slave flip flop	Knowledge and practical application	Daily tests reports
3	4	Practical and theoretical	The D- flip flop and T flip flop	Knowledge and practical application	Daily tests +reports
4	4	Practical and theoretical	The registers, design of registers, enter the information and output from registers	Knowledge and practical application	Daily tests
5	4	Practical and theoretical	The shift register, shift to left, shift to right.	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	The counter- asynchronous Counter	Knowledge And practical application	Tests And reports
7	4	Practical and theoretical	The synchronous counter- the cycle counter,	Knowledge And practical application	Tests and reports
8	4	Practical and theoretical	The multiplexer and its applications	Knowledge And practical application	Tests and reports
9	4	Practical and theoretical	The code convertor – the application of code convertor	Knowledge And practical application	Tests and reports
10	4	Practical and theoretical	Programmable logic array: Concepts of programmable logic array(PLA); Concepts of programmable array logic(PAL	Knowledge And practical application	Tests and reports
11	4	Acknowledgment and Practical application	Buffers, Non inverting buffers, inverting buffers, Tri-state buffers, transmission gates	Knowledge And practical application	Tests and reports
12	4	Acknowledgment and Practical application	Introduction to Sequential logic	Practical +Theoretical	Quizzes+ Reports
13	4	Acknowledgment and Practical application	the basics of the binary system	Practical +Theoretical	Quizzes+ Reports

14	4	Acknowledgment and Practical application	Solve examples and tutorials	Practical +Theoretical	Quizzes+ Reports
15	4	Acknowledgment and Practical application	Mid term exam	Practical+ Theoretical	Quizzes+ Reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1.Curriculum Name:
Electrical Drawing
2. Curriculum Code:
EOTO108
3. Semester / Year:
Curriculum (15 weeks)\ First Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7.Curriculum administrator's name (mention all, if more than one name)
Name: Assist. Lec. Mohammed Ali Mahmood Email: mohammed.am@ntu.edu.iq
8.Curriculum Objectives

Curriculum Objectiv	Introducing the student to how to draw electrical drawings using AutoCAD system and benefiting from other applications in this field

9.Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits, in workshops of institute , electronic boards, manage electrical projects workshops / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10.Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acknowledgment and Practical application	Explaining the dimensions of the drawing in a geometric way, drawing a painting that includes two perspectives with all dimensions in a geometric way	Knowledge and practical application	Tests and reports

2	2	Acknowledgment and Practical application	Drawing complex perspective that contains cylindrical shapes or cavities - drawing a painting that includes two perspectives with writing the dimensions in a geometric way	Knowledge and practical application	Quizzes+ Reports
3	2	Acknowledgment and Practical application	Supplement the previous topic with a panel drawing	Knowledge and practical application	Daily tests Quizzes+ Reports
4	2	Acknowledgment and Practical application	Drawing of an electronic circuit board containing gates Gates	Knowledge and practical application	Daily tests +reports
5	2	Acknowledgment and Practical application	Drawing of an electronic circuit board containing integrated circuits	Knowledge and practical application	Daily tests
6	2	Practical and theoretical	Drawing of an electronic circuit board containing gates and integrated circuits	Knowledge and practical application	Daily tests
7	2	Practical and theoretical	Applications for drawing projections from different perspectives.	Knowledge And practical application	Tests and reports
8	2	Practical and theoretical	Draw perspective from the three projections	Knowledge And practical application	Tests and reports
9	2	Practical and theoretical	Cutting in objects, angle of cutting - cutting lines (marking). Definition of unbroken parts (focusing on complete cutting only). Panel that includes projections after cutting.	Knowledge And practical application	Tests and reports
10	2	Practical and theoretical	Drawing board to control speed of a three-phase motor	Knowledge And practical application	Tests and reports
11	2	Practical and theoretical	How to read a map or a set of maps for electrical circuits.	Knowledge And practical application	Tests and reports
12	2	Practical and theoretical	Electrocardiogram applications on an electronic calculator	Knowledge And practical application	Tests and reports

13	2	Practical and theoretical	Using the Auto CAD system	Knowledge And practical application	Tests and reports
14	2	Practical and theoretical	Use of the orcad system.	Knowledge And practical application	Tests and reports
15	2	Practical and theoretical	Final Exam of the Curriculum	Knowledge And practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark it valuated continually.

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1.Curriculum Name:
Electrical workshop
2. Curriculum Code:
EOTO109
3.Semester / Year:
Curriculum (15 weeks)\ First Level.
4.Description Preparation Date:
8-9-2024
5.Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6.Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7.Curriculum administrator's name (mention all, if more than one name)
Name: Assist.Lec. Omar Hassan Mahmoud Email: Eng.omarhasan94@ntu.edu.iq
8.Curriculum Objectives

Curriculum Objectiv	Identifying and dealing with electronic boards and giving the student experience and proficiency in working with them
9.Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits, in workshops of institute , electronic boards, manage electrical projects workshops / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10.Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acknowledgment and Practical application	Repetition of previous work by the student designing a more complex circuit	Knowledge and practical application	Tests and reports
2	2	Acknowledgment and Practical application	Faulty semiconductor-transistor and diode check for a combination of them	Knowledge and practical application	Quizzes+ Reports

3	2	Acknowledgment and Practical application	A field visit to one of the industrial establishments in the socialist sector	Knowledge and practical application	Daily tests Quizzes+ Reports
4	2	Acknowledgment and Practical application	Building complex and simple electronic circuits on printed boards and knowing how to check and test them, such as a filter circuit	Knowledge and practical application	Daily tests +reports
5	2	Acknowledgment and Practical application	Building a uniform half-wave circuit on the printed board and knowing how to inspect .and test it	Knowledge and practical application	Daily tests
6	2	Practical and theoretical	Building a full wave circuit on the printed board and knowing how .to inspect and test it	Knowledge and practical application	Daily tests
7			Building a full wave voltage multiplier circuit on the printed board and knowing how to inspect and test it	Knowledge and practical application	Tests and reports
8	2	Practical and theoretical	Building the clippers circuit on the printed board and identifying how to check and test it	Knowledge and practical application	Tests and reports
9	2	Practical and theoretical	Building a two-stage amplifier circuit on the printed board and knowing how to inspect .and test it	Knowledge and practical application	Tests and reports
10	2	Practical and theoretical	Building a push-pull amplifier circuit on the printed board and knowing how to check .and test it	Knowledge and practical application	Tests and reports
11	2	Practical and theoretical	Building a RC Oscillator circuit on printed board and knowing how to inspect and test it	Knowledge and practical application	Tests and reports
12	2	Practical and theoretical	Building a Hartley circuit on a flip chart and learning how to inspect and test it	Knowledge And practical application	Tests and reports

13	2	Practical and theoretical	Build a variable DC voltage supply circuit on the printed board and learn how to check and test it	Knowledge and practical application	Tests and reports
14	2	Practical and theoretical	Build a variable DC voltage supply circuit on the printed board and learn how to check and	Knowledge and practical application	Tests and reports
15	2	Practical and theoretical	Applications of electrical circuits	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark it valuated continually.

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
English Language
2. Curriculum Code:
(NTU 200)
3. Semester / Year:
Curriculum (15 weeks)\ second level
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Nawras khaleel Ibraheem Email: nawras.khalil@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objective	Teaching the student how to use English grammar in conversation.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
١	2	Questions words	Unit one :getting to know you tenses Questions words	Theoretical lectures	Daily tests
٢	2	Present simple	Unit two :the way we live Present tenses Present simple Present continuous Have /have got	Theoretical lectures	Daily tests

٣	2	Past simple	Unit three: it all went wrong Past tenses Past simple Past Continuous	Theoretical lectures	Daily tests
٤	2	Some and any	Unit four :let's go shopping Quantity Much and many Some and any Something ,anyone, nobody very where A few, a little, a lot of Articles	Theoretical lectures	Daily tests
٥	2	do Past tenses	Init five ,wtat ao You want to do Past tenses Verb patterns'\ Future intentions Going to and will	Theoretical lectures	Daily tests
٦	2	comparative and superlative Adjectives	Unit six: tell me! What's it like? What's it Iike? comparative and superlative Adjectives	Theoretical lectures	Daily tests
٧	٢	For and since Tense Revision	Unit seven :fame Present Perfect and For and since Tense revision	Theoretical lectures	Daily tests
٨	٢	do's and don'ts	Fn'rt eight: do's and don'ts Have(got) to Shou ld must	Theoretical lectures	Daily tests
٩	٢	what if ?	Unit nine: going Places Time and conditional clauses what if ?	Theoretical lectures	Daily tests
١٠	٢	Verbs Patterns infinitives	Unit ten: scared to death Verbs Patterns infinitives What ,etc.+ in fin it ive Something, etc.+ infinitive	Theoretical lectures	Daily tests
١١	٢	world passives	Unit eleven: Things that changed the world passives	Theoretical practical	Daily tests
١٢	٢	conditional might	Git t*utr" :dreams and realitY Second conditional Might	Theoretical practical	Daily tests
١٣	٢	Present Perfect continuous	tlnit thitt""n ;c i,.ltll :earning a living Present Perfect continuous Present Perfect simple versus Continuous	Theoretical practical	Daily tests

١٤	٢	perfect and past perfect and clarification	Unit fourteen: family ties Present perfect and past perfect and clarification Reported statement	Theoretical practical	Daily tests
١٥	٢		Unit fifteen : revision	Theoretical practical	Daily tests

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 40 % and final mark 60% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Computer
2. Curriculum Code:
NTU 201
3. Semester / Year:
Curriculum (15 weeks)\ second Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Ass.Lec.Nida muhsin ali Email: nida.ali@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objecti	Familiarize the student with various computer applications and be able to distinguish between the types of software that can be handled, and identify artificial intelligence and the prospects of dealing with it and how to benefit from it in all areas of life.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to artificial intelligence	Explanation of the lecture with the presence of means of illustration and practical application	Knowledge and practical application	Tests and reports

2	2	Artificial intelligence techniques and methods	Explanation of the lecture with the presence of means of illustration and practical application	Knowledge and practical application	Daily tests
4	2	Challenges and ethical considerations in artificial intelligence	Explanation of the lecture with the presence of means of illustration and practical application	Knowledge and practical application	Daily tests
5	2	Artificial intelligence in smartphones and virtual assistants such as siri / Google assistant	Explanation of the lecture with the presence of means of illustration and practical application	Knowledge and practical application	Daily tests +reports
6	2	Applications of artificial intelligence in education, health, finance, transport and marketing	Explanation of the lecture with the presence of means of illustration and practical applicatic	Knowledge and practical application	Daily tests
7	2	The impact of artificial intelligence on society	Explanation of the lecture with the presence of means of illustration and practical application	Knowledge and practical application	Daily tests
8	2	Artificial intelligence and international relations	Explanation of the lecture with the presence of means of illustration and practical application	Knowledge and practical application	Tests and reports
9	2	Artificial intelligence and the future of humanity	Explanation of the lecture with the presence of means of illustration and practical application	Knowledge And practical application	Tests and reports
10	2	Ethics of artificial intelligence	Explanation of the lecture with the presence of means of illustration and practical application	Knowledge And practical application	Tests and reports
11	2	Artificial intelligence, privacy and surveillance	Viruses / the reason for the name / definition / ways of spreading the virus/symptoms of infection with the virus / methods of protection / types of viruses computer crimes /theft / hackers	Knowledge And Practical application	Tests and reports

12	2	Modern research and emerging techniques in the field of artificial intelligence	Explanation of the lecture with presence of means of illustration a practical application	Knowledge and practical application	Tests and reports
13	2	Future outlook	Explanation of the lecture with presence of means of illustration practical application	Knowledge And practical application	Tests and reports
14	2	The role of intelligence in smartphones	Explanation of the lecture with presence of means of illustration practical application	Knowledge and practical application	Tests and reports
15	2	Future directions in artificial intelligence	Explanation of the lecture with presence of means of illustration practical application	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Arabic Language
2. Curriculum Code:
NTU 202
3. Semester / Year:
Curriculum (15 weeks)\ second level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Mohammed Abd Qader Hamad Email: Mohamed.qader77@gmail.com
8. Curriculum Objectives

Curriculum Objectiv	Advanced use of computer applications in the field of specialization.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical and examples	The subject and the predicate	Knowledge and application	Tests and reports
2	2	Theoretical examples	The verb, the subject and the object	Knowledge and application	Daily tests

3	2	Theoretical examples	Intransitive and transitive verb	Knowledge and application	Daily tests
4	2	Theoretical examples	Pronouns	Knowledge and application	Daily tests +reports
5	2	Theoretical examples	Original and secondary grammat signs	Knowledge and application	Daily tests
6	2	Theoretical examples	The five actions	Knowledge and application	Daily tests
7		Theoretical examples	Conjunctions and their meanings	Knowledge and practical application	Tests and reports
8	2	Theoretical examples	The connecting and severing link	Knowledge and practical application	Tests and reports
9+10	2	Theoretical examples	Extra characters	Knowledge and practical application	Tests and reports
11	2	Theoretical examples	Nun and Tanween	Knowledge And practical application	Tests and reports
12	2	Theoretical examples	Administrative disCurriculum	Knowledge	Tests
13+14	2	Theoretical	Administrative discurriculum language	Knowledge	Daily tests
15	2	Theoretical	The most common linguistic errors in official books	Knowledge	Daily tests

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 40 % and final mark 60% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
The crimes of the Baath regime in Iraq
2. Curriculum Code:
NTU 203
3. Semester / Year:
Curriculum (15 weeks)\ second level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Rabah Mohammed Freih Email: rabahfrayyih@gmail.com
8. Curriculum Objectives

Curriculum Objective	Identifying the crimes of the Baath regime according to the Iraqi Supreme Criminal Court Law of 2005.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Theoretical and examples	The concept of crimes and their types	Knowledge and application	Tests and reports
2	2	Theoretical examples	Definition of crime	Knowledge and application	Daily tests

3	2	Theoretical examples	Crime sections, Baath crimes	Knowledge and application	Daily tests
4	2	Theoretical examples	Types of international crimes: Decisions issued by the Supreme Criminal Court	Knowledge and application	Daily tests +reports
5	2	Theoretical examples	Psychological and social crimes and their effects	Knowledge and application	Daily tests
6	2	Theoretical examples	Psychological crimes, mechanisms of psychological crimes, effects of psychological Crimes	Knowledge and application	Daily tests
7		Theoretical examples	Social crimes, militarization of society. The Baathist regime is successful in Religion	Knowledge and practical application	Tests and reports
8	2	Theoretical examples	Violations of Iraqi laws. Pictures of human rights violations and crimes of Power	Knowledge and practical application	Tests and reports
9	2	Theoretical examples	Environmental crimes of the Baath regime in Iraq	Knowledge and practical application	Tests and reports
10	2	Theoretical examples	Military and radioactive contamination and mine explosions	Knowledge and practical application	Tests and reports
11	2	Theoretical examples	Destruction of cities and Villages	Knowledge and practical application	Daily Tests
12	2	Theoretical	Drying the marshes.	Knowledge and practical application	Daily tests
13	2	Theoretical examples	Destroying orchards and palm trees	Knowledge and practical application	Daily tests

14	2	Theoretical	Mass grave crimes. The cemeteries of the genocide committed by the Baathist regime in Iraq	Knowledge and practical application	Daily tests
15	2	Chronological classification of genocide Graves	Chronological classification of genocide graves in Iraq for the period from 1963-2003	Theoretical lectures + presentation on smart screens	Daily tests

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 40 % and final mark 60% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Professional Ethics
2. Curriculum Code:
NTU 204
3. Semester / Year:
Curriculum (15 weeks)\ second level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Assist.Lec. Hassan Mohammed Hassan Email: hasan.aljbory@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectives	The student knows professional ethics, its applications in accounting work, and its role in the success of his work and life. The student acquires the skill of analyzing ethical phenomena in the work environment and can predict their effects and determine his position on them.
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	2	Moral	Unit (1) – Ethics	Knowledge and application	Tests and reports
3	2	Work and profession	The concept of ethics and its origin.	Knowledge and application	Daily tests

4	2	Professional ethics	General rules of ethics.	Knowledge and application	Daily tests
5+6	2	Values and professional ethics	Sources of ethics.	Knowledge and application	Daily tests +reports
7+8	2	Unethical behavior in the profession	Unit (5) - Patterns of unethical behavior in the profession Administrative corruption. -Unethical administrative behavior. - Definition of administrative corruption. Types of administrative corruption.	Knowledge and application	Daily tests
9+10	2	Means and methods of consolidating the values of professional Ethics	The importance of ethics for individual and society.	Knowledge and application	Daily tests
11+12+ 13+14+ 15	2	Professional ethics	Unit (2) – Work and profession	Knowledge and practical application	Tests And reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 40 % and final mark 60% summation at last to get the final mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:

Electronic Circuit 1

2. Curriculum Code:

EOTO210

3. Semester / Year:

Curriculum (15 weeks)\ second Level.

4. Description Preparation Date:

8-9-2024

5. Available Attendance Forms:

Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments

6. Number of Credit Hours (Total) / Number of Units (Total)

4 hours per week (60 hours).

7. Curriculum administrator's name (mention all, if more than one name)

Name: Muhannad Tahseen Hamdi
Email: eng.muh@ntu.edu.iq

8. Curriculum Objectives

Curriculum Objective	Building practical electronic circuits, studying their properties and applications, and learning about developing the student's ability to identify errors in connecting electronic circuits

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2+3	4	Practical + theoretical	Class A power amplifiers Class B power amplifiers Class C Power amplifiers	Knowledge and practical application	Tests and reports
4	4	Practical and theoretical	Power supplies	Knowledge and practical application	Daily tests+ reports

5	4	Practical and theoretical	Voltage regulators using variable resistance, Zener diode, series and parallel transistor, Darlington	Knowledge and practical application	Daily tests reports
6	4	Practical and theoretical	thyristor firing methods thyristor switching methods gate circuit (AC), (DC), pulses, applications of silicon modules	Knowledge and practical application	Daily tests +reports
7+8	4	Practical and theoretical	Oscillators and their definition - back feed and their types with drawing their diagrams and finding the mathematical relationships for the final amplification of the system (front gain - back gain – return circuit) - oscillation conditions - examples of oscillator circuits (LC oscillator - Hartley oscillator	Knowledge and practical application	Daily tests
	4	Practical and theoretical	Couples oscillator - phase shift oscillator)	Knowledge and practical application	Daily tests
9+10+11	4	Practical and theoretical	Transistor as a switch – Specifications of its work on the load line - Its response to a rectangular input wave Transformation times – Vibrators and their different types (monostable unstable - bistable) Mathematical relationships – Collector and base resistors - Waveforms of input and output - Circuits - Mug - The idea of their operation - Protection – Overcoming Possible distortions in the output signals - Pulse Width Control.	Knowledge and practical application	Tests And reports
13+12	4	Practical and theoretical	Operational amplifier – typical scheme - template input - non- template input - input impedance – template amplifier circuit output - non-template amplifier circuit gain - voltage function and amplification equation – host - formula for adding N number	Knowledge and practical application	Tests and reports

15+14	4	Practical and theoretical	Inverter collector circuit and output equation - non- inverter collector circuit and output equation – arithmetic examples.	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Microcomputer 1
2. Curriculum Code:
EOTO211
3. Semester / Year:
Curriculum (15 weeks)\ second Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Assis. Prof. Abd Karim Mohammed Saleh Email: abdulkreem86@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objective	Training the student to use microcomputer keys and write and implement programs in machine language
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Introducing the vocabulary of the subject and the distribution of exam grades - numerical systems - the decimal system - the binary system - the octal system - the hexadecimal system and its importance for microcomputers - conversions between systems.	Knowledge and practical application	Tests and reports

2	4	Practical and theoretical	Introducing microcomputers, their types, and their relationship to other electronic computers.	Knowledge and practical application	Daily tests+ reports
2	4	Practical and theoretical	Definitions of microcomputer terms: bit-byte- nibble-word-instruction- program-software-structures-high- level languages-low-level languages- assembly language-machine language.	Knowledge and practical application	Daily tests reports
3	4	Practical and theoretical	Microcomputer architecture - block diagram - input unit - keyboard - mouse - two types of mouse and comparison between them - input port	Knowledge and practical application	Daily tests+ reports
4	4	Practical and theoretical	The transmission system - the data carrier - the address carrier - the lines of control and control - the benefit of each - a	Knowledge and practical application	Daily tests
5	4	Practical and theoretical	Output unit - screen - the difference between computer screen and TV screen - output port.	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	Memory - main memory - read only memory - read and write memory - a comparison between them - auxiliary memories and the difference between them and the main memory.	Knowledge and practical application	Tests and reports
7	4	Practical and theoretical	CPU - Microprocessor - Definition - Block diagram showing the architecture of the microprocessor - Microprocessor 8085 - Terminal and block diagram for it - Data carrier bumpers - Address bus bumpers and a comparison between them.	Knowledge and practical application	Tests and reports
8	4	Practical and theoretical	General records - A record (accumulator) - arithmetic and logic unit - flags register - microprocessor notification 8085 - arithmetic example for determining the status of each flag and interpretation of the case - the utility of the flags record.	Knowledge and practical application	Tests and reports

9	4	Practical and theoretical	Z-80 Microprocessor Notification and Comparison with 8085 Microprocessor Notification - Mathematical Example - PC Program Counter -	Practical +Theoretical	Tests and reports
10	4	Practical and theoretical	SP Stack Indicator - Instruction Log - Command Decoder - Control Unit	Knowledge and practical application	Tests and reports
11	4	Practical and theoretical	Directions of the 8085-Z80 microprocessor - the symbols used to remember - the machine language - a comparison between them - how to extract the codes in the machine language from the instructions table.	Knowledge and practical application	Tests and reports
12	4	Practical and theoretical	Directions of the data transfer group and its types - solving examples - writing an application program.	Knowledge and practical application	Tests and repo
13		Practical and theoretical	The input and output instructions and their relationship to the data transmission group instructions - practical examples.	Knowledge and practical application	Tests and repo
14	4	Practical and theoretical	A set of arithmetic instructions and their types - practical examples - their use in enlarging the digital signal with an applied example.	Knowledge and practical application	Tests and repo
15	4	Practical and theoretical	The set of logical instructions and their types - practical examples - and their use in solving digital circu	Knowledge And practical application	Tests and repo

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute libr free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Measurements Devices 1
2. Curriculum Code:
EOTO212
3. Semester / Year:
Curriculum (15 weeks)\ second Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Amir Mahmoud Amir Email: Amer.m78@gmail.com
8. Curriculum Objectives

Curriculum Objectives	Study the types of devices used for continuous and alternating electrical measurements and solve problems at the work site

9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Familiarity with laboratory equipment	Knowledge and practical application	Tests and reports
2	4	Practical and theoretical	errors in measurements	Knowledge and practical application	Daily tests+ reports

2	4	Practical and theoretical	Galvanometer sensitivity measurement	Knowledge and practical application	Daily tests reports
3	4	Practical and theoretical	Measurement of the internal resistance of the moving coil galvanometer by the voltage divider method	Knowledge and practical application	Daily tests+ reports
4	4	Practical and theoretical	series ohmmeter	Knowledge and practical application	Daily tests
5	4	Practical and theoretical	Ohmmeter parallel	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	DC test bridge for measuring unknown resistance	Knowledge and practical application	Tests and reports
7	4	Practical and theoretical	A direct current bridge to measure the internal resistance of a galvanometer	Knowledge and practical application	Tests and reports
8	4	Practical and theoretical	Double Kelvin DC bridge	Knowledge and practical application	Tests and reports
9	4	Practical and theoretical	DC ammeter and extend its range	Practical +Theoretical	Tests and reports
10	4	Practical and theoretical	Dual beam oscilloscope	Knowledge and practical application	Tests and reports
11	4	Practical and theoretical	Digital oscilloscope calibration	Knowledge and practical application	Tests and reports
12	4	Practical and theoretical	Digital voltmeter calibration using OCD	Knowledge and practical application	Tests and repo
13		Practical and theoretical	DC voltmeter, extending its range.	Knowledge and practical application	Tests and repo

14	4	Practical and theoretical	DC voltmeter, extending its range.	Knowledge and practical application	Tests and repo
15	4	Practical and theoretical	Digital oscilloscope calibration	Knowledge and practical application	Tests and repo

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

Curriculum Name:
Electronic instrumentation maintenance workshop 1
Weekly Curriculum Schedules (Theory and Laboratory), Discussions, Seminars, a Homework Assignments
EOTO214
Semester / Year:
Curriculum (15 weeks)\ second Level.
Description Preparation Date:
8-9-2024
Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
Curriculum administrator's name (mention all, if more than one name)
Name: Assist.Lec. Omar Hassan Mahmoud Email: Eng.omarhasan94@ntu.edu.iq
Curriculum Objectives

Curriculum Objectiv	Maintenance of electrical appliances and equipment and training them with practical experiences in diagnosing faults

Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits, in workshops of institute , electronic boards, manage electrical projects workshops / seminars / laboratories / office activities / example solutions / graduation project / summer training))

Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acknowledgment and Practical application	Clarifying the requirements of electronic equipment maintenance workshops and the necessary equipment and training on them, reviewing maintenance methods, inspection (by senses - devices and by signal injection), industrial safety and security.	Knowledge and practical application	Tests and reports

2	2	Acknowledgment and Practical application	Review of the block diagram of a superheterodyne radio and printed circuit board. Using measuring instruments to identify faults.	Knowledge and practical application	Quizzes+ Reports
3	2	Acknowledgment and Practical application	Practice using a superheterodyne radio schematic and locating components. Practice applying the schematic to the printed circuit board and performing the necessary tests.	Knowledge and practical application	Daily tests Quizzes+ Reports
4	2	Acknowledgment and Practical application	Practice troubleshooting AF stage faults - preamplifier and power amplifier faults.	Knowledge and practical application	Daily tests+reports
5	2	Acknowledgment and Practical application	Practice troubleshooting the IF-stage and detector – amplifier and detector faults – adjusting and regulating the IF-stage.	Knowledge and practical application	Daily tests
6	2	Practical and theoretical	Practice RF stage faults – mixer faults - local oscillator faults	Knowledge and practical application	Daily tests
7	2	Practical and theoretical	Common Radio Faults	Knowledge and practical application	Tests and reports
8	2	Practical and theoretical	Test students with general exercises on radio faults.	Knowledge and practical application	Tests and reports
9	2	Practical and theoretical	Learn the block diagram of a regular black and white TV - learn the models of the electronic units used and the complete units for all stages of the device.	Knowledge and practical application	Tests and reports
10	2	Practical and theoretical	Practice reading the EIC circuit diagram, locating components, especially protection components and modules, and applying the circuit diagram to the printed circuit board. Identify hazardous work areas and how to deal with them.	Knowledge and practical application	Tests and reports

11	2	Practical and theoretical	Training on using TV testing equipment, including training on using the control and regulation keys on the front and back panels.	Knowledge and practical application	Tests and reports
12	2	Practical and theoretical	Power stage troubleshooting training	Knowledge and practical application	Tests and reports
13	2	Practical and theoretical	Repair and adjustment of the channel selector and automatic gain control (AGC) circuit - Repair and adjustment of the IF stage.	Knowledge and practical application	Tests and reports
14	2	Practical and theoretical	Repair of the image stage and CRT display valve.	Knowledge and practical application	Tests and reports
15	2	Practical and theoretical	Synchronizer divider and automatic frequency control (AFC) circuit troubleshooting.	Knowledge and practical application	Tests and reports

Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark it valuated continually.

Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Electronic Circuit 2
2. Curriculum Code:
EOTO216
3. Semester / Year:
Curriculum (15 weeks)\ second Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, a Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Muhanned Tahseen Hamdi Email: eng.muh@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectiv	Building practical electronic circuits and studying their properties and applications
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Subtractor circuit and arithmetic equations for subtracting input voltage VO = V2-V1 - applied circuit	Knowledge and practical application	Tests and reports

2	4	Practical and theoretical	Operations amplifier applications - the integrator circuit - deriving its equation - example - inserting a square wave into the integrator circuit and finding the output wave for it - example - inserting a pulse wave into the integrator circuit and finding the output wave - example - the effect of the voltage of the integrator - solving exercises.	Knowledge and practical application	Daily tests+ reports
3	4	Practical and theoretical	Comparator - its circuit - business idea - inserting a triangular wave into the template input and connecting the non-template input to the ground - inserting a triangular	Knowledge and practical application	Daily tests reports
4	4	Practical and theoretical	wave into the template input and linking the non-template input to a positive reference voltage	Knowledge and practical application	Daily tests+ reports
5	4	Practical and theoretical	Nonlinear applications of the operation amplifier - the example rectifier - the idea of using the operation amplifier in rectifying circuits - its advantages over the circuits without the operation amplifier - a comparison between the ideal and non- ideal properties of the rectifier - the half-wave ideal rectifier circuit - the idea of its work - the perfect rectifier circuit full-wave the business idea.	Knowledge and practical application	Daily tests

6	4	Practical and theoretical	Schmidt firing pin - False shift in comparator and how to prevent it from happening - Example - Schmidt goblet circuit Drawing its switching properties - Example - introducing a random wave into a Schmidt trigger circuit and drawing output voltage - Solving exercises	Knowledge and practical application	Daily tests
7	4	Practical and theoretical	generators using a process amplifier - square wave generator - its circuit - derive the equation for the output wave frequency - Modulate the circuit to give a rectangular wave - an example - circuit design.	Knowledge and practical application	Tests and reports
8	4	Practical and theoretical	Stable single- circuit vibrating pulse generator - business idea - waveform - derivation of the equation for output pulse width - example - design - circuit.	Knowledge and practical application	Tests and reports
9	4	Practical and theoretical	Triangle wave generator - the circuit - business idea - drawing waves - deriving the equations for that - deriving the frequency equation for the output wave.	Knowledge and practical application	Tests and reports
10	4	Practical and theoretical	Analog calculator - its design - solved examples - 555 timer - its construction - diagrams for its use in vibrators - equations for calculating the pulse width time - solved	Practical +Theoretical	Tests and reports
11	4	Practical and theoretical	Effective RC Filters - Their Advantages - Properties - - HPF-LPF- (Features- properties- equations- response curves- arithmetic examples)	Knowledge and practical application	Tests and reports

12+13	4	Practical and theoretical	Active RC Filters - - BSFBPF - Advantages - Features - - (Features - properties - equations - response curves - arithmetic examples	Knowledge and practical application	Tests and reports
14	4	Practical and theoretical	Basic Methods for Manufacturing Integrated Circuits (Single-crystal- Thin- and Thick-Film)	Knowledge and practical application	Tests and reports
15		Practical and theoretical	Manufacturing an integrated circuit for NPN transistor - Manufacturing integrated resistors and capacitors - anufacturing an integrated circuit for a simple electronic circuit.	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Microcomputers 2
2. Curriculum Code:
EOTO217
3. Semester / Year:
Curriculum (15 weeks)\ second Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours per week (60 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Assis. Prof. Abd Karim Mohammed Saleh Email: abdulkreem86@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectiv	Using microcomputer keys and writing and executing programs in machine language

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	A group of branching notices and their types - conditional and unconditional and their reliance on flags - practical examples - the importance of this group in writing programs.	Knowledge and practical application	Tests and reports

2	4	Practical and theoretical	A group of control instructions - their relation to the operation keys - of what differs from the rest of the previous instructions. Programs to perform arithmetic operations: addition - subtraction - multiplication - division - intended addressing and its types in the 8085 processor	Knowledge and practical application	Daily tests+ reports
3	4	Practical and theoretical	Stages of executing a command - Instructing cycle - Machine cycle - The timing diagram for executing a command (instructing the contents of the accumulator to be stored in a memory location for example) - How the microprocessor reads data in memory	Knowledge and practical application	Daily tests+ reports
4	4	Practical and theoretical	Creating repetition loops - time delay loops - one loop - two loops - three loops - application programs for each.	Knowledge and practical application	Daily tests
5	4	Practical and theoretical	Generating pulses at a required frequency and known duty cycle compared to pulse generators using integrated circuits	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	Practical examples showing how to exploit time delay loops in the industrial and household	Knowledge and practical application	Tests and reports
7	4	Practical and theoretical	Writing a program for an ascending counter - with a practical example	Knowledge and practical application	Tests and reports
8	4	Practical and theoretical	Writing a countdown timer program - with a practical example	Knowledge and practical application	Tests and reports

9	4	Practical and theoretical	Writing an ascending/descending counter program - with an example application.	Practical +Theoretical	Tests and reports
10	4	Practical and theoretical	microprocessor - 8086 specifications - architecture - edge plan.	Knowledge and practical application	Tests and reports
11	4	Practical and theoretical	Types of addressing for the 8086 microprocessor - data transfer instructions - multiplication and division instructions - examples of no other instructions.	Knowledge and practical application	Tests and reports
12	4	Practical and theoretical	Comparison of an eight-ranked microprocessor (such as the 8085) and a 16-ranked microprocessor (such as the 8086).	Knowledge and practical application	Tests and reports
13		Practical and theoretical	-order 32 microprocessors, the most prominent of which are their characteristics	Knowledge and practical application	Tests and reports
14	4	Practical and theoretical	- the microprocessors used in the Pentium calculators.	Knowledge and practical application	Tests and reports
15	4	Practical and theoretical	A general review of the curriculum vocabulary	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:

Measurements Devices 2

2. Curriculum Code:

EOTO218

3. Semester / Year:

Curriculum (15 weeks)\ second Level.

4. Description Preparation Date:

8-9-2024

5. Available Attendance Forms:

Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments

6. Number of Credit Hours (Total) / Number of Units (Total)

4 hours per week (60 hours).

7. Curriculum administrator's name (mention all, if more than one name)

Name: Amir Mahmoud Amir
Email: Amer.m78@gmail.com

8. Curriculum Objectives

Curriculum Objectiv	Study the types of devices used for continuous and alternating electrical measurements and solve problems at the work site

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Using an ohmmeter - (voltmeter) to measure the unknown resistance	Knowledge and practical application	Tests and reports
2	4	Practical and theoretical	Effect of load on voltmeter measurement	Knowledge and practical application	Daily tests+ reports

3	4	Practical and theoretical	Effect of load on voltmeter measurement	Knowledge and practical application	Daily tests reports
4	4	Practical and theoretical	Measurement of amplitude and frequency by oscilloscope	Knowledge and practical application	Daily tests+ reports
5	4	Practical and theoretical	Constant voltage measurement by plotting	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	Use a signal generator with an oscilloscope	Knowledge and practical application	Daily tests
7	4	Practical and theoretical	Design and analysis of the main circuit of the signal generator	Knowledge and practical application	Tests and reports
8	4	Practical and theoretical	Maxoy bridge for alternating current, unknown resistance and inductance	Knowledge and practical application	Tests and reports
9	4	Practical and theoretical	An alternating current bridge for measuring an unknown capacitive capacitance	Knowledge and practical application	Tests and reports
10	4	Practical and theoretical	A bridge of alternating current to measure the unknown frequency	Practical +Theoretical	Tests and reports
11	4	Practical and theoretical	Winn gantry of alternating current to measure unknown capacitance	Knowledge and practical application	Tests and reports
12	4	Practical and theoretical	Gantry of alternating current measure inductance	Knowledge and practical application	Tests and reports
13	4	Practical and theoretical	Measurement of phase angle using lysagos shapes	Knowledge and practical application	Tests and reports
14		Practical and theoretical	thermocouple	Knowledge and practical application	Tests and reports

15	4	Practical and theoretical	thermistor resistance	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:

Communication 2

2. Curriculum Code:

EOTO219

3. Semester / Year:

Curriculum (15 weeks)\ second Level.

4. Description Preparation Date:

8-9-2024

5. Available Attendance Forms:

Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments

6. Number of Credit Hours (Total) / Number of Units (Total)

4 hours per week (60 hours).

7. Curriculum administrator's name (mention all, if more than one name)

Name: Riyadh Rajab Muhammad
Email: riyadhrajabmm@gmail.com

8. Curriculum Objectives

Curriculum Objectiv	Studying the types of transmitters, receivers, and wired and wireless communications and the ability to benefit from them in the field of work

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical and theoretical	Digital modulation PSK-FSK-ASK.	Knowledge and practical application	Tests and reports
2	4	Practical and theoretical	Transmission information and system capacity-error (SNR) signal-to-noise ratio	Knowledge and practical application	Daily tests+ reports
3	4	Practical and theoretical	Cell phones - Frequencies used - Techniques used (FDMA) - (TDMA) - (CDMA).	Knowledge and practical application	Daily tests reports

4	4	Practical and theoretical	Teleprinters - radio telegraph transmitters.	Knowledge and practical application	Daily tests+ reports
5	4	Practical and theoretical	(Faximile Transmission) - (Fas-Receiver) - (Telex)	Knowledge and practical application	Daily tests
6	4	Practical and theoretical	Optical fibers - types - characteristics - sending and receiving.	Knowledge and practical application	Daily tests
7	4	Practical and theoretical	Types of antennas - basics of antennas - antenna parameters.	Knowledge and practical application	Tests and reports
8	4	Practical and theoretical	Spread of radio waves (terrestrial - celestial - waves Line of sight.	Knowledge and practical application	Tests and reports
9	4	Practical and theoretical	Vertical antennas – Fright rod antennas - UHF antennas are micro and horn antennas.	Knowledge and practical application	Tests and reports
10	4	Practical and theoretical	Use of microwaves in communications.	Practical +Theoretical	Tests and reports
11	4	Practical and theoretical	Satellite Communications – Features and Characteristics - Transmission and Receive - Earth Stations - Satellite Orbits - Multiple Access.	Knowledge and practical application	Tests and reports
12	4	Practical and theoretical	Microwaves - Generation - Frequency Spectrum.	Knowledge and practical application	Tests and reports
13	4	Practical and theoretical	Mobile - Introduction - Technologies used - The most important considerations in transmission - Shadow - Interference - Noise. - Transferring signals wirelessly - wirelessly (and wirelessly - wired)	Knowledge and practical application	Tests and reports
14		Practical and theoretical	GSM networks; Functions and structural	Knowledge and practical application	Tests and reports

15	4	Practical and theoretical	Thuraya - Thuraya services - Thuraya features - SMS - Thuraya uses – Geographical areas for network service coverage.	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Electronic instrumentation maintenance workshop 2
2. Curriculum Code:
EOTO220
3. Semester / Year:
Curriculum (15 weeks)\ second Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: Assist.Lec. Omar Hassan Mahmoud Email: eng.omarhasan94@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectiv	Using skills in the field of maintenance on electrical appliances and equipment, diagnosing faults and benefiting from them in the field of work

9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits, in workshops of institute , electronic boards, manage electrical projects workshops / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acknowledgment and Practical application	Malfunctions of the horizontal deflection stage and its frequency regulation - High pressure faults - Malfunctions of the vertical deflection stage and its frequency .regulation	Knowledge and practical application	Tests and reports
2	2	Acknowledgment and Practical application	Fixing audio stage malfunctions - FM detector malfunctions - Audio frequency power amplifier Malfunctions	Knowledge and practical application	Quizzes+ Reports

3	2	Acknowledgment and Practical application	Training on fixing general black and white TV faults	Knowledge and practical application	Daily tests Quizzes+ Reports
4	2	Acknowledgment and Practical application	Training on fixing general black and white TV faults	Knowledge and practical application	Daily tests+ reports
5	2	Acknowledgment and Practical application	Students will be tested with general exercises on repairing a black and white television set	Knowledge and practical application	Daily tests
6	2	Practical and theoretical	Track and read color TV map - Locate components - Determine the difference between color TV and Regular	Knowledge and practical application	Daily tests
7		Practical and theoretical	Training on the means of controlling and controlling color TV - adjusting and .organizing colors	Knowledge practical applicati	Tests and reports
8	2	Practical and theoretical	Malfunctions in the power supply stage of color TV - malfunctions of touch control circuits	Knowledge practical applicati	Tests and reports
9	2	Practical and theoretical	Fixed malfunctions of the channel selector - inter-frequency - detector - and automatic gain controller for color TV	Knowledge practical applicati	Tests and reports
10	2	Practical and theoretical	Fix RGB color zoom stage and color screen LED – check the three screen launchers	Knowledge and practical application	Tests and reports
11	2	Practical and theoretical	Make the necessary arrangements for all stages of the device after completing the repair	Knowledge and practical application	Tests and reports
12	2	Practical and theoretical	Examining students	Knowledge and practical application	Tests and reports
13	2	Practical and theoretical	with general troubleshooting exercises for color TV	Knowledge practical application	Tests and reports

14	2	Practical and theoretical	An exercise on the operation and control of the VCD device - regulation by remote control and storage in a modern TV	Knowledge and practical application	Tests and reports
15	2	Practical and theoretical	Exercises to check and measure the processing stages of VCD devices - and the most common malfunctions in them	Knowledge and practical application	Tests and reports

Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark it valuated continually.

Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Project
2. Curriculum Code:
EOTO221
3. Semester / Year:
Curriculum (15 weeks)\ second Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week (30 hours).
7. Curriculum administrator's name (mention all, if more than one name)
Name: staff of department lecturers Email:
8. Curriculum Objectives

Curriculum Objectiv	The student learns how to work collaboratively, draw maps, develop project designs, and follow up on the progress of work on the project
9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits, in workshops of institute , electronic boards, manage electrical projects workshops / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Acknowledgment and Practical application	Choose a topic name for the projects.	Knowledge and practical application	Tests and reports
2+3	2	Acknowledgment and Practical application	Share the projects with students, meet with the supervising professor, and begin reviewing the institution to obtain the required project resources.	Knowledge and practical application	Quizzes+ Reports

4	2	Acknowledgment and Practical application	Gather information about the project, begin various studies, and prepare the necessary designs for the project.	Knowledge and practical application	Daily tests Quizzes+ Reports
5	2	Acknowledgment and Practical application	Begin implementing the planned designs practically and conducting experiments.	Knowledge and practical application	Daily tests+ reports
6	2	Acknowledgment and Practical application	Discuss the practical results and their compatibility with the actual results, and find the necessary explanations for the apparent cases.	Knowledge and practical application	Daily tests
7	2	Practical and theoretical	Arrange the written report sections for each of the stages preceding the final project report as follows: Project Name: Project Professor: Student Names: Summary: Chapter One: Introduction Chapter Two: Theoretical Part Chapter Three: Practical Part and Results Chapter Four: Discussion of the Results, Conclusions, and Proposals Resources	Knowledge and practical application	Daily tests
8		Practical and theoretical	Submit the project prototype along with the final report for final testing and evaluation.	Knowledge and practical application	Tests and reports
9	2	Practical and theoretical	Monitor project progress	Knowledge and practical application	Tests and reports
10+11	2	Practical and theoretical	Conduct seminars to discuss developments and present them to instructors.	Knowledge and practical application	Tests and reports
12	2	Practical and theoretical	Project completion report and percentage of completion	Knowledge and practical application	Tests and reports
13	2	Practical and theoretical	Project testing and testing	Knowledge and practical application	Tests and reports

14	2	Practical and theoretical	Problem resolution	Knowledge and practical application	Tests and reports
15	2	Practical and theoretical	Project submission and delivery to the supervisor along with the project's theoretical report	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark it valuated continually.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:
Control systems
2. Curriculum Code:
EOTO222
3. Semester / Year:
Curriculum (15 weeks)\ second Level.
4. Description Preparation Date:
8-9-2024
5. Available Attendance Forms:
Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours per week (45 hours)
7. Curriculum administrator's name (mention all, if more than one name)
Name: Assist.Lec. Omar Hassan Mahmoud Email: eng.omarhasan94@ntu.edu.iq
8. Curriculum Objectives

Curriculum Objectiv	Teaching basic concepts about various control systems, operating the devices and machines used in them, and dealing with the control system in factories

9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	Introduction to control systems	Knowledge and practical application	Tests and reports
2	3	Practical and theoretical	Open-circuit and closed- circuit control systems	Knowledge and practical application	Daily tests+ reports

2	3	Practical and theoretical	Converting electrical signals into mechanical and vice versa, converting electrical signals into pneumatic and vice versa.	Knowledge and practical application	Daily tests reports
3	3	Practical and theoretical	Error sensing devices used in control, their types	Knowledge and practical application	Daily tests+ reports
4	3	Practical and theoretical	Electrical components to control electric motors - picker - timer - push switches - specific switches.	Knowledge and practical application	Daily tests
5	3	Practical and theoretical	The four variables (temperature - pressure - flow - level measurement) in control systems	Knowledge and practical application	Daily tests
6	3	Practical and theoretical	Controlling the operation and shutdown of a single phase induction motor using 1- B- Thyrostor -Triac electromagnetic receiver)	Knowledge and practical application	Tests and reports
7	3	Practical and theoretical	Complement the applied systems	Knowledge and practical application	Tests and reports
8	3	Practical and theoretical	Digital systems in control	Knowledge and practical application	Tests and reports
9	3	Practical and theoretical	Methods for measuring temperature, pressure, flow and level	Practical +Theoretical	Tests and reports
10	3	Practical and theoretical	The different elements of pneumatic control Systems	Knowledge and practical application	Tests and reports
11	3	Practical and theoretical	Systems applied in pneumatic Control	Knowledge and practical application	Tests and reports
12	3	Practical and theoretical	Use the analog calculator to Control	Knowledge and practical application	Tests and reports

13	3	Practical and theoretical	How to represent digital circuits in control	Knowledge and practical application	Tests and reports
14	3	Practical and theoretical	Using the electronic calculator in application control systems.	Knowledge and practical application	Tests and reports
15	3	Practical and theoretical	Using the electronic calculator in pressure, flow and level	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	are available in the department and the institute library free of charge
Main references (sources)	are available in the free section and the institute library.
Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:

Programmable logic controller (PLC)

2. Curriculum Code:

EOTO223

3. Semester / Year:

Curriculum (15 weeks)\ second Level.

4. Description Preparation Date:

8-9-2024

5. Available Attendance Forms:

Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments

6. Number of Credit Hours (Total) / Number of Units (Total)

3 hours per week (45 hours)

7. Curriculum administrator's name (mention all, if more than one name)

Name: Ass.Lec.Nida muhsin ali
Email: nida.ali@ntu.edu.iq

8. Curriculum Objectives

Curriculum Objecti	Teaching basic concepts about various control systems, operating the devices and machines used in them, and dealing with the control system in factories

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Practical + theoretical	Introduction	Knowledge and practical application	Tests and reports
2	3	Practical and theoretical	Sensors with programmable controller(heat, pressure, motion ..etc)	Knowledge and practical application	Daily tests+ reports
2	3	Practical and theoretical	Electrical switch, electrical contact	Knowledge and practical application	Daily tests reports

3	3	Practical and theoretical	Introduction of ladder language	Knowledge and practical application	Daily tests+ reports
4	3	Practical and theoretical	Logic circuit (AND, OR, NOT, etc.) using ladder language	Knowledge and practical application	Daily tests
5	3	Practical and theoretical	Timers and its types-simulation using ladder language	Knowledge and practical application	Daily tests
6	3	Practical and theoretical	The signal in ladder language	Knowledge and practical application	Tests and reports
7	3	Practical and theoretical	Digital counter in ladder language with examples.	Knowledge and practical application	Tests and reports
8	3	Practical and theoretical	Example of (changeover circuit) using ladder language	Knowledge and practical application	Tests and reports
9	3	Practical and theoretical	Example of traffic light	Practical +Theoretical	Tests and reports
10	3	Practical and theoretical	Application example for open and close the door using motion sensor.	Knowledge and practical application	Tests and reports
11	3	Practical and theoretical	Operating circuit of single phase motor by switch (motor starter) using ladder language.	Knowledge and practical application	Tests and reports
12	3	Practical and theoretical	Operating circuit of three-phase motor(delta-star)	Knowledge and practical application	Tests and reports
13	3	Practical and theoretical	using ladder language.in single phase motor by switch (motor	Knowledge and practical application	Tests and reports
14	3	Practical and theoretical	Application for electrical lift	Knowledge and practical application	Tests and reports

15	3	Practical and theoretical	example for electrical lift	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, this mark will be divided into sub mark 50 % and final mark 50% summation at last to get the final mark ,by adding theoretical marks and practical mark with activity mark , final mark(written + practical) mark

12. Learning and Teaching Resources

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Recommended books and references (scientific journals, reports...)	The Internet, library of department and institute
Electronic References, Websites	The Internet web sites

Curriculum Description Form

1. Curriculum Name:

Renewable energy systems

2. Curriculum Code:

EOTO224

3. Semester / Year:

Curriculum (15 weeks)\ second Level.

4. Description Preparation Date:

8-9-2024

5. Available Attendance Forms:

Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, a Assignments

6. Number of Credit Hours (Total) / Number of Units (Total)

3 hours per week (45 hours)

7. Curriculum administrator's name (mention all, if more than one name)

Name: Ahmed Nazir Hammadi
Email: Ahmed.nther@gmail.com

8. Curriculum Objectives

Curriculum Objecti	Knowing the basics of various renewable energy sources and the necessary techniques for associated energy systems

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))

10. Curriculum Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Practical + theoretical	General introduction to renewable energy - renewable energy sources and their applications - renewable energy and environmental problems The sun - time calculation (time equation and longitude correction	Knowledge and practical application	Tests and reports

2	3	Practical and theoretical	Solar angles (declination - hour angle - solar azimuth angle - sunrise and sunset times and length of the day - angle of incidence) solar radiation in space - terrestrial radiation - total radiation on inclined surfaces	Knowledge and practical application	Daily tests+ reports
2	3	Practical and theoretical	Solar water heating systems - thermosiphon system - solar collector with connected tank	Knowledge and practical application	Daily tests reports
3	3	Practical and theoretical	Direct circulation system - indirect water heating system - tank heating system Heat storage systems (air heat tank system - liquid heat tank system - thermal analyzes of storage systems)	Knowledge and practical application	Daily tests+ reports
4	3	Practical and theoretical	The amount of hot water required - practical requirements (pipes - fasteners - insulators - pumps - valves – other devices)	Knowledge and practical application	Daily tests
5	3	Practical and theoretical	Solar cells – components of a PV electrical generation system	Knowledge and practical application	Daily tests

6	3	application Discussions and - workshops Using modern - presentation and teaching methods Field visits and systematic raining Access to the latest research Self-education- Following -	PV system design	Knowledge and practical application	Tests reports
7	3	Practical and theoretical	PV/T hybrid system	Knowledge and practical application	Tests and reports
8	3	Practical and theoretical	Solar thermal electricity generation systems (parabolic trough collectors - tower energy systems)	Knowledge and practical application	Tests and reports
9	3	Practical and theoretical	Introduction to wind energy	Practical +Theoretical	Tests and reports
10	3	Practical and theoretical	the energy available in the wind -the torque and energy of wind turbines	Knowledge and practical application	Tests and reports
11	3	Practical and theoretical	Wind energy conversion systems - wind generators (rotating tower - power regulators - stop systems - generator)	Knowledge and practical application	Tests and reports

12	3	Practical and theoretical	Performance of air energy conversion systems - power curve for the wind turbine – capacity factor	Knowledge and practical application	Tests and reports
13	3	Practical and theoretical	Introduction to the water cycle - water turbines	Knowledge and practical application	Tests and reports
14	3	Practical and theoretical	Introduction to underground energy - underground power stations (thermal plants - electrical stations) underground heat pumping system	Knowledge and practical application	Tests and reports
15	3	Practical and theoretical	Tidal energy - tidal stations Wave energy - wave energy stations	Knowledge and practical application	Tests and reports

11. Curriculum Evaluation

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Electronic References, Websites	The Internet web sites