Ministry of Higher Education & Scientific Research

Supervision and Scientific Evaluation Directorate

Quality Assurance and Academic Accreditation

International Accreditation Dept.

Guide to Course Descriptions and Academic Programs for

2024 -2025

Ministry of Higher Education & Scientific Research

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Academic Program Specification Form for The Academic Year 2024-2025

University: Northern Technical University

Faculty/Institute: Al-dour Technical Institute

Department: **Medical Instruments Techniques Department**

Name of the academic or professional program: Technical diploma in medical instruments

Name of the final certificate: Technical diploma in Medical Instruments Techniques

Academic system: Curriculum system

File preparation date : 27/1/2025

File filling date: 27/1/2025

Signature

The name of the head of the department

Dr. Asmaa Muneam Abdullah

Signature

Dean's Assistant For Scientific Affairs

Assist. Prof. Dr. Hanan Shahb Ahmad

Check the file by

Quality Assurance and University Performance Division

Name of the director of the Quality Assurance and University Performance Division:

Signature

Asst. Lecturer Hayder Ali Mohssn

Dean's endorsement

Assist. Prof. Dr. Maha Elttayef Jasim

Vision of program
The Department of Medical Instruments Techniques represents an effective means of meeting the community's need for specialized services in supporting various health, research and educational institutions, in addition to investing the teaching Staff and students in primary and higher theoretical and applied scientific research and studies, as well as education, awareness and health and scientific mobilizationWithin future foundation in line with modern developments. to acquire high technical and professional expertise and harness it scientifically according to a systematic perspective
Program message
A Department of Medical Instruments Techniques was established in accordance with the community's need for specialized service cadres with scientific specifications and modern technical standards, and prepare these cadres to work in important health and research institutions, as well as support the private sector , knowing that the department has a clear future mission with high ambition that seeks to provide the best services and develop the teaching and student staff in the fields of scientific and cognitive research and open postgraduate studies for the university's specialized credit, as well as community services and expanding the horizons of scientific cooperation with relevant corresponding departments in order to achieve integration.
Program Goals
The department aims to graduate technicians who have the ability to deal with medical devices of various types in terms of their installation, operation, maintenance, and all their applications and programs.
Program accreditation
No accreditation program
External influences
No external influences

Program structure				
Program structure	**Number of courses**	**Study unit**	**Percentage**	**Notes***
Foundation requirements	**Enterprise requirements**	10	20	18.5%
Institute requirements	**College requirements**	3	7	6.5%
Department requirements	**Department requirements**	26	81	75%
Summer training	**summer training**	Yes		
Others	**Other**			

Program description				
stage Scholarship	name The decision	Code The decision	hours Approved	
			Theoretical	practical
level one				
First level - first semester	English Language 1	NTU 101	2	-
	Principles of Computer	NTU 102	1	1
	Foundations of Mathematics	TIDO 100	2	-
	Mechanical Workshop	TIDO 101	-	3
	DC Electrical Circuits	MDDI100	2	2
	Electronic Principles	MDDI101	2	2
	Digital Circuit Principles	MDDI102	2	2
	Electrical Workshop	MDDI104	-	2
	Physiology	MDDI103	2	-
	Engineering Drawing	MDDI110	-	2
First level - second semester	Arabic Language	NTU 103	2	-
	Sport	NTU 104	1	1
	Human Rights Democracy	NTU 100	2	-
	Calculus	TIDO 102	2	-

	Electrical drawing	MDDI105	-	2
	Electronics Workshop	MDDI106	-	2
	AC Electrical Circuit	MDDI107	2	2
	Electronic	MDDI108	2	2
	Digital Circuit	MDDI109	2	2
Second Level				
The second level - the first semester	The Crimes Of The Baath Regime In Iraq	NTU 203	2	-
	English Language 2	NTU 200	2	-
	Electronic Circuit (1)	MDDI201	2	2
	Microcomputer (1)	MDDI202	2	2
	Electronical Medical Instruments 1	MDDI203	2	2
	Medical Instruments Maintenance workshop 1	MDDI204	-	2
	Project 1	MDDI205	-	2
	Electro-mechanical Medical Instruments	MDDI206	2	2
	Control	MDDI212	2	2
	Renewable energy systems	MDDI214	1	2
The second level - the second semester	Computer	NTU 201	1	1
	Arabic Language	NTU 202	2	-
	Professional Ethics	NTU 204	2	-
	Measurements	MDDI200	2	2

	Devices			
	Electronic Circuit (2)	MDDI207	2	2
	Microcomputer (2)	MDDI208	2	2
	Electronical Medical Instruments 2	MDDI209	2	2
	Medical Instruments Maintenance workshop 2	MDDI210	-	2
	Project 2	MDDI211	-	2
	Renewable energy systems	MDDI213	1	2

Expected learning outcomes of the program
Knowledge
A-1 Preparing and graduating a technical cadre that fulfills the main technical and cognitive requirements to be a high-quality technical and artistic resource in the field of medical devices
The ability to classify medical devices, how they work, diagnose them, and their A-2 risks
A-3 Cooperating with doctors and health institutions to provide the necessary technical support to operate medical devices correctly and effectively
A-4 The ability to write technical reports on the results of examining medical devices and the ability to draw conclusions and their effects
Skills
B-1 Installing and operating various electronic and electromechanical medical devices, both diagnostic and therapeutic
B-2 Scheduling and programming periodic maintenance work
Contributing and supervising the maintenance and calibration of various medical B-3 devices.

B-4 Designing, developing and finding replacement parts for some broken units of medical devices
Values
C-1 Compliance with sanitary and technical standards and regulations applied in the medical process, ensuring patient safety and effectiveness of treatment C-2 The ability to develop oneself and update information in the field of specialization and in the long term Optimal use of all possible means to keep pace with the modernity of the specialty C-3 C-4 Continuous research and development in the field of engineering medical device techniques, and improving the performance, efficiency and general safety of medical devices

Teaching and learning strategies						
((Theoretical lectures / discussion and dialogue / practical lectures / field visits / discussion circles / laboratories / office activities / solving examples / graduation project / summer training))						
Evaluation methods						
((Oral and written exams/observation and cumulative record))						
Education Institution						
Faculty members						
Academic Degree	**Specialization**		**Special requirements/skills**		**Faculty members**	
	Major	**Specialization**			**Staff**	**Lecturer**
lecturer	Physics Scienc	Solid state physics			staff	

	e					
assistant teacher	Electricity Engineering	Electrical and computer Engineering			Staff	
Assistant Professor	Medical Instruments Engineering	Medical Instruments Engineering			Staff	
lecturer	Mechanical engineering	Applied mechanic			Staff	
Asst. lecturer	Computer	computer				

Professional development
Directing new faculty members to follow up on the annual updates of the study plan and the necessity of updating the curricula in a manner consistent with the plan announced by the scientific department
Professional development for faculty members
Conducting field visits to the public and private sectors and universities within the specialty to review the field development in the field of specialization Involving students in discussions, scientific seminars and training courses
Acceptance standard
The admission criteria for morning study are within the central admission plan, which is approved by the Ministry of Higher Education and Scientific Research.

The most important sources of information about the program
Programs and resources are approved by the sectoral committees and are periodically updated through the annual meetings of the relevant committees
Program development plan
Using new concepts and modern methods in the maintenance and calibration of various medical devices through the participation of specialized professors in the scientific department in scientific workshops, seminars, and twinning work with the hospitals specializing

Program skills chart																
				Learning outcomes required from the program												
Year / Level	Code of course	Name of course	Basic or Optional	Knowledge				Skills				Values				
				1A	2A	3A	4A	1B	2B	3B	4B	1C	2C	3C	4C	
First Level	NTU100	Human Rights Democracy	Basic	X	X	X		X	X	X	X	X	X	X		
	NTU101	English Language 1	Basic	X	X	X	X	X	X			X	X			
	NTU102	Principles of Computer	Basic	X	X	X			X	X	X	X	X			
	NTU103	Arabic Language	Basic		X	X	X	X	X	X	X	X	X		X	
	NTU104	Sport	My choice		X			X	X	X	X	X	X			
	TIDO100	Foundations of Mathematics	Basic	X	X		X	X	X		X	X	X			
	TIDO101	Mechanical Workshop	Basic	X	X			X	X		X	X	X			

	TIDO101	**Calculus**	**Basic**	X	X	X			X	X	X	X	X		X
	MDDI100	**DC Electrical Circuits**	**Basic**	X	X	X	X	X	X			X	X		X
	Electronic Principles	**MDDI101**	**Basic**	X	X		X	X	X	X	X	X	X		X
	MDDI102	**Digital Circuit Principles**	**Basic**	X	X	X	X	X	X	X	X	X	X	X	X
	MDDI103	**Physiology**	**Basic**	X	X	X		X	X	X		X	X		X
	MDDI104	**Electrical Workshop**	**Basic**	X	X	X	X	X	X	X		X	X	X	
	MDDI105	**Electrical drawing**	**Basic**	X	X	X		X		X		X	X	X	X
	MDDI106	**Electronics Workshop**	**Basic**	X	X	X	X	X	X	X	X	X	X	X	
	MDDI107	**AC Electrical Circuit**	**Basic**	X	X	X		X	X	X	X	X	X	X	
	MDDI108	**Electronic**	**Basic**	X	X	X		X	X	X	X	X	X	X	
	MDDI109	**Digital Circuit**	**Basic**	X	X	X		X	X	X	X	X	X	X	

	MDDI110	**Engineering Drawing**	**Basic**	X	X	X		X	X	X		X	X	X	X
Second level	**NTU200**	**English Language 2**	**Basic**	X	X	X		X	X	X		X	X	X	X
	NTU201	**Computer**	**Basic**	X	X	X		X	X	X		X	X	X	X
	NTU202	**Arabic Language**	**Basic**		X	X		X	X	X	X	X	X		X
	NTU203	**The Crimes Of The Baath Regime In Iraq**	**Basic**		X			X	X	X		X	X	X	
	NTU204	**Professional Ethics**	**Basic**		X	X	X		X	X	X	X	X		X
	MDDI200	**Measurements Devices**	**Basic**	X	X	X	X	X	X	X		X	X	X	
	MDDI201	**Electronic Circuit (1)**	**Basic**	X	X	X		X	X	X		X	X	X	
	MDDI202	**Microcomputer (1)**	**Basic**	X	X	X		X	X	X		X	X	X	
	MDDI203	**Electronical Medical Instruments 1**	**Basic**	X	X	X		X	X	X		X	X	X	
	MDDI204	**Medical Instruments Maintenance workshop 1**	**Basic**	X	X	X		X	X	X		X	X	X	

	MDDI205	**Project 1**	**Basic**	X	X	X	X	X	X	X	X	X	X	X	
	MDDI206	**Electro-mechanical Medical Instruments**	**Basic**	X	X	X	X	X	X	X		X	X	X	
	MDDI207	**Electronic Circuit (2)**	**Basic**	X	X	X		X	X	X		X	X	X	X
	MDDI208	**Microcomputer (2)**	**Basic**	X	X	X		X	X	X		X	X	X	X
	MDDI209	**Electronical Medical Instruments 2**	**Basic**	X	X	X		X	X	X		X	X	X	X
	MDDI210	**Medical Instruments Maintenance workshop2**	**Basic**	X	X	X		X	X	X	X	X	X	X	X
	MDDI211	**Project 2**	**Basic**	X	X	X		X	X	X	X	X	X	X	
	MDDI212	**Control**	**Basic**	X	X	X		X	X	X	X	X	X	X	
	MDDI213	**Programmable Logic Controller (PLC)**	**Basic**	X	X	X		X	X	X		X	X	X	
	MDDI214	**Renewable energy systems**	**My choice**	X	X	X		X	X	X		X	X	X	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	Democracy and Human Rights (NTU 100)
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments"
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	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	curriculum outcomes and teaching, learning and evaluation methods	
	A-Cognitive objectives	
A-1	- Consolidating the principles of human rights among students in order to achieve a correct understanding of these rights based on Islamic concepts, comparing them to international conventions, and spreading the culture of human rights in society.	
A-2	- Enabling students to explain the concept of democracy, distinguish this concept from other concepts, and understand the meaning of responsibility and respect for the rights and freedoms of others.	
	B - The program's Marathi goals	
B-1	Knows human rights and democratic systems.	
B-2	To learn about civil society organizations.	
	Teaching and learning methods ((Theoretical lectures/discussions))	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	.Improve their discussion skills	
C-2		

	Teaching methods ((Theoretical lectures / discussion and dialogue / practical lectures / field visits / seminars / laboratories / office activities / example solutions / graduation project / summer training))
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))

10. Curriculum structure

Week	Time (H.)	Required Learning Outcomes	Topic Name	Education 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
3 4	2	Agreements and charters	The first requirement: human rights in ancient civilizations, with a focus on the Mesopotamian civilization. The second requirement: Human rights in divine laws, with a focus on human rights in Islam.	Theoretical lectures	Daily tests
5 6	2	Charters and constitutions	Third requirement: Human rights in the Middle Ages:	Theoretical lectures	Daily tests
7 8	2	Public freedoms and equality	a. Human rights in doctrines, schools and political theories.	Theoretical lectures	Daily tests
9 10	2	Classification n of freedoms	B. Human rights in corporations, rights and their declarations, revolutions and constitutions (English documents, American Revolution, French Revolution, Russian Revolution)	Theoretical lectures	Daily tests

11	Infrastructure

*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan

-Creating appropriate curricula with the labor market
-Holding scientific seminars and conferences aimed at updating school curricula
-Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	English Language (NTU 101)
4	Available attendance forms	Weekly Academic Schedules (Theory and Laboratory), Discussions, Seminars, and Homework
5	Semester/year	Curriculum Second trimester (15 weeks)\Second Level
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	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	curriculum outcomes and teaching, learning and evaluation methods	

A-Cognitive objectives	
1 -A	Strengthening students' learning to use the English language in order to help them enrich their knowledge of terms and expressions and strengthen their skills.
A-2	The student can speak English in daily life
B - The program's Marathi goals	
B-1	Teaching the student how to use English grammar in conversation.
B-2	Translation and writing of letters in English.
Teaching and learning methods ((Theoretical lectures/discussions))	

Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
C - emotional and value goals	
C-1	Improve their discussion skills.
C-2	Brainstorming
Teaching methods .((Theoretical lectures/discussions))	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	English Language (NTU 101)
4	Available attendance forms	Weekly Academic Schedules (Theory and Laboratory), Discussions, Seminars, and Homework
5	Semester/year	Curriculum Second trimester (15 weeks)\Second Level
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	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	curriculum outcomes and teaching, learning and evaluation methods	
A-Cognitive objectives		
1 -A	Strengthening students' learning to use the English language in order to help them enrich their knowledge of terms and expressions and strengthen their skills.	
A-2	The student can speak English in daily life	
B - The program's Marathi goals		
B-1	Teaching the student how to use English grammar in conversation.	
B-2	Translation and writing of letters in English.	
Teaching and learning methods ((Theoretical lectures/discussions))		
Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))		

C - emotional and value goals	
C-1	Improve their discussion skills.
C-2	Brainstorming
Teaching methods .((Theoretical lectures/discussions))	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	Computer (NTU 102)
4	Available attendance forms	Weekly Class Schedules (Theory and Practical), Discussions, Workshops, and Assignments
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Teaching students the skills of computer applications and their use in the field of specialization
9	curriculum outcomes and teaching, learning and evaluation methods	

A-Cognitive objectives	
A-1	Know how the calculator works
A-2	Get to know the taskbar
A-3	Learn about creating and deleting files
A-4	Learn about Office requirements
B - The program's Marathi goals	
B-1	Identify the parts of a calculator
B-2	Knowledge of SOFTWARE and HARDWARE
Teaching and learning methods ((Theoretical lectures/practical lectures and presentation on Date show))	
Evaluation methods ((Oral exams/written exams/observation/student's cumulative record))	
C - emotional and value goals	
C-1	Brainstorming...
C-2	Intellectual questions...
Teaching methods .((Theoretical lectures/practical lectures and presentation on Date show))	

Evaluation methods
((Oral exams / written exams / observation / student cumulative record))

10. Curriculum structure

Week	Time (H.)	Required Learning Outcomes	Topic Name	Education 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 + 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	Tests and reports
4	2	Practical + 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	Tests and reports
5	2	Practical + 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	Tests and reports
6	2	Practical + 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	Tests and reports
7	2	Practical + theoretical	Basic system information / Turn off unwanted apps Windows explorer / My computer icon / My computer window panes	Knowledge and practical application	Tests and reports

8, 9	2	Practical + theoretical	Recycle Bin (delete, restore and empty the basket) / my document icon	Knowledge and practical application	Tests and reports
10 , 11	2	Practical + 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 and practical application	Tests and reports
12, 13	2	Practical + 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 and practical application	Tests and reports
14 , 15	2	Practical + 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 and practical application	Tests and reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula - Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	Arabic Language (NTU 103)
4	Available attendance forms	Weekly Class Schedules (Theory and Practical), Discussions, Workshops, and Assignments
5	Semester/year	Curriculum Second trimester (15 weeks)\ First Level
6	Number of study hours (total)	2 hours per week (30 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Teaching the student to use the Arabic language in administrative and accounting correspondence and developing his skills in this field
9	curriculum outcomes and teaching, learning and evaluation methods	
A-Cognitive objectives		
A-1	Teaching the student how to preserve the classical language and stay away from colloquial language	
B - The program's Marathi goals		
B-1	Teaching the student to write without spelling errors by adjusting the rules of the Arabic language	
Teaching and learning methods ((Theoretical lectures/discussions))		
Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))		
C - emotional and value goals		
C-1	. Intellectual questions in the field of the Arabic language.	
Teaching methods .((Theoretical lectures/discussions))		
Evaluation methods ((Oral exams / written exams / observation / student cumulative record))		

10. Curriculum structure

Week	Time (H.)	Required Learning Outcomes	Topic Name	Education Method	Evaluation Method
1	2	Practical	An introduction to linguistic errors - the tied and long ta'a and the open ta'a	Knowledge	Tests and reports
2	2	Practical	Rules for writing the extended and reduced alif - the solar and lunar letters	Knowledge	Tests and reports
3	2	Practical	The opposite and the light	Knowledge	Tests and reports
4	2	Practical	Humza writing	Knowledge	Tests and reports
5	2	Practical	punctuation marks	Knowledge	Tests and reports
6	2	Practical	Noun and verb and differentiate between them	Knowledge	Tests and reports
7	2	Practical	reactants	Knowledge	Tests and reports
8	2	Practical	The number	Knowledge	Tests and reports
9, 10	2	Practical	Common language errors applications	Knowledge	Tests and reports
11	2	Practical	Noon and Tanween - meanings of prepositions	Knowledge	Tests and reports
12	2	Practical	Formal aspects of administrative discurriculum	Knowledge	Tests and reports
13, 14	2	Practical	Administrative discurriculum language	Knowledge	Tests and reports
15	2	Practical	Forms of administrative correspondence	Knowledge	Tests and reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute Adour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	Sport (NTU 104)
4	Available attendance forms	Optional
5	Semester/year	Curriculum - First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	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	curriculum outcomes and teaching, learning and evaluation methods	
A-Cognitive objectives		
A-1	Learn about the most important sports legislation and laws and how to manage sports tournaments and competitions	
B - The program's Marathi goals		
B-1	Identify the motor mechanism of the human body and what are the common injuries that occur in the human body	

Teaching and learning methods))Theoretical lectures/practical lectures((
Evaluation methods .))Oral exams / written exams / semester and final exams((
C - emotional and value goals
C-1 Carrying out his duties at the work site for professional motives.
Teaching methods))Theoretical lectures/practical lectures((
Evaluation methods .))Oral exams / written exams / semester and final exams((

10. Curriculum structure

Week	Time (H.)	Required Learning Outcomes	Topic Name	Education Method	Evaluation Method
1	2	Practical + theoretical	Sports definition, importance and types	Knowledge and practical application	Tests and reports
2	2	Practical + theoretical	Human body movement mechanism	Knowledge and practical application	Tests and reports
3	2	Practical + theoretical	Common sports injuries	Knowledge and practical application	Tests and reports
4	2	Practical + theoretical	Basic skills of the game of basketball	Knowledge and practical application	Tests and reports
5	2	Practical + theoretical	International law of the game of basketball	Knowledge and practical application	Tests and reports
6	2	Practical + theoretical	Basic skills of table tennis and its international law	Knowledge and practical application	Tests and reports
7	2	Practical + theoretical	Basic skills of volleyball and its international law	Knowledge and practical application	Tests and reports
8	2	Practical + theoretical	swimming sport	Knowledge and practical application	Tests and reports

9	2	Practical + theoretical	Basic skills of tennis and its international law	Knowledge and practical application	Tests and reports
10	2	Practical + theoretical	Basic handball skills	Knowledge and practical application	Tests and reports
11	2	Practical + theoretical	International law of handball	Knowledge and practical application	Tests and reports
12	2	Practical + theoretical	Arena and field games (types, international law of)the game	Knowledge and practical application	Tests and reports
13	2	Practical + theoretical	Basic soccer skills	Knowledge and practical application	Tests and reports
14	2	Practical + theoretical	Management of competitions and sports competitions	Knowledge and practical application	Tests and reports
15	2	Practical + theoretical	Sports laws and legislation	Knowledge and practical application	Tests and reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute Aldour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	Mathematics Foundation (TIDO100)
4	Available attendance forms	Weekly Course Schedules (Theory and

		Laboratory), Discussions, Seminars, and Homework Assignments Mandatory
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Teaching the student to use mathematics in scientific subjects and developing his skills in his field of specialization
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	Introducing the student to the use of mathematics in other scientific topics and increasing his ability to think logically when solving exercises, as well as increasing his ability to develop and how to link data with his information to obtain a solution to the problem	
B - The program's Marathi goals		
B-1	.The student can process and analyze mathematical data and reach conclusions .Learn about mathematical methods	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	Carrying out his duties at the work site for professional motives.	
Teaching methods ((Theoretical lectures/practical lectures))		

10. Curriculum structure					
Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1+2	2	Acknowledgment and Practical application	Matrices - Determinants - Electrical applications.	theoretical	Quizzes +Reports
3	2	Acknowledgment and Practical application	Trigonometric identities and trigonometric equations.	theoretical	Quizzes +Reports

4+7	2	Acknowledgment and Practical application	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.	theoretical	Quizzes +Reports
8	2	Acknowledgment and Practical application	Foundations and logarithms and their laws	theoretical	Quizzes +Reports
9+10	2	Acknowledgment and Practical application	Differentiation - Algebra of Derivatives - Polynomial Functions and Their Derivatives - Chain Base - Complex Function - Parametric Function.	theoretical	Quizzes +Reports
11+12	2	Acknowledgment and Practical application	Applications of differentiation - maximum and minimum values - distance, velocity, and acceleration. General physical and engineering applications.	theoretical	Quizzes +Reports
13+14	2	Acknowledgment and Practical application	Finding the length of a curved arc - different applications.	theoretical	Quizzes +Reports
15	2	Acknowledgment and Practical application	Tangent and column equation - velocity and	theoretical	Quizzes +Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute Adour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	Calculus (TIDOI02)
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments Mandatory
5	Semester/year	Curriculum Second trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Teaching the student to use Differentiation and Integration subjects and developing his skills in his field of specialization
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	Introducing the student to the use of mathematics in other scientific topics and increasing his ability to think logically when solving exercises, as well as increasing his ability to develop and how to link data with his information to obtain a solution to the problem	
B - The program's Marathi goals		
B-1	.The student can process and analyze mathematical data and reach conclusions .Learn about mathematical methods	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	Carrying out his duties at the work site for professional motives.	
Teaching methods ((Theoretical lectures/practical lectures))		
Evaluation methods ((Oral exams / written exams / semester and final exams))		

10. Curriculum structure					
Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1+2	2	Acknowledgment and Practical application	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	theoretical	Quizzes +Reports
3+4	2	Acknowledgment and Practical application	Ends - the goal of algebraic and trigonometric functions - applications to ends	theoretical	Quizzes+ Reports
5+6	2	Acknowledgment and Practical application	Integration - laws and its relationship to differentiation - definite and indefinite complementarity	theoretical	Quizzes+ Reports
7+8	2	Acknowledgment and Practical application	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.	theoretical	Quizzes+ Reports
9+11	2	Acknowledgment and Practical application	General methods of integration include substitution,	theoretical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute Adour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**Mechanical Workshop (TIDO102)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	**27/1/2025**
8	curriculum objectives	Teaching the student the principles and basics of mechanical workshops to develop his skills in his field of specialization
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	The student will be able to explain the principles of public safety and the conditions for their availability in the workshop and learn the basics of the welding, plumbing, blacksmithing and lathe workshop to develop his skills in his field of specialization	
B - The program's Marathi goals		
B-1	Principles and basics of mechanical workshops, training in welding, plumbing, blacksmithing, and lathe, and an explanation of the basics of public safety and the conditions that must be met in laboratories	

Teaching and learning methods ((Theoretical lectures/practical lectures))	
Evaluation methods .((Oral exams / written exams / semester and final exams))	
C - emotional and value goals	
C-1	Carrying out his duties at the work site for professional motives.
Teaching methods ((Theoretical lectures/practical lectures))	
Evaluation methods .((Oral exams / written exams / semester and final exams))	

10. Curriculum structure

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	**2**	**Knowledge and Experimental application**	**-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 welded.**	**Theoretical l lecture**	**Tests and reports**
2	**2**	**Knowledge and Experimental application**	**Practical exercises: Welding opposite surfaces, perpendicular surfaces, inclined surfaces, circle welding, longitudinal and transverse cutting**	**Theoretical l lecture**	**Tests and reports**

3	**2**	**Knowledge and Experimental application**	**Welding equipment, practical training on using the electric arc to weld various surfaces, equipment used, electrodes and how to install them, practical training.**	**Power point, Lecture**	**Tests and reports**
4	**2**	**Knowledge and Experimental application**	**Gas welding and gas co2 cutting processes, equipment used and precautions to be taken Doing exercises on welding items using gas co2**	**Power point, Lecture**	**Tests and reports**
5	**2**	**Knowledge and Experimental application**	**Training in gas-shielded arc welding (Tig, Mig).**	**Power point, Lecture**	**Tests and reports**
6	**2**	**Knowledge and Experimental application**	**Assembly exercises using various cutting and welding processes.**	**Power point, Lecture**	**Tests and reports**
7	**2**	**Knowledge and Experimental application**	**-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.**	**Power point, Lecture**	**Tests and reports**
8	**2**	**Knowledge and Experimental application**	**Training on calculating the individual intersecting works, performing an exercise for two intersecting cylinders.**	**Power point, Lecture**	**Tests and reports**
9	**2**	**Knowledge and Experimental application**	**Singular cones and conic ellipses.**	**Power point, Lecture**	**Tests and reports**

10	2	Knowledge and Experimental application	-Lathing (6 weeks) The lathe, its specifications, uses, accessories, installation methods, operating the lathe, types of lathe pens using each of them.	Power point, Lecture	Tests and reports
11	2	Knowledge and Experimental application	Lathing operations: Plane lathe, tool, center work, simple step drill, use of measuring tools.	Power point, Lecture	Tests and reports
12	2	Knowledge and Experimental application	Mapping the external looting in different ways, explaining the laws for each method, and doing an exercise specifically for the external looting.	Power point, Lecture	Tests and reports
13	2	Knowledge and Experimental application	1- Working out the different teeth externally (the triangle). Doing an exercise that includes the triangle tooth 2- Make the tooth an outer square and make an exercise.	Power point, Lecture	Tests and reports
14	2	Knowledge and Experimental application	Cutting speeds, selecting them, and using their tables.	Power point, Lecture	Tests and reports
15	2	Knowledge and Experimental application	Implementing training on decentralized turning and using quadrilateral sampling.	Power point, Lecture	Tests and reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**Principles of Electronics (MDDI101)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and

		Homework Assignments
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	4 hours per week (60 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Introducing the basic scientific concepts related to engineering and harnessing them in the field of electronics and electricity
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	Qualifying the graduate scientifically in the field of electronics and electricity by introducing the basic scientific concepts related to engineering and harnessing them in this field and pushing students towards scientific research outside the framework of the academic curriculum	
B - The program's Marathi goals		
B-1	Ability to manage projects The ability to solve problems at the work site and solve crises in this field	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	Carrying out his duties at the work site for professional motives.	
Teaching methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		

10. Curriculum structure

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	Semiconductor theory - atomic structure - energy levels - crystals - conduction in crystals / gap current - how gaps move	Practical +Theoretical	Quizzes+ Reports
2	4	Acknowledgment and Practical application	Inoculation - P-type positive crystal - negative N-type crystal, electron current and gap current - total resistance.	Practical+ Theoretical	Quizzes+ Reports

3+4	4	Acknowledgment and Practical application	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.	Practical+ Theoretical	Quizzes+ Reports
5	4	Acknowledgment and Practical application	Binary as current-uniform half-wave-value-constant value and calculation-effective-output frequency	Practical +Theoretical	Quizzes+ Reports
6	4	Acknowledgment and Practical application	Full wave unification - using a mid-branch transformer - gantry uniform - calculation of continuous and effective values of voltages and currents - output frequency. Comparison between half-wave and full wave unification - a comparison between full wave units.	Practical+ Theoretical	Quizzes+ Reports
7	4	Acknowledgment and Practical application	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	Practical +Theoretical	Quizzes+ Reports
8+9	4	Acknowledgment and Practical application	Zener diode - structure - symbol - forward and reverse properties -	Practical Theoretical	Quizzes+ Reports
			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.		

10+11	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
12	4	Acknowledgment and Practical application	Transistor characteristic curves - Work areas - Icbo definition, Iceo - Current gain curve - Relationship between Ic, Icbo.	Practical+ Theoretical	Quizzes+ Reports
13	4	Acknowledgment and Practical application	Transistor bias - base bias - emitter bias circuits.	Practical +Theoretical	Quizzes+ Reports
14	4	Acknowledgment and Practical application	Collector bias, self-bias, feed- back bias, voltage divider bias, practical examples.	Practical Theoretical	Quizzes+ Reports
15	4	Acknowledgment and Practical application	Action points, sleep points, practical examples.	Practical Theoretical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute Adour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**DC Electrical circuits (MDDI100)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	4 hours per week (60 hours).
7	Date the description was prepared	**27/1/2025**
8	curriculum objectives	The student's ability to scientifically connect electrical circuits in the laboratory and identify errors
9	curriculum outcomes and teaching, learning and evaluation methods	

A - Cognitive objectives

A-1	Study the concept of electricity, electrical voltage, insulating materials, direct current, and how to connect an electrical circuit

B - The program's Marathi goals

B-1	The traditional method of giving a lecture .Using modern techniques in some topics (smart board - data show and using devices) Modern laboratory

Teaching and learning methods
((Theoretical lectures/practical lectures))

Evaluation methods
((Oral exams / written exams / semester and final exams))

C - emotional and value goals

C-1	The student's ability to scientifically connect electrical circuits in the laboratory Developing the student's ability to identify errors in connecting electrical circuits

Teaching methods
((Theoretical lectures/practical lectures))

Evaluation methods
.((Oral exams / written exams / semester and final exams))

10. Curriculum structure

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method

1	4	Acknowledgment and Practical application	Electric units system- Mathmatic 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	Practical+ Theoretical	Quizzes+ Reports
2	4	Acknowledgment and Practical application	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	Practical+ Theoretical	Quizzes+ Reports
3	4	Acknowledgment and Practical application	Applications on series, parallel, combined and star- delta connections	Practical+ Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	Kirchoff Laws- Kirchoff current and voltage laws with examples	Practical+ Theoretical	Quizzes+ Reports
5	4	Acknowledgment and Practical application	Maxwell's law with examples	Practical+ Theoretical	Quizzes+ Reports
6	4	Acknowledgment and Practical application	Definition of Thevenin's theorem- How to apply in dc current	Practical+ Theoretical	Quizzes+ Reports
7	4	Acknowledgment and Practical application	Definition of Norton's theorem- How to apply in dc current	Practical+ Theoretical	Quizzes+ Reports
8	4	Acknowledgment and Practical application	Examples on Thevinin's and Norton's theorems	Practical+ Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	Definition of Supper position theorem- application of it in dc current-examples- Max. power transfer theorem with examples	Practical+ Theoretical	Quizzes+ Reports

10	4	Acknowledgment and Practical application	AC quantities- definition of AC current characteristics – generation of AC current with waveform drawing- RMS value- Form factor – examples	Practical+ Theoretical	Quizzes+ Report s
11	4	Acknowledgment and Practical application	Vector of AC quantities- definition of it – Phasor representation of its- phase angle- resultant of vector AC add., Subt., multiply, division with examples	Practical+ Theoretical	Quizzes+ Reports
12	4	Acknowledgment and Practical application	Effect of AC current on only resistance circuit-only inductance circuit- only capacitor circuit- phase angle between voltage and current with examples	Practical+ Theoretical	Quizzes+ Reports
13	4	Acknowledgment and Practical application	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	Practical+ Theoretical	Quizzes+ Reports
14	4	Acknowledgment and Practical application	Effect of AC current on resistance and inductance in parallel circuit-resistance and capacitor in series- resistance and inductance and	Practical+ Theoretical	Quizzes+ Reports
			capacitor in series- phase angle- total impedance with examples		
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	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge

*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute Adour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**Principles of digital circuits (MDDI102)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	4 hours per week (60 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Teaching the student the basics of the binary system and building logical and digital circuits
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	Building logical and digital circuits and teaching the student the basics of the binary system	
B - The program's Marathi goals		
B-1	The traditional method of giving a lecture .Using modern techniques in some topics (smart board - data show and using devices) Modern laboratory	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	Developing industrial reality Diagnosing and treating defects	

Teaching methods ((Theoretical lectures/practical lectures))
Evaluation methods ((Oral exams / written exams / semester and final exams))

10. Curriculum structure

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	A general idea of numerical systems (types and details)	Practical +Theoretical	Quizzes+ Reports
2	4	Acknowledgment and Practical application	Transfers between the numerical systems	Practical +Theoretical	Quizzes+ Reports
3	4	Acknowledgment and Practical application	Logic gates (types, working principle, truth tables, logical symbol)	Practical +Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	How to connect the logic gates to form logic circuits.	Practical +Theoretical	Quizzes+ Reports
5	4	Acknowledgment and Practical application	Boolean algebra and the rule of de-Morgan	Practical +Theoretical	Quizzes+ Reports
6	4	Acknowledgment and Practical application	Simplification of logical equations using Boolean algebra and the laws of De Morgan's laws.	Practical +Theoretical	Quizzes+ Reports
7	4	Acknowledgment and Practical application	The design of the logical gates using NOR and NAND circuits,	Practical +Theoretical	Quizzes+ Reports
8	4	Acknowledgment and Practical application	Ways of writing the equation from truth table (POS, SOP).	Practical +Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	Karnaugh Map (for two variables, the three variables, the four variables)	Practical +Theoretical	Quizzes+ Reports
10	4	Acknowledgment and Practical application	Simplification of logical equations using Karnaugh Map	Practical +Theoretical	Quizzes+ Reports
11	4	Acknowledgment and Practical application	Calculations in the binary system (addition, subtraction, subtraction using complements).	Practical +Theoretical	Quizzes+ 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	Binary subtractor circuits (half subtractor ,full Subtractor parallel	Practical +Theoretical	Quizzes+ Reports
		application	subtractor) circuit using the adder circuit by method of 1s complements.		
14	4	Acknowledgment and Practical application	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	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute Adour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**Electronic workshop (MDDI106)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).

7	Date the description was prepared	27/1/2025
8	curriculum objectives	Identifying and dealing with electronic boards and giving the student experience and proficiency in working with them
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	Identifying and dealing with electronic boards and giving the student experience and proficiency in working with them	
B - The program's Marathi goals		
B-1	Ability to manage projects Ability to solve problems on the job site in this field	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	Carry out duties on the job site fairly and with a professional motive	
Teaching methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		

10. Curriculum structure

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	2	Acknowledgment and Practical application	How to use the different measuring devices in the workshop such as (Avometer, oscilloscope, power .supply, ...)	practical	Quizzes+ Reports
2	2	Acknowledgment and Practical application	How to use caustics - Types of irons used in the workshop - Training in caustic .welding	practical	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	practical	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	practical	Quizzes+ 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	practical	Quizzes+ Reports
6	2	Acknowledgment and Practical	Make a circuit to connect the resistors in series /	practical	Quizzes+ Reports
		application	Make a circuit to connect the resistors in parallel Make a circuit to connect the resistors in series and parallel within the circuit		

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	practical	Quizzes+ Reports
8	2	Acknowledgment and Practical application	The different types of switches used in electronic devices and their inspection methods - the current that each switch carries - the use of .each type Types of fuses used in electronic circuits - Types and diameters of wires used in fuses - Current that each type carries - How to repair .fuses	practical	Quizzes+ Reports
9	2	Acknowledgment and Practical application	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	practical	Quizzes+ Reports
10	2	Acknowledgment and Practical application	The different types of semiconductors (diode, transistor, etc.) in terms of how they are	practical	Quizzes+ Reports
			manufactured, the materials used in their manufacture, the methods of numbering them and finding their .equivalents		

11	2	Acknowledgment and Practical application	Checking semiconductors (diode, transistor, etc.) that are idle and valid for a .group of them	practical	Quizzes+ Reports
12	2	Acknowledgment and Practical application	Integrated Circuits - Identifying the numbering of the terminals for several types of these circuits - How to manufacture these circuits - The components involved .in manufacturing	practical	Quizzes+ Reports
13	2	Acknowledgment and Practical application	A scientific film about how electronic components are made (resistors, capacitors, .transistors, ... etc)	practical	Quizzes+ Reports
14	2	Acknowledgment and Practical application	How to read electronic maps and follow circuits to determine the location of the malfunction and its .causes	practical	Quizzes+ Reports
15	2	Acknowledgment and Practical application	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)	practical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan

-Creating appropriate curricula with the labor market
-Holding scientific seminars and conferences aimed at updating school curricula
-Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**Engineering Drawing (MDDI110)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Curriculum First trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Introducing the student to using the AutoCAD system with applications in his field of specialization
9	curriculum outcomes and teaching, learning and evaluation methods	
	A - Cognitive objectives	
A-1	The student's knowledge of the basic principles of drawing and increasing his ability to understand dimensions and measurements and the ability to analyze shapes	
	B - The program's Marathi goals	
B-1	Developing industrial reality through advanced engineering programs	
B-2	The ability to contain the crisis at the work site, address it quickly, and work in a team spirit	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods ((Oral exams / written exams / semester and final exams))		
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
Teaching methods ((Theoretical lectures/practical lectures))		
Evaluation methods ((Oral exams / written exams / semester and final exams))		

10. Curriculum structure

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	2	Acknowledgment and Practical application	Drawing Engineering and industrial drawing - Drawing tools and their use in drawing Vertical static image - Drawing dimensions - Drawing data table - Image, line and surface definitions.	practical	Quizzes+ Reports
2	2	Acknowledgment and Practical application	Drawing line types: straight line, hidden line, center line, cutting line, cutting line for small parts, cutting line for large parts, cutting plane line, dimension line and extension line (painting drawing).	practical	Quizzes+ Reports
3	2	Acknowledgment and Practical application	Another painting on lines includes a group of simple geometric shapes and contains a group of lines.	practical	Quizzes+ Reports
4	2	Acknowledgment and Practical application	Explanation of electrical and electronic symbols	practical	Quizzes+ Reports
5	2	Acknowledgment and Practical application	Drawing of electrical and electronic symbols panel	practical	Quizzes+ Reports
6	2	Acknowledgment and Practical application	Writing Latin letters and numbers - a board that includes writing numbers and letters in a vertical and then tilted angle at 575 in the size of four mm to ten mm.	practical	Quizzes+ Reports
7	2	Acknowledgment and Practical application	Continuation of the previous painting	practical	Quizzes+ Reports

8	2	Acknowledgment and Practical application	How to distribute and install measuring devices (ammeter - voltmeter - wattmeter), protective devices (separators - fuses - cutting devices - circuit breakers - switches).	practical	Quizzes+ Reports
9	2	Acknowledgment and Practical application	Geometric operations include: 1 - dividing a straight line in equal and unequal proportions 2 -	practical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**Electronics (MDDI108)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Curriculum Second trimester (15 weeks)\ First Level.
6	Number of study hours (total)	4 hours per week (60 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Introducing the basic scientific concepts related to the field of electronics and electricity and harnessing them in this field
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	Qualifying the graduate scientifically in the field of electronics and electricity by introducing the basic scientific concepts related to engineering and harnessing them in this field and pushing students towards scientific research outside the framework of the academic curriculum	
B - The program's Marathi goals		
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site and solve crises in this field	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	Carrying out his duties at the work site for professional reasons	
Teaching methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		

10. Curriculum structure					
Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	Transistor continuous equivalent circuit-constant load line-.	Practical +Theoretical	Quizzes+ Reports
2+3	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	The use of the transistor in voltage regulation - series regulator - parallel regulator - DC voltage source circuit.	Practical +Theoretical	Quizzes+ Reports
5+6	4	Acknowledgment and Practical application	Field Effect Transistor - Structure - Curved MOSFET - E-MOSFETD-MOSFET - Wicker Curve - Tight Strength Curves Vgs, Idss, Vp - Comparison of BJT, JFET- theoretical Work	Practical +Theoretical	Quizzes+ Reports
7+8	4	Acknowledgment and Practical application	FET Biasing Circuits - Constant Current Source Biasing - Action Point - Self Biasing - FET Equivalent Circuit - Using FET in Small Signal Amplification - Comparison of FET Types - (MOSFET, FET) (BJT)	Practical +Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	Light Dependent Resistor - Light Emitting Diode - Photodiode - Phototransistor - Seven Pieces Board - Structure and Applications.	Practical +Theoretical	Quizzes+ Reports

10+13	4	Acknowledgment and Practical application	Current-controlled silicon modulators (thyristors) - structure and types - properties - theoretical work - triac - dayac - their symbol - properties - theoretical work - comparison between thyristors, dyacs and triacs - protection of thyristors (from voltage change, from changing current).	Practical +Theoretical	Quizzes+ Reports
14	4	Acknowledgment and Practical application	Operations amplifier 741 - its symbol - its connection terminals - its uses	Practical +Theoretical	Quizzes+ Reports
15	4	Acknowledgment and Practical application	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	Practical +Theoretical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**AC electrical circuits (MDDI107)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Curriculum Second trimester (15 weeks)\ First Level.
6	Number of study hours (total)	4 hours per week (60 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	The student's ability to connect electrical circuits scientifically in the laboratory and identify errors in connecting electrical circuits
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	Study the concept of electricity, electrical voltage, insulating materials, direct current, and how to connect an electrical circuit	
B - The program's Marathi goals		
B-1	The traditional method of giving a lecture	
B-2	Using modern techniques in some topics (smart board - data show) and using devices Modern laboratory	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	The student's ability to scientifically connect electrical circuits in the laboratory	
C-2	Developing the student's ability to identify errors in connecting electrical circuits	
Teaching methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		

10. Curriculum structure

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	Series and Parallel resonance circuits- calculation of voltage, current, impedance, phase angle and frequency at resonance with examples	Practical +Theoretical	Quizzes+ Reports
2	4	Acknowledgment and Practical application	Applications of Thevenin's, Norton's and supper position theorems with examples	Practical +Theoretical	Quizzes+ Reports
3	4	Acknowledgment and Practical application	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	Practical +Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	Apparent power- power triangle drawing- power factor correction	Practical +Theoretical	Quizzes+ Reports
5	4	Acknowledgment and Practical application	Max. power transfer in AC circuits- with examples	Practical +Theoretical	Quizzes+ Reports
6	4	Acknowledgment and Practical application	Networks analysis using Nodal analysis- number of nodal equations	Practical +Theoretical	Quizzes+ Reports

7	4	Acknowledgment and Practical application	Examples on Networks analysis using Nodal analysis	Practical +Theoretical	Quizzes+ Reports
8	4	Acknowledgment and Practical application	AC three phase circuits- generation of 1-phase, 2-phase and three phase current- star delta connection- phase power-line power- total power-examples	Practical +Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	Examples on AC three phase circuits with star delta connections	Practical +Theoretical	Quizzes+ Reports
10	4	Acknowledgment and Practical application	Methods of power measurement for three phase loads- wattmeter- two wattmeter-three wattmeter	Practical +Theoretical	Quizzes+ Reports
11	4	Acknowledgment and Practical application	Transient cases in circuits- DC transient – RL-RC-RLC transient	Practical +Theoretical	Quizzes+ Reports
12	4	Acknowledgment and Practical application	Transient AC currents– Sinusoidal Transient currents in RL-RC-RLC circuits	Practical +Theoretical	Quizzes+ Reports
13	4	Acknowledgment and Practical application	Self induction of coil- equation of self induction- mutual induction between two coils: Progressive-Series connection Reverse-Series connection	Practical +Theoretical	Quizzes+ Reports

14	4	Acknowledgment and Practical application	Transformers- structure- drawing- characteristics- its operation and relationships- types of its- examples	Practical +Theoretical	Quizzes+ Reports
15	4	Acknowledgment and Practical application	Curves of current in induction circuit- current drawing and calculation of time constant-charge, discharge the capacitors- time constant effect- examples.	Practical +Theoretical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet
12	Curriculum development plan	
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization		

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**Digital circuits applications (MDDI109)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Curriculum Second trimester (15 weeks)\ First Level.
6	Number of study hours (total)	4 hours per week (60 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Building logical and digital circuits and teaching the student the basics of the binary system

9	curriculum outcomes and teaching, learning and evaluation methods
A - Cognitive objectives	
A-1	Building logical and digital circuits and teaching the student the basics of the binary system
B - The program's Marathi goals	
B-1	The traditional method of giving a lecture
B-2	Using modern techniques in some topics (smart board - data show) and using devices Modern laboratory
Teaching and learning methods))Theoretical lectures/practical lectures((	
Evaluation methods .))Oral exams / written exams / semester and final exams((	
C - emotional and value goals	
C-1	Developing industrial reality
C-2	Diagnosing and treating defects
Teaching methods ((Theoretical lectures/practical lectures))	
Evaluation methods ((Oral exams / written exams / semester and final exams))	

10. curriculum structure					
Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	The circuit of encoder size of 4:2, 8:3 and 10:4	Practical +Theoretical	Quizzes+ Reports
2	4	Acknowledgment and Practical application	Introduction to sequential logic circuits, a general idea of the Flip Flop, flip flop type (S-R).	Practical +Theoretical	Quizzes+ Reports
3	4	Acknowledgment and Practical application	The flip flop type J- K and master slave flip flop	Practical +Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	The D- flip flop and T flip flop	Practical +Theoretical	Quizzes+ Reports
5	4	Acknowledgment and Practical application	The registers, design of registers, enter the information and output from registers	Practical +Theoretical	Quizzes+ Reports

6	4	Acknowledgment and Practical application	The shift register, shift to left, shift to right	Practical +Theoretical	Quizzes+ Reports
7	4	Acknowledgment and Practical application	The counter-asynchronous counter	Practical +Theoretical	Quizzes+ Reports
8	4	Acknowledgment and Practical application	The synchronous counter-the cycle counter	Practical +Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	The multiplexer and its applications	Practical +Theoretical	Quizzes+ Reports
10	4	Acknowledgment and Practical application	The code convertor – the application of code convertor	Practical +Theoretical	Quizzes+ Reports
11	4	Acknowledgment and Practical application	Programmable logic array: Concepts of programmable logic array(PLA); Concepts of programmable array logic(PAL)	Practical +Theoretical	Quizzes+ Reports

12	4	Acknowledgment and Practical application	Buffers, Non inverting buffers, inverting buffers, Tri-state buffers, transmission gates	Practical +Theoretical	Quizzes+ Reports
13	4	Acknowledgment and Practical	Introduction to Sequential logic	Practical +Theoretical	Quizzes+ Reports

		application	latches and flip flops, Latches-Edge triggered flip flop, Flip-flop operating characteristics, Flip-flop applications		
14	4	Acknowledgment and Practical application	Introduction To State Machine Design,	Practical +Theoretical	Quizzes+ Reports
15	4	Acknowledgment and Practical application	State diagram and State table	Practical +Theoretical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.

*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	**Electrical Drawing (MDDI105)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Second trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Introducing the student to how to draw electrical drawings using the AutoCAD system and benefiting from other applications in this field
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	The student's knowledge of the basic principles of drawing electrical circuits and increasing his ability to understand dimensions and measurements and the ability to analyze shapes	
B - The program's Marathi goals		
B-1	Developing industrial reality through advanced engineering programs	
B-2	The ability to contain the crisis at the work site, address it quickly, and work in a team spirit	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	Carry out duties on the job site fairly and with a professional motive	

Teaching methods ((Theoretical lectures/practical lectures))
Evaluation methods .((Oral exams / written exams / semester and final exams))

10. Curriculum structure					
Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment 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.	practical	Quizzes+ Reports
2	2	Acknowledgment and Practical applicati	Drawing complex perspective that contains cylindrical shapes or cavities -	practical	Quizzes+ Reports

		on	drawing a painting that includes two perspectives with writing the dimensions in a geometric way.		
3	2	Acknowledgment and Practical application	Supplement the previous topic with a panel drawing.	practical	Quizzes+ Reports
4	2	Acknowledgment and Practical application	Drawing of an electronic circuit board containing gates Gates.	practical	Quizzes+ Reports
5	2	Acknowledgment and Practical application	Drawing of an electronic circuit board containing integrated circuits	practical	Quizzes+ Reports
6	2	Acknowledgment and	Drawing of an electronic	practical	Quizzes+ Reports

		Practical application	circuit board containing gates and integrated circuits		
7	2	Acknowledgment and Practical application	Applications for drawing projections from different perspectives.	practical	Quizzes+ Reports
8	2	Acknowledgment and Practical application	Draw perspective from the three projections	practical	Quizzes+ Reports
9	2	Acknowledgment and Practical application	Cutting in objects, angle of cutting - cutting lines (marking). Definition of unbroken parts (focusing on complete cutting only).	practical	Quizzes+ Reports
			Panel that includes projections after cutting.		
10	2	Acknowledgment and	Drawing board to	practical	Quizzes+ Reports

		Practical application	control the speed of a three-phase motor		
11	2	Acknowledgment and Practical application	How to read a map or a set of maps for electrical circuits.	practical	Quizzes+ Reports
12	2	Acknowledgment and Practical application	Electrocardiogram applications on an electronic calculator.	practical	Quizzes+ Reports
13	2	Acknowledgment and Practical application	Using the Auto CAD system.	practical	Quizzes+ Reports
14+15	2	Acknowledgment and Practical application	Use of the orcad system.	practical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques

3	Curriculum name and code	**Electrical workshop (MDDI104)**
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments Mandatory
5	Semester/year	Curriculum Second trimester (15 weeks)\ First Level.
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Identifying and dealing with electronic boards and providing students with experience and proficiency in working with them
9	curriculum outcomes and teaching, learning and evaluation methods	
A - Cognitive objectives		
A-1	Identifying and dealing with electronic boards and giving the student experience and proficiency in working with them	
B - The program's Marathi goals		
B-1	Ability to manage projects	
B-2	Ability to solve problems on the job site in this field	
Teaching and learning methods ((Theoretical lectures/practical lectures))		
Evaluation methods .((Oral exams / written exams / semester and final exams))		
C - emotional and value goals		
C-1	Carry out duties on the job site fairly and with a professional motive	
Teaching methods ((Theoretical lectures/practical lectures))		
Evaluation methods ((Oral exams / written exams / semester and final exams))		

10. Curriculum structure

Electrical Workshops First level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	2	Acknowledgment and Practical application	Repetition of previous work by the student designing a more .complex circuit	practical	Quizzes+ Reports

2	2	Acknowledgment and Practical application	Faulty semiconductor-transistor and diode check for a combination .of them	practical	Quizzes+ Reports
3	2	Acknowledgment and Practical application	A field visit to one of the industrial establishments in the .socialist sector	practical	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	practical	Quizzes+ 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	practical	Quizzes+ Reports
6	2	Acknowledgment and Practical application	Building a full wave circuit on the printed board and knowing how .to inspect and test it	practical	Quizzes+ Reports
7	2	Acknowledgment and Practical application	Building a full wave voltage multiplier circuit on the printed board and knowing how to .inspect and test it	practical	Quizzes+ Reports
8	2	Acknowledgment and Practical application	Building the clippers circuit on the printed board and identifying .how to check and test it	practical	Quizzes+ Reports
9	2	Acknowledgment and Practical application	Using the Zener Diode as a voltage regulator circuit on the printed board and learning how .to check and test it	practical	Quizzes+ Reports
10	2	Acknowledgment and Practical application	Building a transistor amplifier circuit on a printed board and knowing how to check and test it (build a practical common .emitter amplifier circuit	practical	Quizzes+ Reports

11	2	Acknowledgment and Practical application	Building a two-stage amplifier circuit on the printed board and knowing how to inspect .and test it	practical	Quizzes+ Reports
12	2	Acknowledgment and Practical application	Building a push-pull amplifier circuit on the printed board and knowing how to check .and test it	practical	Quizzes+ Reports
13	2	Acknowledgment and Practical application	Building a RC Oscillator circuit on printed board and knowing how to .inspect and test it	practical	Quizzes+ Reports
14	2	Acknowledgment and Practical application	Building a Hartley circuit on a flip chart and learning how to inspect .and test it	practical	Quizzes+ Reports
15	2	Acknowledgment and Practical application	Build a variable DC voltage supply circuit on the printed board and learn how to check and .test it	practical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
-Creating appropriate curricula with the labor market -Holding scientific seminars and conferences aimed at updating school curricula -Follow up on scientific developments in the field of specialization	
1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	English language (NTU 200)
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments

5	Semester/year	Second trimester (15 weeks)\Second Level
6	Number of study hours (total)	2 hours per week (30 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Teaching the student how to use English grammar in conversation
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Identify tenses in English grammar.	
A-2	Identifying interrogative tools in the English language.	
	B - The program's Marathi goals	
B-1	.Ability to converse in English	
	Teaching and learning methods ((Theoretical lectures/discussions))	

Curriculum structure - English language - second level

	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))
	C - emotional and value goals
C-1	Intellectual questions
	Teaching methods ((Theoretical lectures / practical lectures))
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))

Week	Time (H.)	Required Learning Outcomes	Topic Name	Education Method	Evaluation Method
1	2	Questions words	Unit one :getting to know you tenses Questions words	Theoretical + practical	Daily tests
2	2	Present simple	Unit two :the way we live Present tenses Present simple Present continuous Have /have got	Theoretical + practical	Daily tests
3	2	Past simple	Unit three: it all went wrong Past tenses Past simple Past Continuous	Theoretical + practical	Daily tests
4	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 + practical	Daily tests
5	2	do Past tenses	Init five ,wtat ao You want to do Past tenses Verb patterns'\ Future intentions Going to and will	Theoretical + practical	Daily tests
6	2	comparative and superlative Adjectives	Unit six: tell me! What's it like? What's it Iike? comparative and superlative Adjectives	Theoretical + practical	Daily tests
7	2	For and since Tense revision	Unit seven :fame Present Perfect and For and since Tense revision	Theoretical + practical	Daily tests
8	2	do's and don'ts	Fn'rt eight: do's and don'ts Have(got) to Shou ld must	Theoretical + practical	Daily tests
9	2	what if ?	Unit nine: going Places Time and conditional clauses what if ?	Theoretical + practical	Daily tests
10	2	Verbs Patterns infinitives	Unit ten: scared to death Verbs Patterns infinitives What ,etc.+in fin itive Something,etc.+infinitive	Theoretical + practical	Daily tests
11	2	world passives	Unit eleven: Things that changed the world passives	Theoretical + practical	Daily tests

12	2	conditional might	Git t*utr" :dreams and realitY Second conditional Might	Theoretical + practical	Daily tests
13	2	Present Perfect continuous	tlnit thitt""n ;c i,.ltll :earning a living Present Perfect continuous Present Perfect simple versus Continuous	Theoretical + practical	Daily tests
14	2	perfect and past perfect and clarification	Unit fourteen: family ties Present perfect and past perfect and clarification Reported statements	Theoretical + practical	Daily tests
15	2		Unit fifteen : revision	Theoretical + practical	Daily tests

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	Computer (NTU 201)
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Second trimester (15 weeks)\Second Level

6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	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	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Teaching the student to recognize work applications on the calculator and use their applications within the specialization	
	B - The program's Marathi goals	
B-1	Teaching the student the skills of working on a calculator and using its ready-made applications and Internet principles	
	Teaching and learning methods))Theoretical lectures/discussions((	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	Carrying out his duties at the work site using a computer	
	Teaching methods .((Theoretical lectures/discussions))	
	Evaluation methods • ((Adequate explanation of the course • / Daily Tests / Student groups / student cumulative record))	

Course Structure computer 2nd level					
Week	Hours	Subject	Learning method	Attendance Forms	Evaluation method
First	1	Introduction to artificial	Explanation of the lecture with the presence of means	Classroom	**Exams**

		intelligence	of illustration and practical application		
Second	1	History of artificial intelligence	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Third	1	Artificial intelligence techniques and methods	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Fourth	1	Challenges and ethical considerations in artificial intelligence	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Fifth	1	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	Classroom	**Exams**
Sixth	1	Applications of artificial intelligence in education, health, finance, transport and marketing	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Seventh	1	The impact of artificial intelligence on society	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**

Eighth	1	Artificial intelligence and international relations	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Ninth	1	Artificial intelligence and the future of humanity.	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Tenth	1	Ethics of artificial intelligence	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Eleventh	1	Artificial intelligence, privacy and surveillance	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Twelfth	1	Future directions in artificial intelligence	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Thirteenth	1	Modern research and emerging techniques in the field of artificial intelligence	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
Fourteenth	1	Future outlook	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**

Fifteenth	1	The role of intelligence in smartphones	Explanation of the lecture with the presence of means of illustration and practical application	Classroom	**Exams**
1.				Course Evaluation	
Daily, monthly, and final exams as well as weekly reports					
2.				Learning and Teaching Resources	

11	Infrastructure

Textbooks
Main references
Scientific resources within the Internet

11	**Infrastructure**	
*	**The required textbooks**	**are available in the department and the institute library free of charge**
*	**The main references (main)**	**are available in the free section and the institute library.**
*	**electronic references, websites**	**The Internet**

*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	Curriculum name and code	Arabic Language (NTU 202)
4	Available attendance forms	Weekly Course Schedules (Theory and Laboratory), Discussions, Seminars, and Homework Assignments
5	Semester/year	Second trimester (15 weeks)\Second Level
6	Number of study hours (total)	2 hours per week (30 hours).
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Advanced use of computer applications in the field of specialization
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Teaching the student to recognize work applications on the calculator and use their applications within the specialization	
	B - The program's Marathi goals	
B-1	Teaching the student the skills of working on a calculator and using its ready-made applications and Internet principles	
	Teaching and learning methods))Theoretical lectures/discussions((	

Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
C - emotional and value goals	
C-1	Carrying out his duties at the work site using a computer
Teaching methods C- 2 .((Theoretical lectures/discussions))	
Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Week	Time (H.)	Required Learning Outcomes	Topic Name	Education Method	Evaluation Method
1	2	The subject and the predicate	The subject and the predicate	Theoretical + practical	Daily tests
2	2	The verb, the subject and the object	The verb, the subject and the object	Theoretical + practical	Daily tests
3	2	Intransitive and transitive verb	Intransitive and transitive verb	Theoretical + practical	Daily tests
4	2	Pronouns	Pronouns	Theoretical + practical	Daily tests
5	2	Parsing marks	Original and secondary grammatical signs	Theoretical + practical	Daily tests
6	2	The five actions	The five actions	Theoretical + practical	Daily tests
7	2	Conjunctions	Conjunctions and their meanings	Theoretical + practical	Daily tests
8 9	2	The hamza	The connecting and severing link	Theoretical + practical	Daily tests

10	**2**	Extra characters	Extra characters	Theoretical + practical	Daily tests
11	**2**	Nun and Tanween	Nun and Tanween	Theoretical + practical	Daily tests
12 13	**2**	Administrative discourse	Administrative discourse	Theoretical + practical	Daily tests
14 15	**2**	The most common linguistic errors	The most common linguistic errors in official books	Theoretical + practical	Daily tests

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	The crimes of the Baath regime in Iraq (NTU 203)
4	Available attendance forms	Weekly Course Schedules Mandatory
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	2 hours per week (30 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Identifying the crimes of the Baath regime according to the Iraqi Supreme Criminal Court Law of 2005.

9	curriculum outcomes and teaching, learning and evaluation methods
A-Cognitive objectives	
A-1	Knowledge of crimes and their types.
A-2	Identifying all types of Baath crimes.
A-3	Identify the types of crimes
B - The program's Marathi goals	
B-1	The student makes a judgment on the previous system by reviewing its history.
B-2	The student has sufficient insight into what happened during the previous period of rule.
Teaching and learning methods ((Theoretical lectures/discussions))	
Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
C - emotional and value goals	
C-1	.Intellectual questions
Teaching methods ((Theoretical lectures / practical lectures))	
Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Week	Time (H.)	Required Learning Outcomes	Topic Name	Education Method	Evaluation Method
1	2	The concept of crimes and their types	The concept of crimes and their types	Theoretical lectures + presentation on smart screens	Daily tests
2	2	Definition of crime	Definition of crime	Theoretical lectures + presentation on smart screens	Daily tests
3	2	Crime departments	Crime sections, Baath crimes	Theoretical lectures + presentation on smart screens	Daily tests

4	2	Types of international crimes	Types of international crimes: Decisions issued by the Supreme Criminal Court	Theoretical lectures + presentation on smart screens	Daily tests
5	2	Psychological and social crimes	Psychological and social crimes and their effects	Theoretical lectures + presentation on smart screens	Daily tests
6	2	Mechanisms of psychological crimes	Psychological crimes, mechanisms of psychological crimes, effects of psychological crimes	Theoretical lectures + presentation on smart screens	Daily tests
7	2	Social crimes	Social crimes, militarization of society. The Baathist regime is successful in religion	Theoretical lectures + presentation on smart screens	Daily tests
8	2	Violations of Iraqi laws	Violations of Iraqi laws. Pictures of human rights violations and crimes of power	Theoretical lectures + presentation on smart screens	Daily tests
9	2	Intra-criminal crimes	Environmental crimes of the Baath regime in Iraq	Theoretical lectures + presentation on smart screens	Daily tests
10	2	Military pollution	Military and radioactive contamination and mine explosions	Theoretical lectures + presentation on smart screens	Daily tests
11	2	Destruction of cities and villages	Destruction of cities and villages	Theoretical lectures + presentation on smart screens	Daily tests
12	2	Drying the marshes	Drying the marshes.	Theoretical lectures + presentation on smart screens	Daily tests
13	2	Destroying orchards and palm trees	Destroying orchards and palm trees	Theoretical lectures + presentation on smart screens	Daily tests

14	2	Jaam mass graves	Mass grave crimes. The cemeteries of the genocide committed by the Baathist regime in Iraq	Theoretical lectures + presentation on smart screens	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	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	Professional Ethics (NTU 204)
4	Available attendance forms	Weekly Course Schedules
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	2 hours per week (30 hours)
7	Date the description was prepared	27/1/2025
8	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	curriculum outcomes and teaching, learning and evaluation methods
	A- Cognitive objectives
A-1	Knowing the concept of morality and its origin.
A-2	Work behaviors.
	B - The program's Marathi goals
B-1	Professional ethics
	Teaching and learning methods ((Theoretical lectures/discussions))
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))
	C - emotional and value goals
C-1	.Intellectual questions
	Teaching methods ((Theoretical lectures / practical lectures))
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))

10. Curriculum structure

Week	Time (H.)	Required Learning Outcomes	Topic Name	Education Method	Evaluation Method
1 2	**2**	Moral	Unit (1) – Ethics	Theoretical + practical	Daily tests
3	**2**	Work and profession	The concept of ethics and its origin.	Theoretical + practical	Daily tests
4	**2**	Professional ethics	General rules of ethics.	Theoretical + practical	Daily tests
5 6	**2**	Values and professional ethics	Sources of ethics.	Theoretical + practical	Daily tests

7 **8**	**2**	Unethical behavior in the profession	Unit (5) - Patterns of unethical behavior in the profession Administrative corruption. o Unethical administrative behavior. o Definition of administrative corruption. o Types of administrative corruption.	Theoretical + practical	Daily tests
9 **10**	**2**	Means and methods of consolidating the values of professional ethics	The importance of ethics for the individual and society.	Theoretical + practical	Daily tests
11 **12** **13** **14** **15**	**2**	Professional ethics	Unit (2) – Work and profession	Theoretical + practical	Daily tests

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques

3	curriculum name and code	**Electronic Circuit (1) (MDDI201)**
4	Available attendance forms	Weekly Course Schedules THEORETICAL and practical
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	4 hours per week (60 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	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	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Building practical electronic circuits and studying their properties and applications	
A-2	Developing the student's ability to identify errors in connecting electronic circuits	
	B - The program's Marathi goals	
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods ((Theoretical lectures/discussions))	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods ((Theoretical lectures / practical lectures))	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure	
Electronic Circuits(1)	Second Level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1+3	4	Acknowledgment and Practical application	Class A power amplifiers Class B power amplifiers Class C . power amplifiers	Practical+ Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	Power supplies	Practical+ Theoretical	Quizzes+ Reports
5	4	Acknowledgment and Practical application	Voltage regulators using variable resistance, Zener diode, series and parallel transistor, Darlington	Practical+ Theoretical	Quizzes+ Reports
6	4	Acknowledgment and Practical application	thyristor firing methods thyristor switching methods gate circuit (AC), (DC), pulses, applications of silicon modules	Practical+ Theoretical	Quizzes+ Reports
7+8	4	Acknowledgment and Practical application	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 -	Practical+ Theoretical	Quizzes+ Reports

			Couples oscillator - phase shift oscillator)		
9+11	4	Acknowledgment and Practical application	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.	Practical+ Theoretical	Quizzes+ Reports
12+13	4	Acknowledgment and Practical application	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 of	Practical+ Theoretical	Quizzes+ Reports

14+15	4	Acknowledgment and Practical application	Inverter collector circuit and output equation - non-inverter collector circuit and output equation - arithmetic examples.	Practical+ Theoretical	Quizzes+ Reports

11	Infrastructure	
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*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Microcomputer (1) (MDDI202)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	4 hours per week (60 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Training the student to use microcomputer keys and write and implement programs in machine language
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	

A-1	Training the student to use microcomputer keys and write and implement programs in machine language
A-2	
B - The program's Marathi goals	
B-1	Ability to manage projects
B-2	The ability to solve problems at the work site that are necessary in this field
Teaching and learning methods ((Theoretical lectures/discussions))	
Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive
Teaching methods ((Theoretical lectures / practical lectures))	
Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Microcomputers (1) Second Level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method

1	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
2	4	Acknowledgment and Practical application	Introducing microcomputers, their types, and their relationship to other electronic computers.	Practical +Theoretical	Quizzes+ Reports
3	4	Acknowledgment and Practical application	Definitions of microcomputer terms: bit-byte- nibble-word-instruction- program-software- structures-high- level languages-low-level languages-assembly language-machine language.	Practical +Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	Microcomputer architecture - block diagram - input unit - keyboard - mouse - two types of mouse and comparison between them - input port	Practical +Theoretical	Quizzes+ Reports
5	4	Acknowledgment and Practical application	The transmission system - the data carrier - the address carrier - the lines of control and control - the benefit of each - a	Practical +Theoretical	Quizzes+ Reports

			comparison between them.		
6	4	Acknowledgment and Practical application	Output unit - screen - the difference between computer screen and TV screen - output port.	Practical +Theoretical	Quizzes+ Reports
7	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
8	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports

10	4	Acknowledgment and Practical application	Z-80 Microprocessor Notification and Comparison with 8085 Microprocessor Notification - Mathematical Example - PC Program Counter -	Practical +Theoretical	Quizzes+ Reports
			SP Stack Indicator - Instruction Log - Command Decoder - Control Unit		
11	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
12	4	Acknowledgment and Practical application	Directions of the data transfer group and its types - solving examples - writing an application program.	Practical +Theoretical	Quizzes+ Reports
13	4	Acknowledgment and Practical application	The input and output instructions and their relationship to the data transmission group instructions - practical examples.	Practical +Theoretical	Quizzes+ Reports
14	4	Acknowledgment and Practical application	A set of arithmetic instructions and their types - practical examples - their use in enlarging the digital signal with an applied example.	Practical +Theoretical	Quizzes+ Reports

15	4	Acknowledg ment and Practical application	The set of logical instructions and their types - practical examples - and their use in solving digital circuits	Practical +Theoret ical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Measurements Devices (1) (MDDI200)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	4 hours per week (60 hours)
7	Date the description was prepared	27/1/2025

8	curriculum objectives	Study the types of devices used for continuous and alternating electrical measurements and solve problems at the work site
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Interested in studying the types of devices used for continuous and alternating electrical measurements	
A-2		
	B - The program's Marathi goals	
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods ((Theoretical lectures/discussions))	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods ((Theoretical lectures / practical lectures))	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Measurements Devices (1) Second Level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	Familiarity with laboratory equipment	Practical+ Theoretical	Quizzes+ Reports
2	4	Acknowledgment and Practical application	errors in measurements	Practical+ Theoretical	Quizzes+ Reports

3	4	Acknowledgment and Practical application	Galvanometer sensitivity measurement	Practical+ Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	Measurement of the internal resistance of the moving coil galvanometer by the voltage divider method	Practical+ Theoretical	Quizzes+ Reports
5	4	Acknowledgment and Practical application	Measurement of the internal resistance of the moving coil galvanometer by the mid- scaling method	Practical+ Theoretical	Quizzes+ Reports
6	4	Acknowledgment and Practical application	series ohmmeter	Practical+ Theoretical	Quizzes+ Reports
7	4	Acknowledgment and Practical application	Ohmmeter parallel	Practical+ Theoretical	Quizzes+ Reports
8	4	Acknowledgment and Practical application	DC test bridge for measuring unknown resistance	Practical+ Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	A direct current bridge to measure the internal resistance of a galvanometer	Practical+ Theoretical	Quizzes+ Reports
10	4	Acknowledgment and Practical application	Double Kelvin DC bridge	Practical+ Theoretical	Quizzes+ Reports
11	4	Acknowledgment and Practical application	DC ammeter and extend its range	Practical+ Theoretical	Quizzes+ Reports
12	4	Acknowledgment and	Dual beam oscilloscope	Practical+ Theoretical	Quizzes+

		Practical application			Reports
13	4	Acknowledgment and Practical application	Digital oscilloscope calibration	Practical+ Theoretical	Quizzes+ Reports
14	4	Acknowledgment and Practical application	Digital voltmeter calibration using OCD	Practical+ Theoretical	Quizzes+ Reports
15	4	Acknowledgment and Practical application	DC voltmeter, extending its range.	Practical+ Theoretical	Quizzes+ Reports

11	Infrastructure	
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*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Electronic instrumentation maintenance workshop (1) (MDDI204)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	2 hours per week (30 hours)
7	Date the description was prepared	27/1/2025

8	curriculum objectives	Maintenance of electrical appliances and equipment and training them with practical experiences in diagnosing faults
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Providing the student with skills in the field of maintenance on electrical appliances and equipment and training them with practical experiences in diagnosing faults	
	B - The program's Marathi goals	
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods ((Theoretical lectures/discussions))	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods ((Theoretical lectures / practical lectures))	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Electronic instrumentation maintenance workshop (1) Second Level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method

1	2	Acknowledgment and Practical application	Clarify the requirements of the electronic equipment maintenance workshops and the necessary equipment and train them, review the methods of maintenance, check (with the senses - the devices and the injection of signals), industrial safety and .security	Practical	Quizzes+ Reports
2	2	Acknowledgment and Practical application	View the block diagram of the Super Hetrodine radio - and the printout - use the gauges to determine the .malfunction	Practical	Quizzes+ Reports
3	2	Acknowledgment and Practical application	Practicing the map of the Super Heterodyne radio device and determining the locations of the components - practicing the application of the device's	Practical	Quizzes+ Reports

			map with the printed board and conducting the .necessary tests		
4	2	Acknowledgment and Practical application	Practicing to fix AF stage faults - malfunctions of the primary amplifier and the power .amplifier	Practical	Quizzes+ Reports
5	2	Acknowledgment and Practical application	Training on repairing the IF- and detector stage - malfunctions of the inter-amplifier and detector - adjusting and regulating the inter-frequency .stage	Practical	Quizzes+ Reports
6	2	Acknowledgment and Practical application	Training in RF phase faults - mixer faults - local oscillator malfunctions	Practical	Quizzes+ Reports
7	2	Acknowledgment and Practical application	General malfunctions of the radio	Practical	Quizzes+ Reports
8	2	Acknowledgment and Practical application	Test the students with general exercises on the malfunctions	Practical	Quizzes+ Reports

			of the radio		
9	2	Acknowledgment and Practical application	Identify the block diagram of a regular black and white television set - Identify the electronic units used and the complete units belonging to all stages of the .device	Practical	Quizzes+ Reports
10	2	Acknowledgment and Practical application	Training in reading the EIC TV map, identifying the locations of components, especially protection components and units, and applying the device map to the printed board - identifying the dangerous work areas and how to .deal with them	Practical	Quizzes+ Reports
11	2	Acknowledgment and Practical application	Training on the use of television testing devices with training on using the control and regulation keys on the front and	Practical	Quizzes+ Reports

			back sides		
12	2	Acknowledgment and Practical application	Troubleshooting training capacity processing phase	Practical	Quizzes+ Reports
13	2	Acknowledgment and Practical application	Regulation and repair of the automatic gain control and channel	Practical	Quizzes+ Reports
			selector circuit - IF phase repair and .regulation		
14	2	Acknowledgment and Practical application	Fixed CRT monitor and image phase malfunctions	Practical	Quizzes+ Reports
15	2	Acknowledgment and Practical application	Malfunctions of the synchronization pulse junction and .AFC circuit	Practical	Quizzes+ Reports

11	Infrastructure	
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*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan

- Creating appropriate curricula with the labor market
- Holding scientific seminars and conferences aimed at updating school curricula
- Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Electronic Circuit (2) (MDDI207)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	Second trimester (15 weeks))\Second Level
6	Number of study hours (total)	4 hours per week (60 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Building practical electronic circuits and studying their properties and applications
9	curriculum outcomes and teaching, learning and evaluation methods	
	B- Cognitive objectives	
A-1	Building practical electronic circuits and studying their properties and applications	
A-2	Developing the student's ability to identify errors in connecting electronic circuits	
	B - The program's Marathi goals	
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods ((Theoretical lectures/discussions))	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods ((Theoretical lectures / practical lectures))	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Electronic Circuits(2) Second Level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	Subtractor circuit and arithmetic equations for subtracting input voltage VO = V2-V1 - applied circuit	Practical +Theoretical	Quizzes+ Reports
2+3	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	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	Practical +Theoretical	Quizzes+ Reports
			wave into the template input and linking the non-template input to a positive reference voltage		

5	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
6	4	Acknowledgment and Practical application	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	Practical +Theoretical	Quizzes+ Reports
7	4	Acknowledgment and Practical application	Wave 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.	Practical +Theoretical	Quizzes+ Reports

8	4	Acknowledgment and Practical application	Stable single- circuit vibrating pulse generator - business idea - waveform - derivation of the equation for output pulse width - example - design - circuit.	Practical +Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	Triangle wave generator - the circuit - business idea - drawing waves - deriving the equations for that - deriving the frequency equation for the output wave.	Practical +Theoretical	Quizzes+ Reports
10+11	4	Acknowledgment and Practical application	Analog calculator - its design - solved examples - 555 timer - its construction - diagrams for its use in vibrators - equations for calculating the pulse width time - solved examples.	Practical +Theoretical	Quizzes+ Reports
12	4	Acknowledgment and Practical application	Effective RC Filters - Their Advantages - Properties - - HPF-LPF- (Features- properties- equations- response curves- arithmetic examples)	Practical +Theoretical	Quizzes+ Reports

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

11	Infrastructures	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Microcomputers (2) (MDDI208)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	Second trimester (15 weeks))\Second Level
6	Number of study hours (total)	4 hours per week (60 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Using microcomputer keys and writing and executing programs in machine language
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Training the student to use microcomputer keys and write and implement programs in machine language	
	B - The program's Marathi goals	
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods ((Theoretical lectures/discussions))	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods ((Theoretical lectures / practical lectures))	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Microcomputers (2)

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	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.	Practical +Theoretical	Quizzes+ Reports
2	4	Acknowledgment and Practical application	A group of control instructions - their relation to the operation keys - of what differs from the rest of the previous .instructions	Practical +Theoretical	Quizzes+ Reports
3	4	Acknowledgment and Practical application	Programs to perform arithmetic operations: addition - subtraction - multiplication - division - intended addressing and its types in the 8085 processor	Practical +Theoretical	Quizzes+ Reports
4	4	Acknowledgment and Practical application	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	Practical +Theoretical	Quizzes+ Reports

			microprocessor reads data in memory		
5	4	Acknowledgment and Practical application	Creating repetition loops - time delay loops - one loop - two loops - three loops - application programs for each.	Practical +Theoretical	Quizzes+ Reports
6	4	Acknowledgment and Practical application	Generating pulses at a required frequency and known duty cycle compared to pulse generators using integrated circuits.	Practical +Theoretical	Quizzes+ Reports
7	4	Acknowledgment and Practical application	Practical examples showing how to exploit time delay loops in the industrial and household domains.	Practical +Theoretical	Quizzes+ Reports
8	4	Acknowledgment and Practical application	Writing a program for an ascending counter - with a practical example.	Practical +Theoretical	Quizzes+ Reports
9	4	Acknowledgment and Practical application	Writing a countdown timer program - with a practical example	Practical +Theoretical	Quizzes+ Reports
10	4	Acknowledgment and Practical application	Writing an ascending/descending counter program - with an example application.	Practical +Theoretical	Quizzes+ Reports

11	4	Acknowledgment and Practical application	microprocessor - 8086 specifications - architecture - edge plan.	Practical +Theoretical	Quizzes+ Reports
12	4	Acknowledgment and Practical application	Types of addressing for the 8086 microprocessor - data transfer instructions - multiplication and division instructions - examples of no other instructions.	Practical +Theoretical	Quizzes+ Reports
13	4	Acknowledgment and Practical application	Comparison of an eight-ranked microprocessor (such as the 8085) and a 16-ranked microprocessor (such as the 8086).	Practical +Theoretical	Quizzes+ Reports
14	4	Acknowledgment and Practical application	-order 32 microprocessors, the most prominent of which are their characteristics - the microprocessors used in the Pentium calculators.	Practical +Theoretical	Quizzes+ Reports
15	4	Acknowledgment and Practical application	A general review of the curriculum vocabulary	Practical +Theoretical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Electronic instrumentation maintenance workshop (2) (MDDI210)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	Second trimester (15 weeks))\Second Level
6	Number of study hours (total)	2 hours per week (30 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Using skills in the field of maintenance on electrical appliances and equipment, diagnosing faults and benefiting from them in the field of work
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Providing the student with skills in the field of maintenance on electrical appliances and equipment and training them with practical experiences in diagnosing faults	
B - The program's Marathi goals		
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods ((Theoretical lectures/discussions))	

Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive
Teaching methods ((Theoretical lectures / practical lectures))	
Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Second Level**Electronic instrumentation maintenance workshop (2)**

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1+2	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	Practical	Quizes+Reports
3	2	Acknowledgment and Practical application	Fixing audio stage malfunctions - FM detector malfunctions - Audio frequency power amplifier	Practical	Quizes+Reports

			malfunctions		
4	2	Acknowledgment and Practical application	Training on fixing general black and white TV faults	Practical	Quizes+Reports
5	2	Acknowledgment and Practical application	Training on fixing general black and white TV faults	Practical	Quizes+Reports
6	2	Acknowledgment and Practical application	Students will be tested with general exercises on repairing a black and white television set	Practical	Quizes+Reports
7	2	Acknowledgment and Practical application	Track and read color TV map - Locate components - Determine the difference between color TV and regular	Practical	Quizes+Reports
8	2	Acknowledgment and Practical application	Training on the means of controlling and controlling color TV - adjusting and .organizing colors	Practical	Quizes+Reports

9	2	Acknowledgment and Practical application	Malfunctions in the power supply stage of color TV - malfunctions of touch control .circuits	Practical	Quizes+Reports
10	2	Acknowledgment and Practical application	Fixed malfunctions of the channel selector - inter-frequency - detector - and automatic gain controller for .color TV	Practical	Quizes+Reports
11	2	Acknowledgment and Practical application	Fix RGB color zoom stage and color screen LED - check the three screen launchers	Practical	Quizes+Reports
12	2	Acknowledgment and Practical application	Make the necessary arrangements for all stages of the device after completing the repair	Practical	Quizes+Reports
13	2	Acknowledgment	Examining students	Practical	Quizes+Reports
		and Practical application	with general troubleshooting exercises for color TV		
14	2	Acknowledgment and Practical	An exercise on the operation and control of the VCD device - regulation by	Practical	Quizes+Reports

		applicati on	remote control and storage in a modern TV		
15	2	Acknowled gment and Practical applicati on	Exercises to check and measure the processing stages of VCD devices - and the most common malfunctions in .them	Practical	Quizes+Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Project 1 (MDDI205)**
4	Available attendance	Weekly Lecture Schedules (Theory and

	forms	Practical), Discussions, Seminars, and Assignments
5	Semester/year	Second trimester (15 weeks))\Second Level
6	Number of study hours (total)	2 hours per week (30 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	The student learns how to work collaboratively, draw maps, develop project designs, and follow up on the progress of work on the project
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Defines salient project objectives. He learns how to deal with his group of students in order to support group work, draw maps and develop designs for the project	
A-2	Follows the progress of work on the project in terms of time and learns to write the final report	
	B - The program's marathi goals	
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods))Theoretical lectures/discussions((	
	Evaluation methods))Oral exams/written exams/weekly reports/daily attendance/semester and final exams((	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods))Theoretical lectures / practical lectures((	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure Project			Second Level		
Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	2	Acknowledgment and Practical application	Discuss the projects that are tested and determine the method and plan of action.	Practical	Quizes+Reports
2	2	Acknowledgment and Practical application	Defining and allocating responsibilities and setting a schedule for implementing the project.	Practical	Quizes+Reports
3	2	Acknowledgment	Preparing drawings and	Practical	Quizes+Reports
		and Practical application	operating cards for the various mechanics laboratories of the project parts.		
4	2	Acknowledgment and Practical application	Implementation of the project in the laboratories units and preparing reports for the stages that have been reached with the weekly follow-up of the workflow of production rates and operating obstacles.	Practical	Quizes+Reports
5-6	2	Acknowledgment and Practical application	Discussing students with a committee and evaluating implementation plans for the better (and it is considered evaluated at the end of the first semester).	Practical	Quizes+Reports
7-8	2	Acknowledgment and Practical application	Resumption of the implementation of the project paragraphs and completion of the practical side	Practical	Quizes+Reports

9-10-11	2	Acknowledgment and Practical application	Discussing the project details and directing students to prepare the final report (the second semester evaluation is considered).	Practical	Quizes+Reports
12-13	2	Acknowledgment and Practical application	Completion of the project, with both theoretical and practical aspects, and preparation for final discussion	Practical	Quizes+Reports
15-14	2	Acknowledgment and Practical application	Final discussion of the project	Practical (Power point, Lecture)	Quizes+Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Control systems (MDDI212)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	3 hours per week (45 hours)
7	Date the description was prepared	27/1/2025

8	curriculum objectives	Teaching basic concepts about various control systems, operating the devices and machines used in them, and dealing with the control system in factories
9	curriculum outcomes and teaching, learning and evaluation methods	
A-Cognitive objectives		
A-1	Distinguishing between different control systems, operating the devices and machines used in them, and dealing with the control system in factories	
A-2	Qualifying the graduate scientifically in the field of electrical engineering by introducing the basic scientific concepts related to engineering and harnessing them in this field	
B - The program's marathi goals		
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
Teaching and learning methods))Theoretical lectures/discussions((		
Evaluation methods))Oral exams/written exams/weekly reports/daily attendance/semester and final exams((		
C - emotional and value goals		
C-1	Carry out duties on the job site fairly and with a professional motive	
Teaching methods))Theoretical lectures / practical lectures((		

Evaluation methods
((Oral exams / written exams / observation / student cumulative record))

10. Curriculum structure

Control systems Second level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	3	Acknowledgment and Practical application	Introduction to control systems	Practical+Theoretical	Quizes+Reports
2	3	Acknowledgment and Practical application	Open-circuit and closed- circuit control systems	Practical+Theoretical	Quizes+Reports
3	3	Acknowledgment and Practical application	Converting electrical signals into mechanical and vice versa, converting electrical signals into pneumatic and vice versa.	Practical+Theoretical	Quizes+Reports
4	3	Acknowledgment and Practical application	Error sensing devices used in control, their types	Practical+Theoretical	Quizes+Reports
5	3	Acknowledgment and Practical application	Electrical components to control electric motors - picker - timer - push switches - specific switches.	Practical+Theoretical	Quizes+Reports

6	3	Acknowledgment and Practical application	The four variables (temperature - pressure - flow - level measurement) in control systems	Practical+Theoretical	Quizes+Reports
7	3	Acknowledgment and Practical application	Controlling the operation and shutdown of a single phase induction motor using 1- B- Thyrostor-Triac electromagnetic receiver)	Practical+Theoretical	Quizes+Reports
8	3	Acknowledgment and Practical application	Complement the applied systems	Practical+Theoretical	Quizes+Reports
9	3	Acknowledgment and Practical application	Digital systems in control	Practical+Theoretical	Quizes+Reports
10	3	Acknowledgment and Practical application	Methods for measuring temperature, pressure, flow and level	Practical+Theoretical	Quizes+Reports
11	3	Acknowledgment and Practical application	The different elements of pneumatic control systems	Practical+Theoretical	Quizes+Reports
12	3	Acknowledgment and Practical application	Systems applied in pneumatic control	Practical+Theoretical	Quizes+Reports
13	3	Acknowledgment and Practical	Use the analog calculator to control	Practical+Theoretical	Quizes+Reports

		application			
14	3	Acknowledgment and Practical application	How to represent digital circuits in control	Practical+Theoretical	Quizes+Reports
15	3	Acknowledgment and Practical application	Using the electronic calculator in application control systems.	Practical+Theoretical	Quizes+Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Programmable logic controller (PLC) (MDDI213)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	Second trimester (15 weeks))\Second Level
6	Number of study hours (total)	3 hours per week (45 hours)

7	Date the description was prepared	27/1/2025
8	curriculum objectives	Learn about programmable digital controllers and how to program them
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Introducing the student to the components of the software controller and how to program them	
A-2	Learn about programmable digital controllers	
	B - The program's marathi goals	
B-1	Ability to manage work	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods))Theoretical lectures/discussions((	
	Evaluation methods))Oral exams/written exams/weekly reports/daily attendance/semester and final exams((	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods))Theoretical lectures / practical lectures((	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Programmable logic controller (PLC) Second level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	3	Acknowledgment and Practical application	Introduction	Practical+Theoretical	Quizes+Reports
2+3	3	Acknowledgment and Practical application	Sensors with programmable controller(heat, pressure,motion ..etc)	Practical+Theoretical	Quizes+Reports
4	3	Acknowledgment and Practical application	Electrical switch, electrical contact	Practical+Theoretical	Quizes+Reports
5	3	Acknowledgment and Practical application	Introduction of ladder language	Practical+Theoretical	Quizes+Reports
6	3	Acknowledgment	Logic ciruit (AND,OR,NOT,	Practical+Theo	Quizes+Reports

		and Practical application	etc.) using ladder language	retical	
7	3	Acknowledgment and Practical application	Timers and its types- simulation using ladder language	Practical+Theoretical	Quizes+Reports
8	3	Acknowledgment and Practical application	The signal in ladder language	Practical+Theoretical	Quizes+Reports
9	3	Acknowledgment and Practical application	Digital counter in ladder language with examples.	Practical+Theoretical	Quizes+Reports
10	3	Acknowledgment and Practical application	Example of (changeover circuit) using ladder language	Practical+Theoretical	Quizes+Reports
11	3	Acknowledgment and Practical application	Example of traffic light	Practical+Theoretical	Quizes+Reports

12	3	Acknowledgment and Practical application	Application example for open and close the door using motion sensor.	Practical+Theoretical	Quizes+Reports
13	3	Acknowledgment and Practical application	Operating circuit of single phase motor by swith (motor starter) using ladder language.	Practical+Theoretical	Quizes+Reports
14	3	Acknowledgment and Practical application	Operating circuit of three phase motor(delta-star)	Practical+Theoretical	Quizes+Reports
15	3	Acknowledgment and Practical application	Application example for electrical lift	Practical+Theoretical	Quizes+Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization	

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Renewable energy systems (MDDI214)**
4	Available attendance forms	Optional
5	Semester/year	Second trimester (15 weeks))\Second Level
6	Number of study hours (total)	3 hours per week (45 hours)
7	Date the description was prepared	27/1/2025

8	curriculum objectives	Knowing the basics of various renewable energy sources and the necessary techniques for associated energy systems
9	curriculum outcomes and teaching, learning and evaluation methods	
A-Cognitive objectives		
A-1	The ability to apply knowledge in the field of renewable energies and keep pace with the prospects of its rapid development	
A-2	The ability to identify, formulate and find engineering solutions to problems and dilemmas related to various renewable energy systems in an engineering manner	
B - The program's marathi goals		
B-1	The ability to conduct experiments, analyze and interpret results in the field of engineering work according to the required standards	
B-2	The ability to solve problems at the work site that are necessary in this field	

Teaching and learning methods))Theoretical lectures/discussions((
Evaluation methods))Oral exams/written exams/weekly reports/daily attendance/semester and final

exams((
C - emotional and value goals
C-1 Carry out duties on the job site fairly and with a professional motive
Teaching methods))Theoretical lectures / practical lectures((
Evaluation methods ((Oral exams / written exams / observation / student cumulative record))

10. Curriculum structure

Renewable energy systems Second level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	3	Theoretical lectures Practical - application Discussions and - .workshops Using modern - presentation and teaching methods Field visits and systematic training Access to the latest research Self-education- Following - websites	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)	Practical +Theoretical	Quizzes+ Reports

2	3	Acknowledgment and Practical application	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	Practical +Theoretical	Quizzes+ Reports
3	3	Acknowledgment and Practical application	Solar water heating systems - thermosiphon system - solar collector with connected tank	Practical +Theoretical	Quizzes+ Reports
4	3	Acknowledgment and Practical application	Direct circulation system - indirect water heating system - tank heating system	Practical +Theoretical	Quizzes+ Reports
5	3	Acknowledgment and Practical application	Heat storage systems (air heat tank system - liquid heat tank system - thermal analyzes of	Practical +Theoretical	Quizzes+ Reports

			storage systems)		
6	3	Acknowledgment and Practical application	The amount of hot water required - practical requirements (pipes - fasteners - insulators - pumps - valves - other devices)	Practical +Theoretical	Quizzes+ Reports
7	3	Acknowledgment and Practical application	Solar cells – components of a PV electrical generation system	Practical +Theoretical	Quizzes+ Reports
8	3	Acknowledgment and Practical application	PV system design PV/T hybrid system	Practical +Theoretical	Quizzes+ Reports
9	3	Acknowledgment and Practical application	Solar thermal electricity generation systems (parabolic trough collectors - tower energy systems)	Practical +Theoretical	Quizzes+ Reports
10	3	Acknowledgment and Practical	Introduction to wind energy - the energy available in the wind - the torque and energy	Practical +Theoretic	Quizzes+ Reports

		application	of wind turbines	al	
11	3	Acknowledgment and Practical application	Wind energy conversion systems - wind generators (rotating tower - power regulators - stop systems - generator)	Practical +Theoretical	Quizzes+ Reports
12	3	Acknowledgment and Practical application	Performance of air energy conversion systems - power curve for the wind turbine - capacity factor	Practical +Theoretical	Quizzes+ Reports
13	3	Acknowledgment and Practical application	Introduction to the water cycle - water turbines	Practical +Theoretical	Quizzes+ Reports
14	3	Acknowledgment and Practical application	Introduction to underground energy - underground power stations (thermal plants - electrical stations)	Practical +Theoretical	Quizzes+ Reports

			underground heat pumping system		
15	3	Acknowledgment and Practical application	Tidal energy - tidal stations Wave energy - wave energy stations	Practical +Theoretical	Quizzes+ Reports

11	Infrastructure	
*	**The required textbooks**	**are available in the department and the institute library free of charge**
*	**The main references (main)**	**are available in the free section and the institute library.**
*	**electronic references, websites**	**The Internet**

12	Curriculum development plan
	• **Creating appropriate curricula with the labor market** • **Holding scientific seminars and conferences aimed at updating school curricula** • **Follow up on scientific developments in the field of specialization**

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques

3	curriculum name and code	**Computer applications (MDDI215)**
4	Available attendance forms	Optional
5	Semester/year	Second trimester (15 weeks))\Second Level
6	Number of study hours (total)	3 hours per week (45 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Dealing with modern laboratories and equipment, including learning to use simulation programs
9	curriculum outcomes and teaching, learning and evaluation methods	
A-Cognitive objectives		
A-1	Preparing qualified graduates to deal with modern laboratories and equipment, including learning to use simulation programs	
A-2	Preparing students to pass professional tests from local and foreign bodies	
B - The program's Marathi goals		
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
Teaching and learning methods)) ((Theoretical lectures/discussions((		

Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive
Teaching methods ((Theoretical lectures / practical lectures))	

10. Curriculum structure

Computer applications Second Level

Week	hours	Learning Outcomes	Unit/module or topic title	Teaching method	Assessment Method
1	3	Acknowledgment and Practical application	Learn about MATLAB and its most important versions, and get acquainted with the program's interface and basic operations	Practical+ Theoretical	Quizzes+ Reports
2	3	Acknowledgment and Practical application	Understanding the commands of MATLAB	Practical+ Theoretical	Quizzes+ Reports
3+4	3	Acknowledgment and	Learn how to create an m.file, arrays,	Practical+ Theoretical	Quizzes+ Reports

		Practical application	vectors, and operations on them		
5+6	3	Acknowledgment and Practical application	Identify logical expressions in MATLAB and add properties to the drawing within the program	Practical+ Theoretical	Quizzes+ Reports
7	3	Acknowledgment and Practical application	D (2-2 Dimensional)	Practical+ Theoretical	Quizzes+ Reports
8+9	3	Acknowledgment and Practical application	Recognizing the Loops	Practical+ Theoretical	Quizzes+ Reports
10	3	Acknowledgment and Practical application	Introduction to simulation in MATLAB	Practical+ Theoretical	Quizzes+ Reports
11	3	Acknowledgment and Practical application	MATLAB application in electronic circuits	Practical+ Theoretical	Quizzes+ Reports
12	3	Acknowledgment and Practical application	MATLAB application in analog	Practical+ Theoretical	Quizzes+ Reports

			communicatio n - AM type		
13	3	Acknowled gment and Practical applicatio n	MATLAB application in analog communicatio n - FM type	Practical+ Theoretical	Quizzes+ Reports
14	3	Acknowled gment and Practical applicatio n	MATLAB application in digital communicatio ns - type ASK	Practical+ Theoretical	Quizzes+ Reports
15	3	Acknowled gment and Practical applicatio n	MATLAB application in digital communicatio n - FSK and PSK	Practical+ Theoretical	Quizzes+ Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Electronical Medical Instruments 1 (MDDI203)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	4 hours per week (60 hours)
7	Date the description was prepared	27/1/2025
8	curriculum objectives	Preparing the student to be able to use maintenance devices and maintain

		medical devices by studying the medical device as an electronic device and by studying its detailed electronic circuits.
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Interested in studying the types of medical devices used	
A-2	Skills objectives of the program	
	B - The program's Marathi goals	
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods ((Theoretical lectures/discussions))	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods ((Theoretical lectures / practical lectures))	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative	

record))

10. Curriculum structure **Electronical Medical Instruments 1** First Level					
Week	hours	Learning Outcomes	Subject name	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	Introduction to electronic medical devices	Practical Theoretical	Quizzes and Reports
2	4	Acknowledgment and Practical application	Medical terminology in English and Latin	Practical Theoretical	Quizzes and Reports
3	4	Acknowledgment and Practical application	Circulatory system - parts of the heart - major and minor circulation	Practical Theoretical	Quizzes and Reports

4	4	Acknowledgment and Practical application	ECG device - basic stages of the device	Practical Theoretical	Quizzes and Reports
5	4	Acknowledgment and Practical application	Types of electrodes - Meet the patient	Practical Theoretical	Quizzes and Reports
6	4	Acknowledgment and Practical application	Measuring blood pressure - types of blood pressure devices - mercury blood	Practical Theoretical	Quizzes and Reports

			pressure device		
7	4	Acknowledgment and Practical application	Pneumatic pressure device - electronic pressure device	Practical Theoretical	Quizzes and Reports
8	4	Acknowledgment and Practical application	Cardiac defibrillator - its types	Practical Theoretical	Quizzes and Reports
9	4	Acknowledgment and Practical application	Electrodes of vibration devices - circuits of vibration devices	Practical Theoretical	Quizzes and Reports
10	4	Acknowledgment and Practical application	Pacemaker - classification - heart-lung device	Practical Theoretical	Quizzes and Reports
11	4	Acknowledgment and	Heart sound measuring device -	Practical Theoretical	Quizzes and Reports

		Practical application	VCG		
12	4	Acknowledgment and Practical application	Respiratory devices - mechanical breathing	Practical Theoretical	Quizzes and Reports
13	4	Acknowledgment and Practical application	Sensors for spirometers - breathing monitoring devices	Practical Theoretical	Quizzes and Reports
14	4	Acknowledgment and Practical application	Clinical monitoring device	Practical Theoretical	Quizzes and Reports
15	4	Acknowledgment and Practical application	The central nervous system - how sensations and voluntary and involuntary commands are distributed	Practical Theoretical	Quizzes and Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization

1	Educational institution	Northern Technical University / Technical Institute AL-Dour
2	Scientific department/center	Medical Instruments techniques
3	curriculum name and code	**Electronical Medical Instruments 2 (MDDI209)**
4	Available attendance forms	Weekly Lecture Schedules (Theory and Practical), Discussions, Seminars, and Assignments
5	Semester/year	First trimester (15 weeks))\Second Level
6	Number of study hours (total)	4 hours per week (60 hours)
7	Date the description was prepared	**27/1/2025**

8	curriculum objectives	Preparing the student to be able to use maintenance devices and maintain medical devices by studying the medical device as an electronic device and by studying its detailed electronic circuits.
9	curriculum outcomes and teaching, learning and evaluation methods	
	A- Cognitive objectives	
A-1	Interested in studying the types of medical devices used	
A-2	Skills objectives of the program	
	B - The program's Marathi goals	
B-1	Ability to manage projects	
B-2	The ability to solve problems at the work site that are necessary in this field	
	Teaching and learning methods ((Theoretical lectures/discussions))	
	Evaluation methods ((Oral exams/written exams/weekly reports/daily attendance/semester and final exams))	
	C - emotional and value goals	
C-1	Carry out duties on the job site fairly and with a professional motive	
	Teaching methods ((Theoretical lectures / practical lectures))	
	Evaluation methods ((Oral exams / written exams / observation / student cumulative record))	

10. Curriculum structure

Electronical Medical Instruments 2 Second Level

Week	hours	Learning Outcomes	Subject name	Teaching method	Assessment Method
1	4	Acknowledgment and Practical application	EEG device - The basic stages of the device and its parts - Brain diseases	Practical Theoretical	Quizzes and Reports
2	4	Acknowledgment and Practical application	Muscle electricity and the sensory system - the	Practical Theoretical	Quizzes and Reports

			muscular system		
3	4	Acknowledgment and Practical application	EMG device - the basic stages of the device and its parts	Practical Theoretical	Quizzes and Reports
4	4	Acknowledgment and Practical application	Ultrasound devices - their types	Practical Theoretical	Quizzes and Reports
5	4	Acknowledgment and Practical application	physics of ultrasound devices	Practical Theoretical	Quizzes and Reports
6	4	Acknowledgment and Practical application	Fetal monitoring device - components and stages of the device	Practical Theoretical	Quizzes and Reports
7	4	Acknowledgment and Practical application	Birth monitoring device - components and stages of the device	Practical Theoretical	Quizzes and Reports
8	4	Acknowledgment and Practical application	Sonar device - components and of the device	Practical Theoretical	Quizzes and Reports
9	4	Acknowledgment and Practical application	Sonar display devices: A-mode, D-mode, M-mode	Practical Theoretical	Quizzes and Reports

10	4	Acknowledgment and Practical application	Amplifiers and their types	Practical Theoretical	Quizzes and Reports
11	4	Acknowledgment and Practical application	Tracer devices and their types	Practical Theoretical	Quizzes and Reports
]	4	Acknowledgment and Practical application	Display devices of both types: analogue and digital	Practical Theoretical	Quizzes and Reports

13	4	Acknowledgment and Practical application	Surgical cauterization devices and their types	Practical Theoretical	Quizzes and Reports
14	4	Acknowledgment and Practical application	Electronic circuits for surgical cauterization devices and their types	Practical Theoretical	Quizzes and Reports
15	4	Acknowledgment and Practical application	Operating room equipment - used devices	Practical Theoretical	Quizzes and Reports

11	Infrastructure	
*	The required textbooks	are available in the department and the institute library free of charge
*	The main references (main)	are available in the free section and the institute library.
*	electronic references, websites	The Internet

12	Curriculum development plan
	• Creating appropriate curricula with the labor market • Holding scientific seminars and conferences aimed at updating school curricula • Follow up on scientific developments in the field of specialization