Ministry of Higher Education and Scientific Research

Scientific Supervision and Evaluation Apparatus

Quality Assurance and Academic Accreditation Directorate

Accreditation Department

Academic Program and Course Description

2025

Ministry of Higher Education and Scientific Research
Scientific Supervision and Evaluation Authority
Quality Assurance and Academic Accreditation Department

Academic Program Description Form for Colleges and Institutes

University Name: Northern Technical University

College/Institute: Kirkuk Polytechnic College

Scientific Department: Oil Equipment Inspection and Welding Techniques

Name of academic or professional program: Technical Diploma

Name of final certificate: Technical Diploma

Study system: Courses

Description preparation date: / /2025

File filling date:19 / 11/ 2025

Signature:
Name of Head of Department: Swara mohsen
Date:

Signature:
Scientific Assistant Name: Zuhair Shakor
Date: 2025/11/19

File checked by
Quality Assurance and University Performance Division
Quality Assurance and University Performance Division Head: Assist. Lecturer. Alaa Abdulwahhab Azeez Baker
Date:
Signature:

Ministry of Higher Education and Scientific Research

Scientific Supervision and Evaluation Apparatus

Quality Assurance and Academic Accreditation Directorate

Accreditation Department

Academic Program and Course Description

2025

Department of Petroleum Equipment Inspection and Welding Techniques

1. Introduction

Inspection and welding of petroleum equipment are fundamental processes that demand high precision and rigorous quality standards. These operations are essential to ensure the structural integrity of petroleum facilities and to maintain operational continuity, preventing failures that could disrupt production.

Inspection processes involve modern techniques to detect defects and cracks that might lead to oil or gas leaks, which pose significant environmental and economic risks. Strict procedures are implemented according to international standards to ensure inspection quality, including Radiographic Testing (RT), Ultrasonic Testing (UT), Visual Testing (VT), and other Non-Destructive Testing (NDT) methods.

Welding operations rely on advanced techniques that guarantee the strength and durability of welds in pipelines, storage tanks, and metal structures used in the oil industry. Methods such as Shielded Metal Arc Welding (SMAW), Gas Welding, and specialized welding techniques are utilized based on material types and technical specifications.

The department is dedicated to training and qualifying students in the latest inspection and welding methodologies. Students acquire practical skills through workshops and laboratories equipped with state-of-the-art technology. Although the department was established two years ago and has yet to graduate its first cohort, it aspires to provide the labor market with highly qualified personnel possessing the essential skills and knowledge required in the field of petroleum equipment inspection and welding.

---

2. Concepts and Terminology

Program Description:

The Petroleum Equipment Inspection and Welding program aims to equip students with theoretical knowledge and practical skills in inspection and welding techniques. It focuses on utilizing specialized tools and equipment according to certified standards, covering precise applications in NDT, engineering tests, and modern welding methods used in the oil and gas sector.

Inspection Methodologies:

Inspection involves the evaluation of metallic structures and oil pipelines to identify defects and cracks using various techniques (VT, UT, and X-ray). Students are also trained on safety protocols during inspection and ensuring accuracy in technical analysis and conclusions.

---

3. Strategic Framework

Program Vision:

To provide an advanced academic program that integrates theoretical foundations with practical applications, ensuring graduates are fully qualified to work in petroleum equipment inspection and welding according to the latest international standards.

Program Mission:

To prepare technical cadres capable of executing inspection and welding operations based on scientific and practical principles, focusing on achieving quality and safety in the oil and gas sector while contributing to the development of sustainable maintenance and operations.

Program Objectives:

1. **Knowledge Acquisition:** To provide students with advanced knowledge and skills in inspection and welding techniques.

2. **Technical Qualification:** To qualify students to operate the latest devices and equipment in Non-Destructive Testing (NDT) and welding.
3. **Safety & Standards:** To reinforce the concepts of occupational safety and ensure compliance with approved engineering standards.
4. **Market Readiness:** To prepare graduates capable of working in diverse industrial environments in accordance with labor market requirements.

---

4. Learning Outcomes

- **Technical Proficiency:** Acquiring necessary skills in inspecting petroleum equipment and identifying technical defects.
- **Standardized Application:** The ability to apply Non-Destructive Testing (NDT) procedures according to standard specifications.
- **Operational Execution:** Executing welding operations with precision and efficiency to ensure quality and durability in petroleum installations.
- **Analytical Decision-Making:** Analyzing inspection results and making appropriate decisions to improve operation and maintenance processes.

---

5. Educational Strategies

The program adopts integrated educational strategies including:

- **Practical Training:** Hands-on experience in specialized workshops.
- **Applied Fieldwork:** On-site training at industrial locations.
- **Theoretical Instruction:** Academic lectures focusing on core principles.
- **Technological Integration:** Training on the latest software and tools used in the global inspection and welding industry.

Academic Program Specification

This Academic Program Specification provides a concise summary of the main features of the program and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities provided. It is accompanied by a description of each course within the program.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College

2. Scientific Department / Center

Petroleum Equipment Inspection and Welding Techniques Department

3. Academic or Professional Program Name

Diploma in Petroleum Equipment Inspection and Welding Techniques

4. Final Award Name

Technical Diploma

5. Academic System

Courses System (Modular/Credit based)

6. Accreditation Program

ABET (Accreditation Board for Engineering and Technology) Standards

7. Other External Influences

Expert opinions from peer departments in international universities.

8. Date of Preparation

10/01/2025

---

9. Academic Program Objectives

- **A.** Achieve the university's strategic goals within the field of inspection and welding techniques.
- **B.** Provide sound education in the fundamentals of welding for petroleum equipment.
- **C.** Develop the skills and confidence necessary to solve problems in the construction and inspection of petroleum equipment based on engineering and scientific principles.
- **D.** Consistently produce high-caliber graduates.
- **E.** Provide education compatible with the requirements and needs of the labor market.

---

10. Intended Learning Outcomes (ILOs)

The program provides opportunities for students to develop and demonstrate knowledge, understanding, qualities, and skills in the following areas:

1) Knowledge and Understanding:

- **A.** Essential facts, concepts, principles, and theories of welding engineering, and understanding the constraints faced by workers in the petroleum and industrial sectors to make informed decisions.
- **B.** Basic mathematics, sciences, and technical methodologies.
- **C.** Principles and concepts of safety and management.

2) Awareness and Understanding:

- **A.** Professional and ethical responsibilities of the profession.
- **B.** The impact of engineering activities on society and civilization.
- **C.** Adaptation to future global issues and trends.

3) Intellectual Abilities:

- **A.** Solve industrial problems that may be defined by known or unknown conditions.
- **B.** Analyze and discuss available data or conduct specific experiments to obtain further data.
- **C.** Design units and processes and implement necessary improvements.
- **D.** Ability to apply new and emerging techniques.
- **E.** Possess a holistic view of industrial process problems, considering cost, safety, quality, environmental impact, and risk management/assessment.

4) Practical Skills:

- **A.** Use various techniques, equipment, and specialized software related to the field.
- **B.** Utilize laboratory equipment to generate and find data.
- **C.** Develop and provide a safe working environment.

5) Transferable Skills:

- **A.** Apply mathematical skills to practical problems.
- **B.** Effective communication skills (both oral and written).
- **C.** Use information and communication technologies effectively.
- **D.** Management of time and resources.
- **E.** Work effectively within a team.
- **F.** Creativity, particularly in engineering design.
- **G.** Practicality in problem analysis.
- **H.** Extracting information from published sources and literature.

---

11. Program Outcomes & Teaching, Learning, and Assessment Methods

A- Cognitive Objectives

- **A1.** Master essential facts, concepts, principles, and theories of inspection and welding.
- **A2.** Understand the constraints facing technicians in making correct decisions.
- **A3.** Proficiency in basic mathematics and sciences.
- **A4.** Familiarity with modern techniques used in the industry.

- **A5.** Understanding concepts of safety and industrial management.

B- Program-Specific Skill Objectives

- **B1.** Adherence to professional ethics and professionalism.
- **B2.** Understanding the impact of engineering activities on society and civilization.
- **B3.** Adapting to and aligning with future challenges in the industry.

1. **Lectures:** Formal academic presentations covering theoretical foundations.
2. **Discussion and Dialogue:** Interactive sessions to enhance critical thinking.
3. **Enrichment Questions:** Advanced queries designed to expand the student's knowledge base.
4. **Direct Questioning (Interrogation):** Real-time questioning during sessions to ensure comprehension and engagement.

Assessment Methods

1. **Exams:** Including daily quizzes, monthly progress tests, and final examinations.
2. **Reports and Assignments:** Evaluation of written technical reports and periodic homework.
3. **Attendance and Punctuality:** Assessing students' commitment to lecture timings and professional discipline.

C- Affective and Value Objectives

- **C1:** The ability to solve industrial problems within both defined and undefined environments.
- **C2:** Developing the mindset to analyze data and conduct targeted experiments to extract further technical insights.
- **C3:** Committing to the design and improvement of industrial units and processes.
- **C4:** Fostering the ability to adopt new technologies while maintaining a holistic view of industrial engineering challenges—balancing cost, safety, quality, and environmental impact with effective risk management.

D- General and Transferable Skills

(Skills related to employability and personal development)

- **D1:** Practical application of mathematical skills to solve real-world technical problems.
- **D2:** Proficiency in oral and written communication, with the ability to manage and exchange information effectively.
- **D3:** Mastery of time and resource management, alongside the ability to collaborate effectively within multidisciplinary teams.
- **D4:** Demonstrating design capabilities, practicality in problem analysis, and the skill to retrieve and synthesize information from published academic and industrial sources.

- **Program structure**

Curriculum Schedule for Level One						
Course Code	Credit Units	Credit Hours		Course Title		Requirement Type
		practical	Theoretical	English	Arabic	
NTU 103	2	-	2	Arabic language (1)	اللغة العربية (1)	General University Requirements(
NTU 101	2	-	2	English Language (1)	اللغة (1) الانكليزية	
NTU 102	2	1	1	Computer (1)	حاسوب (1)	
NTU 104	2	1	1	Sport	الرياضة	
NTU 100	2	-	2	Democracy and Human Rights	الديمقراطية وحقوق الانسان	
NTU 105	2	-	2	France Language	اللغة الفرنسية	
12		Total University Credit Units				
TIKI110	2	-	2	Mathematics	الرياضيات	Supporting College Requirements
TIKI111	6	6	-	Workshops	المعامل	
TIKI112	2	2	-	Computer Aided Drawing (CAD)	بمساعدة الرسم الحاسوب (CAD)	
10		Total Institutional Requirement Units				
OEIWT 120	4	2	2	Welding Fundamentals	اساسيات اللحام	**Major Requirements**
OEIWT	4	2	2	Engineering Inspection	الفحص الهندسي	

121						
OEIWT 122	4	2	2	Mechanics	الميكانيك*	
OEIWT 123	8	8	0	Fundamentals of Welding Workshop	اساسيات ورشة اللحام	

Curriculum Schedule for Level Two

Course Code	Credit Units	Credit Hours		Course Title		Requirement Type
		Practical	Theoretical	الانكليزية	العربية	
NTU200	2	-	2	English Language (2)	اللغة الانكليزية (2)	General University Requirements
NTU202	2	-	2	Arabic Language (2)	اللغة العربية (2)	
NTU201	2	1	1	Computer (2)	الحاسوب (2)	
NTU203	2	-	2	Crimes of the Baath Regime in Iraq	جرائم البعث البائد في العراق	
NTU204	2	-	2	Professional Ethics	اخلاقيات المهنة	
	10	Total University Credit Units				
TIKI210	4	4	-	Graduation project		Supporting College Requirements
	4	Total Institutional Requirement Units				
OEIWT220	4	2	2	Welding Processes	عمليات لحام	**Major Requirements**
OEIWT221	4	2	2	Fundamentals of Oil Equipment	اساسيات المعدات النفطية	
OEIWT222	4	2	2	Fundamentals of Non-Destructive Testing of Welds	اساسيات اختبارات الملحومات الغير إتلافية*	

Study Plan Semester / First Stage

لتخطيط للتطور

&

utilizing references

2. **Data** Skills in analyzing various subjects.
3. **Resource** Mastery available capabilities efficiently.

OEIWT223	10	10	-	Fundamentals of Oil Equipment Welding Workshop	اساسيات ورشة لحام المعدات النفطية	
OEIWT224	4	2	2	Metallurgy	المعادن	
OEIWT225	4	2	2	Oil Equipment Applications	تطبيقات المعدات النفطية	
OEIWT226	4	2	2	Applications of Non-Destructive Testing of Welds	تطبيقات اختبارات اللحام الغير إتلافية*	
OEIWT227	8	8	-	Applications of Oil Equipment Welding Workshop	تطبيقات ورشة لحام المعدات النفطية	
OEIWT 228	2	1	1	Corrosion	تآكل	
OEIWT229	2	2	-	Engineering and Technical Drawing for Welding Design	الرسم الهندسي والتقني لتصميم الملحومات	
	46	مجموع وحدات متطلبات القسم				

Schedule / First

الشخصي)

1. **Terminology Reference Skills:** Proficiency in technical and specialized terminology.
Management: collecting and data related to technical

Optimization: of utilizing resources and

4. **Comparative Analysis:** Skills in conducting technical comparisons within the field of study.
5. **Conceptualization:** Skills in developing specialized conceptual frameworks regarding relevant topics.
6. **Professional Performance:** Equipping students with the necessary skills for workplace performance and professional excellence.
7. **Self-Directed Learning:** Empowering students with self-learning skills to enable continuous updates of their scientific and technical knowledge in their specialization.

---

2. Admission Criteria (معايير القبول)

(Regulations regarding enrollment in the college/institute)

- **Central Admission:** Students are admitted through the central admission system of the **Ministry of Higher Education and Scientific Research**, based on the college's absorption capacity.
- **GPA Requirements:** Admission is based on the grade point average (GPA) for graduates of high school (**Scientific Branch**) and **Vocational/Technical Education**.

---

3. Main Information Sources about the Program (أهم مصادر المعلومات)

- **Scientific Department:** The administrative and academic office of the Petroleum Equipment Inspection and Welding Techniques Department.
- **Registrar's Office:** The official college department for student records and registration.
- **Course Instru First Stage: Study Plan Schedule**
- **First Semester - Stage 1**

No.	Course Title	Type	Th.	Pr.	Total Hrs	Units
1	Welding Fundamentals	Specialized	2	2	4	4
2	Engineering Inspection	Specialized	2	2	4	4
3	Mechanics (*)	Specialized	2	2	4	4
4	Fundamentals of Welding Workshop	Specialized	-	8	8	8
5	Mathematics	Supporting	2	-	2	2
6	Computer (1)	Supporting	1	1	2	2
7	English Language (1)	General	2	-	2	2
8	Democracy and Human Rights	General	2	-	2	2

No.	Course Title	Type	Th.	Pr.	Total Hrs	Units
9	Sport	General	1	1	2	2
	Total		14	16	30	30

- (*) Denotes that the course is taught in English.
- Second Semester - Stage 1

No.	Course Title	Type	Th.	Pr.	Total Hrs	Units
1	Welding Technology	Specialized	2	2	4	4
2	Engineering Inspection in Oil Facilities	Specialized	2	2	4	4
3	Welding Machines	Specialized	2	2	4	4
4	Applications of Welding Workshop	Specialized	-	6	6	6
5	Workshops	Specialized	-	6	6	6
6	Computer Aided Drawing (CAD)	Supporting	-	2	2	2
7	Safety and Industrial Management	Supporting	2	-	2	2
8	Arabic Language (1)	General	2	-	2	2
	Total		10	20	30	30

- **Second Stage: Study Plan Schedule**
- **First Semester - Stage 2**

No.	Course Title	Type	Th.	Pr.	Total Hrs	Units
1	Welding Processes	Specialized	2	2	4	4
2	Fundamentals of Oil Equipment	Specialized	2	2	4	4
3	Fundamentals of NDT of Welds (*)	Specialized	2	2	4	4
4	Fundamentals of Oil Equipment Welding Workshop	Specialized	-	10	10	10
5	Corrosion	Specialized	1	1	2	2
6	Computer (2)	Supporting	1	1	2	2
7	English Language (2)	General	2	-	2	2
8	Crimes of the Baath Regime in Iraq	General	2	-	2	2
	Total		12	18	30	30

- **Second Semester - Stage 2**

No.	Course Title	Type	Th.	Pr.	Total Hrs	Units
1	Metallurgy	Specialized	2	2	4	4
2	Oil Equipment Applications	Specialized	2	2	4	4

No.	Course Title	Type	Th.	Pr.	Total Hrs	Units
3	Applications of NDT of Welds (*)	Specialized	2	2	4	4
4	Engineering and Technical Drawing for Welding Design	Specialized	-	2	2	2
5	Applications of Oil Equipment Welding Workshop	Specialized	-	8	8	8
6	Graduation Project	Specialized	-	4	4	4
7	Professional Ethics	General	2	-	2	2
8	Arabic Language (2)	General	2	-	2	2
	Total		10	20	30	30

- **Table Legend**
- **Th.: Theoretical Hours**
- **Pr.: Practical Hours**
- **NDT: Non-Destructive Testing**
- **Total Hrs: Total Weekly Hours**
- **ctors:** Academic staff responsible for delivering the program modules

Level	Course Code	Course Title	Core or Elective	Cognitive Objectives (A)	Program-Specific Skills (B)	Affective & Value Objectives (C)	General & Transferable Skills (D)
				A1 A2 A3 A4	**B1 B2 B3 B4**	**C1 C2 C3 C4**	**D1 D2 D3 D4**
First	OEIWT120	**Welding Fundamentals**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	OEIWT121	**Engineering Inspection**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	OEIWT123	**Fundamentals of Welding Workshop**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	OEIWT122	**Mechanics**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	NTU102	**Computer Science**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	TIKI110	**Mathematics**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	NTU101	**English Language**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	NTU104	**Democracy & Human Rights**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √

ar/ Level	Course Code	Course Title	Core/ Elective	Cognitive Objectives (A)	Program-Specific Skills (B)	Affective & Value Objectives (C)	General & Transferable Skills (D)
				A1 A2 A3 A4	B1 B2 B3 B4	C1 C2 C3 C4	D1 D2 D3 D4
First	OEIWT124	**Welding Technology**	Core	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	OEIWT126	**Welding Machines**	Core	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	OEIWT125	**Engineering Inspection in Oil Facilities**	Core	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	TIKI111	**Workshops**	Core	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	TIKI112	**Computer Aided Drawing (CAD)**	Elective	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	OEIWT128	**Safety and Industrial Management**	Elective	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	OEIWT127	**Welding Workshop Applications**	Core	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
First	NTU103	**Arabic Language**	Elective	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √

Level	Course Code	Course Title	Core or Elective	Cognitive Objectives (A)	Program-Specific Skills (B)	Affective & Value Objectives (C)	General & Transferable Skills (D)
				A1 A2 A3 A4	**B1 B2 B3 B4**	**C1 C2 C3 C4**	**D1 D2 D3 D4**
Second	OEIWT220	**Welding Processes**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT221	**Fundamentals of Oil Equipment**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT222	**Fundamentals of NDT of Welds**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	NTU201	**Computer Science II**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT228	**Corrosion**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT200	**English Language II**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT223	**Fundamentals of Oil Equipment Welding Workshop**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	NTU203	**Crimes of the Baath Regime in Iraq**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √

First Stage

(First Semester)

Curriculum Skills Map

Please tick the boxes corresponding to the individual program learning outcomes subjected to evaluation.

Level	Course Code	Course Title	Core or Elective	Cognitive Objectives (A)	Program-Specific Skills (B)	Affective & Value Objectives (C)	General & Transferable Skills (D)
				A1 A2 A3 A4	B1 B2 B3 B4	C1 C2 C3 C4	D1 D2 D3 D4
Second	OEIWT224	**Metallurgy**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT225	**Oil Equipment Applications**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT226	**Non-Destructive Testing (NDT) Applications**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT229	**Engineering & Technical Drawing for Weld Design**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	OEIWT227	**Oil Equipment Welding Workshop Applications**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	TIKI210	**Project**	**Core**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	NTU204	**Professional Ethics**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √
Second	NTU202	**Arabic Language II**	**Elective**	√ √ √ √	√ √ √ √	√ √ √ √	√ √ √ √

Course Title: Fundamentals of Welding

Course Code: OEIWT120

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether they have made the most of the available learning opportunities. It is closely linked to the overall program specification.

---

1. Educational Institution

Northern Technical University / Kirkuk Technical College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Fundamentals of Welding / OEIWT120.

4. Available Attendance Modes

In-person / Blended (Electronic as per Ministry instructions).

5. Semester / Year

First Semester / Academic Year 2024-2025.

6. Total Credit Hours

60 contact hours (4 hours per week).

7. Date of Preparation

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- **A.** Define welding and categorize its various types.
- **B.** Identify and classify different types of weld joints.
- **C.** Recognize and understand welding process variables.
- **D.** Acquire essential practical skills through hands-on training in the welding workshop.

---

9. Course Outcomes, Teaching, Learning, and Assessment Methods

A. Cognitive Objectives (Knowledge and Understanding)

- **A1.** Provide a comprehensive theoretical foundation regarding the fundamentals of welding.
- **A2.** Explain the mechanisms and principles of joining materials.
- **A3.** Demonstrate how to calibrate and adjust welding machine parameters.
- **A4.** Clarify the fundamental principles of both Gas Welding and Arc (Electrical) Welding.
- **A5.** Illustrate types of weld joints and the criteria for selecting the appropriate joint for specific applications.

	Objective
A	Define welding and categorize its various types.
B	Identify and classify different types of weld joints.
C	Recognize and understand welding process variables.
D	Acquire practical skills through hands-on training in the welding workshop.

---

3. Learning Outcomes & Teaching Methods / مخرجات التعلم وطرائق التعليم

Category	Intended Learning Outcomes (ILOs)	Teaching & Assessment Methods
A. Cognitive (Knowledge)	**A1.** Overview of welding fundamentals. **A2.** Mechanism of material bonding. **A3.** Calibration of welding machine variables. **A4.** Principles of Gas and Arc welding. **A5.** Types of joints and selection criteria.	**Methods:** Objective questions (MCQs, T/F), Self & Peer assessment. **Assessment:** Daily quizzes, Monthly & Final exams.
B. Professional Skills	**B1.** Preparation of weld joints. **B2.** Practical application of welding positions. **B3.** Comparison between welding processes. **B4.** Operation of automated analysis devices.	**Methods:** Practical workshop training, hands-on demonstrations.
C. Affective (Values)	**C1.** Proposing new ideas. **C2.** Evaluating topics and providing solutions. **C3.** Differentiating between technical problems.	**Methods:** Presentations, Schematic drawing, Brainstorming sessions.

Category	Intended Learning Outcomes (ILOs)	Teaching & Assessment Methods
	C4. Interpreting phenomena and issues.	
D. Transferable Skills	**D1.** Use of references and terminology. **D2.** Data collection and analysis. **D3.** Resource management and optimization. **D4.** Conducting comparative studies. **D5.** Conceptualizing subject frameworks.	**Methods:** Research assignments, Case studies, Analytical tasks.

4. Assessment Structure / هيكلية التقييم

Assessment Type	Frequency / Timing
Daily/Formative	Quizzes and continuous participation
Monthly/Summative	At the end of each academic month
Final/Sessional	At the end of the semester

Week	Hours	Unit/Subject	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	4	**Welding Definition & Safety Regulations**	General precautions, ventilation, PPE, cylinder handling, connections, safety in welding operations, and fire safety rules.	Lecture	Oral Tests
2-3	8	**Welding Types & Applications**	Weld joints, angles, joint preparation, weld pool, welding positions, welding movements, and basic welding symbols.	Discussion & Dialogue	Self & Peer Assessment
4-6	12	**Arc Welding (SMAW)**	Arc theory, metal transfer methods, arc welding types/advantages, currents used, equipment & machines, arc ignition, stability, and joint configurations.	Discussion & Dialogue	Self & Peer Assessment
7-9	12	**Electrodes for SMAW**	Definition and classification of electrodes, specifications, Flux coating benefits, and the relationship between metal thickness, electrode diameter, and amperage.	Discussion & Dialogue	Self & Peer Assessment
10-11	8	**Gas Welding Fundamentals**	Gas welding concept, advantages/disadvantages, types of gases, and equipment (cylinders, regulators, gauges, hoses, safety valves, torches).	Lecture	Oral Tests
12-15	16	**Flame Types & Zones**	Flame adjustment, weld pool/bead, joint types, positions, torch/filler movement and angles, filler wire classification, fluxes, pipe welding, and gas cutting.	Discussion & Dialogue	Self/Peer Assessment & Written Exams

11. Infrastructure / البنية التحتية

Category	References & Resources
1. Required Textbooks	1. *Welding Principles and Applications*, Larry Jeffus, 4th Ed., Delmar Publisher. 2. *Welding Engineering*, R.L. Agrawal, Khanna Publisher. 3. *Practical Welding*, S. Gibson, Macmillan Press. 4. *Principles of Welding*, L.M. Gourd, 3rd Ed., Edward Arnold.
2. Main References (Sources)	• *Welding Metallurgy*, Dr. Qahtan Al-Khazraji. • *Manufacturing Methods: Casting & Welding*, Dr. Arif Abu Safia & Dr. Abdul Razzaq Khader. • *Metal Welding Engineering*, Dr. Ahmed Salem El-Sabbagh. • *Welding Technology Modules*, Technical & Vocational Training Corporation (TVTC), Riyadh.

Category	References & Resources
	• *SMAW Manual*, YAT Education Solutions (2019/2020). • *Gas Welding (Parts 1 & 2)*, Felix Wutka, Al-Ahram Foundation.
3. Recommended Resources	International specialized scientific journals, technical reports, and reputable academic databases.
4. Electronic References	Reputable international publishing websites and online academic libraries.

---

12. Course Development Plan / خطة تطوير المقرر

Providing students with the latest research findings and modern technological advancements related to the lecture topics to ensure they stay updated with the global welding industry.

---

1. Basic Information / المعلومات الأساسية

Item	Description
Institution	Northern Technical University / Kirkuk Technical College
Department	Oil Equipment Inspection and Welding Techniques
Course Name & Code	Engineering Inspection / OEIWT121
Attendance Mode	In-person / Blended (As per Ministry instructions)
Semester / Year	First Semester / 2024-2025
Total Credit Hours	60 Hours (4 Hours per week)
Preparation Date	2025

---

2. Course Objectives / أهداف المقرر

	Objective
A	List and categorize types of destructive testing for metals.
B	Evaluate and analyze the mechanical properties of metallic materials.
C	Familiarize students with international standards and specifications for inspection.

---

3. Learning Outcomes & Teaching Methods / مخرجات التعلم وطرائق التعليم

Category	Intended Learning Outcomes (ILOs)	Teaching & Assessment Methods
A. Cognitive (Knowledge)	**A1.** Define the concept of engineering inspection science. **A2.** Interpret key properties of metallic materials. **A3.** Demonstrate the application of international standards in the field.	**Methods:** Objective questions (MCQs, T/F), Self & Peer assessment. **Assessment:** Daily quizzes, Monthly & Final exams.
B. Subject Skills	**B1.** Data collection regarding engineering inspection. **B2.** Analysis of technical causes and problems. **B3.** Comparative analysis of past and present experiments. **B4.** Technical communication and reporting skills.	**Methods:** Formative and summative achievement tests, classroom discussions.
C. Affective (Values)	**C1.** Proposing innovative ideas on the subject.	**Methods:** Presentations, Illustrative sketching, Brainstorming sessions.

Category	Intended Learning Outcomes (ILOs)	Teaching & Assessment Methods
	C2. Evaluating topics and providing technical solutions. **C3.** Differentiating between technical issues. **C4.** Analyzing and interpreting technical phenomena.	
D. Transferable Skills	**D1.** Use of technical references and terminology. **D2.** Data collection and analytical reasoning. **D3.** Efficiency in utilizing available resources. **D4.** Conducting comparative studies.	**Methods:** Research-based tasks, analytical assignments, and resource management exercises.

Category	Intended Learning Outcomes (ILOs)	Teaching & Assessment Methods
	D5. Developing specialized conceptual frameworks.	

4. Assessment Structure / هيكلية التقييم

Assessment Type	Frequency / Timing
Daily/Formative	Daily quizzes and classroom participation
Monthly/Summative	Monthly exams at the end of each academic month
Final/Sessional	Comprehensive exam at the end of the semester

بنية المقرر / (

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	4	**Intro to Engineering Inspection**	1. Defining engineering inspection. 2. Classification of engineering materials. 3. Classification of engineering tests.	Lecture + Discussion	Oral Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
			4. Engineering units of measurement.		
2	4	**Tensile Testing (I)**	1. General concept of tensile testing. 2. Specific technical terminology. 3. Stress-Strain curve analysis.	Discussion & Dialogue	Self & Peer Assessment
3	4	**Tensile Testing (II)**	1. Calculation of mechanical properties. 2. Tensile testing machine (UTM) operation.	Discussion & Dialogue	Written Exams
4	4	**Tensile Testing (III)**	1. Standard tensile specimens. 2. Testing procedures and steps. 3. Analysis and evaluation of results.	Lecture + Discussion	Self & Peer Assessment
5	4	**Compression Testing (I)**	1. General concept of compression testing.	Lecture	Oral Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
			2. Technical terminology. 3. Stress-Strain curve behavior.		
6	4	**Compression Testing (II)**	1. Standard specimens. 2. Testing steps and procedures 3. Analysis and evaluation of test results.	Discussion & Dialogue	Self & Peer Assessment
7	4	**Hardness Testing (I)**	Brinell Hardness Test method and application.	Lecture	Written Exams
8	4	**Hardness Testing (II)**	Vickers Hardness Test method and application.	Discussion & Dialogue	Self & Peer Assessment
9	4	**Hardness Testing (III)**	Rockwell Hardness Test method and application.	Lecture	Written Exams
10	4	**Hardness Testing (IV)**	Micro-hardness testing principles.	Discussion & Dialogue	Oral Tests
11	4	**Impact Testing (I)**	1. General concept of impact testing. 2. Specific terminology. 3. Calculation of impact energy.	Lecture + Discussion	Oral Tests
12	4	**Impact Testing (II)**	1. Types of impact tests (Charpy/Izod). 2. Standard specimens. 3. Effects of temperature on impact toughness.	Lecture	Oral Tests
13	4	**Bend Testing (I)**	1. General concept of bend testing. 2. Specific technical terminology.	Lecture + Discussion	Self & Peer Assessment
14	4	**Bend Testing (II)**	1. Standard specimens.	Lecture + Discussion	Written Exams

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
			2. Analysis and evaluation of results.		
15	4	**Bend Testing (III)**	1. Bend testing for weldments. 2. Types of weld bend tests (Face, Root, Side).	Lecture	Tests

0. Course Structure / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	4	**Introduction to Engineering Inspection**	1. Defining engineering inspection. 2. Classification of engineering materials. 3. Classification of engineering tests. 4. Engineering units of measurement.	Lecture + Discussion	Oral Tests
2	4	**Tensile Testing (I)**	1. General concept of tensile testing. 2. Technical terminology. 3. Stress-Strain curve analysis.	Discussion & Dialogue	Self & Peer Assessment
3	4	**Tensile Testing (II)**	1. Calculation of mechanical properties. 2. Tensile testing machine (UTM) operation.	Discussion & Dialogue	Written Exams
4	4	**Tensile Testing (III)**	1. Standard tensile specimens. 2. Testing procedures. 3. Analysis and evaluation of results.	Lecture + Discussion	Self & Peer Assessment
5	4	**Compression Testing (I)**	1. General concept of compression testing.	Lecture	Oral Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
			2. Technical terminology. 3. Stress-Strain behavior in compression.		
6	4	**Compression Testing (II)**	1. Standard specimens. 2. Testing steps and procedures. 3. Analysis and evaluation of results.	Discussion & Dialogue	Self & Peer Assessment
7	4	**Hardness Testing (I)**	Brinell Hardness Test method and application.	Lecture	Written Exams
8	4	**Hardness Testing (II)**	Vickers Hardness Test method and application.	Discussion & Dialogue	Self & Peer Assessment
9	4	**Hardness Testing (III)**	Rockwell Hardness Test method and application.	Lecture	Written Exams
10	4	**Hardness Testing (IV)**	Micro-hardness testing principles.	Discussion & Dialogue	Oral Tests
11	4	**Impact Testing (I)**	1. General concept of impact testing. 2. Specific terminology. 3. Calculation of impact energy.	Lecture + Discussion	Oral Tests
12	4	**Impact Testing (II)**	1. Types of impact tests. 2. Standard specimens. 3. Temperature effects on impact results.	Lecture	Oral Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
13	4	**Bend Testing (I)**	1. General concept of bend testing 2. Technical terminology of the test.	Lecture + Discussion	Self & Peer Assessment
14	4	**Bend Testing (II)**	1. Standard specimens. 2. Analysis and evaluation of results.	Lecture + Discussion	Written Exams
15	4	**Bend Testing (III)**	1. Bend testing for weldments. 2. Classification of weld bend tests.	Lecture	Exams

11. Infrastructure / البنية التحتية

Category	Description / Reference
1. Required Textbooks	Specialized textbooks in **Materials Testing and Quality Control** (to be specified by the department).
2. Main References (ASTM Standards)	**ASTM Standards:** 1. **ASTM E8M:** Standard Test Methods for Tension Testing of Metallic Materials. 2. **ASTM E209:** Standard Practice for Compression Tests of Metallic Materials at Elevated Temperatures. 3. **ASTM E10:** Standard Test Method for Brinell Hardness of Metallic Materials. 4. **ASTM E18:** Standard Test Methods for Rockwell Hardness of Metallic Materials. 5. **ASTM E23:** Standard Test Methods for Notched Bar Impact Testing of Metallic Materials. 6. **ASTM E92:** Standard Test Method for Vickers Hardness of Metallic Materials.

Category	Description / Reference
	7. **ASTM E140:** Standard Hardness Conversion Tables for Metals (Relationship Among Brinell, Vickers, Rockwell, and Knoop Hardness). 8. **ASTM E190:** Standard Test Method for Guided Bend Test for Ductility of Welds. 9. **ANSI/AWS B4.0 – 98:** Standard Methods for Mechanical Testing of Welds. 10. **Lincoln Handbook of Arc Welding.**
3. Recommended Resources	Scientific journals specializing in Engineering Inspection, Materials Science, and International Inspection Reports.
4. Electronic References	Accredited international publishing websites, **ASTM International** database, and specialized engineering portals.

---

12. Course Development Plan /

Establishing active communication channels with industry leaders and employers to gather feedback and integrate market-driven topics and modern inspection technologies into the curriculum.

Course Description Form

Course Title: Welding Workshop Fundamentals

Course Code: OEIWT123

This course description provides a concise summary of the manual skills acquired to execute various welding operations and the ability to operate welding machines and equipment utilized within the welding workshop.

---

1. Educational Institution

Northern Technical University / Kirkuk Technical College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Welding Workshop Fundamentals / OEIWT123.

4. Available Attendance Modes

In-person / Blended (As per Ministry instructions).

5. Semester / Year

First Semester / Academic Year 2025-2026.

6. Total Credit Hours

120 contact hours (8 hours per week).

7. Date of Preparation

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- **A.** List and identify different types of weld joints.
- **B.** Identify and categorize various welding positions.
- **C.** Acquire the manual proficiency and hand-skills required to perform welding operations.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the Arc Welding process and its principles.
- **A2.** Enumerate and classify various welding processes.
- **A3.** Demonstrate the techniques for welding steel plates and pipes using different welding methods.

B. Subject-Specific Skills

- **B1.** Gather information and technical data related to welding workshop environments.
- **B2.** Analyze technical causes and troubleshoot problems during practical tasks.
- **B3.** Conduct comparisons between historical techniques and modern practical experiences.
- **B4.** Develop effective communication and technical delivery skills.

Teaching and Learning Methods

1. **Objective Questioning:** (Multiple-choice, True/False, and Comparative questions).
2. **Self and Peer Assessment:** Developing reflective and collaborative learning.
3. **Examination Structure:**
    - **Formative Achievement Tests:** Integrated with ongoing teaching plans.
    - **Summative Achievement Tests:** * Monthly examinations at the end of each study month.
        - Comprehensive final semester examinations.

Assessment Methods

Utilization of Academic Achievement Tests:

- Daily Quizzes (Practical & Theoretical).
- Monthly Examinations.
- Sessional/Final Examinations.

C. Affective and Value-Based Objectives (Attitudes)

- **C1.** Encourage students to propose innovative ideas and creative approaches related to welding.
- **C2.** Enhance the student's ability to evaluate technical topics and propose effective solutions.
- **C3.** Develop the capability to differentiate between various technical problems and operational challenges.
- **C4.** Interpret and analyze physical phenomena and technical issues encountered in the workshop.

Teaching and Learning Methods for (C):

1. **Presentation & Demonstration:** Using visual aids and live demonstrations.
2. **Technical Sketching:** Drawing illustrative diagrams to represent welding joints and processes.
3. **Brainstorming Sessions:** Collaborative problem-solving and idea generation.
4. **Practical Workshop Training:** Hands-on practice within the welding workshop environment.

D. General and Transferable Skills (Employability & Personal Development)

- **D1.** Proficiency in utilizing technical references, standards, and specialized terminology.
- **D2.** Skills in collecting, organizing, and analyzing technical data relevant to welding.

- **D3.** Resourcefulness in maximizing the use of available workshop facilities and equipment.
- **D4.** Ability to conduct comparative studies and technical benchmarking.
- **D5.** Skills in conceptualizing and formulating specific frameworks for subject-related topics.

- **10. Course Structure (Syllabus) /**
-

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	10	**Occupational Safety & Arc Welding Intro**	Occupational safety precautions, welding equipment setup, training on various surfaces, equipment handling, and electrode installation.	Lecture + Practical Application	Practical Tests
2	10	**Practical Training (1)**	Flat position welding (under eye level) for straight beads.	Lecture + Practical Application	Practical Tests
3	10	**Practical Training (2)**	Flat position welding for external corner joints.	Lecture + Practical Application	Practical Tests
4	10	**Practical Training (3)**	Flat position welding for internal fillet joints (T-Joint).	Lecture + Practical Application	Practical Tests
5	10	**Practical Training (4)**	Butt joint welding in the horizontal position (at eye level).	Lecture + Practical Application	Practical Tests
6	10	**Practical Training (5)**	Vertical-up welding for internal fillet joints (T-Joint).	Lecture + Practical Application	Practical Tests
7	10	**Practical Training (6)**	Vertical-up welding for square butt joints.	Lecture + Practical Application	Practical Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
8	10	**Practical Training (7)**	Vertical-up welding for V-groove butt joints.	Lecture + Practical Application	Practical Tests
9-15	70	**Gas Welding (Oxy-Acetylene)**	Equipment assembly and adjustment, auxiliary tools, gas specifications, filler rods (types/sizes), flux materials, flame types (ignition and adjustment), edge preparation/cleaning, welding in various positions (butt, perpendicular, inclined), circular welding, and longitudinal/transverse cutting.	Lecture + Practical Application	Practical Tests

- ---
- ## 11. Infrastructure

Category	Description / Reference
1. Required Textbooks	All specialized references and manuals related to **Welding Workshop Practice**.
2. Main References (Sources)	**Lincoln Handbook of Arc Welding** (The Procedure Handbook of Arc Welding).
3. Recommended Resources	Scientific journals and technical reports specializing in the **practical and operational aspects** of welding processes.
4. Electronic References	Accredited international scientific websites and specialized industrial engineering portals.

- ## 12. Course Development Plan /
- Updating the practical exercises to include modern welding technologies and ensuring the workshop environment simulates current industrial safety standards to enhance students' readiness for the labor market.

Course Description Form

Course Title: Engineering Mechanics

Course Code: OEIWT122

This course description provides a summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether they have made the most of the available learning opportunities. It is closely linked to the program description.

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Engineering Mechanics / OEIWT122.

4. Available Attendance Modes

In-person / Blended (As per Ministry instructions).

5. Semester / Year

First Semester / Academic Year 2025-2026.

6. Total Credit Hours

60 contact hours (4 hours per week).

7. Date of Preparation

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- **A.** List and define the types of **Stress and Strain**.
- **B.** Evaluate and analyze the **forces acting on bodies**.
- **C.** Identify the most important applications of **Engineering Mechanics** in industry.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental concepts of **Engineering Mechanics**.
- **A2.** Explain the effects of various **forces on physical bodies**.
- **A3.** Demonstrate types of **stresses** and the mathematical methods for their calculation.

B. Subject-Specific Skills

- **B1.** Synthesize technical data regarding Engineering Mechanics.
- **B2.** Analyze technical causes and engineering problems.
- **B3.** Conduct comparisons between historical engineering theories and contemporary practices.
- **B4.** Develop professional communication and technical delivery skills.

C. Affective and Value-Based Objectives (Attitudes)

- **C1.** Propose innovative ideas regarding mechanical systems.
- **C2.** Evaluate engineering scenarios and propose effective solutions.
- **C3.** Differentiate between various mechanical problems.
- **C4.** Analyze and interpret physical phenomena and engineering challenges.

Teaching and Learning Methods

1. **Objective Questioning:** (MCQs, True/False, and Comparative questions).
2. **Self and Peer Assessment.**
3. **Examination Structure:**
    - **Formative Assessment:** Continuous achievement tests integrated with teaching plans.

- **Summative Assessment:** Monthly exams and final sessional exams.

4. **Visual Aids:** Use of presentations, illustrative schematic drawings, and brainstorming sessions.

Assessment Methods

Utilization of Academic Achievement Tests:

- Daily Quizzes (Formative).
- Monthly Examinations.
- Sessional/Final Semester Examinations.

---

12. Course Development Plan

Establishing communication with employers and industry experts to gather their suggestions regarding modern topics that should be integrated into the curriculum to keep pace with labor market needs.

Course Description Form

Course Title: Engineering Mechanics

Course Code: OEIWT122

This course description provides a concise summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether they have made the most of the available learning opportunities. It is strictly aligned with the overall program specification.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Engineering Mechanics / OEIWT122.

4. Available Attendance Modes

In-person / Blended (As per Ministry instructions).

5. Semester / Year

First Semester / Academic Year 2025-2026.

6. Total Credit Hours

60 contact hours (4 hours per week).

7. Date of Preparation

8. Course Objectives

By the end of the academic year, the student will be able to:

- **A.** List and define the various types of **Stress and Strain**.
- **B.** Evaluate and analyze the **external and internal forces** acting on physical bodies.
- **C.** Identify the most critical applications of **Engineering Mechanics** within industrial fields.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental principles and scope of **Engineering Mechanics**.
- **A2.** Explain the physical impact and distribution of forces on solid bodies.
- **A3.** Demonstrate the different types of stresses (Tension, Compression, Shear) and their calculation methods.

B. Subject-Specific Skills

- **B1.** Synthesize and organize technical data regarding mechanical systems.
- **B2.** Analyze technical causes and troubleshoot engineering mechanics problems.
- **B3.** Conduct comparative studies between historical mechanical theories and modern engineering practices.
- **B4.** Develop effective technical communication and reporting skills.

Teaching and Learning Methods

1. **Objective Questioning:** Utilizing multiple-choice questions (MCQs), True/False, and Comparative analysis questions.
2. **Self and Peer Assessment:** To encourage critical thinking and collaboration.

3. **Structured Testing:**
    - **Formative Assessment:** Continuous achievement tests synchronized with the teaching plans.
    - **Summative Assessment:** Monthly exams at the end of each study month and final semester-end examinations.

Assessment Methods

Utilization of Academic Achievement Tests:

- Daily Quizzes (Formative).
- Monthly Mid-term Exams.
- Final Sessional Examinations

C. Affective and Value-Based Objectives (Attitudes)

- **C1.** Propose innovative ideas and creative mechanical solutions.
- **C2.** Enhance the student's ability to evaluate technical problems and provide sound engineering judgments.
- **C3.** Differentiate between various mechanical challenges and failure modes.
- **C4.** Analyze and interpret physical phenomena and their impact on engineering structures.

D. General and Transferable Skills (Employability)

- **D1.** Proficiency in using technical references, engineering manuals, and specialized terminology.
- **D2.** Skills in data collection, categorization, and analytical reasoning.
- **D3.** Resourcefulness in maximizing the utilization of available technical facilities.
- **D4.** Conducting benchmarks and comparative analyses between different engineering cases.
- **D5.** Developing specific conceptual frameworks for mechanical design and analysis.

10. Course Structure (Syllabus) / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	4	**Statics Fundamentals**	Fundamental concepts: Forces, Scalars/Vectors, Units, Force polygon, Cartesian Components.	Lecture + Discussion	Oral Tests
2	4	**Force Analysis**	Problem Solving: Conversion of units, product of a scalar and vector.	Discussion & Dialogue	Self & Peer Assessment
3	4	**Resultant Forces (2-D)**	Resultant of Concurrent/Coplanar force systems, force resolution, and graphical methods.	Discussion & Dialogue	Written Exams
4	4	**Moments**	Computing resultants by analytical methods and moment calculation principles.	Lecture + Discussion	Self & Peer Assessment
5	4	**Couples**	Transformation of couples and forces, moments, and industrial applications.	Lecture	Oral Tests
6	4	**Resultant Forces (3-D)**	Resultant of non-concurrent/Coplanar force systems in three dimensions.	Discussion & Dialogue	Self & Peer Assessment
7	4	**Equilibrium & F.B.D.**	Free Body Diagrams (F.B.D.), equilibrium tests, and types of support conditions.	Lecture	Written Exams
8	4	**Friction**	Principles of Dry Friction, tests, and classroom discussions.	Discussion & Dialogue	Self & Peer Assessment

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
9	4	**Centroids**	Center of Gravity, Centroids of lengths/areas (Simple and Composite shapes).	Lecture	Written Exams
10	4	**Moment of Inertia**	Finding the Moment of Inertia for different shapes (Simple & Composite).	Discussion & Dialogue	Oral Tests
11	4	**Dynamics: Motion**	Linear motion with constant speed and applications of straight-line motion.	Lecture + Discussion	Oral Tests
12	4	**Newton's Laws**	Practical applications of Newton's Second Law of motion.	Lecture	Oral Tests
13	4	**Strength of Materials (I)**	Fundamental concepts: Loads, Stress, Strain, Elasticity, Plasticity, and Deformation.	Lecture + Discussion	Self & Peer Assessment
14	4	**Strength of Materials (II)**	Hooke's Law, Stress-Strain curve analysis, and types of mechanical stress.	Lecture + Discussion	Written Exams
15	4	**Beams**	Classification of beams, types of loads, and beam performance tests.	Lecture	Exams

---

11. Infrastructure / البنية التحتية

Category	Reference / Resource
Required Textbooks	Engineering Mechanics (Statics & Dynamics) - e.g., Meriam & Kraige / Hibbeler.
Recommended Resources	Specialized engineering journals and technical reports in mechanics and material strength.
Electronic References	Accredited engineering platforms (ASME, ScienceDirect) and specialized technical portals.

---

12. Course Development Plan / خطة تطوير المقرر

Establishing proactive communication with industry partners to align the curriculum with current market requirements and modern mechanical analysis tools.

Course Description Form

Course Title: Computer Science 1

Course Code: NTU102

This academic program description provides a concise overview of the most important computer applications and Office software suite. It covers the study of software characteristics and the learning outcomes students are expected to achieve, demonstrating their ability to maximize the available learning opportunities.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Computer Science 1 / NTU102.

4. Available Attendance Modes

In-person / Blended (As per Ministry instructions).

5. Semester / Year

First Semester / Academic Year 2025-2026.

6. Total Credit Hours

30 contact hours (2 hours per week).

7. Date of Preparation

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Identify computer components and master the **Windows 7** operating system, including its commands and window management.
- Master text composition, formatting, and document settings in **Microsoft Word 2010**.
- Create tables, manage graphic objects, work with geometric shapes, and handle data processing in **Microsoft Excel 2010**.
- Design professional **PowerPoint 2010** slides incorporating text and graphics, and configure interactive slide presentations.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental concepts of computer science.
- **A2.** Explain the essential characteristics and technical specifications of computers.
- **A3.** Demonstrate the practical use of various software applications on a computer system.

B. Subject-Specific Skills / الأهداف المهاراتية الخاصة

- **B1.** Gather and synthesize technical information regarding computer systems.
- **B2.** Analyze technical causes and troubleshoot common software/hardware issues.
- **B3.** Conduct comparisons between legacy computing systems and modern technologies.
- **B4.** Develop digital communication and technical delivery skills.

Teaching and Learning Methods for (B):

1. **Objective Questions:** (MCQs, True/False, and Comparative questions).

2. **Self and Peer Assessment.**
3. **Structured Examinations:**
    - **Formative Assessment:** Continuous progress tests during the term.
    - **Summative Assessment:** Monthly and final semester examinations.

C. Affective and Value-Based Objectives / الأهداف الوجدانية والقيمية

- **C1.** Encourage students to propose innovative digital ideas and solutions.
- **C2.** Enhance the student's ability to evaluate software efficiency and provide technical solutions.
- **C3.** Differentiate between various technical problems and security risks.
- **C4.** Interpret and analyze digital phenomena and computing issues.

Teaching and Learning Methods for (C):

1. **Presentation & Demonstration:** Showcasing software features.
2. **Technical Sketching:** Illustrating system architectures and workflows.
3. **Brainstorming Sessions:** Collaborative problem-solving for technical tasks.

D. General and Transferable Skills / المهارات العامة والتأهيلية

- **D1.** Proficiency in using technical references, manuals, and IT terminology.
- **D2.** Skills in digital data collection, organization, and analytical reasoning.
- **D3.** Resourcefulness in maximizing the utilization of available software and hardware capabilities.
- **D4.** Conducting benchmarks and comparative analyses between different applications.
- **D5.** Developing specific conceptual frameworks for digital workflow management.

10. Course Structure (Syllabus) / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	2	**General Introduction**	Define computer basics, **Hardware** components, **Software** types, and an intro to the **Windows** OS.	Lecture + Discussion	Oral & Practical Tests
2	2	**Window Concepts & OS Navigation**	1. Understand window components (resize, move, close, toggle). 2. Explore **Start Menu** contents. 3. Master **"My Computer/This PC"** properties (Processor speed, CPU type, RAM size, OS version).	Discussion & Dialogue	Oral & Practical Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method

Week	Hours	Unit/Subject Topic		Intended Learning Outcomes (ILOs)		Teaching Method	Assessment Method
3	2	**Files and Folders Management**	1. Managing folders/files (Create, Move, Copy, Rename, Delete, Restore/Empty Recycle Bin). 2. Using **Find/Search** command. 3. File **Compression/Decompression** concepts. 4. Controlling **Folder Options** and display settings.	Discussion & Dialogue	Oral & Practical Tests		
4	2	**Microsoft Word: Introduction**	1. Interface components (Command bar, Ribbons, Tools). 2. Default file naming and renaming. 3. Adjusting **Zoom** levels and saving new documents.	Lecture + Discussion	Oral & Practical Tests		
5	2	**Word Art & Text Manipulation**	Inserting WordArt, rotation, resizing, and using the **Format Ribbon** tools.	Lecture	Oral & Practical Tests		

Week	Hours	Unit/Subject Topic		Intended Learning Outcomes (ILOs)		Teaching Method	Assessment Method
6	2	**General Document Settings**	1. Page orientation (Portrait/Landscape). 2. Page borders and **Ruler** visibility. 3. Page numbering, **Headers & Footers**. 4. Print Preview and Printing settings.	Discussion & Dialogue	Oral & Practical Tests		
7	2	**Direct Text & Advanced Elements**	1. Text entry and formatting settings. 2. Inserting **Symbols** and **Equations**. 3. Using **Text Boxes** and Keyboard Shortcuts.	Lecture	Oral & Practical Tests		
8	2	**Graphics & Tables in Word**	1. Managing Shapes, Pictures, **Clip Art**, and Charts.	Discussion & Dialogue	Oral & Practical Tests		

Week	Hours	Unit/Subject Topic		Intended Learning Outcomes (ILOs)		Teaching Method	Assessment Method
			2. Tables: Drawing, resizing, inserting rows/columns, merging/splitting cells, and Sorting (Ascending/Descending).				
9	2	**Microsoft Excel: Introduction**	Launching Excel, interface navigation, saving/closing workbooks, **Workbook Protection**, and file extensions.	Lecture	Oral & Practical Tests		
10	2	**Worksheet Management**	Renaming worksheets, inserting new sheets, deleting, hiding, and **Worksheet Protection**.	Discussion & Dialogue	Oral & Practical Tests		
11	2	**Cell Editing & Data Management**	1. Data management: symbols, cell formatting, and **Find/Sort** functions. 2. Inserting data, columns, and rows.	Lecture + Discussion	Oral & Practical Tests		
12	2	**Charts in Excel**	Creating and formatting various types of data charts and graphs.	Lecture	Oral & Practical Tests		
13	2	**Microsoft PowerPoint**	1. Program interface and launching. 2. Slide preparation: **WordArt**, **Shapes**, **Text Boxes**, and **Background** settings.	Lecture + Discussion	Oral & Practical Tests		

142Custom Animation in PowerPoint

1. Adding animations to slide objects and adding sound effects.

2. Previewing projects in the storyboard and full-screen modes.

3. Managing animations: deleting, reordering, and adding emphasis effects.

Lecture + DiscussionOral & Practical Tests**152Multi-Slide Project & Interactivity**

1. Slide management: adding, editing, and deleting slides.

2. Setting up an **Interactive Show** using **Hyperlinks**.

LectureWritten & Practical Exams

إليك الترجمة الأكاديمية والمنسقة لمقرر **"الرياضيات"** (Mathematics) وفق المعايير الدولية، مع صياغة المصطلحات الرياضية والهندسية:

Course Description Form

Course Title: Mathematics

Course Code: TIKI110

This course description provides a concise summary of the most important characteristics of Mathematics and the learning outcomes the student is expected to achieve, demonstrating whether they have maximized the available learning opportunities. It is strictly linked to the overall academic program description.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Mathematics / TIKI110.

4. Available Attendance Modes

In-person / Blended (As per Ministry instructions).

5. Semester / Year

First Semester / Academic Year 2025-2026.

6. Total Credit Hours

30 contact hours (2 hours per week).

7. Date of Preparation

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Acquire skills in handling mathematical operations and solving **Simultaneous Equations**.
- Master the **graphing of mathematical functions** and understanding engineering applications of **Differentiation**.
- Apply **Integration** techniques and understand **Differential Equations** with their various applications.
- Comprehend **Vectors** and perform calculations of vector angles and magnitudes.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental concepts of mathematical applications in engineering.
- **A2.** Solve simultaneous equations using **Cramer's Rule**.
- **A3.** Graph mathematical functions and identify **Maxima and Minima** points.
- **A4.** Understand the laws of Integration and their fundamental relationship with Differentiation.
- **A5.** Illustrate statistical principles and the related **Probability Theory**.

B. Subject-Specific Skills

- **B1.** Master and understand various complex mathematical operations.
- **B2.** Analyze mathematical laws, formulas, and equations.
- **B3.** Compare classical and modern methods in equation solving.
- **B4.** Develop effective communication and technical delivery skills.

Teaching and Learning Methods

1. **Interactive Digital Delivery:** Utilizing Google applications (Google Classroom/Meet) for interactive electronic lectures.
2. **Visual Presentations:** Using presentation tools and illustrative schematic drawings.
3. **Brainstorming:** Encouraging collaborative problem-solving.
4. **Objective Questioning:** (MCQs, True/False, and Matching questions).
5. **Assessment:** Self and Peer assessment, Formative achievement tests, and Summative exams (Monthly & Final).

C. Affective and Value-Based Objectives (Attitudes)

- **C1.** Propose innovative mathematical ideas and approaches.
- **C2.** Evaluate mathematical topics and provide technical solutions.
- **C3.** Differentiate between various types of mathematical problems.
- **C4.** Interpret and analyze mathematical phenomena and challenges.

D. General and Transferable Skills (Employability)

- **D1.** Proficiency in using mathematical references and specialized terminology.
- **D2.** Skills in data collection and analytical reasoning.
- **D3.** Resourcefulness in utilizing available educational tools and resources.
- **D4.** Conducting comparative studies in mathematical methods.
- **D5.** Conceptualizing and formulating specific frameworks for mathematical topics.

0. Course Structure (Syllabus) / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	2	**Determinants (2x2)**	Understanding determinants, their properties, and solving simultaneous equations using **Cramer's Rule**.	Lecture	Oral Tests
2	2	**Determinants (3x3)**	Mastering properties of 3x3 determinants and solving complex systems via Cramer's Rule.	Discussion & Dialogue	Self & Peer Assessment
3	2	**Trigonometry & Functions**	Understanding Geometric theories, Trigonometric, Logarithmic, and Exponential functions.	Discussion & Dialogue	Written Exams

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
4	2	**Geometric Applications**	Calculating Areas and Volumes; Graphing Trigonometric functions and finding **Maxima/Minima**.	Discussion & Dialogue	Self & Peer Assessment
5-10	12	**Differentiation (Calculus)**	Mastery of Differentiation, Algebra of Derivatives, Chain Rule, Implicit Differentiation, and Multi-variable functions.	Lecture	Oral Tests
11	2	**Integration Basics**	Understanding laws of integration, the relationship between differentiation and integration, Definite and Indefinite integrals.	Lecture	Written Exams
12	2	**Applications of Integration**	Implicit integration and engineering applications (Areas, Volumes, and Physical applications).	Discussion & Dialogue	Self & Peer Assessment
13	2	**Methods of Integration (I)**	Introduction to various techniques and methods of integration.	Lecture	Written Exams
14	2	**Methods of Integration (II)**	Advanced methods and techniques of integration.	Discussion & Dialogue	Self & Peer Assessment
15	2	**Statistics & Probability**	Fundamentals of Statistics and basic Principles of Probability Theory.	Lecture	Written Exams

---

11. Infrastructure / البنية التحتية

Category	Description / Reference
1. Required Textbooks	Core resources available at the Institute’s library for essential mathematical foundations.
2. Main References (Sources)	**George B. Thomas, Jr.**, *"Thomas' Calculus"*, 12th Edition, Addison Wesley, Pearson Education, Inc., 2010.

Category	Description / Reference
3. Recommended Resources	Peer-reviewed scientific journals and reports related to advanced mathematics and engineering applications.
4. Electronic References	Academic websites, online mathematical databases, and e-learning platforms specialized in Calculus and Statistics.

---

12. Course Development Plan / خطة تطوير المقرر

Enhancing the learning experience by providing students with modern research papers, interactive resources, and specialized mathematical software on digital media (CD/Cloud storage) to keep pace with global academic updates.

Course Description Form

Course Title: English Language 1

Course Code: NTU101

This course aims to develop the student's ability to speak, listen, and write in English, enabling them to handle workplace essentials that require proficiency and familiarity with the English language.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

English Language 1 / NTU101.

4. Available Attendance Modes

In-person.

5. Semester / Year

First Semester / Academic Year 2025-2026.

6. Total Credit Hours

30 contact hours (2 hours per week).

7. Date of Preparation

---

8. Course Objectives

By the end of the academic year, the student will be able to:

1. **Understand English tenses and their correct usage within sentences.**
2. **Recognize that the curriculum is tailored to their level and supports progressive development.**
3. **Identify key methods for communication and speaking within a professional work environment.**
4. **Develop active listening skills in English.**
5. **Demonstrate proper writing mechanisms and structures.**

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1. Define the concept of tenses in English grammar.**
- **A2. Explain the methodology of acquiring language skills (Reading, Writing, Listening, Speaking).**
- **A3. Demonstrate the fundamentals of professional writing and speaking.**
- **A4. Illustrate active listening techniques.**
- **A5. Provide practical examples and real-life English conversations.**

B. Subject-Specific Skills

- **B1. Gather information and resources related to English language learning.**
- **B2. Analyze common barriers and challenges in language acquisition.**
- **B3. Compare traditional and modern language teaching methodologies.**
- **B4. Develop interpersonal communication skills and interact effectively with peers.**

Teaching and Learning Methods

1. **Visual Presentations: Using presentation slides and illustrative diagrams.**
2. **Brainstorming: Interactive sessions to encourage spontaneous speaking.**
3. **Objective Questioning: MCQs, True/False, and Matching exercises.**
4. **Formative & Summative Testing: Daily quizzes, monthly exams, and final semester examinations.**

C. Affective and Value-Based Objectives (Attitudes)

- **C1. Encourage students to propose new ideas during discussions.**
- **C2. Evaluate subject matter and propose creative linguistic solutions.**
- **C3. Differentiate between various communication problems.**
- **C4. Interpret and analyze linguistic phenomena and challenges.**

D. General and Transferable Skills (Employability)

- **D1. Proficiency in using English references and technical terminology.**
- **D2. Data collection and analytical skills regarding language topics.**
- **D3. Maximizing the use of available learning technologies and resources.**
- **D4. Conducting comparative linguistic analyses.**
- **D5. Conceptualizing specific frameworks for language development.**

---

10. Course Structure (Syllabus) / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	**2**	**Unit One: Hello!**	**Introductions: Using (am/are/is), possessive adjectives (my/your). Practical workplace greetings.**	**Lecture**	**Oral Tests**

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
2	2	**Unit 2: Your World**	Subject pronouns (He/She/They), Possessive adjectives (His/Her), and forming basic questions.	Lecture + Discussion	Self & Peer Assessment
3	2	**Unit 3: All About You**	Expanding vocabulary and personal information exchange.	Lecture + Discussion	Self & Peer Assessment
4	2	**Unit 4: Family & Friends**	Possessives ('s), possessive adjectives, Has/Have usage, and Adjective + Noun structure.	Lecture + Discussion	Written Exam
5	2	**Unit 5: The Way I Live**	Present Simple (I/You/We/They), Articles (A/An), and descriptive language.	Lecture + Discussion	Self & Peer Assessment
6	2	**Unit 6: Every Day**	Present Simple (He/She), Questions/Negatives, and Adverbs of Frequency (Always, Usually, etc.).	Lecture + Discussion	Oral Tests

Week	Hours	Unit/Subject Topic		Intended Learning Outcomes (ILOs)		Teaching Method	Assessment Method
7	2	**Unit 7: My Favorites**	Question words (Who, Where, Why), Object pronouns, and Demonstratives (This/That).	Lecture + Discussion	Oral Tests		
8	2	**Unit 8: Where I Live**	Describing places using (There is / There are) and Prepositions of place.	Lecture + Discussion	Written Exam		
9	2	**Unit 9: Times Past**	Past Simple of "To Be" (Was/Were born) and introduction to Irregular Verbs.	Lecture + Discussion	Self & Peer Assessment		
10	2	**Unit 10: We Had a Great Time**	Past Simple (Regular & Irregular), Questions, Negatives, and using "Ago".	Lecture + Discussion	Oral Tests		
11	2	**Unit 11: I Can Do That!**	Modal verbs (Can/Can’t), Adverbs, and making polite requests.	Lecture + Discussion	Self & Peer Assessment		
12	2	**Unit 12: Please & Thank You**	Expressions (I’d like...), Some/Any, and the difference between "Like" and "Would like".	Lecture + Discussion	Oral Tests		
13	2	**Unit 13: Here & Now**	Contrasting Present Simple vs. Present Continuous tenses.	Lecture + Discussion	Self & Peer Assessment		
14	2	**Unit 14: It’s Time to Go!**	Expressing future plans and intentions.	Lecture + Discussion	Oral Tests		
15	2	**Revision & Writing**	Writing skills: Drafting emails and informal letters. Comprehensive revision.	Lecture + Discussion	Written Exam		

11. Infrastructure / البنية التحتية

Category	Description / Reference
1. Required Textbooks	The prescribed textbook for the first stage (**New Headway Plus - Beginner level**) as approved by the Middle Technical University.
2. Main References	The official beginner-level English curriculum circulated by the Middle Technical University.
3. Recommended Resources	Peer-reviewed academic journals and language learning periodicals.
4. Electronic References	Accredited international publishing websites, English learning portals, and model educational repositories.

---

12. Course Development Plan / خطة تطوير المقرر

Establishing communication with employers to integrate specialized technical English terminology relevant to the field of oil equipment and welding, ensuring the curriculum meets professional market demands.

Course Description Form

Course Title: Human Rights and Democracy

Course Code: NTU100

This course description provides a concise summary of the most important characteristics of the course and the learning outcomes expected of the student, demonstrating the extent to which the student has maximized the available learning opportunities. It is integrated with the overall academic program description.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Human Rights and Democracy / NTU100.

4. Available Attendance Modes

In-person.

5. Semester / Year

First Semester / Academic Year 2025-2026.

6. Total Credit Hours

30 contact hours (2 hours per week).

7. Date of Preparation

8. Course Objectives

By the end of the academic year, the student will be able to:

- Understand the fundamental principles of **human rights and freedoms**, as well as the rights and duties of individuals, groups, leaders, and subordinates.
- Distinguish the perspective of **Islamic law (Sharia)** on human rights and compare it with other religions.
- Comprehend the **international charters, treaties, and covenants** adopted by human rights organizations worldwide.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental concepts of human rights and democracy.
- **A2.** Distinguish the mechanisms of **international recognition** of human rights.
- **A3.** Identify the role of **Non-Governmental Organizations (NGOs)** in addressing individual and societal rights.
- **A4.** Understand human rights as stipulated in the **Iraqi Constitution**.
- **A5.** Classify human rights guarantees at local, regional, and international levels.
- **A6.** Categorize public and private freedoms.

B. Subject-Specific Skills

- **B1.** Comprehend the legal rights and duties that an individual is obligated to follow.
- **B2.** Recognize the role of institutions and civil society organizations in consolidating human rights.
- **B3.** Compare the roles of organizations toward human rights across different countries.
- **B4.** Acquire specialized skills and methods to identify rights and duties from the perspective of global human rights committees.

Teaching and Learning Methods

1. **Objective Questioning:** (MCQs, True/False, and Matching questions).
2. **Self and Peer Assessment.**
3. **Structured Examinations:**
    - **Formative Assessment:** Continuous achievement tests synchronized with the teaching plans.
    - **Summative Assessment:** Monthly exams and final sessional examinations.

Assessment Methods / طرائق التقييم

#	Assessment Type / نوع التقييم	Description / الوصف
1	**Achievement Tests**	Using continuous tests to measure learning progress, including:
	● Daily Quizzes	Brief assessments during or at the end of lectures.
	● Monthly Exams	Comprehensive tests covering each month's curriculum.
	● Sessional Exams	Mid-semester examinations.
	● Final Exams	Comprehensive end-of-course summative assessment.

C. Affective and Value-Based Objectives / ج- الأهداف الوجدانية والقيمية

- **C1.** Encourage students to propose **innovative ideas** and critical perspectives regarding human rights issues.
- **C2.** Develop the student's ability to **evaluate topics** and provide constructive legal or social solutions.
- **C3.** Enable students to **differentiate between various types of rights violations** and social problems.
- **C4.** Enhance the capacity to **interpret and analyze** democratic phenomena and human rights challenges.

Teaching and Learning Methods / طرائق التعليم والتعلم

#	Method / الطريقة	Application / التطبيق
1	**Interactive E-Learning**	Utilizing **Google Applications** (Classroom/Meet) to deliver lectures electronically and interactively.
2	**Visual Presentations**	Using **MS PowerPoint** and multimedia for presenting core concepts.
3	**Illustrative Diagrams**	Drawing and using charts and schematic diagrams to simplify complex legal structures.
4	**Brainstorming**	Facilitating group discussions to generate ideas and solve hypothetical rights-based scenarios.

D. General and Transferable Skills

- **D1.** Mastery of using specialized **references, legal codes, and terminology** related to human rights.
- **D2.** Proficiency in **collecting, organizing, and analyzing data** relevant to democratic processes.
- **D3.** Resourcefulness in **maximizing available tools** and technological potentials for learning.
- **D4.** Advanced skills in conducting **comparative studies** between different human rights systems.
- **D5.** Developing the ability to **formulate specific concepts** and frameworks for rights-based topics.

Assessment Methods

Utilization of Academic Achievement Tests:

- Daily Quizzes (Formative).

- Monthly Mid-term Exams.
- Final Semester-end Examinations.

10. Course Structure (Syllabus) / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	2	**Historical Development**	Historical evolution of human rights & rights in ancient civilizations (Mesopotamia, etc.).	Lecture	Oral Tests
2	2	**Religious Perspectives**	Human rights in divine religions with a focus on **Human Rights in Islam**.	Discussion	Self & Peer Assessment
3	2	**Middle & Modern Ages**	Rights during the Middle Ages and the transition to modern humanitarian concepts.	Lecture	Self & Peer Assessment
4	2	**Regional Recognition**	Human rights frameworks in Europe, America, Africa, the Islamic world, and Arab regions.	Discussion	Self & Peer Assessment
5	2	**Non-Governmental Organizations (NGOs)**	Roles of (ICRC, Amnesty International, Human Rights Watch, Arab Organization for HR).	Lecture	Oral Tests
6	2	**International Charters (I)**	Universal Declaration of Human Rights & the Two International Covenants (ICCPR & ICESCR).	Discussion	Self & Peer Assessment
7	2	**Regional Conventions**	European, American, African, and Arab Human Rights Charters and Conventions.	Lecture	Oral Tests
8	2	**National Legislation**	Human rights as stipulated in the **Iraqi Constitution**.	Discussion	Self & Peer Assessment
9	2	**Forms & Generations of Rights**	1st Gen (Civil/Political), 2nd Gen (Social/Economic), 3rd Gen (Environmental & Water awareness).	Lecture	Oral Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
10	2	**National Safeguards**	Constitutional, judicial, and political guarantees for protecting rights at the national level.	Lecture	Oral Tests
11	2	**International Safeguards**	The role of the **UN** and regional bodies; the crime of **Genocide**.	Discussion	Oral Tests
12	2	**Individual Freedoms**	Classification: Personal liberty, right to security, and freedom of movement.	Lecture	Self & Peer Assessment
13	2	**Intellectual Freedoms**	Freedom of opinion, freedom of belief/religion, and the right to education.	Discussion	Self & Peer Assessment
14	2	**Civil Liberties**	Freedom of the press, freedom of assembly, and freedom of association.	Lecture	Oral Tests
15	2	**Economic Freedoms**	The right to work, right to property, and freedom of trade and industry.	Lecture	Written Exams

11. Infrastructure / البنية التحتية

Category	Description / Reference
1. Required Textbooks	The official textbook prescribed by the **Ministry of Higher Education and Scientific Research**.
2. Main References	International Bill of Human Rights and the Iraqi Constitution (2005).
3. Recommended Resources	Peer-reviewed academic journals, legal reports, and human rights periodicals.
4. Electronic References	Official websites of international human rights organizations and accredited legal databases.

12. Course Development Plan /

Providing students with the latest resources, academic research, and international treaties on digital media (CD/USB) to ensure they are updated with modern human rights discourse.

First Stage

Second Semester

Course Description Form

Course Title: Welding Technology

Course Code: OEIWT124

This course description provides a concise summary of welding processes and their applications in oil and industrial fields. It also describes the preparation of oil pipe joints and the methodologies for welding them in various welding positions.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Welding Technology / OEIWT124.

4. Available Attendance Modes

In-person / Electronic (As per Ministry instructions).

5. Semester / Year

Second Semester / Academic Year 2025-2026.

6. Total Credit Hours

60 contact hours (4 hours per week).

7. Date of Preparation

8. Course Objectives

By the end of the academic year, the student will be able to:

- **A.** Categorize and list various types of welding processes.
- **B.** Apply welding processes specifically to **Oil Pipelines**.
- **C.** Identify and understand the most important **International Standards and Specifications** governing welding operations.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the concept of welding technology within oil facilities.
- **A2.** Interpret the specific characteristics and properties of each welding process.
- **A3.** Demonstrate how to utilize international welding standards and apply them in real-world scenarios.

B. Subject-Specific Skills

- **B1.** Gather comprehensive information regarding general welding technologies.
- **B2.** Analyze the causes of common defects and problems occurring during welding operations.
- **B3.** Conduct comparative studies between traditional and modern welding practices.
- **B4.** Develop effective technical communication and delivery skills.

Teaching and Learning Methods

1. **Objective Questioning:** MCQs, True/False, and Matching/Comparison questions.
2. **Self and Peer Assessment.**

3. **Structured Examinations:**
    - **Formative Achievement Tests:** Synchronized with the instructional plans.
    - **Summative Achievement Tests:** Includes monthly exams and final semester examinations.

Assessment Methods

- Daily Achievement Tests (Quizzes).
- Monthly Exams.
- Final Sessional Examinations.

C. Affective and Value-Based Objectives (Attitudes)

- **C1.** Encourage students to propose innovative ideas regarding welding techniques.
- **C2.** Develop the ability to evaluate welding scenarios and provide technical solutions.
- **C3.** Differentiate between various technical and industrial problems.
- **C4.** Interpret and analyze technical phenomena and challenges in the field.

D. General and Transferable Skills (Employability)

- **D1.** Proficiency in using specialized references and technical terminology.
- **D2.** Skills in technical data collection and analytical reasoning.
- **D3.** Resourcefulness in utilizing available industrial facilities and tools.
- **D4.** Conducting comparative technical evaluations.
- **D5.** Formulating specific conceptual frameworks for welding projects.

10. Course Structure (Syllabus)

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	4	**Introduction to Welding Technology**	Definitions and basics of Gas Metal Arc Welding (**GMAW/MIG**), its advantages and disadvantages.	Lecture + Discussion	Oral & Practical Tests
2 & 3	8	**Gas Metal Arc Welding (GMAW)**	Main components (Machine, wire feeder, welding guns, gas unit), shielding gases, metal transfer modes, and welding wires.	Discussion & Dialogue	Self & Peer Assessment
4, 5 & 6	12	**The Welding Machine**	Operation and adjustment; technical procedures (Arc striking, arc stability, re-striking), welding angles, and joint types.	Discussion & Dialogue	Written & Practical Exams
7 & 8	8	**Electrodes (SMAW)**	Definition and classification of electrodes; specifications; benefits of **Flux**; relationship between metal thickness, wire diameter, and current intensity.	Lecture + Discussion	Self & Peer Assessment
9 & 10	8	**Gas Welding (OAW)**	Principles, advantages, and disadvantages; used gases; equipment (Cylinders, regulators, pressure gauges, hoses, safety valves, and torches).	Lecture	Oral & Practical Tests
11, 12, 13 & 14	16	**Flame Types & Techniques**	Flame adjustment, weld pool, weld bead, and joint types. Welding positions, torch movement, filler wire angles, flux, **pipe welding**, and gas cutting.	Discussion & Dialogue	Self & Peer Assessment
15	4	**Resistance Welding**	Advantages and types of resistance welding (**Spot, Seam, Projection, and Flash welding**).	Lecture	Written & Practical Exams

11. Infrastructure / البنية التحتية

Category	Description / Reference
1. Main Arabic References	1. *Welding Technology* by Dr. Abdul Razzaq Ismail & Dr. Nawfal Hamad Hassan. 2. *Welding Metallurgy* by Dr. Qahtan Al-Khazraji. 3. *Welding Technology Kit* (Mechanical Production) - Technical Colleges, TVTC, Riyadh. 4. *Welding Program Kits* - Industrial Vocational Institutes, TVTC, Riyadh.
2. Foreign References	5. *Welding Principles and Applications* by Larry Jeffus, 4th edition, Delmar Publishers, USA.
3. Recommended Resources	Specialized scientific and technical journals in welding and production.
4. Electronic References	All accredited and specialized scientific websites related to welding technologies.

---

12. Course Development Plan / خطة تطوير المقرر

Establish continuous communication with industry employers and stakeholders to gather feedback and incorporate modern technological topics required in the current labor market.

Course Description Form

Course Title: Welding Machines

Course Code: OEIWT126

This course description provides a brief overview of welding machines and their fields of application in oil and industrial sectors. It also covers the diagnosis of malfunctions and maintenance procedures for various types of welding machines.

---

1. Educational Institution

Middle Technical University – Technical Institute / Kut.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Welding Machines / OEIWT126.

4. Available Attendance Modes

In-person / Electronic (As per Ministry instructions).

5. Semester / Year

Second Semester / Academic Year 2025-2026.

6. Total Credit Hours

60 contact hours (4 hours per week).

7. Date of Preparation

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- **Categorize** and list different types of welding machines.
- **Apply** the use of welding machines in oil pipeline operations.

- **Identify** the most important international standards and specifications related to welding machines.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental concepts of welding machines.
- **A2.** Interpret the key characteristics and technical specifications of each type of welding machine.
- **A3.** Demonstrate how to apply international standards for welding machines in practical, real-world environments.

B. Subject-Specific Skills

- **B1.** Gather comprehensive data regarding welding machines in general.
- **B2.** Analyze the causes of technical problems and malfunctions in welding machines.
- **B3.** Conduct comparative evaluations between traditional and modern welding machine technologies.
- **B4.** Develop professional communication and technical delivery skills.

Teaching and Learning Methods

1. **Objective Questioning:** (MCQs, True/False, and Comparison questions).
2. **Self and Peer Assessment.**
3. **Structured Examinations:**
    - **Formative Achievement Tests:** Synchronized with the weekly instructional plans.
    - **Summative Achievement Tests:** Monthly exams and final semester-end examinations.

Assessment Methods

- **Daily Quizzes** (Continuous evaluation).

- **Monthly Exams.**
- **Sessional/Term Examinations.**

C. Affective and Value-Based Objectives / ج- الأهداف الوجدانية والقيمية

- **C1.** Encourage students to propose **innovative ideas** regarding machine technology.
- **C2.** Develop the ability to **evaluate technical issues** and provide maintenance solutions.
- **C3.** Enable students to **differentiate between various technical problems** in machine circuits.
- **C4.** Interpret and analyze technical phenomena and industrial malfunctions.

10. Course Structure (Syllabus) / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1-4	16	**Electrical Fundamentals**	Units, symbols, simple circuits, EMF, current intensity, voltage, and resistor connections (Series, Parallel, Compound). AC Current: Sine waves, frequency, and practical apps. **Electromagnetism:** Fields, magnetic properties, field density, and intensity.	Lecture + Discussion	Oral & Practical Tests
5-10	24	**Welding Machine Overview**	Safety precautions, interpreting technical nameplates, and protection devices (Thermal protection, alarm displays, error codes). Machine installation, cable fixing, control panel functions, and current selection. **Maintenance:** Servicing coils, cores, resistors, capacitors, and diodes.	Discussion & Dialogue	Self & Peer Assessment
11-15	20	**Advanced Power Systems**	Three-phase AC current, Electrical Transformers, and Three-phase AC motors. Single-phase AC motors, motor protection, and troubleshooting methods for motor failures.	Discussion & Dialogue	Written & Practical Exams

Second: Course Description - Engineering Inspection in Oil FacilitiesCourse Description Form

Course Title: Engineering Inspection in Oil Facilities

Course Code: OEIWT125

This course description provides a summary of engineering inspection in oil facilities and explains how to evaluate and analyze test results using various techniques to detect defects and deformations and measure mechanical properties. It also introduces students to the fundamentals of engineering inspection, types of tests, and their application methods.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Engineering Inspection in Oil Facilities / OEIWT125.

4. Available Attendance Modes

In-person / Electronic (As per Ministry instructions).

5. Semester / Year

Second Semester / Academic Year 2025-2026.

6. Total Credit Hours

60 contact hours (4 hours per week).

7. Date of Preparation

8. Course Objectives

By the end of the academic year, the student will be able to:

- **A.** List and categorize various types of inspections used in oil facilities.
- **B.** Evaluate and analyze the **mechanical properties** of equipment.
- **C.** Identify the most critical **International Standards** and specifications related to engineering inspection of oil equipment.

B. Subject-Specific Skills / ب- الأهداف المهاراتية الخاصة بالمقرر

- **B1.** Gathering comprehensive data and information regarding **Engineering Inspection** in general.
- **B2.** Analyzing the root causes of technical problems and defects occurring in **oil equipment**.
- **B3.** Conducting comparative evaluations between traditional inspection experiences and modern practices.
- **B4.** Developing effective **technical communication** and information delivery skills.

Teaching and Learning Methods / (1) طرائق التعليم والتعلم

1. **Objective Questioning:** Divided into Multiple Choice Questions (MCQs), True/False, or Comparison questions.
2. **Self and Peer Assessment.**
3. **Examination System:**
    - **A. Formative Achievement Tests:** Continuous assessments aligned with instructional plans.
    - **B. Summative Achievement Tests:**
        - Monthly final tests at the end of each academic month.
        - Sessional final tests at the end of the semester.

Assessment Methods / طرائق التقييم

- **Achievement Testing:** Utilization of **Daily Quizzes**, **Monthly Exams**, and **Sessional/Term Examinations**.

C. Affective and Value-Based Objectives / ج- الأهداف الوجدانية والقيمية

- **C1.** Encouraging students to propose innovative ideas and perspectives related to inspection topics.
- **C2.** Developing the student's ability to evaluate technical subjects and provide feasible solutions.
- **C3.** Enabling students to differentiate between various types of industrial and technical problems.
- **C4.** Enhancing the capacity to interpret and analyze technical phenomena and failures.

Teaching and Learning Methods / طرائق التعليم والتعلم (2)

1. **Visual Presentations:** Utilizing multimedia and slideshows (PowerPoint).
2. **Illustrative Diagrams:** Drawing and using charts/schematics to explain inspection processes.
3. **Brainstorming:** Group sessions to generate ideas and solve hypothetical inspection cases.

D. General and Transferable Skills / د- المهارات العامة والتأهيلية المنقولة

- **D1.** Proficiency in utilizing specialized technical **references, standards, and terminology**.
- **D2.** Skills in gathering and analyzing field data related to inspection topics.
- **D3.** Resourcefulness in **maximizing available facilities** and technological potentials.
- **D4.** Conducting technical comparisons and benchmarking within the field.
- **D5.** Developing specialized concepts and frameworks for engineering inspection scenarios.

- **10. Course Structure (Syllabus) / بنية المقرر**

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	4	**Introduction to Engineering Inspection**	1. Definition of Engineering Inspection. 2. Classification of Engineering Inspections.	Lecture + Discussion	Oral Tests
2	4	**Oil Storage Tank Inspection**	1. General concepts of tank inspection. 2. Types of oil tanks. 3. Atmospheric pressure tanks.	Discussion & Dialogue	Self & Peer Assessment
3	4	**Causes & Frequency of Inspection**	1. Low-pressure tanks. 2. Justification for inspection & causes of damage. 3. Inspection timing and rates.	Discussion & Dialogue	Written Exams
4	4	**External & Internal Inspections**	1. External tank inspection. 2. Internal inspection. 3. Floor/Bottom inspection. 4. Shell/Wall inspection.	Lecture + Discussion	Self & Peer Assessment
5	4	**Oil Tank Testing**	1. Leak testing (Tightness test).	Lecture	Oral Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
			2. Hydrostatic/Pneumatic tank testing. 3. Allowable tolerance limits.		
6	4	**Oil Equipment Inspection**	1. Introduction. 2. Pressure Vessel inspection. 3. Selecting appropriate metals/materials.	Discussion & Dialogue	Self & Peer Assessment
7	4	**Inspection Methodologies**	1. Factors affecting inspection. 2. Utilized inspection methods. 3. Detecting defects in vessel walls.	Lecture	Written Exams
8	4	**Maintenance of Oil Equipment**	1. Minimum wall thickness limits. 2. Wall maintenance and repair methods.	Discussion & Dialogue	Self & Peer Assessment
9	4	**Boiler Inspection (I)**	1. Introduction to steam boilers. 2. Types of steam boilers. 3. Boiler inspection systems.	Lecture	Written Exams
10	4	**Boiler Inspection (II)**	1. Inspection purposes & damage causes.	Discussion & Dialogue	Oral Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
			2. Safety procedures & inspection planning. 3. Evaluation and analysis of inspections.		
11	4	**Oil Pipeline Inspection (I)**	1. General concepts of pipeline inspection. 2. Specialized pipeline terminology. 3. Classification of oil pipelines.	Lecture + Discussion	Oral Tests
12	4	**Oil Pipeline Inspection (II)**	1. Types of weld testing in pipes. 2. Inspection rates. 3. In-service inspection.	Lecture	Oral Tests
13	4	**Oil Pipeline Inspection (III)**	1. Thickness measurement (UT). 2. International standards for pipe inspection. 3. Evaluation of inspection results.	Lecture + Discussion	Self & Peer Assessment
14	4	**Furnace & Chimney Inspection (I)**	1. Introduction to furnace inspection. 2. Types of furnaces and stacks (chimneys). 3. Furnace inspection methods.	Lecture + Discussion	Written Exams
15	4	**Furnace & Chimney Inspection (II)**	1. Burner inspection. 2. Chimney inspection.	Lecture	Exams

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
			3. Inspection of precision instruments.		

- ---

- ## 11. Infrastructure / البنية التحتية

Category	Description / Reference
1. Main References	1. *Lincoln Handbook of Arc Welding*. 2. *ASME Section VIII* – Rules for Construction of Unfired Pressure Vessels. 3. *ASTM Standards Book*.
2. Recommended Resources	Scientific journals specialized in Engineering Inspection within oil facilities.
3. Electronic References	All accredited and specialized scientific websites (e.g., ASME, API, ASTM websites).

- ---

- ## 12. Course Development Plan / خطة تطوير المقرر
- Establishing continuous communication with industry employers to receive their suggestions regarding modern topics and technologies that should be integrated into the curriculum to meet labor market needs.

Course Description Form

Course Title: Workshops (Industrial Engineering)

Course Code: TIKI111

This course description provides a summary of acquiring manual skills to execute machining and manufacturing operations using various hand tools and measuring instruments. It also focuses on the ability to operate machinery using the optimal production methods.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Workshops / TIKI111.

4. Available Attendance Modes

In-person / Electronic (As per Ministry instructions).

5. Semester / Year

Second Semester / Academic Year 2025-2026.

6. Total Credit Hours

90 contact hours (6 hours per week).

7. Date of Preparation

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- **Acquire** manual skills required to execute various machining operations.
- **Execute** various practical exercises specific to each specialized workshop.
- **Identify** the most important international safety standards and guidelines within industrial workshops.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental concepts of industrial workshops and laboratories.
- **A2.** Interpret the key technical characteristics and functions of each workshop.

- **A3.** Demonstrate how to apply international standards related to workshop safety and operations.

B. Subject-Specific Skills

- **B1.** Gather comprehensive information regarding industrial workshops in general.
- **B2.** Analyze the root causes of technical and operational problems occurring in workshops.
- **B3.** Conduct comparative evaluations between traditional manufacturing methods and modern techniques.
- **B4.** Develop effective technical communication and reporting skills.

Teaching and Learning Methods (1)

1. **Objective Questioning:** (MCQs, True/False, and Comparison questions).
2. **Self and Peer Assessment.**
3. **Examination System:**
    - **Formative Achievement Tests:** Continuous assessments aligned with instructional plans.
    - **Summative Achievement Tests:** Monthly final tests and sessional examinations.

Assessment Methods

- **Continuous Assessment:** (Daily Quizzes).
- **Monthly Theoretical & Practical Exams.**
- **Final Sessional/Term Examinations.**

C. Affective and Value-Based Objectives (Attitudes)

- **C1.** Encourage students to propose innovative ideas for manufacturing and machining processes.
- **C2.** Develop the student's ability to evaluate workshop scenarios and provide technical solutions.

- **C3.** Enable students to differentiate between various operational problems.
- **C4.** Interpret and analyze technical phenomena and manufacturing challenges.

Teaching and Learning Methods (2)

1. **Visual Presentations:** Utilizing slides and multimedia for equipment demonstration.
2. **Illustrative Diagrams:** Drawing and using technical schematics for manufacturing steps.
3. **Brainstorming:** Group sessions to solve practical manufacturing dilemmas.

D. General and Transferable Skills (Employability)

- **D1.** Proficiency in using specialized technical **references, manuals, and terminology**.
- **D2.** Skills in technical data collection and analysis regarding manufacturing topics.
- **D3.** Resourcefulness in **maximizing available tools** and technological facilities.
- **D4.** Conducting technical comparisons and benchmarking manufacturing results.
- **D5.** Developing specialized concepts for workshop projects and personal development.

إليك الجدول التفصيلي لبنية مقرر **"المعامل"** (Workshops Syllabus) في الورش الميكانيكية والتقنية المعتمدة دولياً وفق المصطلحات الهندسية باللغة الإنجليزية، مترجماً:

10. Course Structure (Syllabus) / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	6	**Machining Workshop (Milling)**	Horizontal & Universal Milling Machines: Parts and functions, selecting speeds/feeds, accessories and attachments, indexing heads, and milling cutters. Application: Flat surface milling.	Lecture + Discussion	Oral & Practical Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
2	6	**Machining Workshop (Indexing)**	**Indexing Heads:** Using indexing devices, simple indexing, and hole-circle indexing. Application: Creating polygonal shapes using the indexing head.	Discussion & Dialogue	Oral & Practical Tests
3	6	**Machining Workshop (Gears)**	**Gear Milling:** Cutting spur gears on universal milling machines. Maintenance procedures for milling machines.	Discussion & Dialogue	Oral & Practical Tests
4	6	**Foundry Workshop (I)**	Metal casting importance in industry; Foundry unit components; **Industrial Safety** in foundry; Demonstration: Forming a single-piece sand mold.	Discussion & Dialogue	Oral & Practical Tests
5	6	**Foundry Workshop (II)**	Preparing a single-piece sand mold with gating systems and risers; Metal melting and pouring; Casting extraction and cleaning.	Discussion & Dialogue	Oral & Practical Tests
6	6	**Foundry Workshop (III)**	**Melting Furnaces:** Types (Rotary, Tilting, and Fixed), specifications, and industrial applications.	Discussion & Dialogue	Oral & Practical Tests
7	6	**Turning Workshop (Lathe I)**	**The Lathe Machine:** Specifications, accessories, and installation; Tool bits types; Operations: Facing, straight turning, centering, and stepped turning; Use of measuring tools.	Lecture + Discussion	Oral & Practical Tests
8	6	**Turning Workshop (Lathe II)**	**Taper Turning:** External taper methods and governing laws. Application: Machining an external taper exercise.	Lecture	Oral & Practical Tests
9	6	**Turning Workshop (Lathe III)**	**Cutting Speeds:** Selecting speeds via tables; Threading: Cutting external triangular (V-thread) and square threads. Practical threading exercises.	Lecture	Oral & Practical Tests
10	6	**Fitting Workshop (I)**	Role of fitting in industry; **Vernier Caliper** usage; Marking-out (Scriber/Punch); Files and filing processes.	Lecture	Oral & Practical Tests

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
11	6	**Fitting Workshop (II)**	**Manual Sawing:** Metal cutting using hacksaws and safety precautions.	Discussion & Dialogue	Oral & Practical Tests
12	6	**Fitting Workshop (III)**	**Chipping & Drilling:** Using chisels for metal removal and operating drilling machines for hole production.	Discussion & Dialogue	Oral & Practical Tests
13	6	**Sheet Metal Workshop**	Plate cutting and bending equipment; Rolling and grooving machines; Manual plate curving; Seaming methods; Layout and development of simple, cut, and truncated shapes.	Lecture	Oral & Practical Tests

---

11. Infrastructure / البنية التحتية

Category	Description / Reference
1. Main References	1. *Workshop Technology* (Part 1, 2, & 3) by W.A.J. Chapman. 2. *Manufacturing Processes* by B.H. Amstead.
2. Recommended Resources	Technical manuals for lathe and milling machines; Industrial Safety handbooks.
3. Electronic References	Engineering workshop video tutorials (Sandvik Coromant, Haas Automation) and specialized manufacturing websites.

---

12. Course Development Plan / خطة تطوير المقرر

- **Industry Engagement:** Establishing regular contact with industrial stakeholders to update the workshop curriculum based on modern manufacturing trends.
- **Modernization:** Introducing CNC basic concepts to bridge the gap between manual and automated machining.

Course Description Form

Course Title: Workshops (Industrial Engineering)

Course Code: TIKI111

This course description provides a summary of acquiring manual skills to execute machining and manufacturing operations using various hand tools and measuring instruments. It also focuses on the ability to operate machinery using the optimal production methods.

---

1. Educational Institution

Northern Technical University / Kirkuk Polytechnic College.

2. Scientific Department / Center

Oil Equipment Inspection and Welding Techniques Department.

3. Course Name & Code

Workshops / TIKI111.

4. Available Attendance Modes

In-person / Electronic (As per Ministry instructions).

5. Semester / Year

Second Semester / Academic Year 2025-2026.

6. Total Credit Hours

90 contact hours (6 hours per week).

7. Date of Preparation

8. Course Objectives

By the end of the academic year, the student will be able to:

- **Acquire** manual skills required to execute various machining operations.
- **Execute** various practical exercises specific to each specialized workshop.
- **Identify** the most important international safety standards and guidelines within industrial workshops.

---

9. Learning Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental concepts of industrial workshops and laboratories.
- **A2.** Interpret the key technical characteristics and functions of each workshop.
- **A3.** Demonstrate how to apply international standards related to workshop safety and operations.

B. Subject-Specific Skills

- **B1.** Gather comprehensive information regarding industrial workshops in general.
- **B2.** Analyze the root causes of technical and operational problems occurring in workshops.
- **B3.** Conduct comparative evaluations between traditional manufacturing methods and modern techniques.
- **B4.** Develop effective technical communication and reporting skills.

Teaching and Learning Methods (1)

1. **Objective Questioning:** (MCQs, True/False, and Comparison questions).
2. **Self and Peer Assessment.**

3. **Examination System:**
    - **Formative Achievement Tests:** Continuous assessments aligned with instructional plans.
    - **Summative Achievement Tests:** Monthly final tests and sessional examinations.

Assessment Methods

- **Continuous Assessment:** (Daily Quizzes).
- **Monthly Theoretical & Practical Exams.**
- **Final Sessional/Term Examinations.**

C. Affective and Value-Based Objectives (Attitudes)

- **C1.** Encourage students to propose innovative ideas for manufacturing and machining processes.
- **C2.** Develop the student's ability to evaluate workshop scenarios and provide technical solutions.
- **C3.** Enable students to differentiate between various operational problems.
- **C4.** Interpret and analyze technical phenomena and manufacturing challenges.

Teaching and Learning Methods (2)

1. **Visual Presentations:** Utilizing slides and multimedia for equipment demonstration.
2. **Illustrative Diagrams:** Drawing and using technical schematics for manufacturing steps.
3. **Brainstorming:** Group sessions to solve practical manufacturing dilemmas.

D. General and Transferable Skills (Employability)

- **D1.** Proficiency in using specialized technical **references, manuals, and terminology**.
- **D2.** Skills in technical data collection and analysis regarding manufacturing topics.

- **D3.** Resourcefulness in **maximizing available tools** and technological facilities.
- **D4.** Conducting technical comparisons and benchmarking manufacturing results.
- **D5.** Developing specialized concepts for workshop projects and personal development.

C. Affective and Value-Based Objectives / ج- الأهداف الوجدانية والقيمية

- **C1.** Encouraging students to propose innovative ideas for corrosion prevention.
- **C2.** Developing the ability to evaluate industrial cases and provide technical solutions.
- **C3.** Training students to differentiate between various corrosion-related problems.
- **C4.** Interpreting and analyzing technical phenomena and engineering failures.

---

10. Course Structure (Syllabus) / بنية المقرر

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1	2	**Introduction to Corrosion**	Definition of corrosion; Key terms: Anode, Cathode, Ion, Electrolyte, Insulating Joint, Conductor, Polarization, and Electrochemical Series.	Lecture	Oral Tests
2	2	**Faraday's Law & Cells**	Dry cell, Faraday's Law, Anode/Cathode functions, and types of electrochemical cells.	Discussion & Dialogue	Self & Peer Assessment
3	2	**Corrosion Impact**	Direct and indirect costs of corrosion; Impact on industrial facilities; Motives for corrosion control.	Discussion & Dialogue	Self & Peer Assessment

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
4	2	**Corrosion Mechanism**	Understanding the mechanism, conditions, and triggers for the electrochemical process.	Discussion & Dialogue	Self & Peer Assessment
5	2	**Corrosive Agents & Types**	Identifying corrosive materials; Uniform, Galvanic, and Crevice corrosion.	Lecture	Oral Tests
6	2	**Underwater Corrosion**	Pitting corrosion, Selective leaching, and mechanically-assisted corrosion.	Discussion & Dialogue	Self & Peer Assessment
7	2	**Deposit & Stress Corrosion**	Deposit-induced corrosion, Intergranular corrosion, and Stress Corrosion Cracking (SCC).	Discussion & Dialogue	Self & Peer Assessment
8	2	**Thermodynamics**	Electrochemical equilibrium and the Van't Hoff Equation.	Discussion & Dialogue	Self & Peer Assessment
9	2	**Potential-pH Relationship**	Potential difference and pH; Chemical reaction direction; EMF and Electrochemical Series.	Lecture	Oral Tests
10	2	**Corrosion Factors**	**Pourbaix Diagrams** (Potential-pH graphs); Reference electrodes.	Lecture	Oral Tests
11	2	**Reaction Kinetics**	Relationship between potential and current density; Calculating corrosion rates.	Lecture	Oral Tests
12	2	**Protection Mechanisms**	**Cathodic Protection**, Anodic Protection, Coatings, Inhibitors, and proper Engineering Design.	Lecture	Oral & Written Tests
13	2	**Material & Environment**	Influence of metal quality and corrosive media; Surface coverage.	Discussion & Dialogue	Self & Peer Assessment

Week	Hours	Unit/Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
14	2	**Inspection Methods**	Visual inspection, Weight loss method, Polarization, AC Impedance, and X-ray Analysis (XRD).	Lecture + Discussion	Self & Peer Assessment
15	2	**Measurement & Survey**	Choosing protection systems, specialized survey works, and measurement indicators.	Lecture + Discussion	Self & Peer Assessment

---

11. Infrastructure / البنية التحتية

Category	Description / Reference
1. Required Textbooks	1. *Corrosion Control* by Samuel A. Bradford. 2. *Corrosion Control and Surface Finishing* by Hideyuki Kanematsu.
2. Main References	3. *Corrosion of Metals* by Kaesche. 4. *Corrosion Processes* by George Vachtsevanos. 5. *Applied Materials Science: Corrosion* - Saudi Development Institute.
3. Electronic Resources	Reputable international publishing platforms and specialized scientific journals.

Course Description: Computer-Aided Design (CAD)

Course Code: TIK112

Academic Year: 2025–2026

1. General Information

- **Educational Institution:** Northern Technical University / Kirkuk Polytechnic College.
- **Scientific Department:** Oil Equipment Inspection and Welding Techniques Department.
- **Semester:** Second Semester.
- **Total Credit Hours:** 30 Hours (2 hours per week).
- **Attendance Modes:** Blended (In-person / Electronic).

---

2. Course Overview & Objectives

This course introduces the essential principles of Computer-Aided Design using **AutoCAD**. It bridges the gap between traditional manual drafting and modern digital engineering, focusing on the precision required for oil equipment and welding inspections.

By the end of this course, students will be able to:

1. Navigate the AutoCAD environment and utilize advanced drafting tools.
2. Apply geometric constraints to design complex engineering models.
3. Perform **Orthographic Projection**, converting 3D concepts into standardized 2D technical drawings.

---

3. Intended Learning Outcomes (ILOs)

A. Knowledge & Understanding

- **A1:** Understand the foundational principles of technical engineering drawing.
- **A2:** Master the command-line and ribbon interface of AutoCAD.
- **A3:** Identify international standards for line types, weights, and symbols.

B. Intellectual & Subject-Specific Skills

- **B1:** Diagnose and resolve common software glitches or drafting inaccuracies.
- **B2:** Evaluate the efficiency of different drawing methods (e.g., Polar vs. Cartesian coordinates).
- **B3:** Transition fluently from manual sketching to precise CAD execution.

---

4. Course Syllabus (Weekly Structure)

Week	Unit / Topic	Learning Outcomes	Assessment
1	**Introduction**	Software launch, Workspace (Ribbon/Toolbars), and ViewCube.	Practical Lab Check
2	**Project Setup**	Zoom/Pan, File management, **Units**, and **Limits**.	Peer Review
3	**Basic Draw Commands**	Points, Lines, Coordinates, Polygons, and **Hatching**.	Practical Exercise
4	**Curves & Text**	Circles, Arcs, and Ellipses; Single/Multi-line **Text Styles**.	Lab Assignment
5	**Drafting Properties**	Managing **Layers**, Line colors, and Line weights.	Oral Quiz
6	**Geometric Construction**	Combining shapes to form complex engineering models.	Practical Test
7	**Modification (I)**	Mirror, Array, Scale, and Extend operations.	Self-Assessment
8	**Modification (II)**	**Fillet, Chamfer**, Trim, and Explode commands.	Written Mid-term
9	**Dimensioning**	Linear, Radial, and Angular dimensions; **Dim Styles**.	Practical Evaluation
10	**Capstone Workshop**	Comprehensive drafting of a multi-part geometric model.	Final Practical Exam

---

5. Teaching & Assessment Strategies

Teaching Methods

- **Demonstrative Lectures:** Step-by-step software walkthroughs via projector.
- **Interactive Brainstorming:** Discussing the most efficient "short-cut" paths for complex designs.
- **Visual Aids:** Utilizing illustrative diagrams to explain coordinate systems.

Assessment Methods

- **Formative:** Daily lab progress checks and monthly quizzes.
- **Summative:** End-of-semester practical examination focusing on accuracy and speed.

---

6. Infrastructure & Resources

- **Software:** AutoCAD (latest version) and Google Classroom for digital submissions.
- **References:** Digital manuals, ASME/ISO standard drafting guides.
- **Facilities:** Dedicated PC lab with high-performance workstations.

Teaching and Learning Methods

1. Use of presentation and visual aid methods.
2. Drawing illustrative diagrams.
3. Brainstorming methodology.

D. General and Transferable Skills (Other skills related to employability and personal development)

- **D1.** Skills in utilizing references and technical terminology.
- **D2.** Skills in data collection and analysis related to the subject matter.
- **D3.** Skills in optimizing available resources and capabilities.
- **D4.** Skills in conducting comparative studies regarding the subject.

- **D5.** Skills in formulating specialized conceptual frameworks for the subject.

---

10. Course Structure

Week	Hours	Intended Learning Outcomes (ILOs)	Unit / Subject Topic	Teaching Method	Assessment Method
1	2	Program operation and general concepts (Launching AutoCAD, workspace interface, ViewCube, SteeringWheel, Navigation, Ribbon, Menus, Toolbars, and exiting).	**AutoCAD Software**	Lecture	Practical Tests
2	2	Opening existing drawings, controlling display using Zoom and Pan, closing files, creating new files, and saving. Preparation of the drawing sheet using **Units** and **Limits**.	**Drawing Management**	Discussion & Dialogue	Self & Peer Assessment
3	2	Draw Commands (Point, Line, coordinate definition formats, Multiline, Polyline, Rectangle, Polygon). Sections and **Hatching**.	**Draw Commands (I)**	Discussion & Dialogue	Self & Peer Assessment
4	2	Draw Commands (Circle, Arc, Ellipse). Text Commands (Single line text, Multiline text) and creating new **Text Styles**.	**Draw Commands (II)**	Discussion & Dialogue	Self & Peer Assessment
5	2	Controlling drawing specifications (Line type, Line weight, Color). Modifying drawing properties using the **Properties** panel.	**Line Types & Properties**	Lecture	Oral Tests
6	2	Implementation of fundamental shapes and technical drawings.	**Geometric Drafting**	Discussion & Dialogue	Self & Peer Assessment
7	2	Modifying objects using: Mirror, Array, Scale, Break, and Extend.	**Modify Commands (I)**	Discussion & Dialogue	Self & Peer Assessment
8	2	Modifying objects using: Fillet, Chamfer, Trim, and Explode.	**Modify Commands (II)**	Discussion & Dialogue	Written Test

Week	Hours	Intended Learning Outcomes (ILOs)	Unit / Subject Topic	Teaching Method	Assessment Method
9	2	Adding dimensions: Linear, Aligned, Radial, Diameter, Angular, Quick Dimension, Baseline, and Continuous. Managing **Dimension Styles**.	**Dimensioning Methods**	Lecture	Practical Tests
10	2	Drawing exercises and practical testing on various geometric shapes.	**Practical Applications**	Lecture	Practical Tests
11	2	Applied drawing test on complex geometric configurations.	**Practical Exam**	Lecture	Written Test
12	2	Understanding projection theory and the methodology of extracting views.	**Projection Theory**	Lecture	Oral Tests
13	2	Drafting simple engineering projections (Front, Top, and Side views).	**Engineering Projections**	Lecture	Oral & Written Tests
14	2	Practical training and evaluation on projection applications.	**Applied Projections (I)**	Lecture	Oral Tests
15	2	Final comprehensive practical test on engineering projections.	**Applied Projections (II)**	Lecture	Written Test

Course Title: Occupational Safety and Industrial Management

This course description provides a concise summary of the essential regulations regarding the safety and health of the human workforce. This is achieved by ensuring a suitable and safe environment free from any causes of accidents, injuries, or occupational diseases. Furthermore, the course educates students on the concept of **Industrial Management** and its significance in various industries to effectively enhance and serve productivity improvement.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Occupational Safety and Industrial Management / OEIWT128
4. Attendance Modes	In-person / Electronic (as per ministerial instructions)
5. Semester / Year	Second Semester / Academic Year 2025-2026
6. Total Credit Hours	(30) Hours / 2 Hours per week
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Acquire specialized skills in handling and understanding **occupational health and safety** protocols.

- Facilitate a suitable and safe work environment free from accidents, injuries, or occupational illnesses.
- Understand the core concepts of **Industrial Management** and its vital role in various industrial sectors to boost productivity levels.

---

9. Course Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the concept of safety and its associated technical terminology.
- **A2.** Clarify various industrial hazards, their root causes, and prevention strategies.
- **A3.** Demonstrate the impact of safety standards on industrial performance and operations.

B. Subject-Specific Skills

- **B1.** Comprehend and interpret safety instructions and regulations.
- **B2.** Analyze the potential damages and consequences resulting from non-compliance with safety instructions.
- **B3.** Develop professional communication and information delivery skills within an industrial context.

Teaching and Learning Methods (for Cognitive & Skill-based outcomes)

1. **Objective Questions:** Including multiple-choice questions (MCQs), true/false questions, and matching exercises.
2. **Evaluation:** Self-assessment and peer-to-peer assessment.
3. **Examination Types:**
    - **Formative Achievement Tests:** Integrated with instructional plans.
    - **Summative Achievement Tests:** Including monthly final tests and end-of-semester final exams.

Assessment Methods

1. Implementation of Achievement Tests:

- Daily quizzes.
- Monthly examinations.
- Final semester examinations.

C. Affective and Value-Based Objectives

- **C1.** Encourage students to propose innovative ideas regarding safety and management.
- **C2.** Enhance the student's ability to evaluate topics and provide technical solutions.
- **C3.** Develop the ability to differentiate between various industrial problems.
- **C4.** Interpret and analyze technical phenomena and problematic scenarios.

Shutterstock

Teaching and Learning Methods (for Affective outcomes)

1. Use of Google applications for interactive and electronic lecture delivery.
2. Utilization of presentation and visual aid methods.
3. Drafting illustrative diagrams and flowcharts.
4. Implementing the **Brainstorming** methodology.

D. General and Transferable Skills (Employability and Personal Development)

- **D1.** Skills in utilizing technical references and specialized terminology.
- **D2.** Skills in data collection and analysis related to industrial topics.
- **D3.** Skills in the optimal utilization of available resources and capabilities.

- **D4.** Skills in conducting comparative studies within the subject area.
- **D5.** Skills in formulating specialized conceptual frameworks for industrial management.

10. Course Structure

Week	Hours	Intended Learning Outcomes (ILOs)	Unit / Subject Topic	Teaching Method	Assessment Method
1	2	Definitions, OSHA standards, safety objectives, the purpose of OSHA, OSHA laws and regulations, site inspections, and violations.	**Introduction to Safety**	Lecture	Oral Tests
2	2	Components of means of egress, required widths for exit routes, and locations of emergency exits.	**Means of Egress**	Discussion & Dialogue	Self & Peer Assessment
3	2	General requirements, Personal Protective Equipment (PPE) for electrical work, Lockout/Tagout (LOTO) procedures for energy sources.	**Electrical Hazards**	Discussion & Dialogue	Self & Peer Assessment
4	2	Machine guarding and protective barriers for equipment.	**Common Equipment Injuries**	Discussion & Dialogue	Self & Peer Assessment
5	2	OSHA hearing conservation programs, PPE essentials (Head and Hand protection).	**Sound & Noise Measurement**	Lecture	Oral Tests
6	2	Types of fire extinguishers, fire suppression, flammable liquids introduction, portable containers and tanks, compressed gas cylinders, handling and storage instructions.	**Fire Types & Suppression**	Discussion & Dialogue	Self & Peer Assessment
7	2	Introduction to confined space entry, safety procedures, and types of equipment used in hazardous areas.	**Confined Spaces & Hazardous Zones**	Discussion & Dialogue	Self & Peer Assessment
8	2	Medical services, first aid basics, and industrial lighting requirements.	**Chemical Pollutants**	Discussion & Dialogue	Self & Peer Assessment
9	2	Safety guidelines for hand tools, Hazard Communication Standard (HAZCOM), specific chemical risks, and safety mission for PPE.	**Forklift Safety Guidelines**	Lecture	Oral Tests
10	2	Welding types and associated safety methods.	**General Welding Requirements**	Lecture	Oral Tests
11	2	Specific safety codes and rules for stairways and stair systems.	**Stairway Instructions**	Lecture	Oral Tests

Week	Hours	Intended Learning Outcomes (ILOs)	Unit / Subject Topic	Teaching Method	Assessment Method
12	2	Scaffolding rules and tying, fall protection requirements, fall arrest systems. Falling objects hazards. Lifting equipment, metal chains, and synthetic slings.	**Scaffolding Types & Lifting**	Lecture	Oral & Written Tests
13	2	The origin of radiation, types of radiation (ionizing/non-ionizing), and protection methods.	**Introduction to Radiation**	Discussion & Dialogue	Self & Peer Assessment
14	2	Administrative functions, industrial management roles, industrial engineering, and characteristics of industrial administration.	**Industrial Management**	Lecture & Discussion	Self & Peer Assessment
15	2	Industrial plant location and layout, factors affecting site selection, plant layout classification, and advantages/limitations of layout types (Product, Process, Fixed-position, and Hybrid layouts).	**Industrial Plant Layout**	Lecture & Discussion	Self & Peer Assessment

- ---
- ## 11. Infrastructure

Category	Reference / Description
1. Required Textbooks	Official OSHA General Industry Standards (29 CFR 1910).
2. Main References	International Labor Organization (ILO) safety manuals and Industrial Management academic textbooks.
3. Electronic Resources	Official websites for OSHA, NIOSH, and accredited industrial engineering portals.

Here is the academic English translation for the final sections of the **Safety and Industrial Management** course, followed by the new course description for **Arabic Language 1**, maintained in the same professional format.

---

10. Course Structure (Safety & Industrial Management - Final Week)

Week	Hours	Intended Learning Outcomes (ILOs)	Unit / Subject Topic	Teaching Method	Assessment Method
15	2	Understanding industrial plant location/layout; main factors affecting site selection; classification of plant layouts; advantages and limitations of (Product, Process, Fixed-position, and Hybrid) layouts.	**Industrial Plant Layout**	Lecture, Discussion, and Dialogue	Self and Peer Assessment

11. Infrastructure

Category	Reference / Source
1. Required Textbooks	N/A
2. Main References	1. Occupational Safety and Health, US Department of Labor (OSHA). 2. Prof. Dr. Ahmed Lutfi Ibrahim Wanas, *Occupational Safety and Health*, Damietta. 3. Technical Guide for Training Safety Inspectors, ILO 2017. 4. *Industrial Management* - Technical Institutes 1990 (Ayser Sawsan & Faris Jabbar). 5. *Industrial Engineering* - Dr. Adel Abdul-Malik, University of Basra, 2000. 6. *Total Quality Management & ISO Requirements* - Dr. Khalil Al-Ani et al., Baghdad, 2001.
3. Electronic Resources	Accredited and reputable international publishing websites.

12. Course Development Plan

- Providing students with modern research and sources related to **Industrial Protection and Corrosion Prevention**.

Course Description Form

Course Title: Arabic Language 1

This course description provides a summary of the most essential lessons required to learn Arabic grammar rules, with a specific focus on the language used in **administrative correspondence**.

---

1. General Information

Item	**Details**
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Arabic Language 1 / NTU103
4. Attendance Modes	In-person / Electronic (as per ministerial instructions)
5. Semester / Year	Second Semester / Academic Year 2024-2026
6. Total Credit Hours	(30) Hours / 2 Hours per week
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Recognize and master Arabic grammar rules specifically used in **administrative discourse**.

---

9. Course Outcomes, Teaching, and Assessment Methods

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the fundamental concepts of Arabic grammar.
- **A2.** Apply linguistic rules practically in writing.
- **A3.** Demonstrate the impact of language proficiency on the quality of administrative communications.

B. Subject-Specific Skills

- **B1.** Comprehend instructions regarding linguistic and grammatical rules.
- **B2.** Analyze the negative consequences (misunderstandings/errors) resulting from non-compliance with linguistic standards.
- **B3.** Enhance professional communication and delivery skills.

Teaching and Learning Methods

1. **Objective Questions:** Including multiple-choice (MCQs), true/false, and matching questions.
2. **Evaluation:** Self-assessment and peer-to-peer assessment.
3. **Examination Types:**
    - **Formative Achievement Tests:** Conducted alongside the instructional plan.
    - **Summative Achievement Tests:** Including monthly final exams and end-of-semester exams.

9. Course Outcomes, Teaching, and Assessment Methods (Continued)

Assessment Methods

1. Implementation of Achievement Tests:

- Daily quizzes.
- Monthly examinations.
- Final semester examinations.

C. Affective and Value-Based Objectives

- **C1.** Encourage students to propose innovative ideas regarding the subject matter.
- **C2.** Enhance the student's ability to evaluate topics and provide effective solutions.
- **C3.** Develop the ability to differentiate between various linguistic problems.
- **C4.** Interpret and analyze linguistic phenomena and common errors.

Teaching and Learning Methods (for Affective outcomes)

1. Use of Google applications for interactive and electronic lecture delivery.
2. Utilization of presentation and visual aid methods.
3. Drafting illustrative diagrams and linguistic charts.
4. Implementing the **Brainstorming** methodology.

D. General and Transferable Skills (Employability and Personal Development)

- **D1.** Skills in utilizing references and technical linguistic terminology.
- **D2.** Skills in data collection and analysis related to Arabic grammar.
- **D3.** Skills in the optimal utilization of available resources and capabilities.
- **D4.** Skills in conducting comparative studies regarding linguistic styles.
- **D5.** Skills in formulating specialized conceptual frameworks for the subject.

---

10. Course Structure

Week	Hours	Intended Learning Outcomes (ILOs)	Unit / Subject Topic	Teaching Method	Assessment Method
1	2	Introduction to linguistic errors: Taa Marbuta (ة), Taa Maftuha (ت), and long Taa.	**Linguistic Errors**	Lecture	Oral Tests
2	2	Rules for writing Alif Mamduda (آ) and Alif Maqsura (ى) – Solar and Lunar letters.	**Writing Alif Mamduda**	Discussion & Dialogue	Self & Peer Assessment
3	2	Distinguishing between the letters Daad (ض) and Dhaa (ظ).	**Daad and Dhaa**	Lecture	Self & Peer Assessment
4	2	Mastery of Hamza (ء) writing rules in various positions.	**Writing the Hamza**	Discussion & Dialogue	Self & Peer Assessment
5	2	Identifying and applying correct punctuation marks.	**Punctuation Marks**	Lecture	Oral Tests
6+7	4	Understanding Nouns and Verbs and the methods of differentiation.	**Nouns and Verbs**	Discussion & Dialogue	Self & Peer Assessment
8+9	4	Detailed study of the "Objects" (Al-Mafa’eel) in Arabic grammar.	**The Objects (Al-Mafa’eel)**	Lecture	Self & Peer Assessment
10	2	Rules and grammar regarding Numbers (Al-Adad).	**Numbers (Al-Adad)**	Discussion & Dialogue	Self & Peer Assessment
11+12	4	Practical applications on common errors, Noon vs. Tanween, and meanings of Prepositions.	**Common Linguistic Errors**	Lecture	Oral Tests
13+14+15	6	Administrative discourse language and models of administrative correspondence.	**Formal Aspects of Administrative Discourse**	Lecture	Written Tests

11. Infrastructure

Category	Reference / Description
1. Required Textbooks	*Arabic Language Manual*, Dr. Safaa Kadhim Makki & Dr. Lama Mohammed Younis, Middle Technical University, 2019.
2. Main References	General Arabic language references and textbooks.
3. Recommended Resources	All scientific books and journals specialized in the Arabic language.
4. Electronic Resources	Accredited and specialized academic publishing websites.

12. Course Development Plan Providing students with the latest research and modern sources regarding the Arabic language to enhance administrative professional standards.

Second Stage

First Semster

Course Description Form

Course Title: Welding Processes

Course Code: OEIWT220

This course description provides a concise overview of welding processes and their diverse applications within the industrial and oil fields. It further details the preparation of oil pipe joints and the methodologies for welding them across various welding positions.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Welding Processes / OEIWT220
4. Available Attendance Modes	In-person / Electronic (per Ministerial instructions)
5. Semester / Year	**First Semester / Second Stage** - Academic Year 2025-2026
6. Total Credit Hours	(60) Contact Hours (4 Hours per week)
7. Date of Preparation	2025

التصدير إلى "جداول بيانات Google"

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Identify and categorize various types of welding processes.
- Apply **TIG (GTAW)** and **MIG (GMAW)** welding processes effectively on oil pipelines.
- Demonstrate knowledge of the most prominent international standards and specifications governing TIG and MIG welding operations.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define fundamental concepts and terminology of welding processes.
- **A2.** Interpret and explain the specific characteristics and properties of each welding process.
- **A3.** Illustrate the practical application of international welding codes and specifications in real-world scenarios.

B. Subject-Specific Skills

- **B1.** Collect and synthesize technical information regarding general welding operations.
- **B2.** Analyze root causes of common technical problems occurring during welding processes.
- **B3.** Conduct comparative analyses between historical welding practices and modern advancements.
- **B4.** Develop technical communication and digital delivery skills within the field.

Teaching and Learning Methods

1. **Objective Assessments:** Including Multiple Choice Questions (MCQs), True/False, and Matching exercises.
2. **Evaluation:** Self-assessment and peer-to-peer assessment.
3. **Examination Framework:**
    - **Formative Achievement Tests:** Integrated with the weekly instructional plans.

- **Summative Achievement Tests:** Monthly final tests and end-of-semester final examinations.

Assessment Methods

- **Daily Quizzes:** To monitor immediate understanding.
- **Monthly Tests:** To evaluate knowledge retention.
- **Final Exams:** Sessional/Semester examinations.

C. Affective and Value-Based Objectives

- **C1.** Propose innovative ideas regarding welding methodologies.
- **C2.** Evaluate technical topics and formulate effective solutions for engineering challenges.
- **C3.** Differentiate between various industrial and technical problems.
- **C4.** Analyze and interpret physical phenomena and mechanical issues in welds.

D. General and Transferable Skills (Employability Skills)

- **D1.** Proficiency in utilizing technical references and specialized terminology.
- **D2.** Data collection and analytical skills regarding industrial topics.
- **D3.** Optimizing available resources and technical infrastructure.
- **D4.** Performing comparative studies on welding techniques.
- **D5.** Formulating specialized concepts and technical frameworks for welding projects.

---

10. Course Structure (Weekly Syllabus)

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes (ILOs)	Teaching Method	Assessment Method
1 - 3	12	**Introduction to GMAW (MIG/MAG)**	Basics of Gas Metal Arc Welding; pros/cons; metal transfer modes; core components (power source, wire feeder, welding guns, gas unit).	Lecture, Discussion, Practical Training	Oral & Practical Tests
4 - 7	16	**Shielding Gases for GMAW**	Gas types and properties; advantages/disadvantages of different gases; applications; filler wires; **GMAW Safety Regulations**.	Dialogue, Discussion, Practical Training	Self & Peer Assessment
8 - 10	12	**TIG Welding (GTAW) Basics**	Principles of Gas Tungsten Arc Welding; used currents; operational theory; **GTAW Safety Procedures**.	Dialogue, Discussion, Practical Training	Written & Practical Tests
11 - 13	12	**GTAW Parameters & Equipment**	Adjusting gas flow and welding speed; pros/cons; automated and semi-automated welding; components (cooling units, torches).	Lecture, Discussion, Practical Training	Self & Peer Assessment
14 - 15	8	**GTAW Consumables**	Tungsten electrodes (Pure, Thoriated, Zirconiated); shielding gases (Argon, Helium, Mixtures); filler rod specifications.	Lecture, Practical Exercises	Oral & Practical Tests

التصدير إلى "جداول بيانات Google"

---

11. Infrastructure

Category	Reference / Source
1. Required Textbooks	N/A
	1. *Welding Technology Portfolio (Mechanical Production)* - Technical Colleges, TVTC, Riyadh.
2. Main References	
	2. *Welding Program Portfolios* - Industrial Vocational Institutes, TVTC, Riyadh.

Category	Reference / Source
	3. *Welding Principles and Applications*, Larry Jeffus, 4th Edition.
	4. *Lincoln Handbook of Arc Welding*.
3. Electronic Resources	Specialized websites for AWS (American Welding Society) and professional engineering portals.

Here is the academic English translation of the **Fundamentals of Oil Equipment** course description, professionally formatted to match international academic standards.

Course Description Form

Course Title: Fundamentals of Oil Equipment

Course Code: OEIWT221

This course description provides a concise summary of the course's primary characteristics and the learning outcomes expected of the student. It demonstrates the extent to which the student has maximized available learning opportunities and establishes a clear link between these outcomes and the overall program description.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College

Item	Details
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Fundamentals of Oil Equipment / OEIWT221
4. Available Attendance Modes	In-person / Electronic (per Ministerial instructions)
5. Semester / Year	**First Semester / Second Stage** - 2025-2026
6. Total Credit Hours	(30) Contact Hours (2 Hours per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

1. Understand the working mechanics of various types of oil equipment.
2. Identify different types of oil and gas storage tanks.
3. Recognize piping systems and oil-related accessories.
4. Acquire the skills necessary to connect and integrate this equipment within surface oil facilities.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Gain fundamental information regarding the oil and gas industry.
- **A2.** Identify types of oil equipment, including:
    - **Production Equipment:** Such as pumps and artificial lift equipment.

    - **Processing Equipment:** Such as distillation units and separators.
- **A3.** Master operational techniques (operation and maintenance of drilling and production equipment).
- **A4.** Understand Health, Safety, and Environment (HSE) protocols (identifying potential hazards and mitigation procedures).

B. Subject-Specific Skills

- **B1. Safe Equipment Operation:** Training students to use oil equipment efficiently and safely.
- **B2. Maintenance Skills:** Developing the ability to troubleshoot equipment malfunctions and perform necessary repairs.
- **B3. Planning and Organization:** Gaining the skills required to organize and manage projects related to oil equipment.
- **B4. Safety Assessment:** Performing comprehensive safety evaluations.

Teaching and Learning Methods

1. **Objective Assessments:** MCQs, True/False, and Matching exercises.
2. **Evaluation:** Self-assessment and peer-to-peer assessment.
3. **Examination Framework:** Formative (integrated with teaching plans) and Summative (Monthly and Final exams).

Assessment Methods

- Daily Quizzes, Monthly Tests, and Final/Sessional Examinations.

C. Affective and Value-Based Objectives

- **C1.** Encourage students to propose innovative ideas regarding the subject.
- **C2.** Evaluate technical topics and formulate engineering solutions.
- **C3.** Differentiate between various industrial challenges.
- **C4.** Interpret and analyze technical phenomena and problems.

Teaching and Learning Methods (Affective)

1. Presentations and visual aid methods.
2. Drafting illustrative technical diagrams.
3. Brainstorming sessions.
4. **Software Simulations:** Utilizing software like **Pipe Flow Expert** for piping and flow simulation.
5. Instructional videos showcasing oil equipment in action.

---

10. Course Structure (Weekly Syllabus)

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes	Teaching Method	Assessment Method
1 - 2	4	**Storage Tanks**	Types of tanks (Fixed vs. Floating roof); High-pressure and LPG tanks; Tank calibration and industrial safety.	PowerPoint Lecture	Q&A Discussion
3 - 4	8	**Piping Systems**	Piping systems, connections, gaskets, and valves.	**Pipe Flow Expert** Simulations	Q&A Discussion
5 - 6	12	**Equipment Accessories**	Filters, strainers, flares, lifting equipment, and scaffolding.	PowerPoint + Video Demos	Self & Peer Assessment
7 - 8	16	**Corrosion**	Types of corrosion; protection methods; treating corrosion in operating units (Distillation, Storage, etc.).	Discussion & Dialogue	Self & Peer Assessment
9 - 12	24	**Chemical Reactors**	Reaction kinetics; catalysts and poisoning; reactor design; types (Fixed-bed, Fluidized-bed, Slurry).	Lecture	Oral Tests
13 - 15	30	**Separators**	Gas-oil separation plants (GOSP); types and components; factors affecting separation; troubleshooting.	Discussion & Dialogue	Written Tests

11. Infrastructure & References

1. **Nazmiya Mohammed**, *Gas Technology* (Oil Training Institute, Baghdad).
2. **Thanaa Shinar Mahmoud**, *Gas Technology* (Oil Training Institute, Kirkuk).
3. **Tariq Khalaf Al-Khazraji**, *Corrosion: Causes, Types, and Protection Methods*.
4. **Larry Jeffus**, *Welding Principles and Applications*.
5. **Oil Training Institute Manuals** (Mechanical Equipment Technology).
6. **Oil-Storage Tanks and Reservoirs** by C.P. Bowie.
7. **Aboveground Oil Storage Tanks** by Terrance I. Norton.
8. **Oil & Gas Production Handbook**.

2. Course Development Plan

Students require access to a **specialized computer laboratory** for the installation and use of industry-standard oil equipment software. Through this laboratory, students will be able to:

- **Design** various types of oil and gas storage tanks, piping systems, and associated accessories.
- **Analyze** the structural and functional integrity of the designs they have developed.
- **Interpret** engineering diagrams and convert them into standard **Isometric (ISO) drawings** and maps.

Course Description Form

Course Title: Fundamentals of Non-Destructive Testing (NDT 1)

Course Code: OEIWT222

This course description provides a concise summary of non-destructive testing (NDT) and its field of application in the petroleum and industrial sectors. It further details practical applications for inspecting oil pipeline welded joints using various NDT methods.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Fundamentals of NDT 1 / OEIWT222
4. Attendance Modes	In-person / Electronic (per Ministerial instructions)
5. Semester / Year	First Semester / Second Stage - 2025-2026
6. Total Credit Hours	(60) Hours / 4 Hours per week
7. Date of Preparation	2025

---

8. Course Objectives

- Identify and categorize various types of non-destructive tests.

- Apply NDT methods to oil pipeline welded joints.
- Master the primary international codes and standards specific to weld inspection.

---

9. Intended Learning Outcomes (ILOs)

- **A1.** Define the fundamental concepts of Non-Destructive Testing.
- **A2.** Interpret the specific characteristics and physics of each NDT method.
- **A3.** Apply international standards and specifications to practical NDT inspection scenarios.
- **B1.** Gather data regarding engineering inspection in general.
- **B2.** Analyze the causes of technical problems occurring during NDT processes.

---

10. Course Structure (Weekly Syllabus)

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes	Teaching Method	Assessment Method
1	4	**Radiography (RT)**	General introduction to X-ray and Gamma-ray.	Lecture & Discussion	Oral & Practical Tests
2	4	**Radiography (RT)**	Exposure techniques and source placement.	Dialogue	Self & Peer Assessment
3	4	**Radiography (RT)**	Examination procedures and film processing.	Lecture & Discussion	Practical Tests
4	4	**Radiography (RT)**	Film interpretation and identification of artifacts.	Dialogue	Practical Tests
5	4	**Radiography (RT)**	Acceptance criteria and documentation.	Dialogue	Written & Practical Tests
6-7	8	**Ultrasonic (UT)**	Introduction and UT techniques (Pulse-echo).	Dialogue	Oral & Practical Tests
8-10	12	**Ultrasonic (UT)**	Procedures, interpretation, and acceptance.	Lecture & Discussion	Written & Practical Tests

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes	Teaching Method	Assessment Method
11-15	20	**Eddy Current (ET)**	Principles, procedures, and weld acceptance.	Lecture & Discussion	Written & Practical Tests

---

11. Infrastructure & References

- Main References: 1. ASME Boiler & Pressure Vessel Code (2019).

2. ASME Section V, Article 9.

3. Lincoln Procedure Handbook of Arc Welding.

4. ASNT (American Society for Nondestructive Testing) Handbook.

- **Course Development:** Constant coordination with industry partners to align the syllabus with modern industrial requirements.

Course Description Form

Course Title: Metallurgy

Course Code: OEIWT224

1. General Information

Item	Details
1. Semester / Year	First Semester / Second Stage - 2025-2026
2. Total Credit Hours	(60) Hours / 2 Theoretical + 2 Practical weekly

---

8. Course Objectives

1. Understand the classification and properties of engineering materials.
2. Master the classification of ferrous and non-ferrous metals.
3. Comprehend the principles of Heat Treatment.
4. Gain knowledge of ceramic materials and their industrial advancements.

---

9. Intended Learning Outcomes (ILOs)

- **A1.** Define the concept of engineering materials and their atomic structures.
- **A2.** Interpret metal classification (Steels, Cast Irons, Alloys).
- **A3.** Explain the objectives and results of different Heat Treatment cycles.
- **B1.** Interpret engineering drawings containing specialized welding symbols.
- **B2.** Execute geometric drawings and weld joint symbols using specialized software.

Teaching & Assessment Methods

- **Methods:** Presentations, illustrative diagrams, and brainstorming.
- **Assessment:** Daily quizzes, monthly examinations, and end-of-semester final exams.

---

9. Intended Learning Outcomes (Continued)

D. General and Transferable Skills (Employability & Personal Development)

- **D1.** Proficiency in utilizing technical references and specialized metallurgy terminology.
- **D2.** Skills in data collection and analysis regarding material properties and behavior.
- **D3.** Skills in the optimal utilization of available laboratory and technical resources.
- **D4.** Ability to conduct comparative studies between different engineering materials and their applications.
- **D5.** Skills in formulating specialized conceptual frameworks regarding material science.

---

10. Course Structure (Theoretical Syllabus)

Week	Hours	Intended Learning Outcomes (ILOs)	Unit / Subject Topic	Teaching Method	Assessment Method
1	4	Define metallurgy; distinguish between metallic and non-metallic materials.	**Classification of Engineering Materials**	In-person	Daily, Semester, & Final Exams
2	4	Understand atomic bonds, crystallization, crystal density calculations, and structural defects.	**Internal Structure of Materials**	In-person	Daily, Semester, & Final Exams
3	4	Study crystal properties, lattices, crystal angles, symmetry, and axes.	**Crystal Structure of Metals**	In-person	Daily, Semester, & Final Exams
4	4	Define phases; study the Gibbs phase rule and binary equilibrium diagrams.	**Phase Equilibrium Diagrams**	In-person	Daily, Semester, & Final Exams
5	4	Detailed analysis of the Iron-Carbon ($Fe-C$) equilibrium diagram.	**Iron-Carbon ($Fe-C$) Phase Diagram**	In-person	Daily, Semester, & Final Exams
6	4	Understand stress types, stress-strain relationships, and material ductility.	**Mechanical Properties (Part I)**	In-person	Daily, Semester, & Final Exams

Week	Hours	Intended Learning Outcomes (ILOs)	Unit / Subject Topic	Teaching Method	Assessment Method
7	4	Understanding Stiffness and Hardness.	**Mechanical Properties (Part II)**	In-person	Daily, Semester, & Final Exams
8	4	Impact of cooling rates on carbon steel; standard heat treatment methods.	**Heat Treatment of Carbon Steel**	In-person	Daily, Semester, & Final Exams
9	4	Methods for surface heat treatment and hardening.	**Surface Heat Treatment**	In-person	Daily, Semester, & Final Exams
10	4	Ferrous alloys: Cast iron, carbon steel, alloy steel, and stainless steel.	**Metallic Alloys (Ferrous)**	In-person	Daily, Semester, & Final Exams
11	4	Non-ferrous alloys: Aluminum, Magnesium, Copper, Nickel, and Titanium alloys.	**Metallic Alloys (Non-Ferrous)**	In-person	Daily, Semester, & Final Exams
12	4	Thermoplastics vs. Thermosetting plastics; physical properties of polymers.	**Plastic Materials (Polymers)**	In-person	Daily, Semester, & Final Exams
13	4	Classification of composite materials, component properties, and manufacturing.	**Composite Materials**	In-person	Daily, Semester, & Final Exams
14	4	Physics of conductivity and the effect of temperature on electrical conductivity.	**Electrical & Electronic Materials (I)**	In-person	Daily, Semester, & Final Exams
15	4	Specific resistance of alloys, thermal conductivity, Energy Band Theory, and semiconductors.	**Electrical & Electronic Materials (II)**	In-person	Daily, Semester, & Final Exams

11. Infrastructure

Category	Reference / Source
1. Required Textbooks	1. Dr. Issa Masoud, *Fundamentals of Materials Engineering*, 2014. 2. F. Bailey, *Principles of Engineering Metals and Materials* (Trans: Dr. Hussein Baqir). 3. R. Higgins, *Engineering Metallurgy: Applied Physical Metallurgy* (Trans: George Yaqoub).
2. Main References	*Metals: Structure, Properties, and Heat Treatments*, J. Devereux & A. Olliman (Trans: Dr. Jafar Al-Haidari & Adnan Ne'ma).
3. Recommended Resources	*Engineering Materials and Testing*, Dr. Qahtan Al-Khazraji, Adel Mahmoud, and Abdul-Jawad Mohammed.
4. Electronic Resources	Accredited scientific websites and academic journals specialized in materials science.

12. Course Development Plan

- Establish ongoing communication with industrial employers and oil field stakeholders to collect feedback and integrate modern metallurgy requirements into the curriculum.

Course Description Form

Course Title: Engineering and Technical Drawing for Welding Design

Course Code: OEIWT229

This course focuses on the integration of Computer-Aided Design (CAD) with specialized welding engineering requirements. It aims to equip students with the skills to create precise 2D and 3D technical drawings, interpret international welding symbols, and prepare industrial fabrication documents.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Engineering & Technical Drawing for Welding Design / OEIWT229
4. Available Attendance Modes	In-person (Practical Lab-based)
5. Semester / Year	First Semester / Second Stage - 2025-2026
6. Total Credit Hours	(30) Practical Hours (2 Hours per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the semester, the student will be able to:

- Utilize **AutoCAD** for professional engineering drafting and interface configuration.
- Master the fundamentals of **perspective drawing** and geometric projection.
- Execute advanced exercises in **orthographic projections**, sectional views, and assembly drawings.
- Apply international **welding symbols** and standards (AWS, ISO) to technical drawings.
- Design and document various types of welded joints correctly for industrial manufacturing.

---

9. Intended Learning Outcomes (ILOs)

- **A1.** Proficiency in AutoCAD software commands and workspace management.
- **A2.** Ability to visualize and draft 3D geometric shapes and convert them into 2D projections.
- **A3.** Mastery of assembly techniques for complex mechanical parts.
- **B1.** Skill in drafting specialized **welding symbols**, joint types, and fabrication sequences.
- **B2.** Interpretation and analysis of technical drawings containing complex welding codes.
- **B3.** Preparation of professional technical documentation for manufacturing and inspection processes.

---

10. Course Structure (Weekly Syllabus)

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes	Teaching Method	Assessment Method
1-2	4	**AutoCAD & Perspectives**	Interface review; essential commands; drawing 3D perspectives in AutoCAD 2010.	Practical Lab	Daily & Practical Exams
3-4	4	**Dimensioning Rules**	Fundamental rules for technical dimensioning; perspective exercises with full annotations.	Practical Lab	Daily & Practical Exams

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes	Teaching Method	Assessment Method
5-6	4	**Orthographic Projections**	Drawing projections for linear and cylindrical shapes; sectional view exercises.	Practical Lab	Daily & Practical Exams
7	2	**Assembly Drawing**	Techniques for assembling individual mechanical components into a single drawing.	Practical Lab	Daily & Practical Exams
8-9	4	**3D Basics & Modeling**	Switching from 2D to 3D; UCS coordinate system; modeling Box, Cylinder, Sphere, and Cone.	Practical Lab	Daily & Practical Exams
10	2	**Advanced 3D Commands**	Converting 2D shapes to 3D; Using **Extrude, Revolve, Union,** and **Subtract** commands.	Practical Lab	Daily & Practical Exams
11	2	**Welding Symbols (I)**	Technical drawing of welding symbols; scales; weld seam shapes and joint implementation.	Practical Lab	Daily & Practical Exams
12-13	4	**AWS Standards & Penetration**	Drafting full AWS symbols; technical sequence of welding; **Weld Penetration** symbols.	Practical Lab	Daily & Practical Exams
14-15	4	**NDT Symbols**	Drafting symbols/abbreviations for **Non-Destructive Testing (NDT)** and their placement on joints.	Practical Lab	Daily & Practical Exams

---

11. Teaching & Assessment Methods

- **Teaching:** Multimedia presentations, illustrative diagrams, brainstorming, and intensive hands-on computer lab training.
- **Assessment:** Objective questions (MCQs, True/False), self and peer assessment, formative achievement tests, and final practical examinations.

---

12. General Skills

- **D1.** Mastery of technical terminology used in international welding and NDT standards.
- **D2.** Strategic use of available CAD software resources to optimize design workflows.
- **D3.** Comparative analysis of different welding designs for personal and professional development.

Here is the academic English translation for the **Oil Equipment Welding Workshop Fundamentals** course description. This course represents the practical, hands-on application of the theories learned in your previous modules.

Course Description Form

Course Title: Oil Equipment Welding Workshop Fundamentals

Course Code: OEIWT223

This course description provides a concise summary of the course's core characteristics and the learning outcomes the student is expected to achieve. It demonstrates the student's ability to maximize the learning opportunities provided and establishes a direct link to the overall program goals.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Oil Equipment Welding Workshop Fundamentals / OEIWT223
4. Attendance Modes	In-person (Workshop) / Electronic (per Ministerial instructions)
5. Semester / Year	First Semester / Second Stage — 2025-2026
6. Total Credit Hours	(150) Hours (10 Hours per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

1. Understand the equipment and operational principles of **GTAW (TIG)** and **GMAW (MIG/MAG)**.
2. Calibrate, set up, and operate specialized welding machinery.
3. Acquire the manual dexterity and skills required to perform welds in various positions on metal plates.
4. Execute high-quality welds for various joint configurations common in the oil industry.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Identify the fundamentals of Gas Tungsten Arc Welding (GTAW).
- **A2.** Explain the operational principles of Gas Metal Arc Welding (GMAW).
- **A3.** Determine the optimal machine settings required to achieve high-quality weld beads.
- **A4.** Comprehend the essential standards for mastering welds in different spatial positions.

B. Subject-Specific Skills

- **B1.** Execute straight-line bead exercises on metal plates.
- **B2.** Weld various joint types (**Lap, Fillet, and Butt joints**) in multiple positions.
- **B3.** Troubleshoot, detect, and repair common welding defects.
- **B4.** Work with precision and mastery across all assigned welding tasks.

Teaching, Learning, and Assessment

- **Teaching Methods:** Practical workshop demonstrations, hands-on technical training, and continuous feedback (Instructor/Peer).
- **Assessment Methods:** Real-time practical evaluation during workshops, weekly assignments on machine calibration, and a Final Practical Examination.

C. Affective and Value-Based Objectives

- **C1.** Foster professionalism and technical responsibility.
- **C2.** Strict adherence to workshop safety standards and Personal Protective Equipment (PPE).
- **C3.** Develop analytical skills for problem-solving.

D. General and Transferable Skills

- **D1.** Teamwork and effective communication within a workshop environment.
- **D2.** Time management and task organization during fabrication.
- **D3.** Discipline and professional ethics regarding safety.

---

10. Course Structure (Practical Syllabus)

Week	Hours	Unit / Topic	Intended Learning Outcomes	Method	Assessment
Phase 1	---	**Gas Tungsten Arc Welding (GTAW / TIG)**	---	---	---
1-2	8	**Straight Bead Exercises**	Execution of uniform straight lines on plates.	Demo	Practical
3-4	8	**Lap Joints (Flat/Horizontal)**	Mastering overlap welds in 1F and 2F positions.	Training	Practical
5-6	8	**Fillet Welds (1F + 2F)**	Executing corner/tee joints in flat and horizontal.	Training	Practical
7-8	8	**Butt Welds (1G + 2G)**	Groove welding in flat and horizontal positions.	Training	Practical
9-10	8	**Butt Welds (3G + 4G)**	Advanced groove welding: Vertical and Overhead.	Training	Practical
Phase 2	---	**Gas Metal Arc Welding (GMAW / MIG)**	---	---	---
11	8	**Straight Bead Exercises**	Setting wire feed speed and executing beads.	Demo	Practical
12	8	**Lap Joints (Flat/Horizontal)**	Mastering wire-fed welding on overlaps.	Training	Practical

Week	Hours	Unit / Topic	Intended Learning Outcomes	Method	Assessment
13-14	8	**Butt Welds (1G + 2G)**	GMAW groove welding in 1G and 2G.	Training	Practical
15	8	**Butt Welds (3G + 4G)**	Final evaluation of Vertical and Overhead welds.	Training	Final Exam

---

11. Infrastructure & References

- **Textbooks:**
    1. Larry Jeffus, *Welding Principles and Applications*, 4th Ed.
    2. William H. Minnick, *Gas Tungsten Arc Welding Handbook*.
    3. William A. Bowditch, *Welding Technology Fundamentals*.
- **Main Sources:**
    1. *Lincoln Electric Arc Welding Procedure Handbook*.
    2. *AWS Welding Inspection Handbook*.
- **Electronic Resources:** AWS (American Welding Society) and *Welding Journal Online*.

---

12. Course Development Plan

1. Implement **Welding Simulators** to train students on machine calibration virtually before using live equipment.
2. Integrate real-world oil industry case studies.
3. Provide updated technical journals and modern references.

Course Description Form

Course Title: Project I

Course Code: TIKI210

This academic description outlines the learning objectives, teaching methodologies, and assessment strategies for the **Project I** course. The course aims to enable students to execute integrated production projects, introducing them to collective production methods and applying the theoretical and practical knowledge acquired in previous semesters to real-world engineering challenges.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Project I / TIKI210
4. Attendance Modes	In-person (as per Ministerial instructions)
5. Semester / Year	First Semester / Second Stage — 2025-2026
6. Total Credit Hours	(60) Hours (4 Hours per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

1. Execute **integrated production projects** by applying acquired theoretical and practical skills.
2. Understand and apply **collective production methods** and collaborative work plans.
3. Develop **project management skills**, including task delegation, scheduling, and progress tracking.
4. Enhance capabilities in **documenting and analyzing** project phases and preparing technical reports.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Understand the basics of project planning and mass production methodologies.
- **A2.** Identify the tools and techniques required to execute industrial production projects.
- **A3.** Prepare operational plans, including timelines and task allocation matrices.
- **A4.** Analyze operational bottlenecks and propose effective engineering solutions.

B. Subject-Specific Skills

- **B1.** Prepare engineering drawings and **operational routing sheets** for production processes.
- **B2.** Coordinate group work to execute projects within the mechanical workshop units.
- **B3.** Track project milestones, identify deviations, and suggest process improvements.
- **B4.** Draft comprehensive final reports documenting the production cycle and results.

Teaching and Assessment Strategies

- **Teaching Methods:** Interactive lectures, case studies of successful industrial projects, practical workshop training, and weekly progress reviews.
- **Assessment Methods:** Evaluation of project plans and timelines, mid-term presentations, continuous assessment of weekly reports, and a **Final Project Defense** before a specialized committee.

C. Affective and Value-Based Objectives

- **C1.** Foster a sense of professional responsibility and commitment to deadlines.
- **C2.** Ensure strict adherence to **Occupational Health and Safety (OHS)** standards.
- **C3.** Develop self-confidence in managing realistic production projects.

D. General and Transferable Skills (Employability)

- **D1.** Advanced teamwork and leadership within a technical team.
- **D2.** Strategic time management and prioritization.
- **D3.** Technical documentation and professional report writing.

---

10. Course Structure (Weekly Syllabus)

Week	Hours	Unit / Topic	Intended Learning Outcomes	Method	Assessment
1	4	**Discussion & Planning**	Brainstorming project ideas and defining scopes.	Group Discussion	Proposal Submission
2	4	**Task Allocation**	Assigning responsibilities and creating schedules.	Collaborative Planning	Timeline Approval
3	4	**Project Documentation**	Preparing drawings and operational sheets.	Practical Training	Document Review
4-14	4	**Project Execution**	Implementation in the workshop units.	Applied Workshop Work	Weekly Progress Reports
15	4	**Final Presentation**	Presentation of the final product and review.	Presentation & Q&A	Committee Evaluation

---

11. Infrastructure & References

- **Textbooks:**
    1. *Project Management for Engineering, Business and Technology*, John Nicholas & Herman Steyn.

2. *Production and Operations Management*, S. N. Chary (McGraw Hill).
3. *Fundamentals of Mechanical Production Processes*, Technical Workshop Texts.

- **Main Sources:** Workshop equipment manuals and case studies on collective production.
- **Electronic Resources: ASME** (American Society of Mechanical Engineers) resources and the *International Journal of Production Research*.

---

12. Course Development Plan

1. Integrate modern project management software (e.g., MS Project or digital Gantt tools).
2. Conduct regular workshops on **Quality Assurance (QA)** in production.
3. Organize field visits to industrial facilities to observe large-scale project management.
4. Invite industry experts to share practical insights with the students.

Course Description Form

Course Title: Crimes of the Ba'ath Regime in Iraq

Course Code: NTU203

This course description provides a summary of the most significant characteristics of the course and the learning outcomes expected of the student. It demonstrates whether the student has made the most of the available learning opportunities and links these outcomes to the overall program description.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Crimes of the Ba'ath Regime in Iraq / NTU203
4. Attendance Modes	In-person / Electronic (per Ministerial instructions)
5. Semester / Year	Second Semester / 2025-2026
6. Total Credit Hours	(30) Hours (2 Hours per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Identify the various categories of crimes committed by the Ba'ath party regime.
- Recognize prominent figures and groups targeted by the regime.
- Identify the locations and historical contexts of mass graves in Iraq.
- Understand the geographical scope and specific cities targeted by state-sponsored violence.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Gain foundational information regarding the political and judicial history of Ba'ath party crimes.
- **A2.** Understand the concept of "Crime" (types and classifications) as defined by the **Supreme Iraqi Criminal Tribunal**.
- **A3.** Comprehend the psychological impact and mechanisms of state-engineered terror.
- **A4.** Identify violations of human rights, domestic laws, international treaties, and environmental laws.

B. Subject-Specific Skills

- **B1.** Critically analyze the impact of authoritarianism on Iraqi society and the environment.
- **B2.** Interpret legal decisions issued by specialized courts regarding past violations.
- **B3.** Distinguish between different types of international and domestic crimes.

Teaching, Learning, and Assessment

- **Teaching Methods:** Presentations, brainstorming sessions, interactive discussions, and the screening of documentary videos documenting historical events.
- **Assessment Methods:** Objective questions (MCQs and essays), self-assessment, peer assessment, and formative/summative monthly and final exams.

---

10. Course Structure (Syllabus)

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes	Method	Assessment
1-2	4	**Concepts of Crime**	Definition, types, and legal classifications.	Theory/Discussion	Q&A
3-4	4	**International Crimes**	Types of international crimes; Decisions of the Supreme Iraqi Criminal Tribunal.	Theory/Discussion	Q&A
5-6	4	**Psychological & Social Crimes**	Mechanisms of terror; the "Militarization of Society" and its social effects.	Theory/Discussion	Peer Assessment
7-8	4	**Human Rights & Law**	Violations of Iraqi and International law; state position on religion; detention centers and prisons.	Theory/Discussion	Q&A
9-12	8	**Environmental & Urban Crimes**	Chemical bombardment of **Halabja**; "Scorched Earth" policy; draining the Marshes; destruction of palm groves; shelling of holy shrines.	Theory/Discussion	Q&A
13-15	6	**Mass Graves & Legislation**	Chronological classification of mass graves (1963, 1979-2003); Anfal campaign; 1991 uprising; Law No. 32 (Ba'ath Party Prohibition).	Theory/Discussion	Q&A

---

11. Infrastructure & Resources

- **Required Textbooks:** None (Lecture-based).
- **Main References:**
    1. The **Permanent Iraqi Constitution of 2005**.
    2. **Law No. 32 of 2016:** Prohibition of the Ba'ath Party, racist, terrorist, and takfiri entities.
    3. *General Principles of the Iraqi Penal Code*, Prof. Ali Hussein Al-Khalaf & Prof. Sultan Abdul-Qader.
- **Electronic Resources:** International human rights databases and reputable academic publishing sites.

Second stage

Second semester

Course Description Form

Course Title: Oil Equipment Applications

Course Code: OEIWT225

This course provides a concise summary of the most significant characteristics of the module and the learning outcomes the student is expected to achieve. It demonstrates the student's ability to maximize the available learning opportunities and connects these outcomes to the overall program requirements.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Oil Equipment Applications / OEIWT225
4. Attendance Modes	In-person / Electronic (per Ministerial instructions)
5. Semester / Year	Second Semester / 2025-2026
6. Total Credit Hours	(60) Hours (4 Hours per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Prepare welding joints according to international technical standards.
- Apply **Preheating** and **Post-Weld Heat Treatment (PWHT)** procedures.
- Analyze and diagnose welding distortions and propose corrective solutions.
- Develop and apply **Welding Procedure Specifications (WPS)** and **Procedure Qualification Records (PQR)**.
- Acquire practical skills in welding pipes, storage tanks, and pressure vessels.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Understand the technical requirements for welding joint preparation (**Fit-up**).
- **A2.** Interpret the role of heat treatment in ensuring weld integrity and quality.
- **A3.** Explain the root causes of thermal distortions and methods for mitigation.
- **A4.** Comprehend the documentation required for welding quality (WPS, PQR, and WPQR).
- **A5.** Describe the specific design requirements for tanks, boilers, and pressure vessels.

B. Subject-Specific Skills

- **B1.** Execute professional welding joint preparation.
- **B2.** Calibrate and manage preheating and post-heating equipment.
- **B3.** Practically qualify welding procedures and individual welders.
- **B4.** Perform pipe and tank welding in various industrial positions (e.g., 5G, 6G).
- **B5.** Implement **Inspection and Test Plans (ITP)** for welded joints.

Teaching, Learning, and Assessment

- **Teaching Methods:** Theoretical lectures, illustrative diagrams, brainstorming, case studies, and field-based practical workshops.
- **Assessment Methods:** Objective exams (MCQs, True/False), peer assessment, formative monthly tests, and final practical/theory examinations.

---

10. Course Structure (Syllabus)

Part 1: Theoretical Syllabus

Week	Hours	Unit / Topic	Intended Learning Outcomes	Method	Assessment
1	2	**Joint Preparation**	Mastering Fit-up requirements.	Lecture	Achievement Test
2	2	**Heat Treatment**	Preheating & Post-heating importance.	Discussion	Report/Seminar
3	2	**Welding Distortion**	Analysis of causes and control methods.	Case Study	Written Test
4-5	4	**Qualification**	Procedure (PQR) and Welder qualification.	Workshop	Practical Eval
6	2	**Documentation**	Interpretation of WPS & PQR.	Lecture	Theory Exam
7-9	6	**Piping Systems**	Steel pipe welding and Inspection Plans (ITP).	Field Training	Technical Report
10-12	6	**Oil Tanks**	Design, electrode selection, and ITP for tanks.	Group Work	Project Eval
13-15	6	**Boilers & Pressure Vessels**	High-pressure designs and full ITP preparation.	Workshop	Final Project

Part 2: Practical Syllabus

Week	Hours	Practical Topic	Intended Learning Outcomes	Method	Assessment
1-2	4	**Fit-up Implementation**	Physical preparation of joints.	Practical Lab	Practical Eval
3-4	4	**Thermal Controls**	Implementing Preheat and Post-heat.	Lab Workshop	Practical Test

Week	Hours	Practical Topic	Intended Learning Outcomes	Method	Assessment
5	2	**Distortion Control**	Using effective clamping and jig methods.	Field Study	Discussion
6-9	8	**Process Qualification**	Hands-on PQR and Welder testing.	Training	Practical Exam
10-11	4	**WPS Application**	Executing welds based on a specific WPS.	Workshop	Performance Eval
12-15	8	**Industrial ITP**	Preparing ITPs for pipes, tanks, and boilers.	Training	Final Report

---

11. Infrastructure & Resources

- **Required Textbooks:**
    1. Larry Jeffus, *Welding Principles and Applications*.
    2. R.L. Agrawal, *Welding Engineering*.
    3. S. Gibson, *Practical Welding*.
- **Main References:**
    1. Dr. Qahtan Al-Khazraji, *Welding Metallurgy*.
    2. Dr. Ahmed Salem Al-Sabbagh, *Metal Welding Engineering*.
    3. Technical and Vocational Training Corporation (TVTC) manuals.

12. Course Development Plan

1. Integration of **Virtual Reality (VR)** simulators to visualize internal welding processes.
2. Organized field visits to active oil refinery projects and fabrication yards.
3. Updating **Inspection and Test Plans (ITP)** based on current **ASME** and **API** international standards.
4. Providing students with recent research papers on robotic welding in the oil sector.

Course Description Form

Course Title: Computer (Level II) / Computer Networks

Course Code: NTU201

This course is designed to provide students with the essential knowledge and skills in Cybersecurity, E-commerce, and hardware/software troubleshooting, alongside a comprehensive introduction to Artificial Intelligence (AI). The course bridges theoretical principles with practical applications to enhance technical proficiency.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Computer Networks (Level II) / NTU201
4. Attendance Modes	In-person
5. Semester / Year	Second Semester / 2025-2026
6. Total Credit Hours	(30) Hours (1 Hour Theory + 1 Hour Practical per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Understand the fundamentals of **Cybersecurity** and network protection.
- Master the basics of **E-commerce** and digital payment systems.
- Perform professional hardware and software **troubleshooting**.
- Comprehend the history, techniques, and ethics of **Artificial Intelligence**.

---

9. Intended Learning Outcomes (ILOs)

A. Knowledge & Understanding

- **A1.** Identify network types (LAN, WAN) and their core components.
- **A2.** Understand cyber threats and security protocols.
- **A3.** Analyze digital banking, SMS banking, and secure online transaction methods.
- **A4.** Study the evolution and techniques of Artificial Intelligence.

B. Subject-Specific Skills

- **B1.** Implement network security basics in a Windows 7/10 environment.
- **B2.** Execute business tasks via e-mail and digital platforms.
- **B3.** Diagnose common computer hardware and software errors.
- **B4.** Use AI tools and software for practical problem-solving.

Teaching and Assessment

- **Teaching Methods:** In-person instruction, hands-on computer lab applications, diagrams, and brainstorming sessions.
- **Assessment Methods:** Objective testing (MCQs, T/F), peer assessment, daily practical lab exams, monthly theory tests, and the final comprehensive examination.

---

10. Course Structure (Weekly Syllabus)

Week	Unit / Topic	Practical Content	Teaching Method	Assessment
1	**Introduction to Networking**	Identifying hardware & components.	Lab (Windows 7/10)	Daily Exam
2	**Network Security Basics**	Configuring basic security settings.	In-person / Applied	Practical Eval
3	**E-commerce Fundamentals**	Creating & securing commercial e-mail.	Applied Computer	Q&A / Quiz
4	**Future of E-commerce**	Formatting texts & tables (Word 2010).	MS Office Apps	Project Eval
5-6	**Troubleshooting**	Hardware/Software diagnostic tools.	Diagnostic Lab	Case Study
7	**Introduction to AI**	Evolution and ethical challenges.	AI Software Demos	Theory Test
8	**AI in Daily Life**	Virtual assistants (Siri, Google Asst).	Applied Apps	Discussion
9-11	**AI & Society**	Impacts on healthcare, finance, & transport.	Software Simulation	Report
12-13	**Machine Learning vs. Deep Learning**	Distinguishing AI technical categories.	Practical Exercises	Final Project
14-15	**AI Governance & Future**	Global trends and emerging technologies.	Interactive Session	Final Exam

---

11. Infrastructure & Resources

- **Required Books:**
  - *Artificial Intelligence: A Guide for Thinking Humans* – Melanie Mitchell.
  - *AI Superpowers* – Kai-Fu Lee.
  - *The Fourth Age* – Byron Rees.
- **Main References:**

- *Computer Networking: A Top-Down Approach* – Kurose & Ross (Excellent for network layers).
- *Networking All-in-One For Dummies* – Doug Lowe (Simplified basics).
- *CompTIA Network+ Certification Guide* – Glen E. Clarke (Professional standards).

- **Electronic Resources:** Reputable tech journals and instructional sites (e.g., MQALATY).

---

12. Course Development Plan

1. Introduction of **Simulation Software** (like Cisco Packet Tracer) for virtual network configuration.
2. Integration of real-world **Cybersecurity Case Studies**.
3. Updating technical resources to include the latest **Generative AI** trends (ChatGPT, Gemini).
4. Providing periodic workshops on hardware maintenance and data recovery.

Course Description Form

Course Title: Oil Equipment Welding Workshop Applications

Course Code: OEIWT227

This course description provides a summary of the most important characteristics of the module and the learning outcomes the student is expected to achieve. It demonstrates the student's ability to maximize the learning opportunities provided and establishes a direct link between the course and the overall program objectives.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Oil Equipment Welding Workshop Applications / OEIWT227
4. Attendance Modes	In-person / Electronic (per Ministerial instructions)
5. Semester / Year	Second Semester / 2025-2026
6. Total Credit Hours	(120) Hours (8 Hours per week - Practical focus)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Understand the equipment and operating principles of **Gas Tungsten Arc Welding (GTAW/TIG)** and **Gas Metal Arc Welding (GMAW/MIG)**.
- Set up, calibrate, and operate specialized welding machinery.
- Master welding skills across various positions on metal plates.
- Execute high-quality welds for various industrial joint configurations.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Identify the fundamentals and safety protocols of the GTAW process.
- **A2.** Explain the principles of GMAW and the role of shielding gases.
- **A3.** Determine optimal machine settings (voltage, wire speed, gas flow) for high-quality outcomes.
- **A4.** Comprehend the standards required for passing inspections in different welding positions.

B. Subject-Specific Skills

- **B1.** Perform straight-line bead exercises to master arc stability.
- **B2.** Weld Lap, Fillet, and Butt joints in various positions (Flat, Horizontal, Vertical, Overhead).
- **B3.** Troubleshoot, identify, and repair common welding defects (porosity, undercut, lack of fusion).
- **B4.** Work with high precision on complex technical tasks.

Teaching and Assessment

- **Teaching Methods:** In-shop practical demonstrations, hands-on technical training, and continuous feedback from instructors and peers.
- **Assessment Methods:** Continuous practical workshop evaluations, weekly technical assignments on machine setup, and a final practical examination to assess mastery of the 1G through 4G positions.

10. Course Structure (Weekly Syllabus)

Phase 1: Gas Tungsten Arc Welding (GTAW/TIG)

Week	Hours	Unit / Topic	ILOs	Method	Assessment
1-2	16	**Bead on Plate**	Straight line bead execution.	Demo	Practical Eval
3-4	16	**Lap Joints**	Welding in Flat & Horizontal positions.	Training	Practical Eval
5-6	16	**Fillet Welds**	1F and 2F positions.	Training	Practical Eval
7-8	16	**Butt Welds (Part 1)**	1G and 2G positions.	Training	Practical Eval
9-10	16	**Butt Welds (Part 2)**	3G (Vertical) & 4G (Overhead).	Training	Practical Eval

Phase 2: Gas Metal Arc Welding (GMAW/MIG)

Week	Hours	Unit / Topic	ILOs	Method	Assessment
11	8	**Bead on Plate**	Machine setup and bead lines.	Demo	Practical Eval
12	8	**Lap Joints**	Flat & Horizontal lap welds.	Training	Practical Eval
13-14	16	**Butt Welds (Part 1)**	1G and 2G positions.	Training	Practical Eval
15	8	**Butt Welds (Part 2)**	3G & 4G and **Final Performance**.	Training	**Final Practical Exam**

11. Infrastructure & Resources

- **Required Books:**
    1. Larry Jeffus, *Welding Principles and Applications*, Delmar Publisher USA.

2. William H. Minnick, *Gas Tungsten Arc Welding Handbook*.
3. William A. Bowditch, *Welding Technology Fundamentals*.

- **Main References:**
  - *Lincoln Electric Arc Welding Procedure Guide*.
  - *AWS (American Welding Society) Welding Inspection Handbook*.
- **Online Resources:** Official AWS website and *Welding Journal Online*.

---

12. Course Development Plan

1. Introduction of **Welding Simulators** to allow students to practice machine adjustment in a risk-free environment.
2. Integration of real-world industrial case studies involving pipe and pressure vessel fabrication.
3. Providing access to the latest technical journals and AWS digital libraries.
4. Enhancing the feedback loop through digital recordings of student welding techniques for review.

Course Description Form

Course Title: Project 2

Course Code: [Insert Code if available, usually TIKI212]

This academic description outlines the learning objectives, teaching methodologies, and assessment strategies for the **Project 2** course. The module aims to enable students to complete integrated production projects by building upon the theoretical and practical knowledge gained in previous semesters. It emphasizes mass production methods and fosters teamwork in executing real-world engineering projects.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	Project 2
4. Attendance Modes	In-person (as per Ministerial instructions)
5. Semester / Year	Second Semester / 2025-2026
6. Total Credit Hours	(60) Hours (4 Hours per week)
7. Date of Preparation	January 13, 2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Complete **integrated production projects** that synthesize theoretical and practical knowledge.
- Apply **collective production methodologies** and collaborate effectively within project teams.
- Prepare comprehensive **technical reports** documenting progress and project outcomes.
- Effectively present and defend project results in a professional manner.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Understand the lifecycle processes required to complete integrated production projects.
- **A2.** Identify industrial challenges and solutions in mass production environments.
- **A3.** Master the technical standards for drafting final engineering reports.
- **A4.** Critically analyze and evaluate project results against initial specifications.

B. Subject-Specific Skills

- **B1.** Efficiently execute the final practical components of the project.
- **B2.** Compile a final report covering all theoretical and applied aspects.
- **B3.** Coordinate with team members to meet project milestones.
- **B4.** Demonstrate professional presentation skills during the final defense.

Teaching and Assessment Strategies

- **Teaching Methods:** Weekly project review meetings, workshops on technical writing and presentation, and interactive lectures on industrial implementation.

- **Assessment Methods:** Weekly progress tracking, review of final report drafts, and a **Final Oral Examination** during the project presentation.

C. Affective and Value-Based Objectives

- **C1.** Foster professional commitment to meeting project deadlines.
- **C2.** Encourage effective communication and synergy within technical teams.
- **C3.** Build self-confidence in presenting technical work to expert committees.
- **C4.** Develop critical problem-solving mindsets when facing production bottlenecks.

D. General and Transferable Skills (Employability)

- **D1.** Teamwork and leadership in production environments.
- **D2.** Advanced time management and organizational planning.
- **D3.** Professional technical writing and business communication.

---

10. Course Structure (Weekly Syllabus)

Week	Hours	Unit / Topic	Intended Learning Outcomes	Method	Assessment
1–12	48	**Project Execution Phase**	Completion of practical components.	Applied Work	Weekly Progress Evaluation
13	4	**Final Report Drafting**	Structuring data and technical documentation.	Guided Discussion	Draft Review
14	4	**Project Completion**	Finalizing theoretical and practical aspects.	Advisory Sessions	Final Project Evaluation
15	4	**Project Defense**	Presentation and discussion of results.	Oral Presentation	Final Grade & Committee Review

---

11. Infrastructure & Resources

- **Required Textbooks:**
    1. *Project Management Techniques*, John Nicholas & Herman Steyn (Routledge).
    2. *Production and Operations Management*, S. N. Chary (McGraw-Hill).
    3. *Mechanical Workshop Process Fundamentals*, Technical Workshop Series.
- **Main References:**
    - Workshop equipment operational manuals.
    - Industrial case studies on collective production techniques.
- **Electronic Resources: ASME** (American Society of Mechanical Engineers) digital library and the *International Journal of Production Research*.

---

12. Course Development Plan

1. Integrate modern project management software such as **Gantt Charts** and digital tracking tools.
2. Organize regular workshops specifically focused on **Technical Report Writing**.
3. Conduct industrial site visits to observe real-world production lines.
4. Invite industry professionals to provide feedback on student projects.

Course Description Form

Course Title: Professional Ethics

Course Code: NTU204

This course description provides a summary of the most significant characteristics of the module and the learning outcomes expected of the student. It aims to demonstrate the student's ability to navigate ethical dilemmas and adhere to professional standards in technical environments.

---

1. General Information

Item	Details
1. Course Name	Professional Ethics
2. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
3. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
4. Course Code	NTU204
5. Attendance Modes	In-person
6. Semester / Year	Second Semester / 2025-2026
7. Total Credit Hours	(30) Hours (2 Hours per week)
8. Date of Preparation	2025

---

9. Course Objectives

1. Introduce the student to the concept of professional ethics and its critical importance in the workplace.
2. Strengthen commitment to ethical standards across various professional fields.
3. Clarify professional values and the ethical responsibilities of workers in the technical and industrial sectors.
4. Develop the ability to make sound ethical decisions in diverse professional situations.

---

10. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- Understand basic concepts of professional morality and ethics.
- Identify ethical standards, laws, and regulations governing the profession.
- Develop an ethical "sense" for informed decision-making.

B. Subject-Specific Skills

- Apply ethical rules within industrial and technical environments.
- Analyze ethical dilemmas and reach sound professional conclusions.
- Interact with colleagues and management according to recognized ethical codes.

Teaching, Learning, and Assessment

- **Teaching Methods:** Lectures, interactive group discussions, case studies, and interactive applications.
- **Assessment Methods:** Mid-semester exams, in-class exercises, case study presentations, and self-assessment.

---

11. Course Structure (Syllabus)

Week	Hours	Unit / Subject Topic	Intended Learning Outcomes	Method	Assessment
1	2	**Introduction to Ethics**	Grasp the concept of professional ethics.	Lecture + Q&A	Oral Exam
2-3	4	**Professional Values**	Identify core ethical values in industry.	Lecture + Case Study	Written Test
4-5	4	**Laws & Regulations**	Understand ethical laws in technical professions.	Legal Text Analysis	Written Test
6-7	4	**Problem Solving**	Handling ethical dilemmas in the workplace.	Group Discussion	Peer Assessment
8-9	4	**Teamwork Ethics**	Applying ethics in practical teamwork.	Interactive Activity	Monthly Exam
10-11	4	**Violations & Challenges**	Recognizing the impact of unethical behavior.	Simulation	Self-Assessment
12-13	4	**Ethical Decision-Making**	Strengthening awareness in professional choices.	Case Analysis	Written Test
14-15	4	**Comprehensive Review**	Performance evaluation and review.	Practical Exercises	**Final Exam**

12. Infrastructure & Resources

- **Required Textbooks:** *"Professional Ethics in Technical Work"* – Academic Edition.
- **Main References:** Scientific articles, professional codes of conduct, and industrial case studies.

13. Course Development Plan

1. **Update Content:** Regularly refresh the syllabus to align with the latest international professional and ethical standards.
2. **Tech Integration:** Incorporate e-learning resources and interactive ethical-simulation apps.
3. **Workshops:** Organize practical workshops to reinforce the understanding of ethics in real-world scenarios.
4. **Collaborative Learning:** Focus on reality-based case studies and group projects to bridge the gap between theory and practice.

Course Description Form

Course Title: English Language 2

Course Code: NTU200

This course aims to develop students' ability to speak, listen, and write in English, qualifying them to handle basic workplace tasks and professional interactions that require English proficiency.

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department
3. Course Name / Code	English Language 2 / NTU200
4. Attendance Modes	In-person
5. Semester / Year	Second Semester / 2025-2026
6. Total Credit Hours	(30) Hours (2 Hours per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

1. Understand English tenses and their correct application in sentence structure.

2. Recognize that the curriculum is designed for their current level and evolves with their progress.
3. Identify key methods for speaking and communicating within a professional work environment.
4. Develop active listening skills in English.
5. Demonstrate the mechanism of academic and professional writing.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define the concept and usage of various English tenses.
- **A2.** Explain the methodology for acquiring language skills (Reading, Writing, Listening, Speaking).
- **A3.** Outline the basics of professional writing and verbal communication.
- **A4.** Clarify listening comprehension techniques.
- **A5.** Provide practical examples and simulate English conversations.

B. Subject-Specific Skills

- **B1.** Gather information related to technical English terminology.
- **B2.** Analyze common obstacles to language learning and propose solutions.
- **B3.** Compare past and present language learning experiences.
- **B4.** Interact effectively with peers using communication and delivery skills.

Teaching, Learning, and Assessment

- **Teaching Methods:** Presentations, illustrative diagrams, brainstorming, and interactive dialogue.
- **Assessment Methods:** Objective tests (MCQs, True/False, Matching), self-assessment, peer evaluation, and monthly/semester achievement tests.

10. Course Structure (Syllabus)

Week	Hours	Unit / Topic	Grammar & Key Content	Assessment
1	2	**Unit 1: Hello**	Am/Are/Is, My/Your, Professional Practice.	Oral Exam
2	2	**Unit 2: Your World**	He/She/They, His/Her, Questions.	Peer Assessment
3	2	**Unit 3: All About**	Personal Information & Identity.	Self-Assessment
4	2	**Unit 4: Family/Friends**	Possessives, Has/Have, Adjective + Noun.	Written Test
5	2	**Unit 5: The Way I Live**	Present Simple (I/You/We/They), Articles (A/An).	Peer Assessment
6	2	**Unit 6: Every Day**	Present Simple (He/She), Adverbs of Frequency.	Oral Exam
7	2	**Unit 7: My Favorites**	Question Words, Pronouns, This/That.	Oral Exam
8	2	**Unit 8: Where I Live**	There is/are, Prepositions of Place.	Written Test
9	2	**Unit 9: Times Past**	Was/Were, Past Simple (Irregular Verbs).	Self-Assessment
10	2	**Unit 10: Great Times**	Past Simple (Regular), Negatives, "Ago".	Oral Exam
11	2	**Unit 11: I Can Do That**	Can/Can't, Adverbs, Requests.	Peer Assessment
12	2	**Unit 12: Please/Thanks**	I'd like, Some/Any, Like vs. Would like.	Oral Exam
13	2	**Unit 13: Here and Now**	Present Simple vs. Present Continuous.	Self-Assessment
14	2	**Unit 14: Time to Go**	Future Plans (Going to/Will).	Oral Exam
15	2	**Revision**	Writing Emails & Informal Letters.	**Final Written Test**

11. Infrastructure & Resources

- **Required Books:** *New Headway: Beginner* (Universal Textbook approved by the Middle Technical University).
- **Main References:** *New Headway* series and standardized departmental handouts.
- **Recommended Sources:** Peer-reviewed language journals and reputable ESL (English as a Second Language) websites.

---

12. Course Development Plan

1. Incorporate **Digital Language Labs** to enhance listening and pronunciation through specialized software.
2. Introduce **Technical Vocabulary Modules** specifically related to Oil Equipment and Welding to increase employability.
3. Use **Role-Playing Simulations** of workplace scenarios (e.g., reporting a weld defect, safety briefings).
4. Update teaching materials to include modern business communication platforms (Slack/Teams etiquette).

Course Description Form

Course Title: Arabic Language 2

Course Code: NTU202

This course provides a concise overview of the essential Arabic grammar lessons required for professional mastery, with a specific focus on the linguistics of **Administrative Correspondence** (Official Discourse).

---

1. General Information

Item	Details
1. Educational Institution	Northern Technical University / Kirkuk Polytechnic College
2. Scientific Department	Oil Equipment Inspection and Welding Techniques Department

Item	Details
3. Course Name / Code	Arabic Language 2 / NTU202
4. Attendance Modes	In-person / Electronic (per Ministerial instructions)
5. Semester / Year	Second Semester / 2025-2026
6. Total Credit Hours	(30) Hours (2 Hours per week)
7. Date of Preparation	2025

---

8. Course Objectives

By the end of the academic year, the student will be able to:

- Mastery of Arabic grammar rules specifically applied to **Administrative Discourse**.
- Differentiate between formal and informal language in technical documentation.
- Draft professional official letters, reports, and memos with linguistic accuracy.

---

9. Intended Learning Outcomes (ILOs)

A. Cognitive Objectives (Knowledge & Understanding)

- **A1.** Define core concepts of Arabic grammar and syntax.
- **A2.** Understand the practical application of grammar in official writing.
- **A3.** Recognize the impact of linguistic precision on the effectiveness of administrative communication.

B. Subject-Specific Skills

- **B1.** Interpret and implement complex linguistic instructions in writing.

- **B2.** Analyze the administrative risks and misunderstandings caused by linguistic errors.
- **B3.** Develop advanced professional communication and delivery skills.

C. Affective and Value-Based Objectives

- **C1.** Propose creative ideas for improving professional communication.
- **C2.** Evaluate linguistic problems in administrative documents and provide solutions.
- **C3.** Critically analyze the phenomena of linguistic evolution in technical sectors.

Teaching, Learning, and Assessment

- **Teaching Methods:** * Interactive electronic lectures via Google Workspace tools.
    - Visual presentations and illustrative linguistic diagrams.
    - Brainstorming sessions regarding common administrative errors.
- **Assessment Methods:** * Objective testing (MCQs, True/False, Matching).
    - Peer and self-evaluation of drafted documents.
    - Monthly formative and summative achievement exams.

---

10. Course Structure (Syllabus)

Week	Hours	Unit / Topic Focus	Teaching Method	Assessment
1	2	**Intro to Administrative Arabic**	Lecture	Oral Quiz
2	2	**Syntax in Official Writing**	Interactive Dialogue	Peer Eval
3-4	4	**The Mechanics of the Official Letter**	Lecture / Presentation	Self-Eval

Week	Hours	Unit / Topic Focus	Teaching Method	Assessment
5	2	**Common Grammatical Errors**	Workshop	Oral Quiz
6-7	4	**Punctuation & Professional Tone**	Dialogue	Peer Eval
8-10	6	**Drafting Reports & Memos**	Lecture / Practice	Self-Eval
11-12	4	**Language of Legal/Technical Contracts**	Lecture	Oral Quiz
13-15	6	**Review & Final Applications**	Comprehensive Review	**Final Written Exam**

---

11. Infrastructure & Resources

- **Required Books:** * *Arabic Language Manual*, Dr. Safaa Kadhim Maki & Dr. Lama Mohammed Younis (Published by Middle Technical University, 2019).
- **Main References:** * Standard Arabic grammar encyclopedias and administrative writing guides.
- **Electronic Resources:** * Reputable academic publishing sites and digital Arabic linguistic databases.

---

12. Course Development Plan

1. **Modern Research Integration:** Provide students with contemporary research regarding the evolution of Arabic in modern technical administration.
2. **Interactive Digital Content:** Develop specialized interactive modules for real-time correction of administrative drafts.
3. **Industry Alignment:** Review and incorporate actual administrative samples from the oil and gas sector for classroom analysis.