Ministry of Higher Education and Scientific Research Scientific supervision and evaluation device
Department of Quality Assurance and Academic accreditation
Department Accreditation

Academic Program and Course Description Guide

Introduction:

The educational program is a coordinated and organized package of courses that include procedures and experiences organized in the form of academic vocabulary whose main purpose is to build and refine the skills of graduates, making them qualified to meet the requirements of the labor market, which is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.

The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that are being worked on to acquire for students based on the objectives of the academic program, and the importance of this description is evident because it represents the cornerstone in obtaining program accreditation and is written jointly by the teaching staff under the supervision of the scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the description of the academic program circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna track as the basis for their work.

In this regard, we can only emphasize the importance of writing a description of academic programs and courses to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The description of the academic program provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, proving whether he has made the most of the available learning opportunities. It is derived from the description of the program.

Program Vision: An ambitious picture for the future of the academic program to be a sophisticated, inspiring, stimulating, realistic and applicable program.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (semester, yearly, Bologna track) whether it is a requirement (ministry, university, college and scientific department) with the number of study units.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by the student after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty member to develop the student's teaching and learning, and they are plans that are followed to reach the learning goals. That is, describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

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

Academic Program Specification Form for Colleges and Institutions

University: Northern Technical University
Institute: Technical Engineering College / Kirkuk
Department: Surveying Technical Engineering
Date of Form Completion: 2024

The Dean	Dean's Assistant for Scientific Affairs	Head of Department
Dr. Sami R Aslan	Dr. Muntadher.A.Shareef	Dr. Dler Abdullah Omar
Date: 1/11/2024	1/11/2024	

Quality Assurance and University Performance Manager: Dr. Rana Hilmi Abduljabbar
Date: 1/11 /2024

1. Program Vision

The Department of Surveying Engineering seeks excellence, creativity and leadership in its field of engineering and scientific specialization in Iraq and the region to meet the renewed requirements of society coupled with rapid scientific and technological developments.

2. Program Mission

Contribute to the prosperity of society by preparing applied engineers, professional leaders and efficient scientific research cadres with a distinguished level of knowledge and technological innovation in order to achieve quality assurance and academic accreditation in accordance with the internationally approved solid standards in engineering and scientific curricula while adhering to the ethics of the engineering profession.

3. Program Objectives

1. Graduating qualified cadres to carry out ground and photogrammetry and remote sensing techniques, as well as ribbing and leveling works for the natural and artificial features of the earth's surface using traditional and modern surveying devices (Total stations devices) and global navigational and surveying footprint devices (GPS, DGPS). In addition to working on the ability of graduates to possess the skills of maintaining various surveying devices. In addition to preparing and drawing topographic maps, cadastral, real estate, objective and detailed. As well as the use of Geographic Information Systems (GIS) with the aim of building a database and producing digital maps in various fields.

2. Developing the teaching staff in the department by creating the appropriate atmosphere and urging faculty members in the department to scientific research and interest in scientific promotion and complete their studies to obtain higher degrees and higher experiences.

3. Seeking to develop the skilled and scientific capabilities of the department's engineers and technicians and put them in development courses in a way that positively affects their practical performance.

4. Communicate with the community through the departments of the public and private sectors and provide consultations and engineering studies in the field of specialization of the department.

4. Program Accreditation

There isn't any

5. Other external influences

There isn't any

6. Program Structure

Program structure	Number of courses	Unit of study	Percentage	Reviews*
Requirements of the institution	7	17	7.3	
College Requirements	9	35	14.8	
Department Requirements	33	184	77.9	
Summer Training				Essentials

* It can include notes whether the course is basic or optional.

7- Program description

Year/level	semester or semester code	Name of the semester	credit Hours	
			theory	practical
2024-2025 / First	SUE101	Space Basics	**3**	6

2024-2025 / First	TECK103	Laboratories (workshops)	3	
2024-2025 / First	SUE102	Geology of minerals and rocks	2	
2024-2025 / First	SUE103	Descriptive geometry	2	2
2024-2025 / First	SUE104	Calculator Applications	1	2
2024-2025 / First	NTU101	English Language	2	
2024-2025 / First	NTU100	Democracy and Human Rights	2	
2024-2025 / First	SUE105	Planar area	3	5
2024-2025 / First	TECK104	Physics	3	
2024-2025 / First	TECK102	Engineering Drawing		3
2024-2025 / First	TECK101	Principles of calculus	4	
2024-2025 / First	NTU102	Computer Principles	1	2
2024-2025 / First	NTU104	Arabic Language	2	
2024-2025/ second	SUE201	Cadastral Methods	3	3
2024-2025/ second	TECK201	Differential equations	4	
2024-2025/ second	SUE202	Road Networks Survey	2	2
2024-2025/ second	SUE203	Basics of photogrammetry	2	3
2024-2025/ second	SUE204	Cartographic Science	2	2

2024-2025/ second	NTU203	The crimes of the Baath Party regime in Iraq	2	
2024-2025/ second	SUE205	Computer Drawing Applications	1	2
2024-2025/ second	SUE206	Survey of ground networks	2	3
2024-2025/ second	SUE207	Digital Photogrammetry	2	3
2024-2025/ second	SUE208	Maps Production	2	2
2024-2025/ second	TECK202	Engineering Statistics	2	2
2024-2025/ second	SUE209	Principles of Civil Engineering	2	2
2024-2025/ second	NTU201	Professional Ethics	2	
2024-2025/ second	SUE210	Engineering Survey	2	2
2024-2025/ Third	SUE301	Digital Maps	2	4
2024-2025/ Third	TECK300	Engineering and numerical analyses	3	2
2024-2025/ Third	SUE302	Cadastral survey	2	3
2024-2025/ Third	SUE303	Python programming	2	2
2024-2025/ Third	SUE304	Theory of errors and correction	2	2
2024-2025/ Third	SUE309	Road Engineering & Design	2	3
2024-2025/ Third	SUE305	Quantity Survey & Specifications	2	3
2024-2025/ Third	SUE306	Geographic Information Systems	2	3

2024-2025/ Third	SUE307	Land division	2	3
2024-2025/ Third	SUE308	Image processing and intelligent systems	2	2
2024-2025/ Third	TECK302	Summer Internship 2		
2024-2025/ Fourth	NTU410	Scientific Research Methodology	2	
2024-2025/ Fourth	SUE409	Engineering Projects Management	2	2
2024-2025/ Fourth	SUE403	Geodetic Area	2	2
2024-2025/ Fourth	SUE402	Visual Remote Sense	2	3
2024-2025/ Fourth	SUE404	Calibration of devices	2	2
2024-2025/ Fourth	SUE410	Final Graduation Project		4
2024-2025/ Fourth	SUE405	Global Navigation Systems	2	3
2024-2025/ Fourth	SUE406	Maintenance of surveying equipment	2	3
2024-2025/ Fourth	SUE407	Radar remote sensing	2	3
2024-2025/ Fourth	SUE408	Town Planning & Traffic	2	3

No.	Module Code	Module Name in English	Course Name	Number of Units
1	SUE101	Surveying Fundamentals	Space Basics	9
2	TECK103	Workshop	Laboratories (workshops)	4
3	SUE102	Geology of Minerals and Rocks	Geology of minerals and rocks	3
4	SUE103	Descriptive Engineering	Descriptive geometry	7
5	SUE104	Computer Apploications	Calculator Applications	3
6	NTU101	English Language	English Language	2
7	NTU100	Human Right	Democracy and Human Rights	2
8	SUE105	Plane Surveying	Planar area	9
9	TECK104	Physics	Physics	5
10	TECK102	Engineering Drawing	Engineering Drawing	5
11	TECK101	Principles of calculus	Principles of calculus	6
12	NTU102	Computer Principles	Computer Principles	3
13	NTU104	Arabic Language	Arabic Language	2
14	SUE201	Surveying Methods	Cadastral Methods	6
15	TECK201	Differential Equations	Differential equations	5
16	SUE202	Road Networks Survey	Road Networks Survey	5
17	SUE203	Fundamentals of Photogrammetry	Basics of photogrammetry	5
18	SUE204	Cartography	Cartographic Science	4
19	NTU203	Crimes of the Baath Party regime in Iraq	The crimes of the Baath Party regime in Iraq	2
20	SUE205	CAD Applications	Computer Drawing Applications	3
21	SUE206	Ground Networks Survey	Survey of ground networks	5
22	SUE207	Digital Photogrammetry	Digital Photogrammetry	5
23	SUE208	Maps Production	Maps Production	5
24	TECK202	Statistical Engineering	Engineering Statistics	4
25	NTU203	Arabic Language	Arabic Language	2
26	NTU201	English Language	English Language	2
27	NTU202	Computer Principles	Computer Principles	3
28	SUE209	Engineering surveying	Engineering Survey	4
29	SUE301	Digital maps	Digital Maps	6

30	TECK300	Engineering and Numerical Analysis	Engineering and numerical analyses	6
31	SUE302	Cadastral Surveying	Cadastral survey	6
32	SUE303	Programing with python	Python programming	5
33	SUE304	Errors Theory and Adjustments	Theory of errors and correction	5
34	NTU201	Professional Ethics	Professional Ethics	2
35	SUE309	Transportation and design Engineering	Road Engineering & Design	6
36	SUE305	Quantitative Surveying and Specifications	Quantity Survey & Specifications	6
37	SUE306	Geographic Information Systems	Geographic Information Systems	6
38	SUE307	Land Division	Land division	6
39	SUE308	Image processing and intellegent systems	Image processing and intelligent systems	6
40	TECK302	Summer Training 2	Summer Internship 2	0
41	NTU410	Scientific Research Methodology	Scientific Research Methodology	4
42	SUE409	Engineering Project Management	Engineering Projects Management	5
43	SUE403	Geodetic surveying	Geodetic Area	5
44	SUE402	Optical Remote sensing	Visual Remote Sense	6
45	SUE404	Instruments Calibration	Calibration of devices	6
46	SUE209	Principles of Civil Engineering	Principles of Civil Engineering	4
47	SUE410	Final Graduation Project	Final Graduation Project	4
48	SUE405	Global Navigation Satellite System (GNSS)	Global Navigation Systems	6
49	SUE406	Surveying Instruments Maintenance	Maintenance of surveying equipment	7
50	SUE407	Radar Remote sensing	Radar remote sensing	7
51	SUE408	City Planning & Traffic	Town Planning & Traffic	6

7. **Expected learning outcomes of the program**	
Knowledge	
The Department of Surveying Engineering Techniques aims to achieve a set of important cognitive objectives, including: 1. **Understand the basic principles**: Recognize the basic principles of surveying engineering and measurement methods. 2. **Develop technical skills**: Acquire the necessary skills to use modern tools and techniques in scanning such as GPS devices and scanners. 3. **Data Analysis**: Ability to analyze and interpret spatial data and use geographic information systems (GIS) software. 4. **Practical applications**: Understand how surveying techniques are applied in multiple fields such as urban planning, environment, and civil engineering. **Problem Solving**: Develop problem-solving skills by applying theoretical knowledge in practical situations. **Orientation towards sustainability**: Recognizing the importance of sustainability in engineering projects and applying techniques that help in this. **Collaborations and teamwork**: Enhance the ability to work within multidisciplinary teams to achieve common goals. **Research and development**: Encouraging scientific research and developing new technologies in the field of surveying and mapping. These objectives aim to qualify students to be specialists capable of dealing with current and future challenges in the field of surveying engineering techniques.	**A-Knowledge Objectives**
Skills	
The skill objectives of surveying engineering include a set of skills that students need to apply knowledge effectively, including: 1. **Measurement skills**: Proficiency in the use of various measuring instruments, such as telescopes, GPS devices, levels, and scanners. 2. **Ground survey**: Ability to perform ground surveys accurately, including measuring angles and distances. 3. **Data Analysis**: The skill of analyzing spatial data and using specialized software such as geographic information systems (GIS) and data analysis. 4. **Cartography**: The ability to create accurate and useful maps, including diagrams and analysis.	**B- Program Skills Objectives**

Software handling: Mastering the use of design and engineering software, such as AutoCAD and Civil 3D. **Problem Solving**: Develop critical and creative thinking skills to solve complex problems in the field of space. **Effective communication**: the ability to present information and results clearly and effectively, whether written or oral. **Collaboration**: Work efficiently within multidisciplinary teams, enhancing the effectiveness of teamwork. **Project Management**: Understand the principles of project management and how to plan, implement and monitor surveying activities. These skills help students prepare for a successful career in surveying engineering and its multiple applications. 4o mini	
Values	
The value objectives of surveying engineering relate to promoting a set of core values that affect professional and ethical practices, including: 1. **Integrity**: Promote the importance of accuracy and honesty in the collection and analysis of spatial data, ensuring the reliability of results. 2. **Social Responsibility**: Understand the impact of surveying projects on society and the environment, and work to achieve sustainable results. 3. **Professionalism**: Commitment to professional and ethical standards at work, including respect for privacy and data protection. 4. **Collaboration**: Promoting the values of teamwork and partnership with various disciplines and communities to achieve common goals. **Innovation**: Encourage creative thinking and innovation in the development of new technologies and effective solutions to contemporary challenges. **Continuous Learning**: Enhance the value of continuing education and adapt to technological and professional developments in the field of surveying engineering. **Open communication**: Encourage effective and open communication with colleagues and stakeholders to ensure the exchange of knowledge and experiences. **Respect for diversity**: Appreciate cultural and social differences and work to promote an inclusive environment. These values help build professionals with strong work ethics who work towards improving society and the environment through space technologies.	C- Value Objectives

8. Teaching and Learning Strategies

Giving theoretical and practical lectures, field training, laboratory operation, workshops and summer training during the summer vacation period

9. Evaluation methods

The assessment of students in the Department of Surveying Technology Engineering, Kirkuk can be done through a variety of methods and methods, including:

1. Theory tests: include midterm and end-of-semester exams, where students' theoretical knowledge of basic concepts and applications is assessed.

2. Practical Projects: Assigning students to conduct applied surveying projects that require the use of modern tools and techniques, which enhances their practical skills.

3. Written reports: Write reports on practical experiences or research, which helps assess their ability to document and analyze data.

4. Practical tests: Conducting practical tests where students' skills in using measuring tools and carrying out surveys are assessed.

5. Presentations: Students make presentations about their projects or research, assessing communication and presentation skills.

6. Classroom Engagement: Evaluate students' participation in discussions and classroom activities, reflecting their interaction and understanding of the material.

7. Continuous Assessment: Using a continuous evaluation system throughout the semester, where students' performance is evaluated periodically.

8. Group collaboration: Evaluate students' performance on group projects, reflecting their ability to work in a team.

9. Self-assessment: Encourage students to evaluate themselves, which helps develop self-awareness and improve skills.

These methods help provide a comprehensive assessment of students' abilities and skills in the field of surveying technology engineering

10. Faculty

Faculty Members

Preparation of the teaching staff		Special Requirements/Skills (if applicable)		Specialization		Academic Rank
Lecturer	Staff			Specialized	General	
	Permanent staff			Roads & Traffic	Civil Engineering	Assistant Professor
	Permanent staff			Urban Planning	Surveying Engineering	Assistant Lecturer
	Permanent staff			Astronomy and space	Astronomy and Space Sciences	Professor
	Permanent staff			Layers - microscopic fossils	Geological Sciences	Professor
	Permanent staff			Geomatics	Surveying Engineering	Assistant Professor
	Permanent staff			Remote Sensing and GIS	Surveying Engineering	Assistant Professor
	Permanent staff			Space & GIS	Surveying Engineering	Lecturer
	Permanent staff			Space and remote sensing	Surveying Engineering	Lecturer
	Permanent staff			Photogrammetry	Surveying Engineering	Lecturer
	Permanent staff			Networks	Software Engineering	Lecturer
	Permanent staff			Hydrogeologist	Geological Sciences	Assistant Lecturer
	Permanent staff			Photogrammetry	Surveying Engineering	Assistant Lecturer

	Permanent staff			Surveying and GIS	Surveying Engineering	Assistant Lecturer
	Permanent staff			Surveying	Surveying Engineering	Assistant Lecturer
	Permanent staff			Geomatics	Surveying Engineering	Assistant Lecturer
	Permanent staff			Construction	Civil Engineering	Assistant Lecturer
	Permanent staff			forests	Agricultural Engineering	Assistant Lecturer

Professional Development

Mentoring new faculty members

1. **Introducing the university culture**: Provide them with information about the values and objectives of the university, and how to communicate with different departments.
2. **Academic Program Delivery**: Introduce them to the contents of the study programs, students' requirements, and learning objectives for each subject.
3. **Teaching Strategies**: Provide workshops on effective teaching strategies, including the use of technology in education.
4. **Assessment and feedback**: Explain how to evaluate students and provide constructive feedback to improve academic performance.
5. **Academic Guidance**: Introduce them to how to provide academic support to students, including academic advising and career guidance.
6. **Scientific research**: Encourage them to engage in research activities and provide them with information on how to write research proposals and publish research.
7. **Interaction with colleagues**: Reinforce the importance of building a network of relationships with colleagues by participating in academic meetings and social activities.
8. **Professional Development**: Provide information on career development opportunities, including workshops and training courses.
9. **Administrative support**: Show them how to access administrative resources and support available, such as logistical and financial assistance.
10. **Work-life balance**: The importance of maintaining a healthy work-life balance.

Mentoring new faculty members in this way can contribute to enhancing their academic experience and ensuring them a productive learning environment.

Professional development of faculty members

- **Workshops and training courses**: Organizing workshops and training courses on modern teaching methods, the use of technology in education, and performance evaluation.

- **Mentoring**: Provide mentoring programs for new faculty members by experienced colleagues to help them adapt to the university environment.
- **Research Development**: Encourage participation in research conferences and workshops related to their academic fields, as well as support them in writing research proposals.
- **Academic Collaboration**: Promote collaboration among faculty members through joint research projects or curriculum development teams.
- **Self-Assessment**: Encourage faculty members to conduct periodic self-evaluation of their performance and provide feedback from their colleagues and students.
- **Continuous Learning**: Support continuing education by giving them opportunities to study or attend training programs in new fields.
- **Participation in committees**: Involve faculty members in committees to develop curricula or improve education to ensure their effective contribution to the academic process.
- **Leadership Development**: Provide leadership and management development programs, enabling them to assume leadership roles in the future.
- **Incentives**: Incentives to faculty members who participate in developmental activities or achieve outstanding academic achievements.
- **Communication and Engagement**: Create communication platforms for the exchange of knowledge and experiences among faculty members, such as forums or academic publications.

11. Acceptance Criterion

The criterion for admission to the Northern Technical University, Technical Engineering College, Kirkuk, Department of Surveying Technology Engineering based on the central admission and the laws that have been developed by the Iraqi Ministry of Higher Education and Scientific Research.

12. The most important sources of information about the program

Methodological books, notebooks shared by the teaching staff, external sources (Internet), scientific research and the latest developments.

13. Program Development Plan
1. **Assess the current situation** • **Curriculum Analysis**: Review existing approaches to identify strengths and weaknesses. • **Stakeholder Survey**: Gather students, faculty, and alumni feedback about the program. **2. Goal setting** • **Improving academic quality**: Raising the level of education through curriculum modernization. • **Meeting market needs**: Ensure that the program is compatible with the requirements of the labor market. **3. Curriculum Update** • **Integrate new technologies**: Introducing topics on geographic information systems (GIS), scanners, and artificial intelligence. • **Balance between theory and practice**: Enhance the practical side through more applied projects and field exercises. **4.Infrastructure Enhancement** • **Providing modern equipment**: updating the tools and techniques used in education and training.

- **Providing specialized laboratories**: Establishing laboratories specialized in surveying and mapping.

5. Developing the skills of faculty members

- **Continuous Training**: Organizing workshops and training courses for faculty members to enhance their teaching and research skills.

- **Encouraging scientific research**: Supporting faculty members in conducting research and participating in conferences.

6. Evaluate the program periodically

- **Periodic Curriculum Review**: Updating curricula based on the results of assessments and new trends in the industry.

- **Continuous feedback**: Use the feedback of students and alumni to improve the program.

7. Providing academic support

- **Preparation of Academic Advising Programs**: Provide academic guidance to students to help them achieve their academic and career goals.

Program Skills Outline															
Learning outcomes required from the program															
Values				**Skills**				**Knowledge**				**Basic or optional**	**Course Name**	**Course Code**	
C4	**C3**	**C2**	**C1**	**B4**	**B3**	**B2**	**B1**	**A4**	**A3**	**A2**	**A1**				
	*	*	*	*	*	*	*	*	*	*	*	Essential	Space Basics	SUE101	
	*	*	*	*	*	*	*	*	*	*	*	Essential	Laboratories (workshops)	TECK103	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Geology of minerals and rocks	SUE102	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Descriptive geometry	SUE103	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Calculator Applications	SUE104	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	English Language	NTU101	
*	*	*	*				*	*	*	*	*	Essential	Democracy and Human Rights	NTU100	
			*	*	*	*	*	*	*	*	*	Essential	Planar area	SUE105	
	*	*	*	*	*	*	*	*	*	*	*	Essential	Physics	TECK104	

	*	*	*	*	*	*	*	*	*	*	*	Essential	Engineering Drawing	TECK102	
			*	*	*	*	*	*	*	*	*	Essential	Principles of calculus	TECK101	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Computer Principles	NTU102	
*	*	*	*				*	*	*	*	*	Essential	Arabic Language	NTU104	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Cadastral Methods	SUE201	
*	*	*				*	*	*	*	*	*	Essential	Differential equations	TECK201	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Road Networks Survey	SUE202	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Basics of photogramm etry	SUE203	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Cartographic Science	SUE204	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	The crimes of the Baath Party regime in Iraq	NTU203	

*	*	*	*	*	*				*	*	*	Essential	Computer Drawing Applications	SUE205	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Survey of ground networks	SUE206	
*	*	*					*	*	*	*	*	Essential	Digital Photogramm etry	SUE207	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Maps Production	SUE208	
*	*	*	*	*				*	*	*	*	Essential	Engineering Statistics	TECK202	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Principles of Civil Engineering	SUE209	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Professional Ethics	NTU201	
*	*	*			*	*	*	*	*	*	*	Essential	Engineering Survey	SUE210	
*	*	*	*	*	*	*					*	Essential	Digital Maps	SUE301	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Engineering and numerical analyses	TECK300	

*				*	*	*	*	*	*	*	*	Essential	Cadastral survey	SUE302	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Python programming	SUE303	
*	*	*	*				*	*	*	*	*	Essential	Theory of errors and correction	SUE304	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Road Engineering & Design	SUE309	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Quantity Survey & Specifications	SUE305	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Geographic Information Systems	SUE306	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Land division	SUE307	
*	*		*	*		*	*	*	*	*	*	Essential	Image processing and intelligent systems	SUE308	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Summer Internship 2	TECK302	

*	*		*	*				*	*	*	*	Essential	Scientific Research Methodology	NTU410	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Engineering Projects Management	SUE409	
*	*	*	*	*		*	*	*	*	*	*	Essential	Geodetic Area	SUE403	
*	*	*		*	*	*		*	*	*	*	Essential	Visual Remote Sense	SUE402	
*	*	*	*	*	*	*		*		*	*	Essential	Calibration of devices	SUE404	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Final Graduation Project	SUE410	
*	*	*	*	*	*		*	*	*	*	*	Essential	Global Navigation Systems	SUE405	
*	*	*	*		*	*	*	*	*	*	*	Essential	Maintenance of surveying equipment	SUE406	
*	*		*	*	*	*	*	*	*	*	*	Essential	Radar remote sensing	SUE407	

*	*	*	*	*	*		*	*	*	*	*	Essential	Town Planning & Traffic	SUE408	

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

Academic Program Description

Educational institution	Ministry of Higher Education and Scientific Research / Northern Technical University
University / Scientific Department	Kirkuk Technical College of Engineering / Department of Surveying Technologies Engineering
Course Name/Code	Space Essentials SUE101
Program(s) in which you are involved	Bachelor of Engineering in Surveying Technologies
5. Available attendance forms	1- Weekly lesson schedule 2- Discussions, scientific seminars and other extra-curricular activities
6.Semester/Year	Bologna
7. Number of study hours (total)	120
8.Date of preparation of the description	20-10-2024

9. Objectives of the Academic Program
Qualifying a graduate of the Department of Surveying Technology Engineering to be an applied engineer with the ability to carry out surveying applications through
The use of traditional and modern techniques in the design and implementation of vertical and horizontal control networks of various degrees
Preparing , compiling, designing and producing maps of all kinds from ground and air surveys and remote sensing
And conducting high-accuracy surveys for engineering projects (dams, reservoirs, bridges, tunnels, laboratories, roads and airports)
As well as excellence and quality in performance and achieving leadership in the graduates of the department to provide the community with technical engineers in their field of specialization

10. Required Program Outcomes and Methods of Teaching, Learning and Assessment

A- Cognitive Objectives

A1- Ability and knowledge in working on all aspects of surveying

B- Program Skills Objectives

B1 – Survey Projects

B2 – Making networks of ground control points

B3 - Making cadastral maps of all kinds

Teaching and learning methods

Giving theoretical and practical lectures, field training , laboratory operation, workshops and summer training during the summer vacation period.

Evaluation methods

Daily tests, semester exams (theoretical + practical) Discussing periodic reports, discussing output research projects

C- **Emotional and value goals.**

C1- Preparing educational cadres that can be relied upon in state institutions within the specialization.

C2- Develop solutions to the problems in which the institutions and systems specialized in the field of surveying are located.

C3- Work to prepare the requirements of the labor market and raise the economic capacity.

A4-

Teaching and learning methods

Development courses, periodic seminars, seminars.

Evaluation methods
- Periodic tests. - Feedback methods.

d. General and qualifying skills transferred (other skills related to employability and personal development). D1- Communication and conversation skills such as English language and presentation skill. D2- Teamwork skills. D3- Leadership skills and responsibility. D4- Self-education skills and reliance on the same.
Teaching and learning methods
Lectures, laboratories and workshops, summer training, graduation projects.
Evaluation methods
Daily tests, quarterly exams, and final exams.

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Exams	Theoretical+Practical.	Space Basics	Introduction	2 Th + 6 P	1
Exams	Theoretical+Practical.	Space Basics	Scale	2 Th + 6 P	2
Exams	Theoretical+Practical.	Space Basics	Types of scales	2 Th + 6 P	3
Exams	Theoretical+Practical.	Space Basics	Examples of types of scales	2 Th + 6 P	4
Exams	Theoretical+Practical.	Space Basics	Measurements in area	2 Th + 6 P	5
Exams	Theoretical+Practical.	Space Basics	Corner	2 Th + 6 P	6
Exams	Theoretical+Practical.	Space Basics	Solve examples of angles	2 Th + 6 P	7
Exams	Theoretical+Practical.	Space Basics	Obstacles	2 Th + 6 P	8
Exams	Theoretical+Practical.	Space Basics	Types of obstacles	2 Th + 6 P	9
Exams	Theoretical+Practical.	Space Basics	Tape corrections	2 Th + 6 P	10
Exams	Theoretical+Practical.	Space Basics	Solve tape correction questions	2 Th + 6 P	11
Exams	Theoretical+Practical.	Space Basics	Settlement	2 Th + 6 P	12
Exams	Theoretical+Practical.	Space Basics	Types of leveling	2 Th + 6 P	13
Exams	Theoretical+Practical.	Space Basics	Solve settlement examples	2 Th + 6 P	14
Exams	Theoretical+Practical.	Space Basics	Mutual settlement	2 Th + 6 P	15

10. Infrastructure	
Methodology Books	1 Required textbooks
- Methodological books. - Auxiliary Resources (Secondary Books) The Internet, self-education sites, solid international university sites, and Iraqi universities websites	2 Main references (sources)
Research – Internet – Scientific Journals	Recommended books and references (scientific journals, reports ,....)
Research – Internet – Scientific Journals	B Electronic references, websites

11. Course Development Plan
- Courses within the college. - Courses within higher education and scientific research institutions. - Individual or joint scientific research (applied or theoretical) - Scientific seminars and seminars.

Course Description Form

Course Description

Educational institution	Northern Technical University
Scientific Department / Center	Kirkuk Technical College of Engineering
Course Name/Code	Cadre Survey SUE304
Available Attendance Forms	Weekly
Semester / Year	Decisions
Number of Credit Hours (Total)	30 weeks (1 theoretical hour / week) and (2 practical hours / week), with a total of (120 hours / year).
The history of preparation of this description	

1. Course Objectives
Introducing the student to the recent technical developments in surveying in general and in the science of producing cadastral maps in particular , dividing the land and fixing the boundaries.

12. Course Outcomes and Methods of Teaching, Learning and Assessment

A- Cognitive objectives A1 Understanding Cassara maps and their types A2- A3-
B – The skills objectives of the course. B1 – Cadrasari mapping using modern software B2 –
Teaching and learning methods
The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the teaching curriculum of the subject. The method of theoretical presentation using the (data show) device and depending on the method (how and why) of the subject and according to the teaching curriculum of the subject
Evaluation methods
Direct questions in a manner (how and why) of the topic during the theoretical and practical lecture **Sudden exams during the theoretical and practical lecture** **Semester exams for the theoretical side** **Final exams for the theoretical side**
C. Emotional and value goals C1**- Valuing the importance of the cadastral survey** A2-
Teaching and learning methods
The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the teaching curriculum of the subject.
Evaluation methods
Direct questions about how the condition occurs and its causes

d. General and rehabilitative skills transferred (other skills related to employability and personal development).

D1- Learn how to divide and separate lands

D2-

D3-

D4-

13. Course Structure					
Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Definition of Cadress Survey		1
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Design & Development Cadrasary maps using routes and Modern artistic styles.		2
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Calculation of areas and Volumes using knock Athletic and Calculations		3
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Learn and identify the types of closed, open and compound polygons		4
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Identify the types of trends and methods of calculating them mathematively and officially		5
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Learn how to calculate intersections (first, second, and third)		6
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Learn how to calculate the device point profile (resection)		7
Sudden and	Theoretical and practical presentation	Cadre Survey	establishment Boundaries of any plot From the separate land		8

Semester Exams			of them, the calculation Area of each part Separately by Mathematical calculations		
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	immobilization The limits of any Separate plot of them, the calculation Area of each part separately using Modern Survey Programs like GIS and AutoCAD		9
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Identify and understand obstacles and Problem statement and Constraints Understanding the problem Definition and Specific requirements The problem that is Suitable for its dissolution.		10
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Learn the basics To analyze the problem and the use of science		11
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Visualization and part design Engineering		12
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Basic Science Concepts and basic mathematics In the work of growing maps		13

Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Dividing a plot into two equal parts of a known point		14
Sudden and Semester Exams	Theoretical and practical presentation	Cadre Survey	Dividing a plot into two equal parts by a line with a known direction		15

14. Infrastructure	
Course Books	1 Required textbooks
Reference books	2 Main references (sources)
, Research , Internet , Scientific Journals	Recommended books and references (scientific journals, reports ,....)
, Research , Internet , Scientific Journals	B Electronic references, websites ....

15. Course Development Plan
Field Studies

Course Description

Educational institution	Northern Technical University
2.University / Scientific Department	Technical Engineering College – Kirkuk
3.Course Name/Code	Geologist - SUE102
4. Program(s) in which you are involved	
5. Attendance forms available	Weekly

6. Semester /Year	
7. Number of study hours (total)	9 weeks (2 theoretical hours per week over 15 weeks) 30 hours.
8. Date of preparation of this description	

9. Course Objectives

- Understanding the scientific foundations: Enhance students' understanding of fundamental principles in geology, including the composition of the earth, rocks, and minerals.
-
- Analysis of geological phenomena: Enable students to analyze and interpret various geological phenomena such as earthquakes, volcanoes, and rock formations.
-
- Learning about geological time: Teach students about geological time and how to determine the geological ages of layers and rocks.
-
- Applying knowledge to reality: Develop students' ability to apply geological concepts in areas such as natural resource exploration, land planning, and environmental protection.
-
- Developing research skills: Enhancing scientific research skills through conducting field and laboratory experiments.
-
- Science Communication: Improve students' ability to communicate effectively on geological topics, whether in writing or presentations.
-
- Critical thinking: Promote critical thinking through the analysis of geological data and information.
-
- Interaction with environmental challenges: Understand how human activities affect the natural environment and associated geological challenges.
-
- Promoting environmental values: Instilling the values of environmental awareness among students and the importance of preserving natural resources.
-
- Professional Development: Equip students with the knowledge and skills needed to succeed in geology-related fields of work, such as geoengineering, environment, or scientific research

10. Course Outcomes and Methods of Teaching, Learning and Assessment

A. Cognitive Objectives

1- Geology Calculator Concept

2- The student should understand the components of earth science and its layers

3- The student should be fluent in the importance of earth science in real life and its relationship with their main specialization, which is the engineering of surveying techniques

B. Course Skills Objectives

 Understanding the composition of the Earth: The study of the composition and layers of the Earth, including rocks and minerals and how they are formed.

 Analysis of geological processes: the study of various geological processes such as volcanoes, earthquakes, and erosion and how they affect the environment.

 Geological Time Study: Understanding geological time and how to determine the ages of rocks and layers, which helps in understanding the history of the Earth.

 Natural Resources Exploration: The study of natural resources such as oil, gas, and minerals and how to explore and manage them sustainably.

 Geological hazard assessment: Analysis of natural hazards such as earthquakes, floods and volcanoes, and development of strategies to reduce their impact.

 Understanding climate change: studying the relationship between geological processes and climate change and their impact on the environment.

 Interaction with the environment: Understand how human activities affect the Earth, such as pollution and use changes, and how to protect the environment.

 Develop research skills: Enhance students' research and analysis skills through field studies and experiments.

 Providing sustainable solutions: Provide sustainable recommendations for natural resource management and dealing with environmental challenges.

Teaching and learning methods
Lectures and seminars. Weekly reports according to the materials given in the lecture
Evaluation methods
Written and practical exams, semester exams, final exams

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Sudden questions	Theoretical	geologist	Definition of geology, branches of geology, relation of geology to other sciences and their applications f the earth	2	1
Sudden questions	Theoretical	geologist	The relation between thegeology with surveying and its applications, the origin of land and how it was established	2	2
Sudden questions	Theoretical	geologist	Structure of the Earth's layers and their components, Earth's crust and Earth's meal, Earth's core and its components, Layers of the Earth's mantle.	2	3
Sudden questions	Theoretical	geologist	Crystals Definition of crystals, crystal faces, crystal forms, crystal varieties and crystal naming	2	4
Sudden questions and assignments	Theoretical	geologist	Minerals, definition of minerals, formation of minerals. The physical properties of minerals	2	5
Sudden questions	Theoretical	geologist	Rocks, definition of rocks, how rocks are formed in nature and types of rocks	2	6
Sudden questions	Theoretical	geologist	Igneous rocks, their definition, types of igneous rocks, characteristics of igneous rocks, crystallization system of minerals from volcanic magma, classification of types of igneous rocks.	2	7
Sudden questions tests	Theoretical	geologist	Sedimentary rocks, definition of sedimentary rocks, classification of sedimentary rocks, minerals of clastic and non-claustic sedimentary rocks, types of clastic and non-clastic rocks	2	8
Sudden QuestionsExams	Theoretical	geologist	Metamorphic rocks definition, characteristics of metamorphic rocks. Types of metamorphism, classification of metamorphic rocks	2	9
Sudden QuestionsExams	Theoretical	geologist	The cycle of rocks in nature, environments and conditions forming different rocks	2	10

Sudden QuestionsExams	Theoretical	geologist	Mechanical properties of rocks, types of rock strengths, compressive strength and its calculation, tensile strength and methods of calculation	2	11
Sudden QuestionsExams	Theoretical	geologist	Shear resistance of rocks and methods of calculation. Types of rock behavior, definition of stress and strain, relationship between stress and deformation	2	12
Sudden QuestionsExams	Theoretical	geologist	Ground movements, types of ground movements, earthquakes and their identification, earthquake belts in the world, causes of earthquake formation, methods of measuring earthquakes, geological effects of the emergence of earthquakes	2	13
Sudden QuestionsExams	Theoretical	geologist	Volcanoes, definition of volcanoes, how volcanoes are formed and their types, patterns of volcanoes, materials ejected by volcanoes, side effects after the emergence of volcanoes	2	14
Sudden QuestionsExams	Theoretical	geologist	Volcanoes, definition of volcanoes, how volcanoes are formed and their types, patterns of volcanoes, materials ejected by volcanoes, side effects after the emergence of volcanoes	2	15

16. Infrastructure	
• Khan, Mohammad Ibrahim. Industrial engineering. New Age International, 2004. • Vaughn, Richard C. Introduction to industrial engineering. Iowa State Pr, 1985. • Zuriarrain, Amador. "Maynard, HB: Manual de Ingeniería de la Producción Industrial (Book Review)." Boletín de Estudios Económicos 17 (1962): 646. Joseph C. Hartman, "Engineering Economy and the Decision Making Process" Prentice Hall, 2007	1 Required textbooks
https://www.uoanbar.edu.iq/eStoreImages/Bank/6298.pdf	2 Main references (sources)
Research – Internet – Scientific Journals	Recommended books and references (scientific journals, reports ,....)
Research – Internet – Scientific Journals	B Electronic references, websites ....

17. Course Development Plan
Enhance evaluation • **Continuous Evaluation**: Adopting a periodic evaluation system to improve academic performance.

Course Description

Educational institution	Northern Technical University
2.University / Scientific Department	Kirkuk Technical Engineering College - Department of Surveying Technologies Engineering
3.Course Name/Code	Basics of Computer Drawing
4. Program(s) in which you are involved	Second stage
5. Attendance forms available	Quarterly
6. Semester /Year	Chapter One/2024
7. Number of study hours (total)	45
8. Date of preparation of this description	20/10/2024

9. Course Objectives
By achieving these goals, the Engineering Drawing modules provide students with a set of essential skills necessary for effective communication, design, and manufacturing in engineering.
10. Course Outcomes and Methods of Teaching, Learning and Assessment
1. Understanding technical drawings: The goal is to introduce students to the principles, norms, and symbols used in engineering drawings. This includes understanding different perspectives (such as spelling projections), dimensions, scales, and annotations common in engineering drawings. 2. Development of visualization skills: Engineering drawing aims to enhance students' ability to visualize objects and their components based on two-dimensional representations. This involves interpreting drawings and mentally transforming them into three-dimensional objects, enabling students to understand the spatial relationships between different parts. 3. Communicate Design Intent: The goal is to teach students how to communicate design ideas and specifications effectively through engineering drawings. Students learn how to create clear and accurate drawings that convey important information to manufacturers, manufacturers, and other stakeholders involved in the production or construction process.
A- Course Skills Objectives
Teaching and learning methods
Evaluation methods

C- Emotional and value goals It helps the student designer to: - Develop his conceptual skills for engineering space. - Accurately describe the geometric space through two-dimensional drawings or three-dimensional modeling. - Preparation of drawings and construction plans. - Drawing projections of different geometric shapes.
Teaching and learning methods
Exams, homework and classroom skills
Evaluation methods
Exams, homework and classroom skills
Evaluation methods

d) General and qualifying skills transferred (other skills related to employability and personal development).
 	
  Creativity and imagination: the ability to think outside the box and come up with new ideas.
  Critical thinking: Analyze designs and understand what makes them effective or ineffective.
  Communication: The ability to express ideas clearly, whether orally or in writing.
  Time management: Ability to organize work and ensure punctual delivery.

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Exams and homework and classroom	Explanation, discussion and example solving	Recognize the AutoCAD interface	Understand the user interface and basic AutoCAD tools. The ability to open and save files.	3	1
Exams and homework and classroom	Explanation, discussion and example solving	Recognize the AutoCAD interface	Understand the user interface and basic AutoCAD tools. The ability to open and save files.	3	2
Exams and homework and classroom	Explanation, discussion and example solving	Basic drawing tools	Use drawing tools such as lines, shapes, and circles. EXECUTE COMMANDS SUCH AS LINE, CIRCLE, AND RECTANGLE.	3	3
Exams and homework and classroom	Explanation, discussion and example solving	Basic drawing tools	Use drawing tools such as lines, shapes, and circles. EXECUTE COMMANDS SUCH AS LINE, CIRCLE, AND RECTANGLE.	3	4
Exams and homework and classroom	Explanation, discussion and example solving	Modify shapes	□ Use editing tools such as TRIM, EXTEND, and MOVE. □ Execute commands to reshape graphics.	3	5
Exams and homework and classroom	Explanation, discussion and example solving	Modify shapes	□ Use editing tools such as TRIM, EXTEND, and MOVE. □ Execute commands to reshape graphics.	3	6
Exams and homework and classroom	Explanation, discussion and example solving	**Classes and properties**	Create and manage layers. Set properties such as color and thickness	3	7
Exams and homework and classroom	Explanation, discussion and example solving	**Classes and properties**	Create and manage layers. Set properties such as color and thickness	3	8
Exams and homework and classroom	Explanation, discussion and example solving	Dimensions & Measurements	Add dimensions to drawings.	3	9

			UNDERSTAND HOW TO USE DIMENSION TOOLS SUCH AS DIMLINEAR AND DIMANGULAR.		
Exams and homework and classroom	Explanation, discussion and example solving	Dimensions & Measurements	Add dimensions to drawings. UNDERSTAND HOW TO USE DIMENSION TOOLS SUCH AS DIMLINEAR AND DIMANGULAR.	3	10
Exams and homework and classroom	Explanation, discussion and example solving	Three-dimensional drawing	Introduce the basics of three-dimensional drawing. Understand how to convert two-dimensional graphics to three-dimensional.	3	11
Exams and homework and classroom	Explanation, discussion and example solving	Printing and output	Prepare drawings for printing.	3	12
Exams and homework and classroom	Explanation, discussion and example solving	Applied Project	Create a comprehensive project that combines acquired skills. Apply concepts practically to a design project.	3	13
Exams and homework and classroom	Explanation, discussion and example solving	Applied Project	Create a comprehensive project that combines acquired skills. Apply concepts practically to a design project.	3	14
Exams and homework and classroom	Explanation, discussion and example solving	Review & Evaluation		3	15

18. Infrastructure	
"Mastering AutoCAD 2021 and AutoCAD LT 2021" by Brian C. Benton	1 Required textbooks
The Autodesk **website** offers a range of free tutorials and educational content for AutoCAD users.	2 Main references (sources)
	Recommended books and references (scientific journals, reports ,....)
	B Electronic references, websites ....

19. Course Development Plan
A 15-week AutoCAD drawing course development plan, focusing on basic tools, edit commands, layers, dimensions, and individual project design, with periodic reviews and evaluations. alif

Course Description Form

Course Description

In this course, cadastral methods are taught, which include measuring angles and their types, the systems adopted in measuring them, measuring directions, types of references used, the difference between circular and quarter directions, coordinate systems based on distance and direction, and then measuring horizontal distances using tachymetric area (stydia and shadow methods) and measuring horizontal distances using modern electronic devices such as destoms and the comprehensive station.

Northern Technical University	Educational institution
Technical College of Engineering / Kirkuk	Scientific Department / Center
Surveying methods	Course Name/Code
Weekly	Available Attendance Forms
Quarterly	Semester / Year
15 weeks (3 theoretical hours / week) and (3 practical hours / week), with a total of (90 hours / semester).	Number of Credit Hours (Total)
20/10/2024	The date of preparation of this description
2. Course Objectives:	

The student learns about the basic concepts of space and work on different devices and how to use them in different ways and methods of calculating angles, directions and horizontal distances.

10. Course Outcomes and Methods of Teaching, Learning and Assessment

This course results in a student who is familiar with the principles of ground surveying and is able to use theodolite and total station devices to measure angles, directions and horizontal distances.

A- Cognitive objectives
A1- Principles of Land Surveying
A2- Principles of measuring angles and directions
A3- Principles of measuring horizontal distances.

B – The skills objectives of the course.
B1 – Preparing reports for various field experiments
B2 – Use of various scanning devices

Teaching and learning methods

Face-to-face lectures, e-learning, blended learning.

Evaluation methods

Daily tests, mutual question tests and discussions in addition to written tests, monthly exams, final exams .

C. Emotional and value goals C1- Dealing with the basic principles of the advanced space and seeking to apply them C2- Spreading the spirit of cooperation and joint work in field applications
d. General and qualifying-transfer skills (other skills related to employability and personal development). D1- Extensive discussions on concepts D2- Student courses and seminars on modern applications of space D3- Field visits to vital and construction facilities D4- Coordination with various state departments to exchange skills

20. 6

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Introduction to Measuring Angles, Units Used in Measuring Angles, Lexiconomy, Celsius System	6	1
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Directions: Magnetic North, True North, Default North, Quarterly and Circular Directions,	6	2
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Conversion methods between quartile and circular directions, front and back directions.	6	3
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Types of angles: horizontal and vertical angles, interior and exterior angles, deviation angles	6	4
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Theodolite device: types, parts, method of adjusting the device, methods of measuring angles	6	5
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Coordinate systems: polar coordinates, Cartesian coordinates, spherical coordinates.	6	6
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Tachometric survey: definition, purposes, principles.	6	7
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Tachometric Survey: Measurement of horizontal distances by stydia method.	6	8
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Tachometric survey: measurement of horizontal distances by shadow method.	6	9
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Trigonometric leveling: types and applications	6	10
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Principles of electronic distance measurement	6	11
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Applications in measuring distance electronically	6	12
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Correction of errors in electronic measurement	6	13

Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Oblique and horizontal distances	6	14
Quiz and Semester Exams	Theoretical and practical presentation	Surveying methods	Spherical and horizontal distances	6	15

21. Infrastructure	
Course Books	1 Required textbooks
A Text Book of Surveying & Leveling, R. Agor , Khanna Publishers, 2011 Surveying Vol. 1, B.C Punmia , Laxmi Publications, 1995	2 Main references (sources)
, Research , Internet , Scientific Journals	Recommended books and references (scientific journals, reports ,....)
, Research , Internet , Scientific Journals	B Electronic references, websites ....

22. Course Development Plan
The use of modern equipment in line with the labor market and the development and intensification of practical experiences

Course Description Form

Course Description

In this course, the principles of horizontal control networks are taught, which include the principles of polyging, calculating coordinates in closed circular polygons, closed bonding polygons with front and back calculations, methods of correcting coordinates, calculating the closing error, and the relative accuracy of each polygon, and then identifying the principles, types, applications and degrees of triangulation, how to calculate the strength of shapes, deriving geometric conditions in triangulation, how to calculate coordinates in triangulation, and distribution of errors.

Northern Technical University	3. Educational institution

Technical College of Engineering / Kirkuk	4. Scientific Department / Center
Survey of ground networks	5. Course Name/Code
Weekly	6. Available Attendance Forms
Quarterly	7. Semester / Year
15 weeks (3 theoretical hours / week) and (3 practical hours / week), with a total of (90 hours / semester).	8. Number of Credit Hours (Total)
	9. The history of preparation of this description
10.Course Objectives:	
The student learns about the basic concepts of advanced space and work on different devices and how to use them in different ways and methods of calculating coordinates through the laws of polygation and triangulation.	

10. Course Outcomes and Methods of Teaching, Learning and Assessment
This course results in a student who is familiar with the principles of ground surveying and is able to use theodolite and total station devices to calculate coordinates through the laws of polygon and triangulation.

A- Cognitive objectives
A1- Principles of Land Surveying
A2. Principles of Polygation
A3- Principles of Trinity.

B – The skills objectives of the course.
B1 – Preparing reports for various field experiments
B2 – Use of various scanning devices

Teaching and learning methods
Face-to-face lectures, e-learning, blended learning.
Evaluation methods
Daily tests, mutual question tests and discussions as well as written tests, monthly exams, final exams.
C. Emotional and value goals C1- Dealing with the basic principles of the advanced space and seeking to apply them C2- Spreading the spirit of cooperation and joint work in field applications
d. General and qualifying-transfer skills (other skills related to employability and personal development). D1- Extensive discussions on concepts D2- Student courses and seminars on modern applications of space D3- Field visits to vital and construction facilities D4- Coordination with various state departments to exchange skills

23. 6

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Introduction to Horizontal Control Networks	6	1
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Ribbing: definition, types and applications	6	2
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Calculations of polygon and calculation of coordinates	6	3
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Front and reverse accounts	6	4
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Closed Circular Polygon	6	5
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Closed Link Polygon	6	6
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Methods of correcting coordinates	6	7
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Trinity: definition, types and applications	6	8
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Properties of triangulation networks	6	9
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Forms of Triangulation networks	6	10
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	calculate the strength of a figure in triangulation	6	11
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Derivation of geometric conditions in triangulation	6	12
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Triangulation calculations and error distribution	6	13

Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Dimensional triangulation: definition and types	6	14
Quiz and Semester Exams	Theoretical and practical presentation	Survey of ground networks	Calculating coordinates in dimensional triangulation	6	15

24. Infrastructure	
Course Books	1 Required textbooks
Engineering Surveying, W. Schofield & M. Breach, Butterworth-Heinemann 2007. Surveying, A. Bannister, S. Raymond, R. Baker, Longman Scientific & Technical 1993.	2 Main references (sources)
, Research , Internet , Scientific Journals	Recommended books and references (scientific journals, reports ,....)
, Research , Internet , Scientific Journals	B Electronic references, websites ....

25. Course Development Plan
The use of modern equipment in line with the labor market and the development and intensification of practical experiences

Course Description Form

Course Description Geodetic Surveying

The student studies the meaning of geodesy, which is the science that specializes in determining the shape and size of the earth, calculating the coordinates of points, lengths and directions of the lines that lie on its surface, and also studying an overview of the axes used to determine locations and convert between them. The course includes determining the gravity of the globe and its directions, as well as an overview of the geodesy of satellites that have made a breakthrough in the field of geodetic surveying.

Northern Technical University / Kirkuk Technical College	Educational institution
Department of Surveying Engineering Techniques	University Department / Center
Geodesi Survey 407	Course Name/Code
Official working hours	Available Attendance Forms
Fourth Year	Semester / Year

120 hours	Number of Credit Hours (Total)
8/9/2016 and is updated at the beginning of each academic year	The history of preparation of this description

8- Course Objectives:

A- Definition of geodetic surveying.
B- Definition of alpsoid and its elements, determination of a point on its surface, geographical and Cartesian coordinates, how to convert between them, and radii of curvature.
C- Derivation of differential elements used in the development and solution of complex problems in geodetic space.
D- Calculate the shortest curved distance on the surface of the earth .
E- Solve the direct problem and the reverse problem, which is widely used in geodetic surveying in order to calculate distances and positions on the surface of the earth.
F- Enable the student to use trigonometric networks of all kinds, the locations of ground control points and the geodetic budget
G- Study of gravity and geoid and their relationship with alpsoid during cadastral calculations.
H- Learn about satellite geodesy techniques.

9. Learning outcomes and teaching, learning and assessment methods

A. Knowledge and understanding
1. Definition of geodetic surveying applications.
2. Introduction to the elements and properties of albsued.
3. Convert between geographical and Cartesian coordinates.
4. Derivation of the differential element in geodetic space and equation of the curve on the surface of the epsoid.
5. Solve the equation of direct and inverse problem.
6. Make the necessary corrections in practical measurements on the surface of the earth.
7. Definition of geodetic triangles, their types and how to determine ground control points.
8. Determine the Earth's gravitational field and determine the geodes and their relationship with the Sweden.
9. Study of ground reference coordinates and astronomical reference coordinates.

10. Using the methods used in observation by learning satellite geodesy techniques

B- Program-specific skills

1. Acquire extensive knowledge and skill in solving the laws of Alpsoid, which enables the graduate to employ those knowledge and skills in the survey work.

2- The ability to benefit from axis systems and ground control point locations for field work.

3- The ability to make the necessary correction of field measurements .

4- Developing and understanding the systems of terrestrial and astronomical axes for use in surveying work.

5- The ability to derive equations in order to solve complex problems in geodetic.

6- Develop a complete perception of the earth's gravity, the distribution of the earth's gravitational field and the drawing of geoid.

7- Using satellite geodesy techniques.

Teaching and learning methods

- Giving theoretical preparations on the basic principles of the subject with practical examples.
- Training on the use of some important astronomical programs to identify maps and positions of stars and conduct astronomical observations.
- Assigning students practical questions as homework.
- Involve students in the discussion.

Evaluation methods

Participation in the classroom.
Solve homework.
Daily, quarterly and final exams .

C- Emotional and value goals. 1. Develop the student's ability to work on performing duties and deliver them on time . 2. Analyze the problem, find appropriate solutions and anticipate expected results. 3. Develop the student's ability to dialogue and discuss. 4.
Teaching and learning methods
• Managing the lecture in an applied manner linked to the reality of the specialization to attract the student to the subject of the lesson without moving away from the core of the topic so that the material is flexible and understandable and analyzed . • Assigning the student some group activities and duties. • Allocate a percentage of the grade for daily assignments and tests.
Evaluation methods
• Active participation in the classroom is a guide to student commitment and responsibility. • Commitment to the deadline in submitting duties and reports. • Quarterly and final exams express commitment and achievement of knowledge and skills.
d. General and transferable skills (other skills related to employability and personal development). 1. Developing the student's ability to deal with technical means. 2. Develop the student's ability to deal with multiple means. 3. Develop the student's ability to dialogue and discussion and enable him to pass job interviews. 4. Enabling the student to be creative and continuous self-development.
10. The most important sources of information about the program

1. Geometric reference systems in geodesy C. Jekeli Ohio state university
2. Geodesy W. Torge W. degruyter, berlin
3. Geometric geodesy lecture notes R. A. Rapp (I, II, 1992)
4. The 3-D global spatial data model E. Burkholder 2008
5. Physical geodesy Neco sneeuw institute of geodesy Stuttgart university
6. Satellite geodesy Seber
7. Geodetic geometry by Nafi Al-Shafa'i
8. Geodetic Surveying Saudi Technical Education and Methodological Training

11. Curriculum Structure

week		Subject	Central ideas	Objective	Learning method	Evaluation method
1		Overview of geodesy	Introduction fields of geodesy, historical perspective	What is geodesy, who needs it and why	- Giving theoretical preparations on the basic principles of the subject with practical examples. - Training on the use of some important astronomical programs to identify maps and positions of stars and conduct astronomical observations . - Assigning students practical questions as homework. - Involve students in the	Participation in the classroom. Solve homework. Daily, quarterly and final exams

					discussion.	
2,3		Geometrical geodesy	Earths shape, ellipsoidal coordinates	Dealing with the Earths size and shape, study of geometry of the ellipsoid		
4			Meridian plane for a point, geocentric latitude reduced latitude, geodetic latitude, relationship between these various latitudes	To define practical coordinates of points in relation to the ellipsoid, also to find the relationship between different latitudes. Derive the Cartesian coordinates in terms of the latitudes for arbitrary point.		
5,6		Elementary differential geodesy	Radii of curvature normal section, prime vertical, minimum and maximum radii of curvature mean radius of curvature, Gaussian mean radius	Derive differential elements are used in developing the geometry of geodesics on the ellipsoid and solving the problems in geometric geodesy, determine the curvature of an arbitrary normal section, using radius of curvature of the normal		

				section in azimuth to define the mean local radius of the ellipsoid		
7,8		Coordinate system	Geodetic coordinate, Cartesian coordinates, once through "Vincenty method"	Transformation between coordinates		
9		Arc length on the ellipsoid surface	Geodesics, length of arc on the ellipsoid, latitude arc length, meridian arc length	To determine the curve on the ellipsoid connecting two points having the shortest length.		
10		Clairauts constant	Clairauts constant, convergence of the meridians			
11		Ellipsoid and spherical excess	Spherical excess, ellipsoid excess			
12, 13		Coordinates computation	Direct/inverse problem, puissant method, Gauss method	Using two essential problem in the computation of coordinates, directions and distance on the particular given ellipsoid		
14, 15		Local terrestrial coordinators	Local geodetic coordinate system, three dimensional coordinate computation	This set of coordinates forms the basis for traditional three dimensional geodesy and for close range local surveys, in this system make traditional geodetic measuremen		

				ts of distance and angles, or direction using measuring devices. Terrestrial coordinate systems are widely used to define the position of points on the terrain		
16, 17		Astronomic coordinate	Astronomic latitude, astronomic longitude	The direction of gravity at any point is determined naturally by the arbitrary terrestrial mass distribution and the plumb line is defined by this direction. Making angular measurements leads to the determination of azimuth and a type of latitude and longitude.		
18		Reduction of field observation to the geodetic values	Reduction of field observation to the geodetic values	In geodetic works(horizontal surveys referenced to an ellipsoid and vertical surveys to the geoid) correction must be made to field		

				observations to obtain their equivalent geodetic values. For reducing long slope distances to their ellipsoid length, in this method based on elevation differences between the end points of the sloping line		
19		Reduction of distance observation using vertical angles	Reduction of distance observation using vertical angles	The effect of refraction eliminated by averaging reciprocal vertical angles.		
20		Reduction of directions and angles	Reduction of directions and angles	Because of the sphericity of the earth, the normal at observing and target stations are skewed with respect to reach other, and hence two additional corrections may be necessary for deviation of vertical.		
21, 22		Terrestrial reference system	Geodetic datum, horizontal datum, north America datum, NAD27, NAD83, world geodetic system	The WGS system is not based on a single point, but many points, fixed with extreme		

				precision by satellite fixes and statistical methods. The WGS system is applicable worldwide. All regional datums can be referenced to WGS once a survey tie has been made.		
23		Vertical datum	International terrestrial frame ITRF, high accuracy reference network HARN, vertical datums NGVD29, north american vertical datum			
24, 25		Physical geodesy	Geoid , Geoid Separation (N), Orthometric Height (H),	The physical earth's gravity force can be modeled to create a positioning reference frame that rotates with the earth. The geoid is such a surface (an equipotential surface of the earth's gravity field) that best approximates Mean Sea Level (MSL) The orientation of this surface at a given point		

				on geoid is defined by the plumb line. A mean gravity field can be used as a reference surface to represent the actual earth's gravity field.		
26		Gravitation	Vertical of attraction of point mass, gravitational potential, ideal soild	Determining of geometrical and physical shape of the earth and its orientation in space, the grvitational effect of some ideal bodeys		
27		Gravity and gravimetry	Gravimitry, gravity network	Centrifugal acceleration		
28		The normal field	The parametars of normal gravitational potental			
29		Satellite geodesy	Active satellite, The Changing World of Geodesy and Surveying	In geodetic applications, satellites can be used both in positioning and in gravitational field studies. Geodesists have used many different satellites in the past 40 years, ranging from completely passive to highly sophisticate d active (transmitting) satellites,		

				from quite small to very large. Passive satellites do not have any sensors on board and their role is basically that of an orbiting target. One of the advantages of applying space methods to geodesy is the establishment of a highly accurate reference frame for positioning. The centre of mass of the Earth.		
30		=	Determination of directions, determination of ranges, determination of range difference, satellite altimetry, determnination of ranges and range rates, interferometric measurments	The observation techniques used in satellite geodesy.		

12.Infrastructure	
1.Geometric reference systems in geodesy C. Jekeli Ohio state university 2.Geodesy W. Torge W. degruyter, berlin 3.Geometric geodesy lecture notes R. A. Rapp (I, II, 1992) 4.The 3-D global spatial data model E. Burkholder 2008 5.Physical geodesy Neco sneeuw institute of geodesy Stuttgart university 6.Satellite geodesy Seber 9. Geodetic geometry by Nafi' al-Shafi'i7. Geodetic Surveying Saudi Technical Education and Methodological Training 8.	1 Required textbooks
1.Geometric reference systems in geodesy C. Jekeli Ohio state university 2.Geodesy W. Torge W. degruyter, berlin 3.Geometric geodesy lecture notes R. A. Rapp (I, II, 1992) 4.The 3-D global spatial data model E. Burkholder 2008 5.Physical geodesy Neco sneeuw institute of geodesy Stuttgart university 6.Satellite geodesy Seber 10. Geodetic geometry by Nafi' al-Shafi'i7. Geodetic Surveying Saudi Technical Education and Methodological Training 8.	2 Main references (sources)
1.Geometric reference systems in geodesy C. Jekeli Ohio state university 2.Geodesy W. Torge W. degruyter, berlin 3.Geometric geodesy lecture notes R. A. Rapp (I, II, 1992) 4.The 3-D global spatial data model E. Burkholder 2008 5.Physical geodesy Neco sneeuw institute of geodesy Stuttgart university 6.Satellite geodesy Seber 11. Geodetic geometry by Nafi' al-Shafi'i7. Geodetic Surveying Saudi Technical Education and Methodological Training 8.	Recommended books and references (scientific journals, reports ,....)
	B Electronic references, websites ....

13. Course Development Plan
By following up the developments in the field of geodetic surveying and following up the curricula in international universities and introducing these developments into the structure of the curriculum.

Course
Description

Northern technical university	Educational institution
College of technical engineering/ surveying engineering	University / Scientific Department
Detailed equations TECK201/	3. Course name/ code
No	4. Programme(s) in which you are involved
Data Complaint - Bourpont - Blackboard	5. Attendance forms available
First	6. Semester/Year
4 Theoretical	7. Number of study hours (total)
20-10-2024	8. Date of preparation of this description

9. Course Objectives

(a) develop a mathematical relationship to a particular physical problem;
b) solving mathematical equations to obtain unknown variables, (c) choosing the appropriate solution method for the given differential equations,
D. Solving differential equations of the first, second and highest order using different methods in mathematics

10. Course Outcomes and Teaching, Learning and Assessment Methods

A- Cognitive objectives

1. By the end of this course, students will have acquired the basic knowledge of drawing two-dimensional curves using transformation properties.
2. Understand the concepts of boundaries and continuity.
3. Ability to apply differentiation to solve engineering problems.

A- Course Skills Objectives

1. Learn how to use the rule of force, quotient, quotient, and series to differentiate between algebraic trigonometric functions 2. Identify different types of matrices and their properties.
3 - Apply matrix operations to solve the system of linear equations.

Teaching and learning methods

Evaluation methods

Giving theoretical and practical lectures and workshops.

C- Emotional and value objectives Indicative content that includes the following: - Prerequisites for calculus, coordinates and graphs in the plane. - The slope and equations of lines and functions and their graphs. Transformations, circles and equivalents.
Teaching and learning methods
Giving theoretical and practical lectures and workshops.
Evaluation methods
Classroom and online tests, homework, peer feedback activities, and practice tests.

Evaluation methods
d. General and qualifying skills transferred (other skills related to employability and personal development.) The second year of all mathematics programs is designed to give students a thorough grounding in a wide range of mathematical ideas, techniques and tools in order to prepare them for the later stages of their studies. Develop a mathematical relationship to a particular physical problem. Solve mathematical equations to obtain unknown variables. Choosing the appropriate solution method for the given differential equations. Solve differential equations of the first, second and highest order using various methods in classical mathematics.

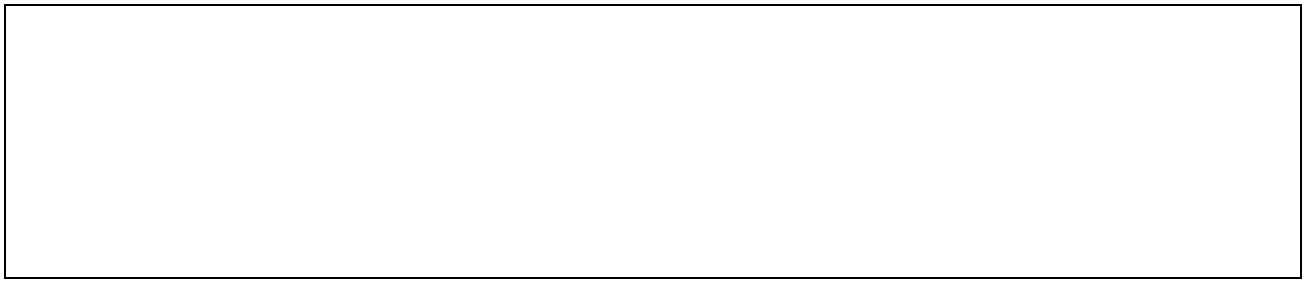
Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Theoretical presentation	Quiz and quarterly exams	A Review for Integration Techniques			1
Theoretical presentation	Quiz and quarterly exams	First Order Differential Equations			2
Theoretical presentation	Quiz and quarterly exams	Methods of Solving First Order D.E.s			3
Theoretical presentation	Quiz and quarterly exams	Integrating Factors			4
Theoretical presentation	Quiz and quarterly exams	Applications on First Order D.E.s			5
Theoretical presentation	Quiz and quarterly exams	Second Order Linear Differential Equations			6
Theoretical and practical presentation	Quiz and quarterly exams	Methods of Solving Second Order D.E.s			7
Theoretical and practical presentation	Quiz and quarterly exams	Applications on Second Order D.E.s			8
Theoretical and practical presentation	Quiz and quarterly exams	Higher Order Linear D.E.s			9
Theoretical and practical presentation	Quiz and quarterly exams	Fourier series for Periodic Functions			10

Theoretical and practical presentation	Quiz and quarterly exams	Even and Odd Functions			11

Theoretical and practical presentation	Quiz and quarterly exams	Applications on Fourier Series			12
Theoretical and practical presentation	Quiz and quarterly exams	Power Series			13
Theoretical and practical presentation	Quiz and quarterly exams	Solution of O.D.E by Power Series			14
Theoretical presentation	Quiz and quarterly exams	Applications for Power Series			15

.10 Infrastructure	
Course Books	1 Required textbooks
"Advanced Engineering Mathematics", by Erwin Kreyszig	2 Main references (sources)
	Recommended books and references (magazines) Scientific , reports ....,)
	B Electronic references, websites .... Internet

.11 Course Development Plan



Course Description

Ministry of Higher Education and Scientific Research / Northern Technical University	1. Educational institution
Kirkuk Technical College of Engineering / Department of Surveying Technologies Engineering	2.University / Scientific Department
Computer Drawing Applications SUE205	3.Course Name/Code
Bachelor of Surveying Engineering	4. Program(s) in which you are involved
1- Weekly lesson schedule 2- Discussions, scientific seminars and other extra-curricular activities	5. Available attendance forms
Bologna	6. Semester /Year
45	7. Number of study hours (total)
/10/202024	8. Date of preparation of this description
9. Course Objectives	
1- Provide students with basic concepts related to engineering drawing 2- Learn about drawing tools in AutoCAD 3- How to draw contour maps and roofs 4- How to draw longitudinal and transverse sections 5- Calculate Cut, Fill quantities	
10. Course Outcomes and Methods of Teaching, Learning and Assessment	
B- Cognitive Objectives 1- The concept of drawing in AutoCAD 2- The concept of contour mapping and surfaces 3-Profile and cross section	
C- Course Skills Objectives Preparation and mapping of contours and surfaces	
Teaching and learning methods	
Theoretical and practical lectures and interactive lectures	
Evaluation methods	
Written and practical tests - reports - semester and final exams	
C- Emotional and value goals	
Teaching and learning methods	
Theoretical and practical lectures and interactive lectures	
Evaluation methods	
Written and practical tests - reports - semester and final exams	
d) General and qualifying skills transferred (other skills related to employability and personal development). Work on understanding and applying contour maps and drawing sections	

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Exams	Theoretical and practical presentation	Computer Drawing Applications	Introduction to AutoCAD	1N+2P	1
Exams	Theoretical and practical presentation	Computer Drawing Applications	Dora	1N+2P	2
Exams	Theoretical and practical presentation	Computer Drawing Applications	modify	1N+2P	3
Exams	Theoretical and practical presentation	Computer Drawing Applications	Dimension	1N+2P	4
Exams	Theoretical and practical presentation	Computer Drawing Applications	INTRODUCTION CIVIL 3D	1N+2P	5
Exams	Theoretical and practical presentation	Computer Drawing Applications	point	1N+2P	6
Exams	Theoretical and practical presentation	Computer Drawing Applications	Surface	1N+2P	7
Exams	Theoretical and practical presentation	Computer Drawing Applications	Contour Map	1N+2P	8
Exams	Theoretical and practical presentation	Computer Drawing Applications	Alignment	1N+2P	9
Exams	Theoretical and practical presentation	Computer Drawing Applications	Profile	1N+2P	10
Exams	Theoretical and practical presentation	Computer Drawing Applications	Existing ground profile	1N+2P	11
Exams	Theoretical and practical presentation	Computer Drawing Applications	Design line	1N+2P	12
Exams	Theoretical and practical presentation	Computer Drawing Applications	Create Assembly	1N+2P	13
Exams	Theoretical and practical presentation	Computer Drawing Applications	Cross section	1N+2P	14
Exams	Theoretical and practical presentation	Computer Drawing Applications	Calculate volume	1N+2P	15

26. Infrastructure	
Course Books	1 Required textbooks
Reference books	2 Main references (sources)
, Research , Internet , Scientific Journals	Recommended books and references (scientific journals, reports ,....)
, Research , Internet , Scientific Journals	B Electronic references, websites ....

27. Course Development Plan
Field Studies

Course Description

Ministry of Higher Education and Scientific Research / Northern Technical University	2. Educational institution
Kirkuk Technical College of Engineering / Department of Surveying Technologies Engineering	2.University / Scientific Department
Engineering StatisticsSUE312	3.Course Name/Code
Bachelor of Surveying Engineering	4. Program(s) in which you are involved
1- Weekly lesson schedule 2- Discussions, scientific seminars and other extra-curricular activities	5. Attendance forms available
Decisions	6. Semester /Year
30	7. Number of study hours (total)
/10/202024	8. Date of preparation of this description
9. Course Objectives	
6- Provide students with basic concepts related to engineering statistics 7- Identify and understand basic patterns in complex systems, allowing for control and optimization based on statistical analysis	
10. Course Outcomes and Methods of Teaching, Learning and Assessment	
D- Cognitive Objectives 1- Enabling students to understand the concept of engineering statistics 2. Apply statistical methods to predict possible outcomes in the future	
E- Course Skills Objectives Enable students to understand the concept of probability, probability distributions and statistical analysis of data. Probability statistics are used in many applications such as economics, finance, natural and social sciences, mathematical statistics and others.	
Teaching and learning methods	
Theoretical and interactive lectures	
Evaluation methods	
Written exams – reports – semester and final exams	
C- Emotional and value goals	
Teaching and learning methods	
Theoretical and interactive lectures	
Evaluation methods	
Written exams – reports – semester and final exams	

d) General and qualifying skills transferred (other skills related to employability and personal development).
Understand the concept of engineering statistics and probability theory and how to use them in multiple fields

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Exams	theoretical	Engineering Statistics	Introduction	2	1
Exams	theoretical	Engineering Statistics	View statistical data	2	2
Exams	theoretical	Engineering Statistics	Data Description	2	3
Exams	theoretical	Engineering Statistics	Central Trend Scales	2	4
Exams	theoretical	Engineering Statistics	Contrast metrics	2	5
Exams	theoretical	Engineering Statistics	Exploratory Data Analysis	2	6
Exams	theoretical	Engineering Statistics	Probability	2	7
Exams	theoretical	Engineering Statistics	Discrete probability distributions	2	8
Exams	theoretical	Engineering Statistics	Normal distribution	2	9
Exams	theoretical	Engineering Statistics	Applications of normal distribution	2	10
Exams	theoretical	Engineering Statistics	Hypothesis testing	2	11
Exams	theoretical	Engineering Statistics	Medium T Test	2	12
Exams	theoretical	Engineering Statistics	Regression	2	13
Exams	theoretical	Engineering Statistics	Linear regression	2	14
Exams	theoretical	Engineering Statistics	Nonlinear regression	2	15

28. Infrastructure	
Probability & Statistics for Engineers & Scientists	1 Required textbooks
Probability & Statistics for Engineers & Scientists Probability, Statistics, and Reliability for Engineers and Scientists, 3rd Edition by Bilal M. Ayyub and Richard H. McCuen	2 Main references (sources)
Research – Internet – Scientific Journals	Recommended books and references (scientific journals, reports ,....)
Research – Internet – Scientific Journals	B Electronic references, websites

29. Course Development Plan
By following up the developments in the field of engineering statistics and following up the curricula in international universities and introducing these developments into the structure of the curriculum

Course Description Form

Course Description

The student learns how to produce maps from satellite and aerial images as well as from land surveys using geographic information systems..

Northern Technical University	11.Educational institution
Northern Technical University Department of Surveying Technology Engineering	12. University / Scientific Department
Maps Production	13.Course Name/Code
GIS	14.Program(s) in which you are involved
Weekly	15.Available Attendance Forms
Second Semester / Second Year	16.Semester / Year
15 weeks (2 theoretical hours / week) and (2 practical hours / week), with a total of (60 hours / year).	17.Number of Credit Hours (Total)
18.Course Objectives: The student learns how to produce maps using the GIS program LGES, as well as the student learns what are the sources of map production and how to deal with them and create maps of the type of contour maps, topographic maps and basic maps.	
The concept of city planning and basic designs, types and levels of planning, preparation and survey of land uses and types of	
Surveys Town Planning, Urban Renewal and Environmental Planning, , Types of roads, parking lots and intersections	
, railways and airports, the role of cadastral work in the development of basic designs of the city	
Planning theories and planning schools and stages of the planning process - the emergence of cities and types of cities and the development of the master plan	

For the city, concepts and basics of transportation and traffic engineering and upstream and destination studies

30. Course Outcomes and Methods of Teaching, Learning and Assessment This course produces all types of maps, including contour, topographic and basic.

A- Cognitive objectives

A1- The **concept of cartography and basic designs for making maps**

A2-

A3-

B – The skills objectives of the course.

B1 – Preparation and survey of land uses and types of surveys for the production of maps

B2 – The use of geographic information in the production of maps

Teaching and learning methods

Lecture

Evaluation methods

Written exams, semester exams, final exams .

C. Emotional and value goals

C1- **Valuing dealing with the Kharrat and setting the general plan of the city**

A2-

Teaching and learning methods

Lecture

Evaluation methods

Written Exams, Semester Exams, Final Exams

d. General and rehabilitative skills transferred (other skills related to employability and personal development).

D1- Work on understanding and applying urban renewal and environmental planning

D2-

D3-

D4-

31. Course Structure					
Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	The pattern of maps Maps style		1
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	The method of lettering Methods of writing on terrain		2
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	The positioning of letters is the site of writing on the terrain		3
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Counter line Contour lines		4
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Counter interval methods selection Methods for choosing a contour period		5
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Types of contour lines Types of contour lines		6
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Base maps Basic Maps		7
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Coordinate system Coordinate system		8
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Create maps using the surveying software (GIS)Create maps using LGIS		9
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Reading and interpreting maps Reading and interpreting maps		10

Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Map functions Map Directories		11
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Land survey Surveying the ground		12
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Arial photography Aerial Survey		13
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Remote sensing Remote sensitization		14
Quiz Semester Exams	Theoretical and practical presentation	Maps Production	Global information system (GIS)Geographic Information Systems		15

32. Infrastructure	
Course Books	1 Required textbooks
Reference books	2 Main references (sources)
, Research , Internet , Scientific Journals	Recommended books and references (scientific journals, reports ,....)
, Research , Internet , Scientific Journals	B Electronic references, websites ....

33. Course Development Plan
Field Studies

Course Description Form

Course Description

It is a science interested in making a map from various sources such as ground survey using the total station and others, or satellite survey sources using satellites, taking satellite images and converting them into maps using special programs, or from aerial survey sources, taking aerial photos and converting them into maps.

Northern Technical University	19.Educational institution
Northern Technical University Department of Surveying Technology Engineering	20. University / Scientific Department
Cartographic Science	21.Course Name/Code
GIS	22.Program(s) in which you are involved
Weekly	23.Available Attendance Forms
First Semester / Second Year	24.Semester / Year
15 weeks (2 theoretical hours / week) and (2 practical hours / week), with a total of (60 hours / year).	25.Number of Credit Hours (Total)
	26.The history of preparation of this description
27.Course Objectives: The student learns about the types of maps and learns how to make and draw a map, the student learns how to read the map and what symbols mean, the student learns how to benefit from the map in the practical aspect and benefit from it in the areas of life.	

The concept of city planning and basic designs, types and levels of planning, preparation and survey of land uses and types of
Surveys Town Planning, Urban Renewal and Environmental Planning, , Types of roads, parking lots and intersections
, railways and airports, the role of cadastral work in the development of basic designs of the city
Planning theories and planning schools and stages of the planning process - the emergence of cities and types of cities and the development of the master plan
For the city, concepts and basics of transportation and traffic engineering and upstream and destination studies

34. Course Outcomes and Methods of Teaching, Learning and Assessment This course produces all types of maps, including contour, topographic and basic.
A- Cognitive objectives A1- The **concept of cartography and basic designs for making maps** A2- A3-
B – The skills objectives of the course. B1 – Preparation and survey of land uses and types of surveys for the production of maps B2 –
Teaching and learning methods
Lecture
Evaluation methods
Written exams, semester exams, final exams .
C. Emotional and value goals C1- **Valuing dealing with the Kharrat and setting the general plan of the city** A2-
Teaching and learning methods
Lecture

Evaluation methods
Written Exams, Semester Exams, Final Exams
d. General and rehabilitative skills transferred (other skills related to employability and personal development). D1- Work on understanding and applying urban renewal and environmental planning D2- D3- D4-

35. Course Structure					
Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	The nature of cartography, map design , techniques used, graphic arts and visual perception		1
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Types of maps and their uses		2
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	The relationship of cartography with surveying and remote sensing		3
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Methods of correcting measurement errors, types and laws		4
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Map production in Iraq, coding and signing of site features		5
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Encoding—Sign linear features		6
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Coding - Signing cadastral features		7
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Standard symbol tables used in topographic maps		8
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Cartographic summarization - its causes and purposes		9
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Cartographic summarization processes		10

Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Application of summarization operations in topographic and thematic maps		11
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Map Design – Introduction, Delivery Theory		12
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Map Design – Map Perception		13
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Map Design – Calligraphy		14
Quiz and Semester Exams	Theoretical and practical presentation	Cartographic Science	Iraqi Topographic Map Design		15

36. Infrastructure	
Course Books	1 Required textbooks
Reference books	2 Main references (sources)
, Research , Internet , Scientific Journals	Recommended books and references (scientific journals, reports ,....)
, Research , Internet , Scientific Journals	B Electronic references, websites ....

37. Course Development Plan
Field Studies

Course Description

The course directly contributes to introducing students to the field of project management using Microsoft Project

Providing the various departments in the organization with project scheduling incidents, as well as linking the tasks of the project and calculating its cost to achieve the organization's various economic goals.

Northern Technical University	3. Educational institution
Kirkuk Technical Engineering College - Department of Surveying Technologies Engineering	2.University / Scientific Department
Engineering Project Management SUE409	3.Course Name/Code
Fourth stage	4. Program(s) in which you are involved
Quarterly	5. Attendance forms available
First Semester 2024	6. Semester /Year
60	7. Number of study hours (total)
20-10-2024	8. Date of preparation of this description
9. Course Objectives	

Qualifying graduates to work in various public and private productive and service sectors. Provide students with basic knowledge and skills in the field of project management. Implementation of training programs for project management. Enriching the knowledge of the glitch of the practical application of Microsoft Project.
10. Course Outcomes and Methods of Teaching, Learning and Assessment
Cognitive Objectives Know and understand the principles of project management science and cognitive objectives. Familiarity with different strategies in the field of project management. Familiarity with the nature of workers' organizations for public and private projects.
Course Skills Objectives Preparing and designing new projects using the electronic computer. Production scheduling and evaluation of investment projects. Practical application of modern projects in the field of labor management.
Teaching and learning methods Duties inlaboratory computer programs and lectures.
Evaluation methods Tests and examinations _ preparation of reports _ presentation _ research projects. The evaluation may be based on a combination of individual and group work.
C- Emotional and value goals And enable the student to take the student's acquisition of theknowledge necessary to manage new projects for the purpose of, Monitoring and solving a decision in choosing the best projectfrom an economic point of view, solving a problem or achieving a specific goal, then ending projects The ability to schedule the implementation of project activities, conflicts within projects
Evaluation methods
Exams, homework and classroom skills
Evaluation methods
Style of dialogue and discussions - Brainstorming style - Reports -
D_ General and rehabilitation skills transferred An idea about engineering projects, their types and the role of surveying in them.

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
And discussion on questions interaction and answer	Lectures	Project Management Portal		4	1
discussion on questions interaction and answer	Lectures	Elements of project management		4	2
And discussion on questions interaction and answer	Lectures	Projects in the contemporary business environment		4	3
And discussion on questionsinteraction and answer	Lectures	Project Lifecycle		4	4
And discussion on questionsinteraction and answer	Lectures	Project Selection		4	5
And discussion on questionsinteraction and answer	Lectures	Project Management		4	6
And discussion on questionsinteraction and answer	Lectures	Project Manager Career Path		4	7
And discussion on questionsinteraction and answer	Lectures	Project organization		4	8
And discussion on questions interaction and answer	Lectures	Project Plan		4	9
And discussion on questionsinteraction and answer	Lectures	Project scheduling		4	10
And discussion on questionsinteraction and answer	Lectures	Project scheduling methods		4	11
And discussion on questionsinteraction and answer	Lectures	Project scheduling methods		4	12
And discussion on questionsinteraction and answer	Lectures	Project Control		4	13
And discussion on questionsinteraction and answer	Lectures	Control of project assets		4	14
Answering the questions	Exams	examination		4	15

Infrastructure	
Musa Ahmed Khair El-Din.d- Written by (Contemporary Project Management-)	1 Required textbooks
Haitham Hijazi - Project Management Starter - M1 Abdul Sattar Al-Ali.D- General Projects Department-2	2 Main references (sources)
	Recommended books and references (scientific journals, reports ,....)
	B Electronic references, websites ....

Course Development Plan
Using methods of solving administrative problems practically at the individual or collective level with high efficiency Presentation and practical presentation of the content of the project management course Innovation, development and continuous improvement in the application of the program to help inthe institutional industry

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, proving whether he or she has made the most of the available learning opportunities. It must be linked to the program description.

Northern Technical University	Educational institution
Kirkuk Technical Engineering College - Department of Surveying Technologies Engineering	2.University / Scientific Department
Descriptive Engineering SUE103	3.Course Name/Code
First stage	4. Program(s) in which you are involved
Quarterly	5. Attendance forms available
First Semester 2024	6. Semester /Year
60	7. Number of study hours (total)
20-10-2024	8. Date of preparation of this description
9. Course Objectives	
Training the student's mind on imaginary visualization of objects and their representation on the ground	
10. Course Outcomes and Methods of Teaching, Learning and Assessment	
Cognitive Objectives 1- Representation of stereoscopic points at the level 2- Studying the positions and characteristics of the rectum in space and representing them at the level 3- Study of the main levels and assistance and their practical applications 4- Study of models and members of their surfaces	
Course Skills Objectives Seeking through various projection methods (Centralization،Parallel)، to show the geometric relationships between(Points and the lines and levels and sizes)، with the aim of accessing, throughResearch Continuousand projective actions Different alternativeFor analytical geometry، to helpDesigner To translate his ideas into unambiguous spatial forms	
Teaching and learning methods	
B - Explanation, discussion and solution of examples Knowledge and understanding Representing solid points on a plane Study the positions and properties of the rectum in space and represent them on the plane Study the main and auxiliary levels and their practical applications Study of solids and their surfaces B - Explanation, discussion, and solving examples	
Evaluation methods	
Exams, homework and classroom skills	
C- Emotional and value goals It helps the student designer to: - Develop his conceptual skills for engineering space. - Accurately describe the geometric space through two-dimensional drawings or three-dimensional modeling. - Solve linear and angular measurement problems. - Solving cognitive problems (perspective) for different geometric shapes.	
Evaluation methods	
Exams, homework and classroom skills	
Evaluation methods	
Exams and homework and classroom	

d) General and qualifying skills transferred (other skills related to employability and personal development).
Descriptive geometry uses simple language to express basic ideas For three-dimensional space Without resorting to abstract mathematical language, it can therefore be understood even by those who do not have a scientific background High.

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Exams and homework and classroom	Explanation, discussion and example solving	General Introduction - Basic Definitions in Descriptive Geometry and Related Topics Levels and axes of projection	Understanding descriptive geometry and its relationship to geometric topics	4	1
Exams and homework and classroom	Explanation, discussion and example solving	Types of projection: central, oblique, vertical, digital, stereoscopic (measured)	Multiple projection theories	4	2
Exams and homework and classroom	Explanation, discussion and example solving	Representing a point with positive and negative coordinates	Understanding events in the void	4	3
Exams and homework and classroom	Explanation, discussion and example solving	represent a line in different directions,	Position the rectum in four quarters in space,	4	4
Exams and homework and classroom	Explanation, discussion and example solving	Status matters	Position the rectum in four quarters in space,	4	5
Exams and homework and classroom	Explanation, discussion and example solving	Measurement Problems	Position the rectum in four quarters in space,	4	6
Exams and homework and classroom	Explanation, discussion and example solving	Initial Auxiliary Levels	Main auxiliary levels	4	7
Exams and homework and classroom	Explanation, discussion and example solving	Secondary auxiliary levels	Objective of non-main auxiliary levels	4	8
Exams and homework and classroom	Explanation, discussion and example solving	Lines, planes and geometric surfaces - some bodies and crystals	The relationship between them	4	9
Exams and homework and classroom	Explanation, discussion and example solving	A general study of geometric objects, their rotation or cutting them in a plane, finding the shape of the resulting sectors, finding	Geometric objects	4	10

		straight intersection points for them and calculating their volumes and surface areas			
Exams and homework and classroom	Explanation, discussion and example solving	Cube, cuboid and parallelepiped	Regular bodies	4	11
Exams and homework and classroom	Explanation, discussion and example solving	Prism : Threesome, Quartet Pyramid: Triangular,Quadruple	Uniform geometric bodies	4	12
Exams and homework and classroom	Explanation, discussion and example solving	Cylinder Head	Methods of projecting cylindrical objects	4	13
Exams and homework and classroom	Explanation, discussion and example solving	The individuals of flat surfaces, cube, prism, pyramid. At the level of the sheet Uneven surface personnel:cylinder	Rooftop personnel	4	14
Exams and homework and classroom	Explanation, discussion and example solving	Rooftop personnel	Rooftop personnel	4	15

Infrastructure	
Medhat Fadil, Baghdad University Press, Descriptive Engineering	1 Required textbooks
Emmanuel Faraj Karim, Higher Education Press/Baghdad, Descriptive Geometry Part One	2 Main references (sources)
Binding prepared for lectures and provided to students	Recommended books and references (scientific journals, reports ,....)
	B Electronic references, websites ....

Course Development Plan
Some of the basic concepts of descriptive geometry are: definitionBasic Engineering Entities(pointˋDashˋlevelˋdirection(Infinite point)Milan (infinite line). Conditions of affiliation: point on line, line on surface and point on surface. CasesIntersection: Between two lines, between a line and a surface, and between two surfaces. Conditionsparallelism and orthogonality(As special cases of intersection.

Conditions of seam and especially between Conics Between Rotational surfaces·
Corcomparison، symmetry، opposite symmetry، perspective synthesis، composition، transformation، opposite transformation and rebound·

Course description form
Course description

This course will provide the student with a foundation in mathematical principles and to solve the differential equations of first and higher order using classic mathematics methods, and their engineering applications.

Teaching Institution	Northern Technical University
Scientific Department / Center	Technical Engineering College-Kirkuk
Course name/code	Engineering Analysis
Forms of attendance available	weekly
Semester/year	Frist Semester/ Third Year
Number of hours of study (total)	3 theoretical hour/week, with a total of 45 hours/semester.
Date of preparation of this description	20-10-2024

Course Aims
Developing a mathematical relation for a given physical problem.
Solving the mathematical equations to get the unknown variables.
Choosing the appropriate solution method for the given differential equations.
Solving first, second and higher order of differential equations, using different method in classical mathematics.
Modeling and solving different engineering problems using classical mathematics.
Understanding Fourier series and solving its applications.
Understanding Power series and solving its applications.

Methods learning outcomes teaching, Learning and Assessment
A\ Knowledge and Understanding:
A1- Concept and applications of engineering analysis
A2- Modeling different engineering problems
A3- Solving different engineering problems using differential equations solving methods
A4- Understanding Fourier and Power series and solving their related engineering problems

B\ Subject- specific skills:
B1 – Solving different engineering analysis problems
B2 – Modeling different engineering problems
B3 – Solving Differential Equations of first, second, and higher orders
B4 – Solving different Fourier and Power series engineering problems

Teaching and learning methods: Giving theoretical lectures in engineering analysis and forming and solving different problems using workshops. In-person lectures, e-learning, blended learning.
Assessment Methods: Daily exams, quarterly exams (theoretical), homework solving.
C- Thinking Skills: Formulating and solving engineering analysis problems, choosing the appropriate mathematical method to solve standard and nonstandard mathematical problems
Teaching and learning methods: Giving theoretical, solving examples, assigning homework examples, doing workshops for solving engineering mathematical problems.
Assessment Methods: Daily exams, quarterly exams (theoretical) - discussion of class work and home work examples, doing workshops to solve the engineering mathematical problems.
D- General and transferred skills (other skills related to employability and personal development). Understanding and solving mathematical problems related to different engineering applications via classical mathematics and differential equations.

Program structure					
Week	Hours	Required Learning Outcomes	Unit Name/Subject	Teaching Method	Method of Assessment
1	3	Engineering Analysis	First Order Differential Equations	Theoretical presentation	Sudden and quarterly exams
2	3	Engineering Analysis	Methods of Solving First Order D.E.	Theoretical presentation	Sudden and quarterly exams
3	3	Engineering Analysis	Applications on First Order D.E.	Theoretical presentation	Sudden and quarterly exams
4	3	Engineering Analysis	Second Order Linear D.E. with Constant Coefficients	Theoretical presentation	Sudden and quarterly exams
5	3	Engineering Analysis	Applications on Second Order D.E.	Theoretical presentation	Sudden and quarterly exams
6	3	Engineering Analysis	Higher Order Linear D.E.	Theoretical presentation	Sudden and quarterly exams
7	3	Engineering Analysis	Applications on Higher Order D.E.	Theoretical presentation	Sudden and quarterly exams
8	3	Engineering Analysis	Integrating Factors	Theoretical presentation	Sudden and quarterly exams
9	3	Engineering Analysis	Applications on Integrating Factors	Theoretical presentation	Sudden and quarterly exams
10	3	Engineering Analysis	Fourier series for Periodic Functions	Theoretical presentation	Sudden and quarterly exams
11	3	Engineering Analysis	Applications on Fourier Series	Theoretical presentation	Sudden and quarterly exams
12	3	Engineering Analysis	Even and Odd Functions	Theoretical presentation	Sudden and quarterly exams
13	3	Engineering Analysis	Applications on Even and Odd Fourier Series	Theoretical presentation	Sudden and quarterly exams
14	3	Engineering Analysis	Power Series	Theoretical presentation	Sudden and quarterly exams
15	3	Engineering Analysis	Applications of Power Series	Theoretical presentation	Sudden and quarterly exams

Infrastructure	
Required Course Books	" Advanced Engineering Mathematics", by Erwin Kreyszig
Main references (sources)	"Mathematics - Schaum's Outline of Differential Equations", by Richard Bronson
Recommended books and references (scientific journals, reports,....)	"Advanced Engineering Mathematics", by C. Ray Wylie
B - Electronic references, Internet sites ...	Any other Advanced Engineering Mathematics book

Course Development Plan: Adding more recent subject in engineering analysis

Course Description Form

Course Description

Provide a basic understanding of how geographic information systems (GIS) and satellite imagery can be used to visualize and analyze spatial data. Basic techniques for analyzing, processing, and creating geospatial data in both pixel-based formats (e.g., satellite imagery and digital terrain models) and vector-based formats (e.g., point, line, and polygonal spatial data representations). Also how to obtain high-resolution satellite imagery and other GIS data from online data servers.

Northern Technical University	Educational institution
Kirkuk Technical College of Engineering	Scientific Department / Center
Surveying Systems II	Course Name/Code
Weekly	Available Attendance Forms
Semester Courses	Semester / Year
4 weeks (1 theoretical hour / week) and (3 practical hours / week), with a total of (4 hours / semester).	Number of Credit Hours (Total)
20/10/2024	The history of preparation of this description
Course Objectives:	
The student will be introduced to the basic theoretical and practical applications of the GIS Fundamentals Unit , including: 1. Introduce basic GIS concepts: Provide a basic understanding of spatial data, including its types (vectors and rasters) and how geographic features are digitally represented. 2- Hands-on GIS programs: Provide students with basic skills in using common GIS programs for tasks such as importing data, creating maps, and simple spatial queries. 3- Fundamentals of Data Visualization: Introduce students to how to create basic maps and graphs to communicate spatial information. 4- Spatial awareness of problem solving: Develop an initial understanding of how to deal with problems from a spatial perspective.	

Course Outcomes and Methods of Teaching, Learning and Assessment This course produces a student who is able to recognize how to deal with data

A- Knowledge and Understanding:

Definition of geographic information systems (GIS) and their basic components.
Explain the difference between vector and raster data formats.
Describe common coordinate systems used in GIS (e.g., latitude and longitude, UTM).
Identify different types of spatial data used in GIS (such as points, lines, and polygons).

B- Skills:
Navigation and use of basic functions within the GIS program is common.
Import spatial data into a GIS project.
Create simple maps that contain basic elements such as title, drawing legend, and scale.
Perform basic spatial queries to identify or analyze data based on location.
Create basic visualizations such as maps and graphs to represent spatial information.

C- Problem Solving:
Apply the basic spatial perspective to identify and analyze problems with a geographical component.
Formulate simple spatial queries to answer questions related to geographic data.

D. Communications:
Communicate spatial information effectively using clear and concise maps and graphs.

Project work: Demonstrate the skills acquired through a small project using GIS software.
Data collection and integration: Explore ways to obtain and integrate spatial data from different sources.

By achieving these results, students will gain a solid foundation in GIS concepts and basic software skills. This prepares them to further learn GIS or apply these skills in their chosen field.

C- The skills objectives of the course.
C1 – Preparing various reports on various topics in geographic information systems
C2 - Data collection and analysis: Students learn how to form data from satellite data, aerial photographs and other cadastral data

Teaching and learning methods

E-Learning, Blended Learning, Face-to-Face Lecture, Practical Application to Classroom Programs

Evaluation methods

Daily and oral tests, mutual question tests and discussions in addition to written tests, monthly exams , final exams.

C. Emotional and value goals
Dealing with the basic principles in the basics of geographic information systems

d. General and rehabilitative skills transferred (other skills related to employability and personal development).
D1- Extensive discussions on concepts
D2- Courses and seminars on the applications of geographic information systems
D3- Giving more different geographical data to students and making projects on them

6					
Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Sudden and Semester Exams	Theoretical and practical presentation	Introduction to GIS	Introduction to GIS	4	1
Sudden and Semester Exams	Theoretical and practical presentation	GIS components	GIS components	4	2
Sudden and Semester Exams	Theoretical and practical presentation	Design and manage geographic databases	Design and manage geographic databases	4	3
Sudden and Semester Exams	Theoretical and practical presentation	Design and manage geographic databases	Design and manage geographic databases	4	4
Sudden and Semester Exams	Theoretical and practical presentation	Coordinate systems and map projections	Coordinate systems and map projections	4	5
Sudden and Semester Exams	Theoretical and practical presentation	Principles of Cartography - Map Design	Principles of Cartography - Map Design	4	6
Sudden and Semester Exams	Theoretical and practical presentation	Spatial Analysis in GIS	Spatial Analysis in GIS	4	7
Sudden and Semester Exams	Theoretical and practical presentation	Data models (vector and raster)	Data models (vector and raster)	4	8
Sudden and Semester Exams	Theoretical and practical presentation	Acquire and manage spatial data (data sources)	Acquire and manage spatial data (data sources)	4	9
Sudden and Semester Exams	Theoretical and practical presentation	Spatial data concepts	Spatial data concepts	4	10
Sudden and Semester Exams	Theoretical and practical presentation	Coordinate systems and projections	Coordinate systems and projections	4	11
Sudden and Semester Exams	Theoretical and practical presentation	Geodesy	Geodesy	4	12
Sudden and Semester Exams	Theoretical and practical presentation	Review	Review	4	13

Infrastructure	
1- GIS Fundamentals: A First Text on Geographic Information Systems 2- The Esri Guide to GIS Analysis	1 Required textbooks
GIS Lounge: https://www.geographyrealm.com/ (Provides GIS news, tutorials, and job listings) Geospatial World: https://www.geospatialworld.net/news/ (Offers news and insights on the GIS industry) Directions Magazine: https://www.directionsmag.com/ (A publication focused on GIS technology and applications).	2 Main references (sources)
, Research , Internet , Scientific Journals	Recommended books and references (scientific journals, reports ,....)
, Research , Internet , Scientific Journals	B Electronic references, websites ....

Course Development Plan
Using the programs developed by Azri specialized in geographic information systems and in line with the labor market and developing and intensifying practical experiences

Course description form
Course description/Quantitative Survey

This course will give the students a foundation in quantitative surveys and explain building material.

Teaching Institution	Northern Technical University
Scientific Department / Center	Technical College of Kirkuk
Course name/code	Quantitative Survey
Forms of attendance available	Weekly
Semester/year	2024-2025
Number of hours of study (total)	weeks (2 theoretical+3 practical hour/week)
Date of preparation of this description	2024-10-9

Course Aims

A-Studies soil foundation properties and all material that deal with construction building.

B – Cement manufacture, type, properties.

C – Aggregate Classification, type, source and properties.

D – Fresh concrete (Workability, Palpability, Segregation).

E- Brick (Type of brick, Advantages and disadvantages, Brick manufacture)

Methods Learning Outcomes Teaching, Learning, and Assessment

A-Cognitive objectives

-At the end of this course, students will gain knowledge of soil foundation properties. .1

-Classifies the soil-making experimental and theoretical tests.

- Being able to solve Engineering problems about soil compaction.

B- Subject-specific skills - Learn how to use the best materials for construction.4. functions. -Recognizing different types of soil and their properties. -Applying the theoretical method to solve a compaction equation and find the degree of compaction .
Teaching and learning methods
Giving theoretical and practical lectures, workshops.
Assessment Methods
In-class and online quizzes, homework, peer feedback activities and practice exams.
C- Thinking Skills Indicative content including the following: -Prerequisites for estimation, quantities and price .
Teaching and learning methods
Giving theoretical and practical lectures, workshops.
Assessment Methods
In-class and online quizzes, homework, peer feedback activities and practice exams.
D- General and transferred skills (other skills related to employability and personal development).

Program structure					
Week	Hours	Required Learning Outcomes	Unit Name/Subject	Teaching Method	Method of Assessment
1		A Review for soil properties		Theoretical presentation	Sudden and quarterly exams
2		Classification of soil + Soil deformation		Theoretical presentation	Sudden and quarterly exams
3		Sieve analysis Hydrometer analysis		Theoretical presentation	Sudden and quarterly exams
4		Description of an assemblage of soil particle		Theoretical presentation	Sudden and quarterly exams
5		Compaction, type of compaction, factor affecting compaction.		Theoretical presentation	Sudden and quarterly exams
6		Cement manufacture Type of cement		Theoretical presentation	Sudden and quarterly exams
7		Cement properties		Theoretical and practical presentation	Sudden and quarterly exams
8		Aggregate Fine aggregate		Theoretical and practical presentation	Sudden and quarterly exams
9		Coarse aggregate Classification		Theoretical and practical presentation	Sudden and quarterly exams
10		Fresh concrete Workability		Theoretical and practical presentation	Sudden and quarterly exams
11		Palpability Segregation		Theoretical and practical presentation	Sudden and quarterly exams
12		Brick Type of brick		Theoretical and practical presentation	Sudden and quarterly exams
13		Advantages and disadvantages		Theoretical and practical presentation	Sudden and quarterly exams
14		Brick manufacture		Theoretical and practical presentation	Sudden and quarterly exams
15		Concrete Block		Theoretical presentation	Sudden and quarterly exams

Infrastructure	
Required Course Books	Course Books
Main references (sources)	"Advanced soil engineering ", by Das
Recommended books and references (scientific journals, reports,....)	Building Construction Book / Zuhair Sakus
B - Electronic references, Internet sites ...	

Course Development Plan
Field Studies

Course Description

Northern Technical University	Educational institution
Kirkuk Technical College of Engineering	2.University / Scientific Department
Photogrammetry Basics / SUE203	3.Course Name/Code
Bologna Track	4. Program(s) in which you are involved
Came	5. Available attendance forms
Quarterly	6. Semester /Year
125 credit hours	7. Number of study hours (total)
20/10/2024	8. Date of preparation of this description

9. Course Objectives

The student learns about the basic concepts of photogrammetry and learns about the work on the various devices and programs for drawing aerial photographs and how to use them in different ways.

10. Course Outcomes and Methods of Teaching, Learning and Assessment

This course produces a student capable of performing various skills from aerial surveying experiments such as projecting and lifting buildings from aerial photographs and calculating areas and coordinates from different aerial photographs.

Cognitive Objectives

1- Different photogrammetry and aerial concepts

2. Aerial Photograph Concepts

3- Concepts of air surveying works

Course Skills Objectives

1 – Preparing various air survey reports for various practical experiments

2 – Preparing calculations for photogrammetry and aerial surveys and calculating coordinates and altitudes from aerial images.

Teaching and learning methods

E-Learning, Blended Learning, Face-to-Face Learning

Evaluation methods

Daily and oral tests, mutual question tests and discussions in addition to written tests, semester exams, final exams .

C- Emotional and value goals

1_ Dealing with the basic principles of air space and seeking to apply them

d) General and qualifying skills transferred (other skills related to employability and personal development).

1. Extensive discussions on concepts
2- Student courses and seminars on modern air surveying applications
3- Field visits to vital and construction facilities
4- Coordination with various state departments to exchange skills

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
		A brief history of aerial survey and remote sensing - its development and use at the present time and the relationship of aerial survey with sensing about and types of projections and types of images	The student understands a brief history of aerial survey and remote sensing, its development and use at the present time, and the relationship of aerial survey with sensing about and types of projections and types of images	5 hours per week (2 theoretical + 3 practical) Total 5 hours	First
		The difference between aerial photographs and a map and some important terms	The student understands the difference between aerial photographs and a map and some important terms	5 hours per week (2 theoretical + 3 practical) Total 10 hours	Second
		Vertical aerial photographs, geometric relationships, coordinate systems, scale drawing, vertical aerial photographs over flat ground and over land of different levels and average scale	The student understands vertical aerial photographs, geometric relationships, coordinate systems, scale drawing, vertical aerial photographs over flat ground and over land of different levels, and average scale	5 hours per week (2 theoretical + 3 practical) Total 15 hours	Third
		The student understands other methods for calculating the scale of vertical aerial photographs and ground coordinates from vertical aerial photographs, calculating horizontal and oblique distances between points and displacement resulting from terrain, and calculating altitudes.	The student understands other methods for calculating the scale of vertical aerial photographs and ground coordinates from vertical aerial photographs, calculating horizontal and oblique distances between points and displacement resulting from terrain, and calculating altitudes.	5 hours per week (2 theoretical + 3 practical) Total 20 hours	Fourth
		Stereoscopic vision and its foundations and depth	The student understands stereoscopic	5 hours per week	V

		perception using the eyes with stereoscopic vision by images and conditions and the use of a mirrored stereoscope	vision and its foundations and the perception of depth using the eyes with stereoscopic vision by images and their conditions and the use of a mirrored stereoscope	(2 theoretical + 3 practical) Total 25 hours	
		Airline design, airplane altitude, local scale, longitudinal interferome, lateral overlap, baseline, total image count count	Al-Tab understands airline design, plane altitude, local scale, longitudinal interferome, lateral overlap, baseline, and total image count counting.	5 hours per week (2 theoretical + 3 practical) Total 30 hours	Sixth
		Stereoscopic distancing and the relationship between distancing, point height and distance difference	The student understands stereoscopic distancing and the relationship between distancing, point height and distance difference	5 hours per week (2 theoretical + 3 practical) Total 40 hours	Seventh and eighth
		The student recognizes finding the distance of the base points of two consecutive air images and the equations of distance	The student recognizes finding the distance of the base points of two consecutive air images and the equations of distance	5 hours per week (2 theoretical + 3 practical) Total 45 hours	Ninth
		Aerial images in steering in the tilt, turn and deflection system and the auxiliary system of inclined images	The student understands aerial images in orientation in the system of inclination, detour and deviation and the auxiliary axes system of inclined images	5 hours per week (2 theoretical + 3 practical) Total 55 hours	X
		Calendar of oblique aerial photographs - the foundations of the calendar and the methods of evaluation	The student understands the calendar of oblique aerial photographs, the foundations of the calendar and the methods of evaluation	5 hours per week (2 theoretical + 3 practical) Total 65 hours	Eleventh

		How to check the created stereoscopic model	The student understands how to check the stereoscopic model that has been created	5 hours per week (2 theoretical + 3 practical) Total 75 hours	Twelfth
		Mosaic - its advantages and disadvantages, uses and types - and the foundations of the model using gasket devices, internal guidance, relative and absolute guidance	Mosaic - its advantages and disadvantages, uses and types - and the foundations of the model using gasket devices, internal guidance, relative and absolute guidance	5 hours per week (2 theoretical + 3 practical) Total 85 hours	Thirteenth – Fifteenth

Infrastructure	
photogrammetry ,remote sensing , stereo analyst	1 Required textbooks
stereo analyst. 1 Airdas 14 Photogrammetry Internet	2 Main references (sources)
Photogrammetry books Remote Sensing Books Scientific reports on free websites	Recommended books and references (scientific journals, reports ,....)
YouTube Education https://www.youtube.com/watch?v=rsWDyJZG6bg https://www.youtube.com/watch?v=YCjskqSLRO4 https://www.youtube.com/watch?v=GGfNE5P8iik Free book and research sites, including http://www.4shared.com/office/2VjkQJmOce/ Dawod_Remote_Sensing_2015.html https://www.geosystems.fr/images/PDF/2015 _StereoAnalyst_IMAGINE_Brochure_SCREEN.pdf	B Electronic references, websites ....

Course Development Plan

Course Description

Northern Technical University	Educational institution
Technical Engineering College – Kirkuk	2.University / Scientific Department
Arabic	3.Course Name/Code
	4. Program(s) in which you are involved
Weekly	5. Attendance forms available
	6. Semester /Year
60 hours	7. Number of study hours (total)
21\10\2024	8. Date of preparation of this description

9. Course Objectives

1. Developing the spirit of pride in the Arabic language.
2. Develop the student's language skills
3. Upgrading the students' professional and research level
4. Developing the grammatical and literary abilities of the university student

10. Course Outcomes and Methods of Teaching, Learning and Assessment

Cognitive Objectives

- 1 Qualifying students to obtain knowledge and understanding of the intellectual foundations and applications of Arabic language sciences.

A-2 Qualifying students to acquire knowledge and understanding of grammar.
A- 3 Qualifying students to acquire knowledge and understanding of morphology.
A-4 Qualifying students to acquire knowledge and understanding of the science of spelling and expression.
A-5 Qualifying students to acquire knowledge and understanding of literature.
A-6 Qualifying students to obtain knowledge and understanding of the basic standards of Arabic language sciences.

Course Skills Objectives

B-1 Introducing the student to the importance of the Arabic language from a scientific and applied point of view.
B-2 Developing speaking skills (Arabic)
B-3 Qualifying the student with knowledge and outputs related to grammar.
B-4 Develop the student's knowledge and perceptions.

Teaching and learning methods

Lecture

Evaluation methods

Written and practical exams, semester exams, final exams

C- Emotional and value goals

1- Teaching the student to receive (acceptance/receiving)
C-2 Develop the student's ability to respond
C-3 The student should be able to evaluate (give value) Valuing
C-4 Improving the student's abilities in value organization
C-5 Integration of value with the behavior of the individual (giving a personality trait) Value by Characterization.

Teaching and learning methods

Lecture

Evaluation methods

Written and practical exams, semester exams, final exams

Evaluation methods

Allocating prizes (books, certificates of appreciation).

- Allocate part of the student's evaluation on his participation in these activities.
- Allocate a place in the scientific department or on the website to display photos, products and names of students

Distinguished.

d) General and qualifying skills transferred (other skills related to employability and personal development).

D-1 Teaching the student oral and written communication skills
D-2 The use of modern technological tools such as the use of computers, the Internet and special scientific programs
Preparing reports, tables, forms and presentations.
D-3 Encourage the student to work in a team work.
D-4 Developing the student's abilities to make the best use of time (time management).

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Sudden questions	theoretical	Arabic	What do we study Arabic and why is it important? Why was Arabic called the language of the Qur'an? What are the other names of the Arabic language? What are the most important sciences of the Arabic language?	2	1
Sudden questions	theoretical	Arabic	What's the word? What is the difference between a word, a word, and a word? What are the sections of the word? What are the signs of nouns, verbs and letters?	2	2
Sudden questions	theoretical	Arabic	What are the types of verb in terms of form? What are the sections of the verb in terms of time? What are the sections of the verb in terms of composition?	2	3
Sudden questions	theoretical	Arabic	What are the types of verb in terms of form? What are the sections of the verb in terms of time? What are the sections of the verb in terms of composition?	2	4
Sudden questions and assignments	theoretical	Arabic	What do we mean by denial? What do we mean by knowledge?	2	5
Sudden questions	theoretical	Arabic	What do we mean by building and Arabization? What are building scientists? What are the original and sub-parsing scientists?	2	6
Sudden questions	theoretical	Arabic	What is a noun sentence? What is the definition of beginner and news? What are the types of beginner? What are the types of news?	2	7
Sudden questions tests	theoretical	Arabic	What is the definition of the subject? What are the provisions of the actor? What are the types of actor?	2	8
Sudden QuestionsExams	theoretical	Arabic	What is the definition of deputy actor? How to formulate the passive verb? What are the provisions of the deputy actor? What acts on behalf of the actor? What are the types of deputy actor?	2	9
			What do we mean by the phenomenon of the difference between Dhad and Zaa? Why was Arabic called the Dhad language? What are the places	2	

			of difference between Dhad and Zaa in terms of (name, drawing, pronunciation and meaning)?		
			What do we mean by tethered and open Taa? What is the adjuster to differentiate between the writing of the tied and open Taa? What are the positions of writing the tied T?	2	
			What is the meaning of hyphenation? What is the meaning of the cutting hamza? What are the positions of Hamza?	2	
			What do we mean by language numbering and termination? What are the types of punctuation marks? What does each type look like? What are the positions of each punctuation scientist?	2	
			Reading the required text of the surah is controlled by movements. Statement of the syntactic provision of the text.	2	
			What is the life of the poet Abu Firas Al-Hamdani? Read a poem: (The wailing dove) controlled by movements. Analysis and clarification of the verses of the poem.	2	

Infrastructure	
The Holy Quran. -Explanation of Ibn Aqeel. -Al-Wajeez in Arabic. -Arabic grammar (easy grammar and morphology) -Dictation rules.	1 Required textbooks
Al-Wajeez in Arabic for non-specialists.	2 Main references (sources)
Research – Internet – Scientific Journals	Recommended books and references (scientific journals, reports ,....)
Research – Internet – Scientific Journals	B Electronic references, websites ....

Course Development Plan

Developing the vocabulary of the curriculum to keep pace with developments in the field of applied uses of animals for the development of
Sustainable ecology.
Adoption of new teaching methods.
See the experiences of the most developed countries in this field and benefit from their accumulated experience.
Work on the establishment of laboratories specialized in the field of zoology.

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Course Description Form

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, proving whether he or she has made the most of the available learning opportunities. It must be linked to the description of the programme.

Course Description:

Northern Technical University \ Kirkuk Technical Engineering College	Educational institution
Department of Surveying Engineering	Scientific Department / Center
Baath crimes in Iraq	Course Name / Code
Came	Available Attendance Forms
Chapter One and Two	Semester / Year
48 hours per year	Number of Credit Hours (Total)
20\10\2024	The history of preparation of this description
Course Objectives:	
Creating a comprehensive general knowledge of all the Baath Party's behaviors during its rule.	
Introducing the student to the crimes committed by the Baath and his abuse of authority.	
Introducing the student to the decisions of the Supreme Criminal Court regarding the trial of Saddam Hussein and his associates.	
Introducing the student to the violations committed by the Baathist regime of international and humanitarian law.	

Course Outcomes and Methods of Teaching, Learning and Assessment

Cognitive Objectives :
1_ Identify the concept of crime and its types.
2- Identify the details of the crimes discussed before the Supreme Criminal Court.
3_ Identify environmental crimes committed by the Baath Party.
4_ Identify the crime of mass graves.
5- There is a message that we seek to convey to students, that history is merciless and unforgettable, neither for a politician nor for a regime that abuses its right at the expense of Iraqi citizens.

B - Course skills objectives
Acquire skill in identifying behaviors that are considered a crime in the Iraqi Penal Code No. (111) of 1969.
Identify the international conventions that oblige countries to adopt them.

Teaching and learning methods

Reading books and manuals related to the curriculum
Exercises and activities during and outside the lecture
Giving students daily preparation, the purpose of which is to give the student self-confidence, and the other goal is to distinguish between good and bad students.

Evaluation methods

1. Participation in the classroom
2. Assignments and exercises required of the student
3. Daily and Semester Exams
4. Student behavior inside the hall.

C- Emotional and value goals
Graduating individuals with knowledge and culture in everything related to the Baath crimes in Iraq.
Making the student realize the importance of including the Baath Party among the banned parties.
Building a generation that believes in the importance of respecting human rights and adhering to international laws and norms.

Course Structure First Semester

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
	Explanation and discussion	The concept of crimes	Gain knowledge	2	The first
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Crime Sections	Gain knowledge	2	Second
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Types of international crimes	Gain knowledge	2	Third
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Decisions of the Supreme Criminal Court	Gain knowledge	2	Fourth
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Psychosocial crimes	Gain knowledge	2	V
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	The basic duties of the state and its three levels	Gain knowledge	2	Sixth
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Mechanisms of psychological crimes	Gain knowledge	2	Seventh
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Effects of mental crimes	Gain knowledge	2	Eighth
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Social crimes	Gain knowledge	2	Ninth
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Militarization of society	Gain knowledge	2	X
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	The position of the Baathist regime on religion	Gain knowledge	2	Week 11
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Baathist regime's violation of Iraqi laws	Gain knowledge	2	Week 12
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Some decisions of political and military violations of the Baath regime	Gain knowledge	2	Week 13
Granting grades to participants and conducting a daily exam in the lecture	Explanation and discussion	Places of Prisons and Detention of the Baath Regime	Gain knowledge	2	Week 14

12.Course Structure Chapter II

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Awarding Scores to Participants	Explanation and discussion	Environmental crimes of the Baath regime in Iraq	Gain knowledge	2	The first
Awarding grades to participants and conducting a daily exam In the lecture	Explanation and discussion	War and radioactive contamination and mine explosion	Gain knowledge	2	Second
Granting grades to participants and conducting a daily exam In the lecture	Explanation and discussion	Contamination with radioactive materials	Gain knowledge	2	Third
Granting grades to participants and conducting a daily exam In the lecture	Explanation and discussion	Chemical bombing of the city of Halabja	Gain knowledge	2	Fourth
Awarding Scores to Participants	Explanation and discussion	Destruction of cities and villages (scorched earth policy)	Gain knowledge	2	V
Granting grades to participants and conducting a daily exam In the lecture	Explanation and discussion	The crime of draining the marshes	Gain knowledge	2	Sixth
Granting grades to participants and conducting a daily exam In the lecture	Explanation and discussion	Dredging palm groves, trees and plantings	Gain knowledge	2	Seventh
Granting grades to participants and conducting a daily exam In the lecture	Explanation and discussion	Mass grave crimes	Gain knowledge	2	Eighth
Granting grades to participants and conducting a daily exam In the lecture	Explanation and discussion	Genocide graves committed by the Baathist regime	Gain knowledge	2	Ninth
Granting grades to participants and conducting a daily exam In the lecture	Explanation and discussion	Chronological classification of genocide graves in Iraq for the period 1969 AD - 2003 AD.	Gain knowledge	2	X

Infrastructure	
Binding prepared by the Ministry of Higher Education and Scientific Research	Required textbooks
Hussein Aliwi Al-Ziyadi, Dr. Abbas Attia Al-Quraishi, Environmental Crimes of the Baath Regime in Iraq, Publisher: Iraqi Center for Documenting Extremist Crimes, Dar Al-Kafeel Press, 1st Edition, Holy Karbala, 2023. Salim Matar, Encyclopedia of the Iraqi Environment, First Arabic Edition, 2010. Archive of the Iraqi Center for Documenting Crimes of Extremism at the Abbasid Holy Shrine.	Key references (sources)
Muhammad al-Fadhil, Crimes against State Security, New Press, Damascus, 1978.	Recommended books and references (scientific journals, reports, ...)
	Electronic references, websites, ...

Course Development Plan
1- Addressing the individual (irresponsible) decisions that were issued by Saddam Hussein. 2_ Add a section that addresses the consequences of the Baathist regime's violations of international and humanitarian laws.

Course Description

Northern Technical University	Educational institution
Technical Engineering College – Kirkuk	2.University / Scientific Department
English	3.Course Name/Code
	4. Program(s) in which you are involved
Weekly	5. Attendance forms available
Chapter One	6. Semester /Year
60 hours	7. Number of study hours (total)
20\10\2024	8. Date of preparation of this description
9. Course Objectives	
Develop communication skills: Enhance the ability to speak and listen effectively in various daily and academic situations. Improve reading skills: Develop critical reading skills and comprehension of written texts, including essays and literature. Enhanced writing skills: Improve academic and creative writing ability, including organizing ideas and using the right grammar. Learn vocabulary and grammar: Expand students' linguistic dictionary and enhance their understanding of English grammar. Promote cultural interaction: An understanding of English culture and its history, helping to promote cultural awareness and respect for diversity. Apply language in practical contexts: Enable students to use English in their professional fields, including writing CVs and business correspondence. Develop critical thinking: Enhance the ability to think critically by analyzing texts and discussing different ideas. Prepare students for tests: Prepare students for standardized tests in English, such as TOEFL or IELTS, if required. Boost self-confidence: Build students' confidence in using English through practice and interaction. Develop self-learning skills: Encourage students to develop self-learning strategies to further improve their English skills outside the classroom.	
10. Course Outcomes and Methods of Teaching, Learning and Assessment	

Cognitive Objectives

 Grammar Understanding:

Learn basic English grammar, such as tenses, verbs, and nouns, and how to use them correctly.

 Vocabulary expansion:

Acquire new vocabulary in diverse topics and apply it in different contexts.

 Understanding texts:

Analyze and understand written texts, including essays, stories, and academic texts.

 Develop reading skills:

Understand different reading strategies, such as speed reading and critical reading.

 Apply writing skills:

Recognize different writing styles, including academic, formal, and creative writing.

 Appreciation of English-speaking cultures:

Understand the cultural and social aspects associated with the English language and its role in communication.

 Discourse analysis:

Learn how to analyze speeches and conversations, and understand the dynamics between speakers.

 Understanding the elements of communication:

Recognize elements of effective communication, such as tone, gestures, and context.

 Develop listening skills:

Understand effective listening strategies and apply them in different situations.

 Recognize text types:

Recognize the different types of literary and professional texts, and understand the characteristics of each genre.

Course Skills Objectives

 Oral communication skills:

The ability to express ideas clearly and confidently in everyday and professional conversations.

Use strategies such as active listening and active participation.

 Writing skills:

Write a variety of texts in an organized and clear manner, such as articles, letters, and reports.

Apply the correct grammar and vocabulary in writing.

 Reading skills:

Use effective reading strategies such as identifying key ideas and supporting details.

Critically evaluate and understand texts.

 Listening skills:

Ability to understand and respond to conversations, lectures, and audio recordings.

Distinguish the main ideas and supporting information in the audio material.

 Vocabulary expansion:

Use new vocabulary in appropriate contexts, enhancing students' ability to express.

 Text analysis:

Ability to analyze literary or academic texts, and understand their deep meanings.

Teaching and learning methods

Lecture

Evaluation methods
Written and practical exams, semester exams, final exams
C- Emotional and value goals Ability to communicate with the outside world and keep pace with the development taking place
Teaching and learning methods
Lecture
Evaluation methods
Written and practical exams, semester exams, final exams
Evaluation methods
d) General and qualifying skills transferred (other skills related to employability and personal development). - Work on the understanding and application of linguistic rules in daily and professional life that requires knowledge of the English language.

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Sudden questions	Theoretical lecture	English Language	Present simple	6	1,2,3.
Sudden questions	Theoretical lecture	English Language	Past simple	6	4,5,6
Sudden questions	Theoretical lecture	English Language	Present continuous	2	7
Sudden questions	Theoretical lecture	English Language	Past continuous	2	8
Sudden questions and assignments	Theoretical lecture	English Language	Wh questions in simple present	2	9
Sudden questions	Theoretical lecture	English Language	Future Tense	2	10
Sudden questions	Theoretical lecture	English Language	Modal verbs	6	11,12,13

Infrastructure	
Graham Brown, David Watson, "Cambridge IGCSE Information and communication technology", 3rd edition (2020) Alan Evans, kendall Martin, Mary Anne Poatsy, "Technology in action complete", 16th edition (2020) Ahmed Banafa, "introduction to artificial intelligence (AI), 1st edition (2024) Al-Khidr Ali Al-Khidr Researchers, "Computer Basics" 2016 Dr. Adel Abdel Nour, "Introduction to the World of Artificial Intelligence" 2005	1 Required textbooks
Reference books	2 Main references (sources)
Research – Internet – Scientific Journals	Recommended books and references (scientific journals, reports ,....)
Research – Internet – Scientific Journals	B Electronic references, websites ....

Course Development Plan
Conducting a review in English for students to identify the basics of speaking in a basic way and prepare to discuss graduation research. alif

Course Description

Northern Technical University	Educational institution
Technical Engineering College – Kirkuk	2.University / Scientific Department
Arabic	3.Course Name/Code
	4. Program(s) in which you are involved
Weekly	5. Attendance forms available
Chapter One	6. Semester /Year
60 hours	7. Number of study hours (total)
21\10\2024	8. Date of preparation of this description
9. Course Objectives	
1. Developing the spirit of pride in the Arabic language. 2. Develop the student's language skills 3. Upgrading the students' professional and research level 4. Developing the grammatical and literary abilities of the university student	
10. Course Outcomes and Methods of Teaching, Learning and Assessment	
Cognitive Objectives - 1 Qualifying students to obtain knowledge and understanding of the intellectual foundations and applications of Arabic language sciences. A-2 Qualifying students to acquire knowledge and understanding of grammar. A- 3 Qualifying students to acquire knowledge and understanding of morphology. A-4 Qualifying students to acquire knowledge and understanding of the science of spelling and expression. A-5 Qualifying students to acquire knowledge and understanding of literature. A-6 Qualifying students to obtain knowledge and understanding of the basic standards of Arabic language sciences.	
Course Skills Objectives B-1 Introducing the student to the importance of the Arabic language from a scientific and applied point of view. B-2 Developing speaking skills (Arabic) B-3 Qualifying the student with knowledge and outputs related to grammar. B-4 Develop the student's knowledge and perceptions.	
Teaching and learning methods	
Lecture	
Evaluation methods	
Written and practical exams, semester exams, final exams	
C- Emotional and value goals 1- Teaching the student to receive (acceptance/receiving) C-2 Develop the student's ability to respond C-3 The student should be able to evaluate (give value) Valuing C-4 Improving the student's abilities in value organization C-5 Integration of value with the behavior of the individual (giving a personality trait) Value by Characterization.	
Teaching and learning methods	
Lecture	
Evaluation methods	
Written and practical exams, semester exams, final exams	
Evaluation methods	
Allocating prizes (books, certificates of appreciation). - Allocate part of the student's evaluation on his participation in these activities. - Allocate a place in the scientific department or on the website to display photos, products and names of students Distinguished.	

d) General and qualifying skills transferred (other skills related to employability and personal development).

D-1 Teaching the student oral and written communication skills
D-2 The use of modern technological tools such as the use of computers, the Internet and special scientific programs
Preparing reports, tables, forms and presentations.
D-3 Encourage the student to work in a team work.
D-4 Developing the student's abilities to make the best use of time (time management).

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The week
Sudden questions	theoretical	Arabic	What do we study Arabic and why is it important? Why was Arabic called the language of the Qur'an? What are the other names of the Arabic language? What are the most important sciences of the Arabic language?	2	1
Sudden questions	theoretical	Arabic	What's the word? What is the difference between a word, a word, and a word? What are the sections of the word? What are the signs of nouns, verbs and letters?	2	2
Sudden questions	theoretical	Arabic	What are the types of verb in terms of form? What are the sections of the verb in terms of time? What are the sections of the verb in terms of composition?	2	3
Sudden questions	theoretical	Arabic	What are the types of verb in terms of form? What are the sections of the verb in terms of time? What are the sections of the verb in terms of composition?	2	4
Sudden questions and assignments	theoretical	Arabic	What do we mean by denial? What do we mean by knowledge?	2	5
Sudden questions	theoretical	Arabic	What do we mean by building and Arabization? What are building scientists? What are the original and sub-parsing scientists?	2	6
Sudden questions	theoretical	Arabic	What is a noun sentence? What is the definition of beginner and news? What are the types of beginner? What are the types of news?	2	7
Sudden questions tests	theoretical	Arabic	What is the definition of the subject? What are the provisions of the actor? What are the types of actor?	2	8
Sudden QuestionsExams	theoretical	Arabic	What is the definition of deputy actor? How to formulate the passive verb? What are the provisions of the deputy actor? What acts on behalf of the actor? What are the types of deputy actor?	2	9
			What do we mean by the phenomenon of the difference between Dhad and Zaa? Why was Arabic called the Dhad language? What are the places	2	

			of difference between Dhad and Zaa in terms of (name, drawing, pronunciation and meaning)?		
			What do we mean by tethered and open Taa? What is the adjuster to differentiate between the writing of the tied and open Taa? What are the positions of writing the tied T?	2	
			What is the meaning of hyphenation? What is the meaning of the cutting hamza? What are the positions of Hamza?	2	
			What do we mean by language numbering and termination? What are the types of punctuation marks? What does each type look like? What are the positions of each punctuation scientist?	2	
			Reading the required text of the surah is controlled by movements. Statement of the syntactic provision of the text.	2	
			What is the life of the poet Abu Firas Al-Hamdani? Read a poem: (The wailing dove) controlled by movements. Analysis and clarification of the verses of the poem.	2	

Infrastructure	
The Holy Quran. -Explanation of Ibn Aqeel. -Al-Wajeez in Arabic. -Arabic grammar (easy grammar and morphology) -Dictation rules.	1 Required textbooks
Al-Wajeez in Arabic for non-specialists.	2 Main references (sources)
Research – Internet – Scientific Journals	Recommended books and references (scientific journals, reports ,....)
Research – Internet – Scientific Journals	B Electronic references, websites ....

Course Development Plan

Adoption of new teaching methods. .

Course Description Form

Course description

Introduce the student to the types of error definition, classification and their using in surveying operation and using Method **of Least Square principle in reducing the effects of errors on the measured results. as well as studying Methods of measuring** and adjustment **angles by theodolites, in addition to finding difference in heights between point by using differential levelling and adjustment the errors that appear in device, levelling operation. Also obtain skill in** Electromagnetic **Distance Measurement (EDM).**

Teaching Institution	Northern Technical University/ Technical College of Kirkuk
Scientific Department / Center	Surveying Technical Engineering
Course name/code	Surveying Instrument Maintenance

Forms of attendance available	weekly
Semester/year	
Number of hours of study (total)	30 weeks (2 theoretical hour/week) and (2 practical hours/week), with a total of (120 hours/year).
Date of preparation of this description	
Course Aims	
Familiarizing students with the types of error definition, classification and their using in surveying operation	
and using Method of Least Square principle in reducing the effects of errors on the measured results.	
How to distinguish the Methods of measuring and adjustment angles by theodolites, in addition to finding difference in heights between point by using differential levelling and adjustment the errors that appear in device,	
, as well as training students on how to obtain skill in Electromagnetic Distance Measurement (EDM).	

A\ Knowledge and Understanding A1- The concept of Surveying Instrument Maintenance and its various methods, their relationship and their uses in surveying operation.
B- Subject- specific skills B1 - Knowing the types of errors and their diagosnistic testing and treatment and their use in topographical and angle measurement.
Teaching and learning methods
Giving theoretical and practical lectures, field training, running laboratories, workshops and summer training during the summer vacation period.
Assessment Methods
Daily exams, quarterly exams (theoretical + practical) - discussion of periodic reports, discussion of graduate research projects

C- Thinking Skills C1 Able to detect and treatment with the type of errors in surveying operation .
Teaching and learning methods
Giving theoretical and practical lectures, field training, running laboratories, workshops and summer training during the summer vacation period.
Assessment Methods
Daily exams, quarterly exams (theoretical + practical) - discussion of periodic reports, discussion of graduate research projects
D- General and transferred skills (other skills related to employability and personal development). D1- Possessing Surveying Instrument Maintenance knowledge and its practical applications in surveying operation.

Program structure					
Week	Hours	Required Learning Outcomes	Unit Name/Subject	Teaching Method	Method of Assessment
1		Accuracy and Error definition and their using in surveying operation. Kinds of error	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
2		The classification of errors during surveying operation.	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
3		Method of Least Square principle	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
4		Solution examples by using the method of least squares	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
5		Determination the instrument constant of a tacheometry by using the method of least squares	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
6		Verniers **diffinition and their using in surveying operation ,giving some example in** Verniers reading ,Some mistakes commonly made in the use of the vernier transit	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
7		Methods of measuring angles by theodolites, Measuring angles by repetition	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
8		Methods of measuring angles by theodolites, Method of reiteration	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
9		Adjustment of Theodolites ,Temporary Adjustment	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
10		Adjustment of Theodolites, Permanent adjustment, First adjustment: - to make the axis of the plate levels perpendicular to the vertical axis.	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
11		Second adjustment: - to make the line of means that the intersection of the cross hair should coincide the horizontal and vertical hairs are checked, Horizontzl hair adjustment, Vertical hair adjustment	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
12		Third adjustment:- To make the horizontal axis perpendicular to the vertical axis . Forth adjustment:-To make the bubble – tube axis of the telescope parallel to the line of collimation	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams

13		The Error Of Theodolite Instrument	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
14		Errors in transit work	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
15		First term practical examination	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
16		Leveling staves, Types of leveling staves	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
17		Leveling Instrument . Type of Leveling Instrument	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
18		Leveling , Type of leveling .simple leveling, Compound Leveling or Differential Leveling,	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
19		Reciprocal Leveling	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
20		Longitudinal or Profile Leveling	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
21		Cross-section Leveling	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
22		Adjustment of the Dumpy Level, Adjustment of the Cross-Wire Ring To make the horizontal cross-wire lie in a plane perpendicular to the vertical axis.	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
23		Adjustment of the Bubble Tube , Adjustment of Line of Sight	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
24		Sensitivity of Bubble Tub	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
25		Errors in differential leveling and their correction	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
26		Electromagnetic Distance Measurement (EDM) , Basic concept of measurement	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
27		EDM systems , Microwave system (long range) .	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
28		Medium-range instruments	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams
29		Short- range instruments	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams

30		second term practical examination	Surveying Instrument Maintenance	Theoretical and practical presentation	Sudden and quarterly exams

Infrastructure	
Required Course Books	Course Books
Main references (sources)	reference books
Recommended books and references (scientific journals, reports,....)	Research, internet, scientific journals
B - Electronic references, Internet sites ...	Research, internet, scientific journals

Course Development Plan
Field Studies