

Ministry of higher education and scientific research
Scientific supervision and evaluation directorate
Quality assurance and academic accreditation

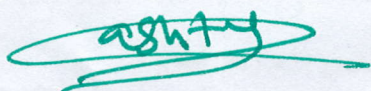
ACADEMIC PROGRAM SPECIFICATION FORM

University: Northern Technical University

College: Polytechnic College/ Kirkuk

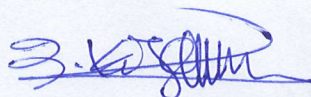
Department: Building and Construction Engineering Technology

Date of form:



Prof. Dr. Ashty M. Arif
The Dean

Date: / /



Asist.prof. Zuhair shakur
Dean's Assistant for scientific Affairs

Date: 15/10/2025



Head of Department: Prof. Dr. Qais Fadhil Hasan

Date: 15/10/2025



Asist. lecturer. Alaa AbdulWahhab Aziz
Quality Assurance and University Performance Manager

Date: 15/10/2025



Republic of Iraq - Ministry of Higher Education and Scientific Research

Northern Technical University

Diploma and Bachelor's Degree in Building and Construction Engineering Techniques (Polytechnic College/
Kirkuk - First cycle)

Two years (Four semesters) - 120 ECTS / Four years (Eight semesters) - 240 ECTS - 1 ECTS = 25 hrs

Program Curriculum (2025 - 2026)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي

الجامعة التقنية الشمالية

دبلوم وبكالوريوس في تخصص تقنيات هندسة البناء والإنشاءات (كلية البوليتكنيك/ كركوك الدورة الأولى)

سنتان (أربع فصول دراسية) - 120 وحدة ائتمانية / أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
- كل وحدة ائتمانية = ٢٥ ساعة

المنهاج الدراسي للعام 2025-2026



Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
I	C 1	1	NTU100	Democracy and Human Rights	الديمقراطية وحقوق الإنسان	Arabic	2						3	33	17	50	2.00	S	
		2	NTU101	English Language I	اللغة الإنكليزية 1	English	2						3	33	17	50	2.00	S	
		3	TIK 110	Mathematics I	الرياضيات 1	English	3						3	48	52	100	4.00	B	
		4	CITB 102	Construction Materials	مواد الإنشاء	Arabic	2		2				3	63	37	100	4.00	C	
		5	TIK 111	Mechanical Workshops	معامل ميكانيك	Arabic			3				3	48	102	150	6.00	B	
		6	CITB 100	Engineering Mechanics I	ميكانيك هندسي 1	English	4				2		3	93	57	150	6.00	B	
		7	CITB 101	Engineering drawing	رسم هندسي	Arabic				6			3	93	57	150	6.00	B	
						Total	13	0	5	6	2	0	21	411	339	750	30		
	C 2	1	NTU102	Computer I	الحاسوب 1	English	2		2				3	63	12	75	3.00	B	
		2	NTU103	Arabic Language I	اللغة العربية 1	Arabic	2						3	33	17	50	2.00	S	
		3	CITB 103	Building materials and asphalt	مواد البناء والأسفلت	Arabic	2		2		1		3	78	72	150	6.00	C	
		4	TIK 112	Mathematics II	رياضيات 2	English	3						3	48	52	100	4.00	B	
		5	CITB 104	Building construction and fabrication	المباني والبناء المصنع	Arabic	2		2				3	63	37	100	4.00	C	
		6	CITB 105	Surveying I	مساحة 1	Arabic	2			3			3	78	72	150	6.00	B	
		7	CITB 106	Construction Machines	مكائن إنشائية	Arabic	3					2	3	78	47	125	5.00	C	
						Total	16	0	6	3	1	2	21	441	309	750	30		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)								
	C 3	1	NTU 201	English Language II	اللغة الإنكليزية 2	English	2							3	33	17	50	2.00	S	
		2	NTU 200	Crimes of the baath regime in Iraq	جرائم نظام البعث في العراق	Arabic	2							3	33	17	50	2.00	S	
		3	CITB 200	Concrete Technology	تكنولوجيا الخرسانة	Arabic	2		4		1			3	108	67	175	7.00	C	
		4	CITB 201	Computer Applications I	تطبيقات الحاسوب 1	English	2		2					3	63	37	100	4.00	B	
		5	CITB 202	Soil Mechanics	ميكانيك التربة	Arabic	2		4		1			3	108	67	175	7.00	C	
		6	CITB 203	Project I	مشروع 1	Arabic	2							3	33	17	50	2.00	C	
		7	CITB 204	Civil drawing	الرسم المدني	English	2			4				3	93	57	150	6.00	C	
						Total		14	0	10	4	2	0	21	471	279	750	30		
	II	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
CL (hr/w)		Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)														
C 4		1	NTU 203	Arabic Language II	اللغة العربية 2	Arabic	2							3	33	17	50	2.00	B	
		2	CITB 210	Surveying II	مساحة 2	Arabic	2				3			3	78	72	150	6.00	B	
		3	CITB 205	Construction drawing	الرسم الانشائي	English	2				4			3	93	82	175	7.00	C	
		4	CITB 206	Quantitative survey	مسح كمي	English	2		2		1			3	78	72	150	6.00	C	
		5	CITB 207	Technology of Construction	تقنيات الانشاء	Arabic				3				3	48	52	100	4.00	C	
		6	NTU 202	Computer II	الحاسوب 2	English	2		2					3	63	12	75	3.00	B	
		7	CITB 208	Project II	مشروع 2	Arabic	1		1					3	33	17	50	2.00	S	
						Total		11	0	5	10	1	0	21	426	324	750	30		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)								
III	C 5	1	CITB 300	Engineering Mechanics II	الميكانيك الهندسي 2	English	2				2		3	63	37	100	4.00	C		
		2	CITB 301	Structural Analysis	التحليل الإنشائي	English	3				2		3	78	72	150	6.00	C		
		3	CITB 302	Fluid Mechanics	ميكانيك الموائع	English	2		2				3	63	37	100	4.00	C		
		4	CITB 303	Repair & Rehabilitation of Structures	إصلاحات وإعادة تأهيل المنشآت	Arabic	3						3	48	52	100	4.00	C		
		5	CITB 304	Engineering Geology	الجيولوجيا الهندسية	English	2						3	33	67	100	4.00	S		
		6	CITB 305	Computer Applications II	تطبيقات الحاسبة 2	English	2		2				3	63	37	100	4.00	C		
		7	CITB 306	Probability & Statistics	الاحتمالات والأحصاء	English	2				1		3	48	52	100	4.00	C		
					Total	16	0	4	0	5	0	21	396	354	750	30				
	C 6	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
			CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)												
			1	CITB 307	Modern Construction Technology	تكنولوجيا البناء الحديث	English	2				2		3	63	37	100	4.00	C	
			2	CITB 308	Const. Manag. and Eng. Economy	إدارة البناء والاقتصاد الهندسي	English	3				2	1	3	93	57	150	6.00	C	
			3	CITB 309	Environmental Engineering	هندسة البيئة	Arabic	2				2		3	63	37	100	4.00	C	
			4	CITB 310	Engineering Physics	الفيزياء الهندسية	Arabic	2						3	33	17	50	2.00	S	
			5	CITB 311	Eng. Analysis and Numerical Methods	التحليل الهندسي والطرق العددية	English	3				2		3	78	72	150	6.00	S	
			6	CITB 312	Strength of Materials	مقاومة المواد	English	2		2				3	63	37	100	4.00	C	
		7	CITB 313	Building construction	انشاء المباني	Arabic	2						3	33	67	100	4.00	C		
					Total	16	0	2	0	8	1	21	426	324	750	30				

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Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Technical Engineering College
Architecture and building engineering
technics department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	الديمقراطية وحقوق الانسان			Module Delivery	
Module Type	SUPPLEMENT			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	NTU100				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1	Semester of Delivery			
Administering Department		College	Technical Engineering College -Kirkuk		
Module Leader	Asst. Lect. Azhar Shakir Khorsheed		e-mail		
Module Leader's Acad. Title	Asst. lecture		Module Leader's Qualification	Master of law	
Module Tutor	None		e-mail	None	
Peer Reviewer Name			e-mail		
Review Committee Approval	01/09/2025		Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. يتعلم الطالب خلال السنة الدراسية أساسيات حقوق الإنسان والديمقراطية ما حقوقه كيف يدافع عنها بالطرق القانونية وماهي ضماناتها الداخلية والدولية. 2. استحصل المعرفة في مجال الديمقراطية وأنواع أنظمتها واثرها على حقوق الإنسان. 3. تنمية شخصية الطالب وتعزيز وعيهم في الأنظمة السياسية. أهداف المادة الدراسية 1. الديمقراطية وتفصيلها وكيفية تطبيقها على أرض الواقع وأهمية ان يكون فعال في المجتمع من خلال احترامه لحقوق الآخرين ومعرفة ان الحقوق والحريات تنتهي عند بداية حقوقهم وحرياتهم ويؤدي واجباته بدلا من اكتساب الحقوق فقط. 2. تعزيز ثقافة السلام القائمة على العدل والمساواة.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. تمكين الطالب من معرفة أساسيات الدفاع عن حقوقه وحقوق الآخرين بعد معرفتها ومعرفة أهميتها له وللمجتمع بصورة عامة وأيضاً معرفه كل شخص حدود حقوقه وحريته. 2. تمكين الطالب في المشاركة السياسية وذلك من خلال مشاركته في الانتخابات وتأثير هذه المشاركة على سي الانتخابات وتشكيل السلطة فيما بعد. 3. معرفة الطالب ضمانات حقوقه وحرياته وماهي مصادرها. 4. معرفة الفرق بين الحقوق والحريات. 5. تمكين الطالب من معرفة ماهي المفهوم العلمي للديمقراطية وما هي جذورها وأنواعها وأشكالها. 7. يتعلم الطالب كيف يؤثر النظام الديمقراطي على حقوق الإنسان 8. مخرجات التعلم للمادة الدراسية 9. وماهي العلاقة بينها. 10. ادراك الطالب ضرورة ان يكون مواطن فعال في المجتمع ايضاً فه شروط الناخب وشروط المرشح للانتخابات 11. معرفه أنظمة الانتخابات وايهما افضل. 12. فهم الطالب للقانون الدولي لحقوق الإنسان ومعرفة المنظمات الدولية بشكل مختصر والية عملها كالأمن المتحدة ومنظمة الصليب الاحمر وغيرها.
Indicative Contents المحتويات الإرشادية	1. تعريف حقوق الإنسان وحقوق الإنسان في الحضارات القديمة.

	2. (تعريف الحق وتعريف الانسان ومعرفة أهمية حقوق الانسان بالنسبة للإنسان والمجتمع أيضا دراسة حقوق الانسان في الحضارات كالحضارة المصرية والعراقية واليونانية والرومانية > الجزء الثاني معرف حقوق الانسان في الأديان السماوية واهمها الإسلام 4. لصادر حقوق الانسان تتضمن (مصادر دولية كالإعلان العالمي لحقوق الانسان والعهدان الدوليان والمصادر الإقليمية التي تشمل الاتفاقيات الإقليمية كالاتفاقية الأوروبية والأمريكية والدستور 6. ضمانات حقوق الانسان (كالضمانات الدستورية والقانونية 7. الاتفاقيات الدولية والإقليمية لحقوق الانسان 8. الحريات العامة وانواعها والمقارنة فيما بينها 9. ستقبل حقوق الانسان والعولمة وحقوق الانسان 10. تعريف وتاريخ وأنواع الديمقراطية (دراسة تعريف ونشأة وتطور الديمقراطية مبادئها وانواعها كالديمقراطية المباشرة وغير المباشرة والنظام الرئاسي والبرلماني 11. تعريف الانتخاب وشروطه وأنواع النظم الانتخابية وتعريف المجلس النيابي 12. العلاقة بين الديمقراطية وحقوق الانسان.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	زيادة وعي الطالب بأهمية معرفه حقوقه وواجباته اتجاه المجتمع وعلاقة حقوق الانسان بالنظام الديمقراطي ثقافة عامة في مجموعة من المجالات ومنها المجال القانوني والسياسي والاجتماعي ورفع ثقة الطالب بنفسه من خلال ربط المادة النظرية بالواقع العملي

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	5,7,8 and 10	LO #1, #10
	Assignments	4	10% (10)	2,6,10, and 12	LO #3, #4 and #6, #7
	Projects / Lab.	-	10% (10)	Continuous	All
	Report	-	10% (10)	Continuous	All
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	محاضرة تعريفية عن المادة واهميتها
Week 2	تعريف الحق والانسان وحقوق الانسان واهمية حقوق الانسان, حقوق الانسان في الدين الإسلامي والحضارات القديمة.
Week 3	مصادر حقوق الانسان الدولية والإقليمية والمحلية.
Week 4	ضمانات حقوق الانسان الدستورية والقانونية وضمانات حقوق الانسان على الصعيد الدولي.
Week 5	ضمانات حقوق الانسان في الإسلام
Week 6	دور المنظمات الإقليمية في حماية حقوق الانسان.
Week 7	خصائص حقوق الانسان وتعريف الحريات العامة وانواعه والمقارنة بينها وبين الحقوق
Week 8	القانون الدولي لحقوق الانسان والقانون الدولي الإنساني ومنظمة الصليب الأحمر
Week 9	مستقبل حقوق الانسان وسبل تطويرها.
Week 10	لعولمة وحقوق الانسان.
Week 11	تعريف الديمقراطية وتطورها التاريخي ومبادئها. الديمقراطية بين العالمية والخصوصية اشكال الديمقراطية / الديمقراطية المباشرة.
Week 12	الديمقراطية شبه المباشرة والديمقراطية التمثيلية / اركان النظام التمثيلي / اشكال النظام التمثيلي.
Week 13	المجلس النيابي وانواعه / الانتخاب وشروطه / هيئة الناخبين.
Week 14	تنظيم عملية الانتخاب / تحديد الدوائر الانتخابية / القوائم الانتخابية / المرشحو / الحملة الانتخابية / التصويت.
Week 15	نظم الانتخابات و علاقة الديمقراطية بحقوق الانسان وكيفية التأثير والتأثر فيما بينها.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	حقوق الانسان والطفل والديمقراطية / تأليف ماهر صالح علاوي ورياض عزيز هادي وعلي عبد الرزاق محمد واخرون / العاتك / بيروت	Yes
Recommended Texts	عصام العطية / القانون الدولي العام / المكتبة القانونية بغداد/2012	Yes
Websites		

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Polytechnic College
Building and Construction Engineering
Techniques Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Diploma and Bachelor's degree *First Level – First Semester* *Mathematics 1* الرياضيات 1

1. Mission & Vision Statement

- **Vision Statement**

To provide first-year Building and Construction Engineering Techniques students with a rigorous foundation in differential and integral calculus, emphasizing practical application to solve fundamental engineering problems and develop critical analytical thinking skills.

- **Mission Statement**

To empower future technical engineers and their assistants to model, analyze, and solve real-world building and construction engineering challenges from optimizing structures to calculating volumes and centroids with confidence and mathematical precision.

2. Program Specification

Program code:	TIK110	ECTS:	4
Duration:	1 st level, 1 st Semester	Method of Attendance:	Full Time

The module Mathematics 1 (Differential and Integral Calculus) is a foundational component specified within this document. Its role and design are directly derived from the program's core objectives, which are to produce technically proficient graduates capable of solving practical

problems in the building and construction engineering. The specification mandates this module to ensure all students acquire the essential analytical tools of calculus. This is not merely an academic exercise; the course is purposefully designed to underpin key engineering concepts. Graduates of this program will be well-positioned to pursue careers in building services design, facility management, construction, and consultancy, or to continue their studies in specialized or advanced engineering fields. The program also supports national and global development goals by fostering innovation, sustainability, and professional responsibility in the next generation of engineers.

Module Information					
معلومات المادة الدراسية					
Module Title	MATHEMATICS I			Module Delivery	
Module Type	BASIC			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	TIK 110				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		1	Semester of Delivery		1
Administering Department		Building and Construction Engineering Techniques Department	College	Polytechnic College/ Kirkuk	
Module Leader	Prof. Dr. Qais Fadhil Hasan		e-mail	dr.qaishasan@ntu.edu.iq	
Module Leader's Acad. Title		Professor	Module Leader's Qualification		Ph.D. in civil engineering
Module Tutor	None		e-mail	None	
Peer Reviewer Name		None	e-mail	None	
Review Committee Approval		01/09/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None		Semester
Co-requisites module	None		Semester

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understand the fundamental concepts of limits, derivatives, and integrals, and their applications in solving real-world engineering problems. 2. Develop the ability to analyze and interpret mathematical functions using graphical, and analytical methods. 3. Apply differentiation and integration techniques to solve different problems in physics, engineering, and economics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	LO#1: Understand the concepts of limits, continuity, and the derivative as a rate of change. LO#2: Differentiate a wide range of functions (polynomial, trigonometric, exponential, logarithmic) and apply differentiation to find tangents, rates of change, and extrema (maxima/minima). LO#3: Apply differentiation to solve optimization problems relevant to engineering design (e.g., minimizing material cost, maximizing strength). LO#4: Understand the concept of integration as the limit of a sum and as the inverse process of differentiation. LO#5: Evaluate integrals using standard techniques (substitution, parts, partial fractions) and apply integration to calculate areas, volumes of revolution, and centroids. LO#6: Translate simple engineering problems into mathematical models solvable by calculus.
Indicative Contents المحتويات الإرشادية	• Weeks 1-2: Foundations of Differentiation ○ Functions, limits, and continuity. ○ The derivative from first principles. ○ Interpretation as slope of a tangent and instantaneous rate of change. • Weeks 3-4: Techniques of Differentiation ○ Rules of differentiation (sum, product, quotient, chain rule). ○ Derivatives of trigonometric, exponential, and logarithmic functions. ○ Higher-order derivatives. • Weeks 5-6: Applications of Differentiation I ○ Equations of tangent and normal. ○ Related rates problems (e.g., rate of change of concrete slump, water flow). ○ Curve sketching: identifying maxima, minima, and points of inflection. • Week 7: Applications of Differentiation II & Mid-Term Review ○ Applied problems in civil engineering (e.g., optimal beam cross-section, minimal surface area for a reservoir). ○ Review and problem-solving session. • Weeks 8-9: Foundations and Techniques of Integration ○ The indefinite integral as anti-differentiation. ○ The definite integral as the limit of a sum and area under a curve. ○ Fundamental Theorem of Calculus. ○ Basic integration techniques: power rule, standard integrals. • Weeks 10-11: Advanced Integration Techniques ○ Integration by substitution.

	- Integration by parts. - Integration using partial fractions (simple cases). Weeks 12-13: Applications of Integration - Calculating areas between curves and under curves. - Calculating volumes of solids of revolution (highly relevant for earthworks, structural volumes). - Calculating centroids of areas (direct application to beam bending and structural analysis). Week 14: Integration in Engineering Contexts - Solving problems involving work, fluid pressure, or other engineering applications of integration. Week 15: General Review and Examination Period - General Review and Final summative assessment period.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The Strategies used are: - Explanation using modern presentation tools. - Lecture method using an interactive whiteboard. - Forming discussion groups and classwork within the lecture. - Reflective questions such as: what, how, when, and why. - Homework assignments requiring self-explanations based on causal considerations.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.47
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment (40%)	Quizzes	5	10% (10)	3, 6, 8, 9, 11	LO#2, #3, #4, #6
	Assignments	5	10% (10)	4, 6, 8, 11, 13	LO#1, #3, #5, #6
	Projects	2	10% (10)	13	All
	Report	1	10% (10)	14	All
Summative assessment (60%)	Mid-term Exam	1 hr	10% (10)	7	LO#1-4
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Materials Covered
Week 1	Introduction to Limits and Continuity
Week 2	Derivative of Functions
Week 3	Algebraic Functions Differentiation
Week 4	Chain Rule and Trigonometric Derivatives
Week 5	Exponential, Logarithmic, and Advanced Differentiation
Week 6	Engineering Applications for Derivatives
Week 7	Curve Analysis and Optimization & Mid-Term Test
Week 8	Concept of Integration: Antiderivatives and Areas
Week 9	Substitution Method for Integration
Week 10	Integration by Parts
Week 11	Integrating Rational Functions with Partial Fractions
Week 12	Calculating Areas with Integrals
Week 13	Calculating Volumes of Revolution
Week 14	Calculating Centroids of Plane Areas
Week 15	General Review and Simple Project Work

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
	Materials Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"CALCULUS", by George. B. Thomas	Yes
Recommended Texts	"Engineering Mathematics", by John Bird	No
Websites	https://www.youtube.com/watch?v=AsgHtqiTwsg	

3. Credits, Grading and GPA

• Credits

Northern Technical University/ Polytechnic College-Kirkuk is following the Bologna Process with the European Credit Transfer System (ECTS). The total degree program number of ECTS is 120 for Diploma, and ECTS is 240 for Bachelor's, 30 ECTS per semester. 1 ECTS is equivalent to 25 hours student workload (SWL), including structured and unstructured workload.

• Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound works with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Polytechnic College
Building and Construction Engineering
Techniques Department



MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية
Diploma and Bachelor's degree
First Level – First Semester
English Language I
اللغة الانكليزية 1

1. Mission & Vision Statement

- ***Vision Statement***

To provide first-year Building and Construction Engineering Techniques students with English proficiency as a strong foundation for academic success, professional communication, and lifelong learning, enabling them to participate confidently in a globalized world.

- ***Mission Statement***

The English Language course aims to equip students with essential skills in reading, writing, listening, and speaking, build confidence in using English for academic and daily contexts, provide a foundation for advanced study and specialized courses and foster critical thinking, creativity, and intercultural communication through language learning.

2. Program Specification

Program code:	NTU 101	ECTS:	2
Duration:	1 st level, 1 st Semester	Method of Attendance:	Full Time

The module English language I is a supplementary component specified within this document. Its role and design are directly derived from the program's university objectives, which are to produce technically proficient graduates capable of read and comprehend short academic and general texts, write simple, structured paragraphs and short essays, engage in basic conversations, discussions, and oral presentations and listen and respond to short lectures, conversations, and media content.

Module Information					
معلومات المادة الدراسية					
Module Title	English Language I			Module Delivery	
Module Type	SUPPLEMENT			Class	
Module Code	NTU101				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		1	Semester of Delivery		1
Administering Department			College	Polytechnic College/ Kirkuk	
Module Leader	Asst. Prof. Dr Inas Mahmood Ahmed		e-mail	inas.mahmood@ntu.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	Module Leader's Qualification		Ph.D.
Module Tutor	None		e-mail	None	
Peer Reviewer Name		Asst. Lect.	e-mail	@ntu.edu.iq	
Review Committee Approval		01/09/2025	Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The student learns how to communicate effectively and appropriately in real life situation and use English effectively for study purpose across the curriculum. In addition, develop the interest in and appreciation of Literature, integrate the use of the four language skills i.e. Reading, Listening, Speaking and Writing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Knowledge and Understanding - Developing reading skills and reading speed. Subject- specific skills - Writing summaries in which they will communicate appropriately, accurately and effectively what has been read.
Indicative Contents المحتويات الإرشادية	This course emphasizes the fundamental language skills of reading, writing, speaking, listening, thinking, viewing and presenting.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lecture-Based Instruction Interactive Lectures: Practical Skills - Giving theoretical and practical lectures, workshops. Transferable Skills - Communicate effectively with professionals and clients. - Work collaboratively in teams and manage time effectively. - Demonstrate professionalism, lifelong learning, and ethical responsibility.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	5% (10)	3, 5,7 and 10	LO #1, #10
	Assignments	4	5% (10)	2,6,10, and 12	LO #3, #4 and #6, #7
	Projects / Lab.	-	10% (10)	Continuous	All
	Report	-	10% (10)	Continuous	All
Summative assessment	Midterm Exam	1hr	20% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The uses of there is/ there are
Week 2	Present Tense Simple
Week 3	Understanding Passive and Active Voice
Week 4	Simple Past Tense
Week 5	Can/ Can't ability and permission
Week 6	The use of would like, want and like.
Week 7	Everyday English: talking about yourself
Week 8	The present continuous tense
Week 9	Negative and tag questions
Week 10	Present Continuous Form with Future Meanings (1, 2, 3)
Week 11	How to write a paragraph about yourself, how to write an essay
Week 12	Present Perfect Tense
Week 13	Review for WH-questions
Week 14	The uses of hot verbs (Do, Does, and Did)
Week 15	Modal verbs (Ability and Possibility)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<i>Beginner Student's Book.</i> NEW Headway. John and Liz Soars. OXFORD.	Yes
Recommended Texts	Any books in English grammar.	No
Websites		

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

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Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Polytechnic College
Building and Construction Engineering
Techniques Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Diploma and Bachelor's degree *First Level – First Semester* **ENGINEERING DRAWING** الرسم الهندسي

1. Mission & Vision Statement

- **Vision Statement**

To prepare students capable of expressing engineering ideas with clarity and precision through drawing.

To make engineering drawing a common language for understanding and analyzing shapes and systems.

To graduate creative engineers with strong scientific foundations in engineering drawing.

- **Mission Statement**

To provide students with the essential knowledge and skills to understand the universal language of engineering.

To train them in using traditional tools and modern software for accurate and efficient drawings.

To instill values of accuracy, organization, and teamwork as a solid base for their academic future.

2. Program Specification

Program code:	CITB 101	ECTS:	6
Duration:	1 st level, 1 st Semester	Method of Attendance:	Full Time

The **Engineering Drawing** module is considered a core component of this program. Its role and design are directly derived from the program's fundamental objectives, which aim to prepare technically proficient graduates capable of expressing engineering ideas and analyzing design problems in the field of building and construction. The program specification mandates this module to ensure that all students acquire essential skills in engineering drawing, including reading and interpreting plans, creating accurate technical drawings, and understanding the geometric

relationships between different elements. This course is not merely an academic exercise; it is purposefully designed to provide a foundation for understanding and applying key engineering concepts in practice. Graduates of this program will be well-positioned to pursue careers in building design, preparation of engineering plans, project management, and engineering consultancy, or to continue their studies in specialized or advanced engineering fields. The program also supports national and global development goals by fostering innovation, sustainability, and professional precision in the next generation of engineers.

Module Information					
معلومات المادة الدراسية					
Module Title	ENGINEERING DRAWING			Module Delivery	
Module Type	BASIC			☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	CITB 101				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1	Semester of Delivery			
Administering Department		Building and Construction Engineering Techniques Department	College	Polytechnic College/ Kirkuk	
Module Leader	Assis. Lect. Janan Oral		e-mail	Janan-oral@ntu.edu.iq	
Module Leader's Acad. Title		Assistant lecturer	Module Leader's Qualification		M.Sc in Agriculture
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Review Committee Approval		01/09/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- Introduce students to the fundamentals of engineering drawing as a basic language of communication among engineers and technicians in various fields. 2-Develop skills in using traditional and digital drawing tools (such as rulers, set squares, compasses, and supporting software) with accuracy and efficiency. 3- Enable students to read engineering drawings and understand symbols, scales, and projections used in technical drawings. 4-Enhance practical skills in drawing two-dimensional (2D) geometric shapes, including lines, arcs, polygons, and composite figures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	LO#1: Knowledge & Understanding 1. Explain the fundamental principles of engineering drawing as a language of technical and engineering communication. 2. Differentiate between types of lines, symbols, scales, and international standards used in technical drawings. 3. Describe the basics of orthographic projection, perspective, and sectional views. LO#2: Intellectual & Practical Skills 4. Use traditional and digital drawing tools efficiently and accurately. 5. Construct two-dimensional (2D) geometric shapes such as lines, arcs, polygons, and composite figures. 6. Represent three-dimensional (3D) objects using different projection methods. 7. Interpret engineering drawings and extract the required technical information. 8. Apply international standards (ISO, DIN) in preparing engineering drawings. LO#3: General Skills & Competencies 9. Demonstrate accuracy, organization, and attention to detail when preparing drawings. 10. Integrate theoretical knowledge with practical application through exercises and small projects. 11. Utilize engineering drawing as a supportive tool for design and implementation in subsequent courses and professional practice.

Indicative Contents المحتويات الإرشادية	Weeks 1-2: Introduction to Engineering Drawing Drawing instruments, materials, and their uses. Standard conventions: line types, lettering, title blocks, and drawing scales. Weeks 3-4: Geometric Construction & Dimensioning Constructing geometric shapes (triangles, polygons, circles). Principles of dimensioning: placement, standards, and practices. Weeks 5-6: Orthographic Projection - Fundamentals Principles of orthographic projection (First Angle vs. Third Angle). Drawing multi-views (front, top, side views) of simple objects. Week 7: Sections and Auxiliary Views & Mid-Term Review Creating section views to show interior details. Introduction to auxiliary views. Review and problem-solving session. Weeks 8-9: Pictorial Drawing Isometric projection: drawing 3D objects on a 2D plane. Oblique projection (Cavalier and Cabinet). Weeks 10-12: Introduction to CAD Basic CAD software interface and tools. Creating simple geometric shapes and orthographic views using CAD. Layering, line types, and basic editing commands. Weeks 13-14: Reading Construction Drawings Interpreting architectural plans, elevations, and section drawings. Understanding basic structural drawing symbols and details. Week 15: General Review, Project Finalization, and Examination Period Integration of skills, final project submission. General review for the final exam.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The Strategies used are: • Explanation using modern presentation tools. • Lecture method using an interactive whiteboard. • Forming discussion groups and classwork within the lecture. • Reflective questions such as: what, how, when, and why. • Homework assignments requiring self-explanations based on causal considerations.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	3, 6, 8, 9, 11	LO#2, #4, #6
	Assignments	5	10% (10)	4, 6, 8, 11, 13	LO#1, #3, #5
	Projects	2	10% (10)	13	All
	Report	1	10% (10)	14	All
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO#1-4
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Materials Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Delivery Plan (Weekly Syllabus) المناهج الأسبوعي العملي	
	Materials Covered
Week 1	Engineering drawing and its importance; mounting drawing boards; data tables; use of drawing tools; types of lines: vertical, horizontal, and inclined at various angles.
Week 2	Engineering drawing and its importance; mounting drawing boards; data tables; use of drawing tools; types of lines: vertical, horizontal, and inclined at various angles.
Week 3	Drawing scales and their types, with examples of geometric shapes drawn at various scales.
Week 4	Geometric operations related to straight lines and triangles.
Week 5	Geometric operations related to circles, including drawing polygons inscribed in and circumscribed around circles.
Week 6	Geometric operations related to ovals, including drawing geometric decorations and various decorative shapes.
Week 7	Types of conic sections and drawing spirals.
Week 8	Projection: definition, projection angles, and representation of the three views; explanation of projection methods with drawings of simple object faces.
Week 9	Applications for various vertical and horizontal objects.
Week 10	Projection of various vertical and horizontal objects.
Week 11	Orthogonal projection of objects containing inclined surfaces.
Weeks 12,13,14	Orthogonal projection of objects with cylindrical protrusions and recesses.
Week 15	Axonometric projection at a 30° angle: definition and principles.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Technical Drawing with Engineering Graphics", F. E. Giesecke, et al.	No
Recommended Texts	Engineering Drawing and Design", D. Madsen & D. P. Madsen	No
Websites	https://www.youtube.com/c/EngineeringDrawing https://www.autodesk.com/support/learning/training	

3. Credits, Grading and GPA

- Credits**

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- Grading**

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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:		Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.		

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Mechanical Workshop

Module Information				
معلومات المادة الدراسية				
Module Title	Mechanical Workshop		Module Delivery	
Module Type	B		Theory Lecture Lab Tutorial x Practical Seminar	
Module Code	TIK111			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UG1	Semester of Delivery		1
Administering Department	Building and construction engineering techniques department	College	Polytechnic college of Kerkuk	
Module Leader	Assist Prof. Dr. Kamalaldin Fadhil Hasan		e-mail	dr_kamal@ntu.edu.iq
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date		Version Number	1.0	

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	تعريف وتعليم الطلبة على بعض الورش الهندسية التي يحتاجها في حياته المهنية الهندسية. Introduce and teach students to some of the engineering workshops that they need in their engineering career.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- التعرف على العدد اليدوية , التعرف على الطرق الصحيحة لتشغيل مكائن النجارة التعرف على انواع الخشب واستعمالاته 2- طرق السباكة المختلفة انواع المعادن المستعملة بالسباكة تشكيل قالب عملي بسيط امام الطلبة باستعمال ادوات المقالب. 3- والتعرف على انواع الافران وطرق تشغيلها وضخها بالمعادن وحسب التمرين وخارج المجول وتنظيفه. 4 - ادوات القياس وكيفية استعمالها ادوات التخطيط واستعمالاتها. 5 - القطع بالمنشار , المنشار اليدوي وكيفية تركيب واصلاح المنشار. 6 - السمكرة داخل الورشة العدد اليدوية المختلفة انواع البليت المستخدم وكيفية قياس السمك. 7 - الخراطة , المخرطة ومواصفاتها , وكيفية استخداماتها وملحقاتها وطرق تركيبها . 8 - اللحام العدد والادوات المستخدمة بلحام القوس الكهربائي. 9 - الادوات المستخدمة بلحام الاوكس اميكي انواع المشاعل الغازات المستخدمة ومواصفاته.
Indicative Contents المحتويات الإرشادية	النجارة , الامان والسلامة المهنية عند العمل بورشة النجارة , التعرف على العدد اليدوية , التعرف على الطرق الصحيحة لتشغيل مكائن النجارة .
	تنفيذ عمل بسيط وذلك باستعمال العدد والادوات النجارية المختلفة
	تنفيذ تمرين لقالب عمود بسيط
	السباكة الامان والسلامة المهنية عند العمل بورشة السباكة .
	البرادة السلامة المهنية فى ورشة البرادة والأدوات.
	القطع بالمنشار , المنشار اليدوي وكيفية تركيب واصلاح المنشار.
	السمكرة السلامة المهنية داخل الورشة.
	الخراطة , السلامة المهنية لورشة الخراطة.
	اللحام السلامة المهنية واحتياطات الامن.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	الاستراتيجية الرئيسية التي سيتم اعتمادها في تقديم هذه الوحدة هي تشجيع مشاركة الطلاب في التدريبات ، وفي الوقت نفسه صقل وتوسيع مهارات التفكير النقدي لديهم. سيتم تحقيق ذلك من خلال الفصول الدراسية والبرامج التعليمية التفاعلية ومن خلال النظر في نوع التجارب البسيطة التي تتضمن بعض أنشطة أخذ العينات التي تهم الطلاب. The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Projects / Lab. إسم الورشة				
	النجارة		%10	1,2,3	
	السباكة		%7	4,5	
	البرادة		%6	6,7	
Summative assessment	السمكرة		%10	8,9,10	
	الخراطة		%10	11,12,13	
	اللحام		%7	14,15	
	Final Exam		%50		تقييم فصلي
Total assessment			100% (100 Marks)		تقييم فصلي

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	

Week 11	
Week 12	
Week 13	
Week 14	
Week 15	
Week 16	

Delivery Plan (Weekly Lab. Syllabus)	
المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	البرادة (3 اسابيع) : التركيز على تدريب الطالب على أعمال البرادة بصورة صحيحة وكيفية استعمال أدوات القياس والمبارد والقطع بالمنشار والثقب والفلووظة . أ- السلامة المهنية داخل الورشة . ب- أدوات القياس: (المسطرة لدرجة – شريط القياس – القدمة ذات الورنية وكيفية استعمالها والمحافظة عليها) . ج- عملية التخطيط (الشكرة) : سطوح الأساس العدد المستخدمة وهي : (البرجل العدل – برجل التخطيط – الذنبة وكيفية التذنب – مادة الاظهار – الزاوية القائمة – الخطاط العادي – الخطاط الحساس – مقياس الارتفاع – المنقلة الجامعة وقياس الزاوية) . د- المبارد أنواعها – أشكالها – كيفية استعمالها والمحافظة عليها وتنظيفها. هـ- المناجل أنواع وطرق ربط المشغولات عليها . تمرين بسيط على عمليات البرد والتخطيط وحسب الرسم التنفيذي .
Week 2	
Week 3	
Week 4	القطع بالمنشار : المنشار اليدوي وسلاح المنشار – تثبيت سلاح المنشار – الشروط الواجب توفرها في عملية النشر . تمرين يشمل البرادة – التخطيط – النشر وحسب الأبعاد المعطاة بالرسم التنفيذي .
Week 5	الثقب : أنواع المثاقب – أنواع البرايم – وكيفية استعمالها – طرق استخراج البراغي المكسورة . تمرين يشمل البرادة ، التخطيط ، الثقب وحسب الأبعاد المعطاة ، بالرسم التنفيذي .
Week 6	اللحام (3 اسابيع) : بتم تركيز التدريب في ورشة اللحام على مختلف العدد والأدوات والأجهزة الموجودة داخل الورشة بالطريقة الأمثل : أ- السلامة المهنية داخل الورشة . ب- العدد والأدوات المستخدمة في الورشة . ج- مكائن لحام القوى الكهربائية، أجزاءها، طريقة تشغيلها. تنفيذ تمارين لحام (الخطوط مستقيمة، بخطوط متراسة، املاء زاوية).
Week 7	تنفيذ تمرين لحام (بوابات ، قوالب ، أنابيب) .
Week 8	اللحام بالغاز الاوكسياسيتلين . أ- السلامة المهنية عند العمل . ب- أنواع الغازات المستعملة في اللحام الغازي وكيفية استعمالها . تنفيذ تمارين (لحام ذاتي ، لحام بواسطة سلك حديد ، لحام بواسطة سلك براس) .
Week 9	السمكرة (3 اسابيع) : التركيز على تدريب الطالب على كيفية التخطيط على الصفائح المعدنية وكيفية القطع والتجميع وعملية اللحام للصفائح باستعمال أدوات التخطيط والقطع اليدوي والميكانيكي وأدوات الثني وأدوات اللحام اليدوي والميكانيكي أ- السلامة المهنية داخل الورشة . ب- أدوات القياس . ج- أدوات التخطيط .

	د- أنواع الصفائح وقياساتها . تمرين عملي باستعمال الأدوات المذكورة (تمرين بسيط باستعمال الأدوات المذكورة) .
Week 10	أ- ماكينات القطع والثني . ب- ماكينات اللحام النقطة . تنفيذ تمرين على عمليات التخطيط والقطع والثني واللحام (قوالب ، صب ، بوابات) .
Week 11	طريق الربط : الدرس اليدوية ، الدرس الأمريكية . تنفيذ تمرين على عمليات التخطيط والقطع والربط ، (دكت تبريد ، خزان ماء) .
Week 12	الخراطة : يتم تركيز على تدريب الطالب على ماكينات الخراطة المختلفة والتدريب على أدوات القياس اللازمة لتنفيذ تمارين متنوعة أو كيفية عمل الأسنان الخارجية والداخلية وكيفية اختيار أقلام القطع . أ- السلامة المهنية داخل ورشة الخراطة . ب- المخرفة أجزاءها وكيفية العمل عليها ، جداول السرعات ، أنواع أقلام الخراطة ، ربط المشغولات ، ضبط المركز ، أدوات . ج- تنفيذ عمليات خراطة (مستوية ، عدلة ، مدرجة) مع استخدام أدوات القياس . شرح قوانين الخراطة المسلوحة الخارجية والداخلية . تنفيذ تمرين خراطة لمسلوب خارجي ومسلوب داخلي . شرح قوانين الأسنان الخارجية والداخلية . تنفيذ تمرين خراطة الأسنان خارجية وداخلية .
Week 13	النجارة والنماذج (3 اسابيع) : يتم تدريب الطالب على استعمال العدد والأدوات النجارية وأدوات القياس المستعملة والتعرف على ماكينات النجارة المختلفة واجراءات السلامة وصيانة الماكينات . أ- السلامة المهنية داخل الورشة . ب- أنواع الأخشاب ومصادرهما واستعمالاتها . ج- أدوات القياس والعدد اليدوية المستعملة في ورشة النجارة . تنفيذ تمرين لشكل متوازي الاضلاع ، اسطوانة ، شكل مسدس
Week 14	التعريف بالماكينات الموجودة في ورشة النجارة واجراءات السلامة والصيانة اللازمة ، عمل تمارين لكيفية الربط بين أجزاء الخشب تنفيذ تمرين تعشيق على هيئة T و + .
Week 15	تعريف الطالب بطرق صيغ الأخشاب ، الشفرات (أنواعها ، أشكالها) . تنفيذ تكمين خطر متنوع .

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1-Serope Kalpajian and others: Manufacturing and engineering technology, fifth edition,2001 Prentice Hall. 2 - Manufacturing and engineering technology, sixth edition in SI units,2009 Prentice Hall. 3 – Rajender Singh: Introduction to basic manufacturing processes and workshop technology; 2006 New age international, India. 4- Andrew Y. C. Nee: Handbook of Manufacturing Engineering andTechnology, Springer-Verlag London 2015.	No

Recommended Texts		No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Polytechnic College
Building and Construction Engineering
Techniques Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Diploma and Bachelor's degree *First Level – First Semester* *Construction materials* مواد الانشاء

1. Mission & Vision Statement

- **Vision Statement**

To be a leading course in developing skilled, innovative, and environmentally responsible construction professionals who are capable of selecting and utilizing materials that contribute to safe, durable, and sustainable built environments

- **Mission Statement**

To equip students with a comprehensive understanding of construction materials—covering their properties, applications, sustainability, and performance—by combining theoretical knowledge with practical learning experiences that align with industry standards and emerging technologies.

2. Program Specification

Program code:	CITB102	ECTS:	4
Duration:	1 st level, 1 st Semester	Method of Attendance:	Full Time

This course provides an in-depth understanding of the properties, classifications, behavior, and selection of common and advanced construction materials. Emphasis is placed on material performance, testing, sustainability, and real-world applications in construction and infrastructure projects. The course includes laboratory sessions to give hands-on experience with material testing and evaluation.

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

- Understand the physical, chemical, and mechanical properties of key construction materials.
- Evaluate materials for durability, strength, and sustainability.
- Select appropriate materials based on design requirements and environmental factors.
- Conduct basic material tests in a laboratory setting and interpret results.
- Understand innovations in construction materials including green and recycled options.

Module Information			
معلومات المادة الدراسية			
Module Title	Construction Materials		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CITB102		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	
Administering Department	Building and Construction Engineering Techniques Department	College	Polytechnic College/ Kirkuk
Module Leader	Diana Hussein Neamat	e-mail	diana.hussein@ntu.edu.iq
Module Leader's Acad. Title	Assist. lecturer	Module Leader's Qualification	M.Sc. in civil engineering
Peer Reviewer Name		e-mail	
Review Committee Approval	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	This course provides full knowledge about the construction materials properties, standards and laboratory tests.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Understanding the characteristics of different construction materials. - The ability of utilizing the proper construction material according to the type of structure. - Understanding the installation methods of construction materials. - Understanding the standards specification of construction materials.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Enable students to identify the physical and mechanical properties of the common construction materials.		

	- Improving the student ability of selecting the suitable material that qualifies the requirements of the desired work. - Enabling the students to work as a laboratory field tester. - Improving the students' skills enabling the establishment of a career based on the academic knowledge.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- Lecture method using a whiteboard and a data show. - Forming working groups during the laboratory sessions to conduct the desired tests. - Preparation of seminars by students under the supervision of their lecturer. - Giving students assignments (H.W) to evaluate the students benefit from the lesson. - Conducting a scientific technical visit to an under construction visit - Forming groups to conduct a project during the course. Attending online (web-based) sessions.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	6	10% (10)	3, 6, 8, 9, 11,13	LO #1 - #2, LO #3 - #4,
	Assignments	5	10% (10)	4, 6, 8, 11, 13	LO #1 - #2, LO #3 - #4,
	Report	12	20% (20)	All	All
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO#1-4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المناهج الاسبوعي النظري	
	Materials Covered
Week 1	- Demonstrates knowledge of the Physical properties & standard specification for construction materials. - Ability to identify types of metallic materials, nonmetallic materials.
Week 2	Demonstrates Advantages & disadvantages of clay bricks
Week 3	Identifying clay brick types of defects, Standard specification.
Week 4	- Demonstrates knowledge of the Sand-lime brick: Properties. - Conducts the Standard tests & monitor the specification.
Week 5	- Demonstrates knowledge of the Glass bricks, Concrete bricks: Properties. - Conducts the Standard tests & monitor the specification.
Week 6	- Ability to identify the Cellular concrete blocks: Properties. - Monitoring and conducting Standard tests & specification.
Week 7	Demonstrates knowledge and Definition of the thermostone.
Week 8	Demonstrates knowledge and Definition of the Building stone
Week 9	Demonstrates the uses and properties of the building stones.
Week 10	Demonstrates the uses, properties and types of the Portland cement.
Week 11	Demonstrates the uses and properties of the concrete pipes.
Week 12	Demonstrates the uses and properties of the structural steel.
Week 13	- Demonstrates the uses and properties of the steel, welding and screws. - Monitoring and conducting Standard tests & specification.
Week 14	- Demonstrates knowledge of the Types, Properties of flooring materials (Tiles & concrete flags) - Demonstrates knowledge standards tests & specification of flooring materials.
Week 15	Demonstrates the properties of the Environmentally friendly materials
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Syllabus) المناهج الاسبوعي العملي	
	Materials Covered
Week 1	Recognition of construction materials laboratory, industrial prevention and occupational safety methods, how to maintain the equipment and basic tools used, and how to use balances.
Week 2	Able to conduct and identify the Clay brick tests: Density , Dimension , Specific Gravity.
Week 3	Able to conduct and identify the Clay brick tests: Absorption.
Week 4	Able to conduct and identify the Clay brick tests: compressive strength.
Week 5	Able to conduct and identify the Clay brick tests: Analysis of soluble salts.

Week 6	Able to conduct and identify the Concrete bricks & block tests: (Density, Absorption, Compressive strength).
Week 7	Limestone Brick Tests: Density, Absorption, Compressive Strength.
Week 8	Able to conduct and identify the Sand-lime brick tests: (Density, Absorption, Compressive strength).
Week 9	Thermostone tests: density, absorption, compressive strength.
Week 10	Visit to the construction materials lab. In Kirkuk city.
Week 11	Able to conduct and identify Tile tests: (Dimension, Total absorption, Face absorption, Modulus of rupture).
Week 12	Able to conduct and identify Tile tests: (Dimension, Total absorption, Face absorption, Modulus of rupture).
Week 13	Able to conduct and identify some types of stone.
Week 14	Tests of steel, Tension test.
Week 15	Learn about some of the materials used in the production of environmentally friendly materials.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	كتاب المواد الانشائية (جلال بشير سرسم- سعيد عبدالعالي)	yes
Recommended Texts	Construction materials reference book by John M. Cimbala.	No
Websites	https://www.slideshare.net/ www.buildforless.co.uk https://www.youtube.com	

3. Credits, Grading and GPA

- Credits**

Northern Technical University/ Polytechnic College-Kirkuk is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 120 for Diploma, and ECTS is 240 for Bachelor's, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

- Grading**

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound works with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:		Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.		

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Diploma and Bachelor's degree *First Level – First Semester* *Engineering Mechanics I* الميكانيك الهندسي 1

1. Mission & Vision Statement

- **Vision Statement**

To provide first-year Building and Construction Engineering Techniques students with strong foundation in engineering mechanics that develop analytical thinking, problem solving and ability to apply physical principles in building and construction engineering, preparing them for advanced structural and design courses.

- **Mission Statement**

To introduce the fundamental laws of statics as applied to engineering systems. So, they can build the ability to model, analyze and solve basic mechanical problems relevant to building and construction scenarios.

2. Program Specification

Program code:	CTTB 100	ECTS:	6
Duration:	1 st level, 1 st Semester	Method of Attendance:	Full Time

The module Engineering mechanics1 is a foundational component specified within this document. Its role and design are directly derived from the program's core objectives, which are to produce

technically proficient graduates capable of solving practical problems in the building and construction engineering. The specification mandates this module to ensure all students acquire the essential foundation in engineering mechanics that develop analytical thinking, problem solving and ability to apply physical principles in building and construction engineering. This is not merely an academic exercise; the course is purposefully designed to underpin key engineering concepts. Graduates of this program will be well-positioned to pursue careers in building services design, facility management, construction, and consultancy, or to continue their studies in specialized or advanced engineering fields. The program also supports national and global development goals by fostering innovation, sustainability, and professional responsibility in the next generation of engineers

Module Information					
معلومات المادة الدراسية					
Module Title	ENGINEERING MECHANICS 1			Module Delivery	
Module Type	BASIC			☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	CTTB 100				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		1	Semester of Delivery		1
Administering Department		Building and Construction Engineering Techniques Department	College	Polytechnic College/ Kirkuk	
Module Leader	Ass. Prof. Dr. Inas Mahmood Ahmed		e-mail	inas.mahmood@ntu.edu.iq	
Module Leader's Acad. Title		Assistant Professor	Module Leader's Qualification		Ph.D. in civil engineering
Module Tutor	None		e-mail	None	
Peer Reviewer Name		None	e-mail	None	
Review Committee Approval		01/09/2025	Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	1. Introduce students to the basic principles of mechanics, including statics. 2. Develop the ability of resolve forces, analyze equilibrium and determine reactions in structures. 3. Teach fundamental concepts of centroids, moments of inertia and their applications in building design.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	LO#1: Explain the laws of mechanics and their relevance to building and construction engineering. LO#2: Identify and classify different types of forces, supports and loading conditions. LO#3: formulate free body diagrams and apply equilibrium equations to solve static problems. LO#4: Analyze simple structural elements (beams, trusses, frames) under different loading conditions. LO#5: Calculate centroids, moment of inertia, and apply them in structural analysis. LO#6: Apply engineering mechanics concepts to real-world construction problems.		
Indicative Contents المحتويات الإرشادية	• Weeks 1, 2 &3: Introduction to Mechanics ○ Forces systems ○ Scalar & vector quantities ○ The Parallelogram law ○ Triangle law ○ Forces & components ○ The Moment of a force ○ Varignon's theorem ○ Applications of Varignon's theorem • Weeks 4, 5: Demonstrates knowledge of the force ○ Couple ○ Resultant of force systems ○ Resultant of concurrent force ○ Resultant of parallel force ○ Resultant of non-concurrent force • Weeks 6, 7 & 8: Equilibrium of force system ○ Free body diagram ○ Equilibrium of concurrent force ○ Equilibrium of parallel force ○ Equilibrium of non-concurrent force		

	○ Types of beams ○ Supports and loads ○ Equilibrium of beams • Week 9, 10: knowledge of the Trusses ○ Analysis of trusses ○ Method of joint ○ Method of section ○ Frame analysis • Weeks 11, 12: Centroid of area and lines ○ Centroids by integration ○ Centroids of composite area ○ Applications ○ knowledge Friction ○ Theory of friction ○ Types of friction ○ Wedges ○ Computes Angle of friction • Weeks 13, 14: Centroids ○ Computes Centroids of areas • Weeks 15: Moment of inertia ○ Compute moment of inertia
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The Strategies used are: • Explanation using modern presentation tools. • Lecture method using an interactive whiteboard. • Forming discussion groups and classwork within the lecture. • Reflective questions such as: what, how, when, and why. • Homework assignments requiring self-explanations based on causal considerations.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	3, 6, 8, 9, 11	LO#2, #4, #6
	Assignments	5	10% (10)	4, 6, 8, 11, 13	LO#1, #3, #5
	Projects	2	10% (10)	13	All
	Report	1	10% (10)	14	All
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO#1-4
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Materials Covered
Week 1	Forces systems, Scalar & vector quantities, the parallelogram law
Week 2	Triangle law, Forces and components, the moment of inertia
Week 3	Varignon's theorem, applications of Varignon's theorem
Week 4	Couple, Resultant of force system
Week 5	Resultant of concurrent force, resultant of parallel force, resultant of non- concurrent force,
Week 6	Free body diagram, equilibrium of concurrent force, equilibrium of parallel force
Week 7	equilibrium of non-concurrent force, types of beams
Week 8	Supports and loads, equilibrium of beams
Week 9	Analysis of trusses, method of joints
Week 10	Methods of section, frame analysis
Week 11	Centroids by integration, centroids of composite area, applications knowledge of friction
Week 12	Theory of friction, types of friction, wedges, compute angle of friction
Week 13	Calculating Volumes of Revolution
Week 14	Compute of centroids of areas
Week 15	Compute moment of inertia

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

	Materials Covered
Week 1	
Week 2	
Week 3	

Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering Mechanics / F.L. Singer	No
Recommended Texts	Engineering Mechanics / Mclean & Nelson Engineering Mechanics / J.F. Shelley Engineering Mechanics / A. Higdon & W.B. Siles. Mechanics for Engineers / Statics / F.P. Beer, E.R. Johnston, Jr n, 1982.	No
Websites		

3. Credits, Grading and GPA

- Credits**

Northern Technical University/ Polytechnic College-Kirkuk is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 120 for Diploma, and ECTS is 240 for Bachelor's, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

- Grading**

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound works with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:		Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.		

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Polytechnic College
Building and Construction Engineering
Techniques Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Diploma and Bachelor's degree *First Level – Second Semester* **Computer 1** الحاسوب 1

1. Mission & Vision Statement

- **Vision Statement**

To provide first-year students with a strong and structured foundation in computer fundamentals, emphasizing practical skills in using software and digital tools that support their academic success and prepare them for technical and engineering applications.

- **Mission Statement**

To equip students with the essential knowledge and skills in computer operation, basic programming concepts, and information technology, enabling them to use computers efficiently, solve simple technical problems, and adapt confidently to modern digital environments in engineering and applied sciences.

2. Program Specification

Program code:	NTU102	ECTS:	3
Duration:	1 st level, 2 nd Semester	Method of Attendance:	Full Time

The module **Computer 1 (Introduction to Computer Applications and Programming)** is a foundational component specified within this document. Its role and design are directly derived

from the program's core objectives, which are to produce technically proficient graduates capable of utilizing digital tools and computational methods to solve practical problems in building and construction engineering. The specification mandates this module to ensure all students acquire essential computer literacy skills, including operating systems, office applications, data management, basic programming concepts, and engineering-related software fundamentals.

This is not merely a theoretical introduction to computers; the course is purposefully structured to support key engineering tasks such as data analysis, technical documentation, digital communication, basic modeling, and problem-solving through computational thinking. By integrating practical laboratory sessions with theoretical knowledge, students develop the competence to apply computer technologies effectively within engineering environments.

Graduates of this program will be well-prepared to employ digital tools in building services design, project planning, construction management, and technical consultancy, or to pursue further studies in advanced computing, information systems, or specialized engineering software applications. The module also contributes to national and global development goals by promoting digital transformation, technological innovation, sustainability, and professional responsibility among future engineers.

Module Information				
معلومات المادة الدراسية				
Module Title	COMPUTER 1		Module Delivery	
Module Type	BASIC		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	NTU102			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	1	Semester of Delivery		
Administering Department		Building and Construction Engineering Techniques Department	College	Polytechnic College/ Kirkuk
Module Leader	Asst. Lect. Janan Oral Hashim		e-mail	Janan-oral@ntu.edu.iq
Module Leader's Acad. Title		Asst. Lect.	Module Leader's Qualification	M.Sc in Agriculture
Module Tutor	Asst. Lect. Yahya Khaleel Kareem		e-mail	yahya.kh@ntu.edu.iq
Peer Reviewer Name		None	e-mail	None

Review Committee Approval	18/02/2026	Version Number	1.0
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Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	• To introduce students to the fundamental concepts of computer systems, including hardware components, software types, and operating systems. • To develop students' practical skills in using office productivity applications, such as word processing, spreadsheets, and presentation software. • To enhance students' ability to manage digital files and information efficiently using operating system tools and basic data organization techniques. • To promote digital literacy, cybersecurity awareness, and ethical use of information technology in academic and professional environments.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	LO#1: Demonstrate understanding of basic computer concepts, including hardware components, software types, and operating system functions. LO#2: Operate an operating system efficiently, including managing files and folders and configuring basic system settings. LO#3: Use office productivity software effectively to create formatted documents, perform basic data analysis using spreadsheets, and design structured presentations. LO#4: Apply fundamental internet skills and cybersecurity practices to communicate digitally and use online resources safely and ethically.		
Indicative Contents المحتويات الإرشادية	Weeks 1-2: Operating Systems (OS) • Define operating systems, their types, features, and importance. • Overview of Windows OS versions (95 to 10) and their characteristics. • Explain the differences between operating systems and application software. • Using the desktop, Start menu, taskbar, and understanding hardware-software interactions. Weeks 3: Files and Folders • Rules of differentiation (sum, product, quotient, chain rule). • Derivatives of trigonometric, exponential, and logarithmic functions. • Higher-order derivatives. Weeks 4–5: Computer Hardware • Identify types of computers: Mainframe, Supercomputer, Desktop, Laptop, Tablet, Mobile devices, etc. • Understand internal components: microprocessor, system memory, and storage systems. • Recognize input/output devices: keyboard, mouse, monitor, printer, projector, speakers.		

- Understand how all hardware components work together.

Week 6: Control Panel and System Settings

- Customize desktop and display settings, change date, time, language, and accessibility options.
- Understand power options: shutdown, sleep, hibernate, and manage power settings.
- Recognize safe mode versus normal mode operations.
- Manage user accounts: create accounts, set rights and access, and modify controls.

Week 7: Software Concepts and Management

- Define software and system requirements, and its relationship with hardware.
- Learn about application software types: office suites, databases, engineering, medical, multimedia, and entertainment software.
- Manage software: install, uninstall, reinstall, and update programs.
- Use disk management tools, protect data, handle viruses/malware, and access Windows help and support.

Weeks 8–9: Key Applications (Office 2010/2013)

- Introduction to key applications: Word, Excel, PowerPoint, and interface overview.
- Create files from templates, access commands, and exchange data between files.
- Edit text: enter, modify, save, and open documents; write in Arabic and English.
- Use basic editing tools: cut, copy, paste, font formatting, alignment, and spell check.

Weeks 10–11: Advanced Word Features

- Paragraph settings: line spacing, paragraph spacing, and margins.
- Use lists and quick styles for text formatting.
- Find and replace, document formatting, page background, and watermark.
- Multi-directional writing: Arabic in English direction and English in Arabic direction.

Week 12: Page Setup and Multimedia

- Page setup: paper size, orientation, margins, and page breaks.
- Add page numbers, titles, and apply columns.
- Insert multimedia: images, objects, and manipulate them.
- Create and format tables, insert Excel tables, and select table elements.

Weeks 13–14: PowerPoint Presentations

- Introduction to presentations: definition, components, and purpose.
- Create, save, open, and close presentations.
- Manage slides: insert, delete, rearrange, change layout, and modify themes.
- Navigate within the presentation and configure presentation settings.

Week 15: Advanced PowerPoint Features

- Manage slide objects: select vs edit mode, text, tables, and charts.
- Insert pictures, clip art, multimedia files, and create master slides.

	- Animate objects: customize animations and apply slide transitions. - Run, preview, and print presentations; set up slide shows.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The Teaching and Learning Strategies Used Are: - Explanation and demonstration using modern presentation tools and computer-based applications. - Interactive lectures supported by practical demonstrations in the computer lab. - Forming small discussion groups and conducting hands-on class activities during the session. - Using reflective and analytical questions such as: what, how, when, and why to enhance understanding. - Assigning practical homework tasks that require independent practice and problem-solving using computer applications.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	0.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment (40%)	Quizzes	2	10% (10)	6, 9	LO#2, #3, #4
	Assignments	1	10% (10)	4	LO#1, #3, #4
	Projects	1	10% (10)	13	All
	Report	1	10% (10)	14	All
Summative assessment (60%)	Mid-term Exam	1 hr	10% (10)	7	LO#1-4
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Materials Covered
Week 1,2	Operating systems OS's : (What is an OS's and what it can do , types of OS's , their features importance) ;Windows OS's (95 , 97 , 2000 , Me , XP , Vista , 7 , 8 , 8.1 and 10) and their characteristics ; Explain the differences between OS's and software application ; Computer power On / Off ; Using Mouse and their buttons . Looking at the Desktop ; Navigation around desktop ; Using Start Button ; Working with Application ; Using Taskbar ; Understanding Software and Hardware (their differences , importance and relationships) ; Explain how hardware can influence the OS and software and Vice Versa ; Software updates, security and bugs ; Software Ethics .
Week 3	Files & Folders : Looking at typical Window ; Moving and Sizing Window ; Using scroll Bars ; Understanding and Using My Computer and Recycle Bin ; Concepts of Drive, Folders and files (differences and importance) ; Directory and folder hierarchy and structure ; Understanding File Name and common Extensions . Folder And Files Managements (Create , Copy ,Cut , Delete , Rename , Find , and Move) ; Common Keyboard Shortcuts ; Undelete folder and files using Recycle Bin ; Display the differences between Uninstall and Undelete or Delete .
Week 4,5	Computer Hardware ; Identifying Computers (Main Frame ; Super Computers ; Mini computers ; Desktop ; Notebooks ; Laptop ; Tablet PCs ; Servers ; Hand-held or Mobile computers ; Music or Media players and Electronic Book readers) . Looking Inside a Computer (Microprocessor , System memory , Storage Systems) ; Recognizing Input / Output Devices (using Keyboard ; Pointing devices ; Microphones ; Monitor ; Printers ; Projector and Speakers) ; Understanding How it works together .
Week 6	Using Control Panel : Customizing Desktop and Display ; Changing Data and Time ; Changing Language ; Accessibility Settings . Understanding Power Options (Shut Down , Sleep , Hibernate) ; Working With Power Settings ; Identifying Mode Of Operation (Safe Mode and Normal Mode) ; Understanding User Accounts and Rights (Create New User Account ; Changing Controls ; Rights and Access)
Week 7	What is a Software (Checking System Requirements & Hardware Implications) ; Application Software (Integrated Suites, Desktop Publishing , Spreadsheets , Database , Management , Presentations , Art , Engineering , Mathematic , Statistics , Medical , Management , Content Creation , Multimedia , Entertainment and System protection); Managing Software (Install New one, Uninstall , Reinstall and Updating Software . Disk Management Programs (Disk Clean-up , Check , Optimize and Compression); What is Troubleshooting ?; Managing Hardware / Software ; Keep Copies of data ; Dealing with Viruses , Malware and Trojans; Getting windows help and support .
Week 8,9	Key Applications (Office 2013 Or 2010) What is Key Applications ? : What it can do? ; Getting started (Start & Power point) < Looking at the main screen (for Word ,Excel , Power point) , Accessing Commands and Characteristic Features , Understanding Ribbon ; Tabs ; Status Bar ; Scroll Bar ; Create files from templates , How to get Help , Manipulating Files and Data Exchange Microsoft Word: Entering and Editing Text (using editing keys) , Writing in Arabic and English ,Changing Orientation , Using Ruler , Move Around the Document Selecting Text (word , line , paragraph , pages & all pages) Save ;Close ; Open Document , Customizing

	View ,Edit Text Using (redo, undo, cut, copy & paste), Formatting text using font command ,Paint Brush and Alignment Types Spell Check and Correction
Week 10,11	Understanding Tab setting , Working with Indents , Organizing List , Working with Paragraphs , Change Line Space , Set Paragraph Space , Working with Styles &Using Quick Styles , Finding and Replacing items, Document Formatting , Page Background and Watermark , Learn how write Arabic in English direction and write English word in Arabic direction
Week 12	Page setup (change paper size , orientation , margins) ,Insert Page breaks ,Adding Page number or titles , Applying Columns and how to use it , Preview and Print document , Using Multimedia files (Insert images, objects) and manipulating them , Using Tables (create new one , insert excel table , selecting items in the table) and Formatting Tables
Week 13,14	Understanding PowerPoint & Presentation ; What dose a presentation Include ; Working with presentations (Creating ; saving ; Closing ; Opening presentations) ; Moving around in the presentation ; Managing the Slides (Inserting ; Deleting ; Rearranging Slides , Changing Layout Changing or modifying themes
Week 15	Managing Slide Objects (Using Select Versus Edit Mode ; Manipulating Text Create Tables & Charts ; Inserting Pictures or Clip art or Multimedia) ; Creating Master Slide ; Animating Objects (Customizing the animation , Applying Slide Transitions) ;Running the Slide Show and set up the Presentation; Previewing and Printing Presentation

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
	Materials Covered
Week 1,2	computing fundamentals Display OS's basics, ON \shutdown computer, log Off, log on, restart, sleep, using mouse (pointing , selecting, dragging and execution) Using desktop, moving around the desktop and using the main application Icons, using start button; application programs (install, open ,close and uninstall)
Week 3	Looking at window details (Title bar, Tools bar, Address Bar , status bar and windows' s content);expand collapse close Window; moving and resizing window
Week 4,5	Working with drive , folders and files using the listed operation ; using common short cuts (Ctrl + C; +V; +A; +S...etc.); restore folders or files dandify the hardware and explain the different types of computer using illustrations of what provided by internet
Week 6	Understanding the application software; Types and their using ; How install And Uninstall Programs and display their differences from delete; Update or reinstall the software
Week 7	Delete systematically unnecessary files, scandisk, compress, disk; Understand the most common troubleshooting of computer or software; copy files or disk, using antivirus; getting help for windows; getting online help
Week 8,9	Starting each programs & identify the main screen in details as title bar , main ribbon and theirtools ,formula bar in excel , windows content, status bar . . . etc.
Week 10,11	Writing text with some wrong words and different formatting types to perform the task of this lesson

Week 12	Indent text by hanging the first line or hanging the mine paragraph body , line space types, find and replace text, find and replace using formatted text, add background and watermark, add different styles for word and pages
Week 13,14	Create presentations, create using temple, insert slide, change slide layout ,save work
Week 15	Open previous work, insert image , clipart, worksheet, put transition time between slides, run slide show

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Shelly, G. B., & Vermaat, M. E. (2018). <i>Discovering Computers: Digital Technology, Data, and Devices</i> . Cengage Learning.	No
Recommended Texts	Parsons, J. J., & Oja, D. (2019). <i>Computer Concepts: Illustrated Introductory</i> . Cengage Learning.	No
Websites	https://www.youtube.com/watch?v=Olm22l7gae4&list=PLZZdF7TtQ_kp5Z6Q_uqn8MoOENz8BCzBF6	

3. Credits, Grading and GPA

- Credits**

Northern Technical University/ Polytechnic College-Kirkuk is following the Bologna Process with the European Credit Transfer System (ECTS). The total degree program number of ECTS is 120 for Diploma, and ECTS is 240 for Bachelor's, 30 ECTS per semester. 1 ECTS is equivalent to 25 hours student workload (SWL), including structured and unstructured workload.

- Grading**

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound works with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Polytechnic College
Building and Construction Engineering
Techniques Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Diploma and Bachelor's degree *First Level – Second Semester* *Mathematics 2* الرياضيات 2

1. Vision & Mission Statement

- **Vision Statement**

To provide first-year Building and Construction Engineering Techniques students with principles of second part of mathematics (Advanced Mathematics) like vectors, complex numbers, partial derivatives, polar and cylindrical coordinates, double and triple integrals, Matrices, with their engineering applications.

- **Mission Statement**

To empower future technical engineers and their assistants to model, analyze, and solve real-world building and construction engineering challenges from optimizing structures to calculating volumes and centroids with confidence and mathematical precision.

2. Program Specification

Program code:	TIK112	ECTS:	4
Duration:	1 st level, 2 nd Semester	Method of Attendance:	Full Time
Subject Lecturer:	Prof. Dr. Qais F. Hasan	Total Weekly Hours:	3

The module Mathematics 2 is a foundational component specified within this document. Its role and design are directly derived from the program's core objectives, which are to produce technically proficient graduates capable of solving practical problems in the building and construction engineering. The specification mandates this module to ensure all students acquire the essential analytical tools of calculus. This is not merely an academic exercise; the course is purposefully designed to underpin key engineering concepts. Graduates of this program will be well-positioned to pursue careers in building services design, facility management, construction, and consultancy, or to continue their studies in specialized or advanced engineering fields. The program also supports national and global development goals by fostering innovation, sustainability, and professional responsibility in the next generation of engineers.

Module Information					
معلومات المادة الدراسية					
Module Title	MATHEMATICS I			Module Delivery	
Module Type	BASIC			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	TIK 112				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		1	Semester of Delivery		1
Administering Department		Building and Construction Engineering Techniques Department	College	Polytechnic College/ Kirkuk	
Module Leader	Prof. Dr. Qais Fadhil Hasan		e-mail	dr.qaishasan@ntu.edu.iq	
Module Leader's Acad. Title		Professor	Module Leader's Qualification		Ph.D. in civil engineering
Module Tutor	None		e-mail	None	
Peer Reviewer Name		None	e-mail	None	
Review Committee Approval		01/09/2025	Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	1. Understand the fundamental concepts of vectors, complex numbers, partial derivatives, polar and cylindrical coordinates, double and triple integrals, Matrices, and their applications in solving real-world engineering problems. 2. Develop the ability to analyze and interpret mathematical functions using graphical, and analytical methods. 3. Apply all the above knowledge techniques to solve different problems in physics, engineering, and economics.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	LO#1: Understand the concepts of vectors, complex numbers, and partial derivatives, with their applications in solving different engineering problems. LO#2: Understanding the polar and cylindrical coordinates and their applications in solving real-world engineering problems LO#3: Understanding the double and triple integrals with their engineering applications especially in area, surface of revolution, and volume calculations. LO#4: Understand the concept of Matrices and their addition, subtraction, multiplication and inverse, with the engineering applications in real world problems. LO#5: Solving the system of simultaneous equations using Gauss Elimination techniques and its application in solving different engineering problems.		
Indicative Contents المحتويات الإرشادية	• Weeks 1-2: Review of differentiation and integration techniques ○ Introduction to differentiation. ○ Review to the most important integration techniques. • Weeks 3-5: Matrices ○ Principles of matrices, including addition, subtraction, and multiplication. ○ Matrix inversion method with their physical applications. ○ Using matrices in solving system of simultaneous equations. • Weeks 6-8: Vectors ○ Dot product of two vectors. ○ Cross product of two vectors. ○ Applications of dot and cross product in solving engineering problems. • Weeks 9-10: Line and plane equations ○ Equation of a line in space. ○ Equation of a plane. • Week 11: Complex numbers ○ Introduction to complex numbers. ○ Properties of complex numbers. ○ Fundamental Theorem of Calculus. ○ Basic integration techniques: power rule, standard integrals.		

	• Week 12: Cartesian and polar coordinates ○ Introduction to cartesian and polar coordinates. ○ Relations between cartesian and polar coordinates. • Week 13: Partial derivatives ○ Partial derivatives of functions of two or more independent variables. ○ Application of partial derivatives. • Weeks 14-15: Double and triple integrals ○ Understanding double and triple integration techniques. ○ Calculating surface area of revulsions and volumes. ○ Solving engineering problems for surfaces and volumes
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The Strategies used are: • Explanation using modern presentation tools. • Lecture method using an interactive whiteboard. • Forming discussion groups and classwork within the lecture. • Reflective questions such as: what, how, when, and why. • Homework assignments requiring self-explanations based on causal considerations.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.47
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment (40%)	Quizzes	5	20% (20)	3, 6, 8, 9, 11	LO#2, #3, #4, #5
	Assignments	2	10% (10)	8, 13	LO#1, #3, #4, #5
	Projects	1	5% (5)	13	All
	Report	1	5% (10)	14	All
Summative assessment (60%)	Mid-term Exam	1 hr	10% (10)	7	LO#1-3
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Materials Covered
Week 1	Review of Differentiation and Integration
Week 2	Introduction to Matrices
Week 3	Determinant and Inverse of Matrices
Week 4	Solving Simultaneous Equations by Matrices
Week 5	Vector Analysis and Principles
Week 6	Dot Product of Two Vectors
Week 7	Cross Product of Two Vectors
Week 8	Applications of Dot Product and Cross Product
Week 9	Equation of a Line in Space
Week 10	Equation of a Plane
Week 11	Complex Numbers and Properties
Week 12	Cartesian and Polar Coordinates
Week 13	Partial Derivatives of Functions
Week 14	Double and Triple Integrals
Week 15	Applications of Double and Triple Integrals

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
	Materials Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"CALCULUS", by George. B. Thomas	Yes
Recommended Texts	"Advanced Engineering Mathematics", by Erwin Kreyszig.	Yes
Websites	https://tutorial.math.lamar.edu/classes/de/la_matrix.aspx	

3. Credits, Grading and GPA

• Credits

Northern Technical University/ Polytechnic College-Kirkuk is following the Bologna Process with the European Credit Transfer System (ECTS). The total degree program number of ECTS is 120 for Diploma, and ECTS is 240 for Bachelor's, 30 ECTS per semester. 1 ECTS is equivalent to 25 hours student workload (SWL), including structured and unstructured workload.

• Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound works with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Polytechnic College
Building and Construction Engineering
Techniques Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Diploma and bachelor's degree *First Level – First Semester* *Construction materials & Asphalt* مواد البناء والأسفلت

1. Mission & Vision Statement

- **Vision Statement**

To be a leading course in preparing competent and innovative civil engineering professionals specialized in construction materials and asphalt technology, capable of selecting, designing, and evaluating materials that ensure safety, durability, performance, and sustainability in buildings and transportation infrastructure.

- **Mission Statement**

The mission of the Construction Materials and Asphalt course is to provide students with a solid theoretical foundation and practical skills for the characterization, testing, selection, and design of construction and asphalt materials. The course aims to enhance students' ability to evaluate material performance, ensure quality control, apply sustainability principles, and adopt modern technologies in building and pavement engineering in accordance with recognized engineering standards and professional practice.

2. Program Specification

Program code:	CITB126	ECTS:	4
Duration:	1 st level, 2 nd Semester	Method of Attendance:	Full Time

This course provides a comprehensive understanding of the properties, classification, behavior, and selection of conventional and advanced construction materials, with particular emphasis on asphalt materials and pavement technology. The course highlights material performance, mix design principles, durability assessment, sustainability considerations, and practical applications in building structures and transportation infrastructure projects. Laboratory sessions are integrated into the course to provide hands-on experience in testing concrete, aggregates, bituminous

materials, and asphalt mixtures, enabling students to evaluate material quality and performance according to relevant engineering standards.

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

- Understand the physical, chemical, and mechanical properties of major construction and asphalt materials.
- Evaluate materials and asphalt mixtures in terms of strength, durability, performance, and sustainability.
- Select appropriate construction and pavement materials based on structural design requirements, traffic loading, and environmental conditions.
- Perform standard laboratory tests on aggregates, cement, concrete, bitumen, and asphalt mixtures, and accurately interpret the results.
- Recognize recent innovations in construction and asphalt materials, including green materials, recycled aggregates, warm-mix asphalt, and sustainable pavement technologies.

Module Information					
معلومات المادة الدراسية					
Module Title	Construction Materials			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CITB126				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGx111	Semester of Delivery		1
Administering Department		Building and Construction Engineering Techniques Department	College	Polytechnic College/ Kirkuk	
Module Leader	Diana Hussein Neamat		e-mail	diana.hussein@ntu.edu.iq	
Module Leader's Acad. Title		Assist. lecturer	Module Qualification	Leader's	M.Sc. in civil engineering
Peer Reviewer Name			e-mail		
Review Committee Approval		15/02/2026	Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	1. Introducing students to the physical, chemical, and mechanical properties of construction and asphalt materials, as well as their production methods. 2. Familiarizing students with modern and advanced alternatives in construction materials and asphalt technologies, including environmentally friendly and recycled materials. 3. Introducing students to modern techniques in the production and manufacturing of construction materials and asphalt mixtures in accordance with recognized engineering standards. 4. Preparing students to perform standard laboratory tests on construction and asphalt materials to verify their compliance with technical specifications. 5. Enabling students to evaluate the suitability of materials for various construction applications in a manner that ensures strength, durability, safety, and economy. 6. Developing students' ability to analyze laboratory test results and make appropriate engineering decisions regarding material quality and approval.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the types of construction and asphalt materials used in buildings, structures, and pavements, and understand their fundamental properties. 2. Understand the adopted national and international standard specifications for construction and asphalt materials and the requirements for their use in engineering projects. 3. Perform standard laboratory tests for construction materials (cement, aggregates, concrete), bituminous materials, and asphalt mixtures in accordance with approved procedures. 4. Analyze laboratory and field test results and evaluate the compliance of materials with standard specifications and quality requirements. 5. Determine the suitability of materials for construction applications and select appropriate types based on design requirements, environmental conditions, and traffic loads. 6. Understand methods of mixing and designing concrete and asphalt mixtures and the principles used in determining component proportions. 7. Recognize industrial, composite, and advanced materials in construction and asphalt engineering, including sustainable and recycled materials. 8. Apply principles of quality control and quality assurance to the quantities and properties of construction materials during project execution. 9. Supervise field testing procedures and monitor implementation processes to ensure materials meet the required performance standards. 10. Calculate the required quantities of construction materials according to bills of quantities and construction drawings.		

	11. Address execution problems resulting from the use of non-compliant materials and propose appropriate technical solutions to ensure structural safety.
Indicative Contents المحتويات الإرشادية	1. Enable students to identify and analyze the physical and mechanical properties of conventional construction materials and commonly used asphalt materials in building and pavement projects. 2. Enhance students' ability to select appropriate materials and mixtures that meet structural performance, durability, and sustainability requirements under specific design and environmental conditions. 3. Prepare students to perform the role of laboratory testing technicians or field testing supervisors through training on standard laboratory and field testing procedures for construction and asphalt materials. 4. Develop students' scientific and practical skills to support the establishment of a solid professional career based on academic knowledge and sound engineering practice in the fields of construction and infrastructure.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lecture method using a whiteboard and a data show. 2. Forming working groups during the laboratory sessions to conduct the desired tests. 3. Preparation of seminars by students under the supervision of their lecturer. 4. Giving students assignments (H.W) to evaluate the students benefit from the lesson. 5. Conducting a scientific technical visit to an under construction visit Forming groups to conduct a project during the course. Attending online (web-based) sessions.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	20% (20)	3, 6, 8, 9, 11,13	LO #1 - #2, LO #3 - #4,
	Assignments	5	10% (10)	4, 6, 8, 11, 13	LO #1 - #2, LO #3 - #4,
	Report	12	10% (10)	All	All
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO#1-4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week الاسباع	Materials Covered
Week 1	• Binding materials and their types; non–moisture-resistant binding materials (such as gypsum), including their properties and manufacturing methods.
Week 2	• Moisture-resistant materials (cement mortar, cement–lime mortar), lime, its manufacturing process, and its properties.
Week 3	• Gypsum products: their types, properties, and types of secondary ceiling materials.
Week 4	• Finishing materials: tiles and slabs, their types, manufacturing methods, application methods, and joints.
Week 5	• Wood: its origin, commonly used types, methods of use, wood drying techniques, and wood defects.
Week 6	• Metals (ferrous and non-ferrous materials) and their uses in buildings; iron, its manufacturing methods, types, and applications.
Week 7	• Damp-proofing materials and the reasons for their use; highly moisture-resistant materials, their types, manufacturing methods, and applications.
Week 8	• Semi-flexible and flexible damp-proofing materials, their types, applications, manufacturing methods, and liquid waterproofing materials.
Week 9	• Epoxy: definition, properties, types, and applications.
Week 10	• Thermal insulation materials and acoustic insulation materials.
Week 11	• Paints and glass.
Week 12	• Overview of asphalt materials and their properties.
Week 13	• Types of asphalt and their uses in construction works.
Week 14	• Bituminous mastic: applications, properties, and standard tests.
Week 15	• Bituminous felt: properties, applications, and field tests.
Week 16	• Preparatory week before the final examination.

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي العملي

	Materials Covered
Week 1	The ability to identify laboratory equipment, apply occupational safety instructions, and conduct gypsum tests such as fineness, setting time, and specimen preparation.
Week 2	The ability to prepare cement mortar and cement–lime mortar, perform workability and compressive strength tests, and analyze the results.
Week 3	The ability to conduct physical tests on gypsum products and secondary ceiling materials, such as density and water absorption, and evaluate their suitability for use.
Week 4	The ability to perform tests on tiles and slabs (water absorption, breaking strength), apply proper fixing methods, and treat joints correctly.
Week 5	The ability to measure moisture content and density of wood, diagnose defects, and propose appropriate treatment and drying methods.
Week 6	The ability to perform tensile and hardness tests on metals, identify types of steel, and understand corrosion protection methods.
Week 7	The ability to apply damp-proofing materials and conduct permeability and water absorption tests for rigid and semi-flexible waterproofing materials.
Week 8	The ability to implement practical applications of liquid bituminous materials and evaluate adhesion and flexibility properties.
Week 9	The ability to prepare and apply epoxy materials and test adhesion and compressive resistance of treated surfaces.
Week 10	The ability to conduct tests on thermal and acoustic insulation materials and interpret the results practically.
Week 11	The ability to test paints in terms of viscosity and drying time, and assess the resistance of glass to impact and breakage.
Week 12	The ability to perform standard tests on asphalt materials such as penetration, softening point, and viscosity in accordance with approved specifications.
Week 13	The ability to design and prepare an asphalt mix using the Marshall method, perform stability and flow tests, and analyze the results.
Week 14	The ability to conduct tests on asphalt mastic and evaluate its physical and mechanical properties.
Week 15	The ability to carry out field tests for bituminous felt and bituminous waterproofing layers and assess their performance efficiency.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	كتاب المواد الانشائية (جلال بشير سرسم- سعيد عبدالعالي)	yes
Recommended Texts	كتاب الاسفلت العملي, لؤي علي طه, المعهد التقني-الموصل, مؤيد عبدالرحيم ايوب, المعهد التقني-الموصل	No
Websites	https://www.slideshare.net/ www.buildforless.co.uk https://www.youtube.com	

3. Credits, Grading, and GPA

- **Credits**

Northern Technical University/ Polytechnic College-Kirkuk is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 120 for the Diploma, and 240 ECTS for Bachelor's, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs. student workload, including structured and unstructured workload.

- **Grading**

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
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	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound works with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
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ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Polytechnic College
Building and Construction Engineering
Techniques Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Diploma and Bachelor's degree *First Level – Second Semester* *Surveying I*

1. Mission & Vision Statement

- *Vision Statement*

The mission of this course is to provide students with fundamental knowledge and practical skills in surveying, enabling them to measure, analyze, and represent land data accurately using standard surveying instruments and methods in engineering applications.

- *Mission Statement*

The vision of this course is to prepare competent engineering graduates capable of applying modern surveying techniques with accuracy and professionalism to support sustainable infrastructure development and engineering projects.

2. Program Specification

Program code:	CITB 105	ECTS:	6
Duration:	1 st level, 2 nd Semester	Method of Attendance:	Full Time

The Surveying module is a core component of the engineering program, aimed at providing students with fundamental theoretical knowledge and practical skills in land measurement, data collection, and spatial analysis for engineering purposes. The course emphasizes the use of standard surveying instruments, field techniques, accuracy, and error control, forming a solid

foundation for construction, infrastructure, and site development projects. It also prepares students for professional engineering practice and supports their progression to advanced studies in civil and surveying-related engineering fields.

Module Information					
معلومات المادة الدراسية					
Module Title	SURVEYING I			Module Delivery	
Module Type	BASIC			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	CITB 105				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		1	Semester of Delivery		2
Administering Department		Building and Construction Engineering Techniques Department	College	Polytechnic College/ Kirkuk	
Module Leader	Asst. Lect. Pinar Salahaldin Hussein		e-mail	pinar-salahaldin@ntu.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification		Master of Civil Engineering
Module Tutor	Asst. Lect. Janan Oral Hashim		e-mail	janan-oral@ntu.edu.iq	
Module Tutor	Asst. Lect. Yashar Hussein Ali		e-mail	yashar@ntu.edu.iq	
Peer Reviewer Name		None	e-mail	None	
Review Committee Approval		01/09/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To introduce students to the fundamental principles of surveying and its applications in civil engineering. 2. To develop students' ability to perform surveying-related calculations accurately for engineering purposes. 3. To train students in the proper use of different surveying instruments used in civil engineering works. 4. To enable students to prepare and interpret engineering maps and drawings for civil engineering projects. 5. To qualify students to plan, supervise, and execute civil engineering projects efficiently and in accordance with professional standards.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	LO#1: Understand the fundamental concepts, principles, and terminology of surveying used in civil engineering applications. LO#2: Measure horizontal and vertical distances, elevations, and angles accurately using standard surveying methods and instruments. LO#3: Perform surveying calculations related to levels, areas, volumes, and coordinates required for civil engineering works. LO#4: Use and operate surveying instruments (such as level, tape, compass, and related tools) correctly and safely in field and laboratory practices. LO#5: Prepare, read, and interpret surveying maps, plans, contour maps, and engineering drawings for civil engineering projects. LO#6: Apply surveying techniques to plan, supervise, and execute civil engineering projects while considering accuracy, safety, and professional standards.
Indicative Contents المحتويات الإرشادية	• Weeks 1–2: Fundamentals of Surveying and Distance Measurement - o Definition of surveying, its fields, branches, applications, and units of measurement. - o Surveying instruments: tapes, arrows, ranging rods, field book, and report writing. - o Measurement of horizontal distances on level and uneven ground using approximate methods and tape measurement. • Week 3: Scales and Setting Out Works - o Types of scales (numerical, graphical, longitudinal, and grid scales). - o Setting out and dropping perpendiculars. - o Practical exercises on building layout and centerline setting out. • Week 4: Chain Surveying and Mapping - o Chain surveying of an area. - o Field data collection and preparation of maps to a specified scale. • Weeks 5–6: Levelling Fundamentals and Computations - o Levelling instruments: types, setup, and levelling staffs. - o Longitudinal levelling. - o Computation of reduced levels using Height of Instrument and Rise and Fall methods.

	• Week 7: Advanced Levelling and Accuracy - o Double levelling and reciprocal levelling. - o Inverted levelling and obstacles in levelling. - o Sources of errors, degree of accuracy, permissible error, and error adjustment. • Week 8: Profiles and Formation Lines - o Longitudinal and cross-sections. - o Plotting profiles and cross-sections. - o Formation (grade) line and gradient calculation. • Week 9: Area Computation Methods - o Calculation of land and cross-section areas using graphical methods, mathematical formulas, and coordinate methods. • Week 10: Earthwork and Instrument Testing - o Calculation of earthwork quantities (cut and fill). - o Testing and adjustment of levelling instruments (two-peg test) and determination of instrument constant. • Weeks 11–12: Contouring and Topographic Mapping - o Contour lines: properties, contour interval, and contour spacing. - o Field contouring by direct and grid (network levelling) methods. - o Contour plotting by calculation and interpolation. - o Preparation of a topographic map. • Week 13: Planimeter and Compass Surveying - o Measurement of irregular areas using planimeter. - o Compass surveying, bearings, local attraction, and closed traverse survey with corrections. • Week 14: Horizontal Curves - o Horizontal curves: types and elements of simple circular curves. - o Design and setting out of simple circular curves using tape methods. • Week 15: Vertical Curves and Final Review - o Computation and setting out of vertical curve elevations. - o General review and practical assessment.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The Strategies used are: • Modern presentation tools Explaining surveying concepts using presentations and visual aids to simplify understanding. • Interactive lecture Delivering lectures using a whiteboard to explain surveying calculations and drawings step by step. • Discussion and class activities Engaging students in discussions and class activities to solve surveying problems and interpret measurements. • Reflective questioning Using reflective questions (what, how, when, and why) to enhance analytical understanding of surveying methods.

• Homework with self-explanation Assigning homework that requires students to explain surveying procedures and justify method selection.			
Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment (40%)	Quizzes	1	10% (10)	6	LO #1, #2, #3
	Assignments	1	10% (10)	12	LO #2,#4,#5 and #6
	Projects/Lab. Report	1	10% (10)	Continuous	All
	Report	1	10% (10)	Continuous	All
Summative assessment (60%)	Mid-term Exam	1hr	10% (10)	7	LO #1 - #6
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Materials Covered
Week 1	Introduction to surveying: definition, fields, branches, applications, units of measurement, and horizontal distance measurement on level and uneven ground.
Week 2	Horizontal distance measurement on uniformly sloping ground, including methods based on elevation difference, slope gradient or angle, setting out perpendiculars, and overcoming obstacles.
Week 3	Chain surveying and types of offsets during surveying operations.
Week 4	Levelling: definitions, objectives, and computation of point elevations using the Height of Instrument method with examples.
Week 5	Computation of point elevations using the Rise and Fall method with solved examples.
Week 6	Double levelling, effects of earth curvature and atmospheric refraction, inverted levelling, and reciprocal levelling with examples.

Week 7	Sources of errors in levelling, degree of accuracy, permissible error, and longitudinal profiles with plotting examples.
Week 8	Cross-sections, determination of cross-section elevations, plotting of cross-sections, and grade line (formation line) and its slope calculations.
Week 9	Calculation of areas of land and cross-sections using graphical methods, mathematical formulas, coordinates, and the use of a planimeter.
Week 10	Calculation of earthwork volumes (cut and fill), testing and adjustment of the level instrument, and levelling adjustment.
Week 11	Contour lines: properties, contour interval, factors affecting contour interval, contour spacing, and contouring by direct and indirect methods.
Week 12	Plotting of contour lines using calculation and interpolation methods, slopes, calculation of reservoir volumes, and drawing sections from contour maps.
Week 13	Bearings and deflections, whole-circle and reduced bearings, local attraction, and compass surveying with practical exercises.
Week 14	Horizontal curves: types (simple circular and compound curves), elements of a simple circular curve, design equations, and curve setting out.
Week 15	Vertical curves and the design of vertical curves.

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

	Materials Covered
Week 1	Introduction to surveying instruments, tape types and readings, use of arrows and ranging rods, field book and report writing, and horizontal distance measurement.
Week 2	Scales (numerical and graphical) with exercises on setting out and dropping perpendiculars for a simple building layout.
Week 3	Chain surveying of an area and preparation of a map to a specified scale.
Week 4	Levelling instrument, its types and setup, levelling staffs and readings, and longitudinal levelling using the Height of Instrument method.
Week 5	Practical exercises on computing elevations using the Height of Instrument and Rise and Fall methods.
Week 6	Double levelling and reciprocal levelling with adjustment of reduced levels.
Week 7	Exercises on inverted levelling, accuracy, permissible error, and error correction.
Week 8	Longitudinal and cross-sections, plotting profiles, and determination of formation line and its gradient.
Week 9	Practical exercises on calculation of land and cross-section areas using graphical, mathematical, and coordinate methods.
Week 10	Testing and adjustment of the levelling instrument (two-peg test) and determination of instrument constant.

Week 11	Field contouring using the direct method and grid (network levelling) method.
Week 12	Contour plotting using calculation and interpolation methods and a topographic mapping project.
Week 13	Use of planimeter for irregular areas, compass surveying, closed traverse survey, correction of bearings, and computation of internal angles.
Week 14	Setting out simple horizontal curves using tape only, with practical exercises on simple circular curve design and plotting.
Week 15	Practical exercise on computation of vertical curve elevations and setting out on the ground.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	كتاب هندسة المساحة – د. عباس زيدان خلف	No
Recommended Texts	Charles D. Ghilani & Paul R. Wolf(2015), <i>Elementary Surveying: An Introduction to Geomatics</i> ,14th Edition	No
Websites	https://www.youtube.com/watch?v=2bZTNGheX3o&list=PLm_MSClsnwm-nXQO0YD7jbz0QTbqxx9AP	

3. Credits, Grading and GPA

- Credits**

Northern Technical University/ Polytechnic College-Kirkuk is following the Bologna Process with the European Credit Transfer System (ECTS). The total degree program number of ECTS is 120 for Diploma, and ECTS is 240 for Bachelor's, 30 ECTS per semester. 1 ECTS is equivalent to 25 hours student workload (SWL), including structured and unstructured workload.

- Grading**

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound works with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded

(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي