Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mechanics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22011**				
ECTS Credits	**10**				
SWL (hr/sem)	**250**				
Module Level	UG1		**Semester of Delivery**	1	
Administering Department	**Technical building and Construction**		**College**	**Technical College/ Al Mussaib**	
Module Leader	Dr. Ammar Adil Abdulnabe		**e-mail**	ammaralbakry@atu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	PHD in Mechanical engineering	
Module Tutor			**e-mail**		
Peer Reviewer Name	Dr.Mohamed Hamza		**e-mail**	mohamed.mussa@atu.edu.iq	
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 Objectives أهداف المادة الدراسية	1. Teaching the student, the fundamentals of engineering mechanics (Static's & Dynamics) in the engineering applications, the loads analysis, resultants. 2. Equilibrium in 2-D and 3-D, moments and couples. 3. First and second moment of inertia, motion of particles, and their theories.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Teaching the student, the fundamentals of engineering mechanics (Static's &

	2. Dynamics) in the engineering applications, the loads analysis, resultants, 3. equilibrium in 2-D and 3-D, moments and couples. 4. first and second moment of inertia, motion of particles, and their theories. 5. Equipment and machinery design. 6. Inspection, installation, operation, maintenance and repair of all kinds of devices, turbocharged machines and equipment.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A -</u> Introduction, Fundamentals concepts, Load Analysis & Vectors, Moments, Couples, Resultant of Force Systems, Equivalent Systems of Forces. <u>Part B -</u> Equilibrium of Rigid Bodies , Centroids of Area, Friction, Center of Gravity, Work, Moment of Inertia.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The primary 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

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	157	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	10.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**250**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Project	1	10% (10)	15	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	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	Introduction, Fundamentals concepts
Week 2	Load Analysis & Vectors
Week 3	Moments
Week 4	Couples
Week 5	Resultant of Force Systems
Week 6	Resultant of Force Systems
Week 7	Equivalent Systems of Forces
Week 8	Equilibrium of Rigid Bodies
Week 9	Trusses
Week 10	Friction
Week 11	Centroids of Area
Week 12	Center of Gravity
Week 13	Work
Week 14	Moment of Inertia
Week 15	Preparing for the final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	J. L. Meriam L. G. Kraige	Yes
Recommended Texts	John Wiley & Sons, Inc	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	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.

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Drawing**			**Module Delivery**	
Module Type	**Core**			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22012**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department		Technical building and Construction	**College**	Technical College/ Al Mussaib	
Module Leader	Hayder saad Oleiwi		**e-mail**	Hayder.rashid@atu.edu.iq	
Module Leader's Acad. Title		Assist. Lecturer	**Module Leader's Qualification**		M.Sc in mechanical engineering
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name		**Dr. Ammar Adel**	**e-mail**	ammaralbakry@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	This course aims to introducing the fundamentals of engineering drawing to the student so that he can be qualified to express his thoughts, draw and execute the projects related to civil engineering.
Module Learning Outcomes	1. A. Knowledge Outcomes: Upon completion of the course, students should be able to: 2. Get information about the important tools for engineering drawing. 3. Learning how to draw the shapes, angels and lines and others which is essential for engineer

	4. Understand the main idea of using dimension for engineering drawing 5. Familiarize with different drawing equipment, technical standards and procedures for construction of geometric figures. 6. Explain the principle of projection and sectioning 7. Understand the intersection, development of surface of body and enclosure Learning the main idea from assembly and detail drawing 8. Student basic knowledge of technical drawings professions and means of communications to others. 9. Ability to draw three dimension objects on the paper. 10. Develop student's imagination and ability to represent the shape size and specifications of physical objects 11. Students will become familiar with office practice and standards. 12. Students will become familiar with Auto Cad two dimensional drawings. Students will develop good communication skills and team work.
Indicative Contents	Introduction to defined the engineering drawing and auto CAD soft wear [6 hrs.] Windows setting ,limits ,grids , snap , object snap [6 hrs.] Draw menu, line, polyline ,ray ,constriction line , polygon [6 hrs.] Circle , arc ,rectangle ,ellipse [6 hrs.] Modify menu [6 hrs.] Dimension menu , hatching [6 hrs.] Perspective ,ortho graphic projection [6 hrs.] The first and the third angle projection method [6 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based 1. Exams 2. Student feedback 3. Body language 4. Home work.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	78	**Structured SWL (h/w)**	5.2
Unstructured SWL (h/sem)	22	**Unstructured SWL (h/w)**	1.5
Total SWL (h/sem)	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3,5,6,10	LO #1,2,…..10
	Assignments	2	10% (10)	7, 8	LO # 8
	Projects / Lab.	1	10% (10)	Continuous	
	report	1	10% (10)	13	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	LO # 1-12
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to defined the engineering drawing and auto CAD soft wear
Week 2	Introduction to defined the engineering drawing and auto CAD soft wear
Week 3	Windows setting ,limits ,grids , snap , object snap
Week 4	Draw menu, line, polyline ,ray ,constriction line , polygon
Week 5	Circle , arc ,rectangle ,ellipse
Week 6	Circle , arc ,rectangle ,ellipse
Week 7	Modify menu
Week 8	Modify menu
Week 9	Dimension menu , hatching
Week 10	Dimension menu , hatching
Week 11	Perspective ,ortho graphic projection
Week 12	Perspective ,ortho graphic projection
Week 13	The first and the third angle projection method
Week 14	The first and the third angle projection method
Week 15	Preparing to final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Recommended Texts	1- Engineering Drawing (plan and solid geometry) N.D.Bhatt 2- Auto CAD 2009 , 2d training manual \ K.S.Kurland 3- الرسم الهندسي \ هاشم عبود العيسوي ويوسف حسين الراضي 4- الهندسة الوصفية \ د يوسف نيقولا	No
Recommended Texts		
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.

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22013**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department		**Technical building and Construction**	**College**	**Technical College/ Al Mussaib**	
Module Leader	Ahlam Obaid Hassan		**e-mail**	tcm.ahlam@atu.edu.iq	
Module Leader's Acad. Title		Assist lecturer	**Module Leader's Qualification**		M.Sc in Structural-Civil Engineering
Module Tutor			**e-mail**		
Peer Reviewer Name		Prof.Dr. Nabeel Hameed	**e-mail**	Inm.nbl@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	To teach students the principles of mathematics necessary for undergraduate study and to achieve the desired goal which is the use of the principles and fundamentals of mathematics in solving problems related to engineering in general and civil engineering in particular and linking these principles with other subjects.
Module Learning Outcomes	Upon completion of the course, students should be able to: 1. Skill of thinking 2. Skill of conclusion and evaluation 3. Skill analysis 4. The skill of observation 5. The student's ability to excel and cognitive perception to diagnose theories and general 6. Principles in the study. 7. Future planning to link, what students learn in daily life. 8. Practice different patterns in mathematical proofs. 9. Self-reliance in getting to the idea and how to manage solving the scientific problem. 10. Statistical concepts and applications in civil engineering. 11. Critical Thinking 12. Analytical methods in solving problems 13. Identify operational problems to carry out civil engineering studies and evaluate alternative solutions.
Indicative Contents	Introduction to engineering mathematics, study of the some mathematics preliminaries, course description, student learning outcomes, course outline (Syllabus), grading units, typical grading and references of the course. [3 hrs.] Limit & Continuity [4 hrs.] Slope of the straight line , Slope of the curve [3 hrs.] Derivatives of algebraic functions, Chain rule, Second and higher order derivative, Application in mechanics [3 hrs.] Trigonometric functions [3 hrs.] Derivatives of trigonometric functions [3 hrs.] Inverse of trigonometric function , The exact value of trigonometric functions Derivatives of inverse of trigonometric functions [3 hrs.] Logarithmic and exponential functions , Logarithmic method in derivatives [3 hrs.] Derivative of logarithmic and exponential functions , Derivative of au , loga u [3 hrs.] Hyperbolic functions, Relation between the hyperbolic functions and exponential functions [3 hrs.] Derivative of hyperbolic functions [3 hrs.]

	Applications of derivatives , Rate of change [3 hrs.] Integration of algebraic functions [3 hrs.] Applications of indefinite integration and finite integration [3 hrs.] Integration of trigonometric functions and inverse Trigonometric functions [3 hrs.] Integration of lnx,u-1,au,eu [3 hrs.] Methods of integration [4 hrs.] Area by calculus (Rectangular method ,Trapezoidal rule, Simpson rule) [4 hrs.] Area under curve , Area between two curves [4 hrs.] Volume by revolution (Disk strip ,Washer strip, Shell strip) [4 hrs.] Length of the plane curve , Area of surface of revolution [4 hrs.] Matrices (Inverse Matrix) [4 hrs.] Matrices (Grammar Method) [4 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1. Exams. 2. Student feedback. 3. Preparation of scientific reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	93	**Structured SWL (h/w)**	6.2
Unstructured SWL (h/sem)	107	**Unstructured SWL (h/w)**	7.1
Total SWL (h/sem)	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3 ,10	
	Seminar	1	10% (10)	6	
	Assignments	2	10% (10)	7, 8	
	Tutorial	1	10% (10)	11	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Limits
Week 2	Slope of the straight line , Slope of the curve
Week 3	Derivatives of algebraic functions , Chain rule , Second and higher order derivative , Application in mechanics, Trigonometric functions
Week 4	Derivatives of trigonometric functions Inverse of trigonometric function , The exact value of trigonometric functions
Week 5	Derivatives of inverse of trigonometric functions Logarithmic and exponential functions , Logarithmic method in derivatives
Week 6	Logarithmic and exponential functions , Logarithmic method in derivatives Derivative of logarithmic and exponential functions , Derivative of a^u , $\log_a u$
Week 7	Hyperbolic functions , Relation between the hyperbolic functions and exponential functions Derivative of hyperbolic functions
Week 8	Applications of derivatives , Rate of change Integration of algebraic functions
Week 9	Applications of indefinite integration and finite integration Integration of trigonometric functions and inverse Trigonometric functions
Week 10	Integration of trigonometric functions and inverse Trigonometric functions, Integration of $\ln x, u^{-1}, a^u, e^u$
Week 11	Methods of integration
Week 12	Area by calculus (Rectangular method ,Trapezoidal rule, Simpson rule) Area under curve , Area between two curves
Week 13	Volume by revolution (Disk strip ,Washer strip, Shell strip)
Week 14	Length of the plane curve , Area of surface of revolution Matrices (Inverse Matrix) Matrices (Grammar Method)
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1.Calculus "Seven Edition" By H. Anton , I.Bivens , S. Davis 2.Advanced Engineering Mathematics , By C.R. Wylie , 3.Calculus , By Thomas	
Recommended Texts		
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.

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Physics**			**Module Delivery**	
Module Type	**Support Learning activity**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22014**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		**UGI**	**Semester of Delivery**		**1**
Administering Department		**Technical building and Construction**	**College**	**Technical College/ Al Mussaib**	
Module Leader	**dr.Haider fawzi mahmood**		**e-mail**	**haider.fawzi@atu.edu.iq**	
Module Leader's Acad. Title			**Module Leader's Qualification**	**Ph.D**	
Module Tutor	**None**		**e-mail**	**E-mail**	
Peer Reviewer Name		**Maher Abd Al Ameer**	**e-mail**	**maher Kadim@atu.edu.iq**	
Scientific Committee Approval Date			**Version Number**	**1.0**	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	**After successful completion of this course the student will be able to understand:** **1. student's knowledge of Units, Physical Quantities and Vectors.** **2. Demonstrates knowledge of Standards and Units, Utilization of Units and conversions.** **3. definition of linear motion equation .** **4. He will be able compute 2-D and 3-D Motion.** **5. definition of Newton's Law.** **6. Implements the Applications of Newton's Law.** **7. knowledge and calculation of work and Kinetic Energy.** **8. He will be able calculation of the Potential Energy and Conservation of**

	Energy knowledge and calculation of the Momentum, Impulse and Collisions. **9. definition of and calculation of the Rotational motion of Rigid Bodies and calculation of the Rotational Kinematics.**
Module Learning Outcomes	**The ability to convert units in various systems Distinguish between different physical quantities and the standards that define these quantities The ability of the student to solve the problems of the linear equation and the two- and three-dimensional kinetic equations. Implementing applied problems on Newton's law and solving potential energy and momentum issues And how to solve the problems of rotational motion of solid bodies**
Indicative Contents	**Preparing the student to continue self-learning, acquiring skills and developing his potential**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Assessment is based on** **4. Exams. 2 Student feedback. 3 Homework's**

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	**63**	**Structured SWL (h/w)**	**4.2**
Unstructured SWL (h/sem)	**37**	**Unstructured SWL (h/w)**	**2.5**
Total SWL (h/sem)	**100**		

Module Evaluation تقييم المادة الدراسية					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**2**	**10% (10)**	**3,5,6,10**	
	Assignments	**2**	**10% (10)**	**7, 8**	
	Projects / Lab.	**1**	**10% (10)**	**Continuous**	
	report	**1**	**10% (10)**	**13**	
Summative assessment	**Midterm Exam**	**2 hr**	**10% (10)**	**12**	
	Final Exam	**3hr**	**50% (50)**	**16**	
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
Week	**Material Covered**
Week 1	1**Demonstrates knowledge about the introduction and Scope of Physics 1, Units, Physical Quantities and Vectors**
Week 2	**Demonstrates knowledge of Standards and Units, Utilization of Units and conversions.**
Week 3	**Demonstrates knowledge and implementation of the Linear Motion.**
Week 4	**Demonstrates knowledge and compute 2-D and 3-D Motion.**
Week 5	**Demonstrates knowledge about Newton's Law.**
Week 6	**Review and solution of the homework.**
Week 7	**Demonstrates knowledge and calculation of work and Kinetic Energy.**
Week 8	**Demonstrates knowledge and calculation of work and Kinetic Energy.**
Week 9	**Demonstrates knowledge and calculation of the Potential Energy and Conservation of Energy.**
Week 10	**Demonstrates knowledge and calculation of the Momentum, Impulse and Collisions.**
Week 11	**Demonstrates knowledge and calculation of the Rotational motion of Rigid Bodies.**
Week 12	**Demonstrates knowledge and calculation of the Rotational Kinematics.**
Week 13	**Demonstrates knowledge and calculation of the Rotational Kinematics.**
Week 14	**general review**
Week 15	**prepare to final exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Lectures prepared by the teacher**	
Recommended Texts	**book_Bueche,_Frederick_Hecht,_Eugene_Schaums_Outline_of_College**	
Websites		

مخطط الدرجات			**Grading Scheme**	
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.

Module Information معلومات المادة الدراسية					
Module Title	**Human rights and democracy**			**Module Delivery**	
Module Type	**Basic learning activity**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22015**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department		**Technical building and Construction**	**College**	Technical College / Al Mussaib	
Module Leader	Hasan Omran Al-keif		**e-mail**	hasanalkeif@gmail.com	
Module Leader's Acad. Title		Assist. lecturer	**Module Leader's Qualification**		MSc in art
Module Tutor	None		**e-mail**		
Peer Reviewer Name		Dr.Shaimaa Haded	**e-mail**		
Scientific Committee Approval Date			**Version Number**	1	

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	1-زيادة معرفة الطالب بالجانب المفاهيمي النظري والتطور التاريخي لمادة حقوق الانسان والديمقراطية 2- تنمية مهارات الطالب التحليلية والنقدية فيما يتعلق بواقع ومستقبل حقوق الانسان والديمقراطية 3- تدريب الطالب على اهمية المشاركة الفاعلة في جوانب الحياة العامة كتعزيز احترام مبادى حقوق الانسان العامة والمشاركة الفاعلة في الحياة السياسية والثقافية. 4- تمكين الطلاب من فهم اهمية التعليم ودوره في نشر ثقافة حقوق الإنسان والديمقرلطية في بناء مجتمع حضاري يقوم على أساس الحكم الصالح الذي من اهم مقوماته الإيمان بحقوق الإنسان والتربية عليها والمشاركة الفاعلة في الحكم عبر الانتخابات الحرة والعادلة
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- يفهم معنى حقوق الانسان وأشكالها 2- يعرف المواثيق والعهود الدولية لحقوق الانسان 3- يعرف مفهوم الحريات وتصنيفها 4- اهم مبادئ وتطبيقات نظم الديمقراطية
Indicative Contents المحتويات الإرشادية	1- التعامل مع الانتهاكات الحاصلة لحقوق الانسان 2- يفهم حقوقه وواجباته اتجاه المجتمع 3- فهم ممارسة التطبيقات الديمقراطية

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- التحضير اليومي للمادة والمناقشة الفاعلة وبطريقة او اسلوب التفكير النقدي 2-استخدام اسلوب مجموعات التركيز المصغرة لمناقشة مفردات المادة 3-كتابة اوراق تحليلة لمفردات المادة او خارجها والتي لها علاقة مباشرة بمواضيع حقوق الانسان والديمقراطية 4- الامتحانات التحريرية اليومية والنصف الشهرية 5- الامتحانات الفصلية والنهائية او المشاركة اليومية-2 اختبارات يومية-3 اختبارات فصلية-4 الاختبارات النهائية-5 الحضور اليومي 6-تقديم تقارير كنشاط فصلي

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	18	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1.2
Unstructured SWL (h/sem)	32	**Unstructured SWL (h/w)**	2.1

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
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**	2	10%	4,8	
	Assignments	1	10%	9	
	seminar	1	10%	11	
	Report	1	10%	13	
Summative assessment	**Midterm Exam**	2 hr	10%	7	
	Final Exam	3hr	%50	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	حقوق إنسان، تعريفها، أهدافها. حقوق الإنسان في الشرائع السماوية مع التركيز على حقوق الانسان في الاسلام
Week 2	حقوق الانسان في التاريخ المعاصر الحديث المنظمات غير الحكومية العاملة بحقوق الانسان
Week 3	حقوق الانسان في الدساتير العراقية
Week 4	العلاقة بين حقوق الانسان والحريات العامة حقوق الانسان الاقتصادية والاجتماعية والسياسية
Week 5	حقوق الانسان الحديثة ضمانات احترام وحماية حقوق الانسان على الصعيد الوطني
Week 6	دور المنظمات الاقليمية العاملة بحقوق الانسان النظرية العامة للحريات
Week 7	القاعدة الشرعية لدولة القانون تنظيم الحريات من قبل السلطة العامة
Week 8	الديمقراطية وتعريفها وانواعها مفاهيم الديمقراطية

Week 9	الديمقراطية في العالم الثالث ألانظمة الديميقراطية في العالم الثالث
Week 10	مفهوم الحريات و تصنيف الحريات العامة الحريات ألاساسية، الحريات الفكرية والاقتصادية والاجتماعية
Week 11	حرية االامن والشعور باالاطمئنان وحرية الذهاب واالياب حرية التعليم والصحافة والتجمع
Week 12	حرية الجمعيات والعمل حرية التملك
Week 13	حرية التجارة والصناعة حرية المرأة
Week 14	الحريات السياسية والحريات العامة
Week 15	التقدم العلمي والتقين والحريات العامة مستقبل الحريات العامة
Week 16	الامتحان النهائي

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	هادي, رياض عزبز. (2005). حقوق الانسان (تطورها ـ مضامينها ـ حمايتها) (بغداد.(الدليمي, حافظ علوان. (2009). قراءة معاصرة لموضوعة حقوق الانسان.	
Recommended Texts		
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.

Module Information معلومات المادة الدراسية					
Module Title	**Advanced English skills**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22016**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	UGI		**Semester of Delivery**	**1**	
Administering Department	**Technical building and Construction**		**College**	**Technical College/ Al Mussaib**	
Module Leader	**Alaa Abid Al-Kadhim**		**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**	MSC in construction material	
Module Tutor					
Peer Reviewer Name	Dr. Abass K. Al Rekabi		**e-mail**	Dr.abbas.rikabi@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**		

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	The goal is to study English language and gain knowledge of it as benefit engineers in general, and to develop speaking skills and understand its basic rules taking the way to the acquisition of the ability to use technical key words in their work and the capability of communicating with other engineers correctly
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Developing speaking skills and understanding its basic rules to take the way to the acquisition of the ability to use technical keywords in their work and the capability of communicating with other engineers correctly .
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: 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			
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	2	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.1
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
	seminar	1	10% (10)	continuous	
Summative assessment	**Midterm Exam**	2 hr	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	Parts of speech, vocabulary and comprehension
Week 2	Verb to be, present simple, vocabulary and comprehension.
Week 3	Possessive adjective, possessives, verb to have, verb to do, vocabulary and comprehension.
Week 4	Definite Indefinite articles, pronouns, subject, object,
Week 5	This and that, expletive there, prepositions, vocabulary and comprehension
Week 6	Plurals, , expressions of quantity, , vocabulary and comprehension
Week 7	Simple past, modal verbs, auxiliary verbs,
Week 8	Question words, asking questions, vocabulary and comprehension.
Week 9	Negative and interrogative, I would like and I like, vocabulary and comprehension.
Week 10	Writing a composition, punctuation, vocabulary and comprehension.
Week 11	Present continues, vocabulary and comprehension
Week 12	Types of questions, (yes -no) questions and (wh) questions
Week 13	Simple past, vocabulary and comprehension
Week 14	Simple past, **revision**
Week 15	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Headway plus for beginners	Yes
Recommended Texts	Any Grammar and comprehension for technical learning	No
Websites	1- https://www.coursera.org/browse/physical-science-and-engineering/electrical-e ngineering 2- https://link.springer.com/book/10.1007/978-981-10-8624-3 3- https://progressivecollege.ie/courses/early-learning-and-care-qqi-level-5-major-award/?gad=1&gclid=EAIaIQobChMI_Nqu2tqA_wIVZ4VoCR2O0woLEAAYASAAEgI9WvD_BwE	

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

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Module Information معلومات المادة الدراسية					
Module Title	**Construction Materials**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22021**				
ECTS Credits	**9**				
SWL (hr/sem)	**225**				
Module Level		UGI	**Semester of Delivery**		2
Administering Department		**Technical building and Construction**	**College**	**Technical College/Al Mussaib**	
Module Leader	Lamyaa Ghanim		**e-mail**	lamyaa@atu.edu.iq	
Module Leader's Acad. Title		Assis. lecturer	**Module Leader's Qualification**		M.Sc. in Civil Engineering - Materials (Building & Construction)|
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name		Dr.Zahraa Fakhri	**e-mail**	dr_zahraajawad@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	1. Describe the physical and mechanical properties of different types of brick, source and its manufacturing process. 2. Describe the physical and mechanical properties of bonding materials, source and its manufacturing process. 3. Name the constituents of Portland cement and its types. 4. Describe the constituents of different types of blocks, properties and uses. 5. Describe the different types of clay tiles, specification, properties and uses. 6. Describe the structural axis of wood properties of timber and seasoning properties of timber. 7. Describe different types of metals, properties, specification and uses. 8. Describe the field work and inspection necessary for successful results in concrete construction. 9. Conduct and document laboratory investigation. 10. work in small team with individual of diverse backgrounds.
Module Learning Outcomes	Upon completion of the course, students should be able to: 13. An ability to apply knowledge of mathematics, science, and engineering. 14. An ability to design and conduct experiments and to analyse and interpret data. 15. An ability to design a system, component, or process to meet desired need. 16. An ability to identify, formulates, and solves engineering problems. 17. An ability to communicate effectively 18. Understanding the impact of engineering solutions on global and societal context 19. Using the techniques, skills, and modern tools necessary for engineering practice 20. Present laboratory findings in a clear, concise laboratory report. 21. Using technical methods and scientific approach with knowledge of specification and properties. 22. Managing of critical situation findings of the projects. 23. Ability to control projects on site through right decision with materials. 24. Critical Thinking.
Indicative Contents	Physical properties and standard specifications for construction materials, types of metallic materials and non-metallic materials. [4 hrs.] Clay bricks [4 hrs.] Sand-lime bricks, glass bricks, Concrete bricks [4 hrs.] Concrete blocks, cellular concrete blocks. [4 hrs.] Building stones. [4 hrs.] Bonding materials, cement mortar, cement lime mortar, gypsum. [4 hrs.] Flooring materials, tiles and concrete flags. [4 hrs.] Water proofing materials [4 hrs.] Polymers [4 hrs.]

	Epoxy, Steel. [4 hrs.] Metallic materials (non-ferrous) [4 hrs.] Timber (wood), insulation materials. [4 hrs.] Acoustical materials, protective coating (paints). [4 hrs.] Glass, bituminous materials (asphalt). [4 hrs.] Plastic. [4 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 2. Homework problem sets, 3. Exams 4. Lab reports

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	123	**Structured SWL (h/w)**	5.2
Unstructured SWL (h/sem)	102	**Unstructured SWL (h/w)**	4.8
Total SWL (h/sem)	225		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3, 10	
	Assignments	1	10% (10)	7, 8	
	Seminar	1	10% (10)	11	
	Lab report	4	10% (10)	continuous	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Physical properties and standard specifications for construction materials, types of metallic materials and non-metallic materials.

Week 2	Clay bricks
Week 3	Sand-lime bricks, glass bricks, Concrete bricks
Week 4	Concrete blocks, cellular concrete blocks.
Week 5	Building stones.
Week 6	Bonding materials, cement mortar, cement lime mortar, gypsum.
Week 7	Flooring materials, tiles and concrete flags.
Week 8	Water proofing materials
Week 9	Polymers
Week 10	Epoxy, Steel.
Week 11	Metallic materials (non-ferrous)
Week 12	Timber (wood), insulation materials.
Week 13	Acoustical materials, protective coating (paints).
Week 14	Glass, bituminous materials (asphalt).
Week 15	Plastic.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Recognition of laboratory , Using of balances .
Week 2	Clay brick tests : Density , Dimension , Absorption , Compressive strength , Efflorescence , Analysis of soluble salts , Porosity
Week 3	Sand-lime brick tests : (Density , Absorption , Compressive strength) .
Week 4	Concrete bricks & block tests : (Density , Absorption , Compressive strength) .
Week 5	Cellular concrete block tests : (Density ,Absorption , Compressive strength) .
Week 6	Bonding materials (gypsum) tests : , Fineness , Standard consistency ,Time of setting of gypsum, Compressive strength , Tensile strength of gypsum .
Week 7	Tile tests : (Dimension , Total absorption, Face absorption, Modulus of rupture) .
Week 8	Concrete flags :(Absorption , Fracture strength) .
Week 9	Standard specification for water proofing materials Standard specification of epoxy .
Week 10	Timber (wood) : Compressive strength parallel & perpendicular to fiber test , Modulus of rupture .
Week 11	Steel : (Tensile strength test) .
Week 12	Standard specification for insulating materials . Standard specification for acoustical materials .
Week 13	Standard specification for paints . Standard specification for glass .

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Materials of Construction / R. C. Smith. 2- Civil Engineering Materials / N. Jackson. 3- Iraqi Standards Specifications. 4- American Society for Testing Materials (ASTM). 5- انشاء المباني / يوسف الدواف 6- انشاء المباني / زهير ساكو , ارتين ليفون	
Recommended Texts		
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.

Module Information معلومات المادة الدراسية					
Module Title	**Plane Surveying**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**ATU22022**				
ECTS Credits	**9**				
SWL (hr/sem)	**225**				
Module Level		UGI	**Semester of Delivery**		2
Administering Department		Technical building and Construction	**College**	Technical College/ Al Mussaib	
Module Leader	Fatin Mizher Radhi		**e-mail**	faten.mz@atu.edu.iq	
Module Leader's Acad. Title		Assis. lecturer	**Module Leader's Qualification**		M.Sc . in Survey engineering
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name		Porf.Dr.Maki Jafar	**e-mail**	maki_jafar@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	The aims of this course are to: 1. Understanding the basic principles of plane surveying. 2. Being familiar with the basic tools and surveying equipment. 3. Practicing field training related to engineering applications. 4. Acquiring some skills that help students in their future work.
Module Learning Outcomes	A graduate of this major should be able to: 1. General basics of surveying,foundemetals of surveying, units of measurements, plotting scale . 2. Explain the difference between plane and geodetic surveying . 3. Linear measurements ,mean for measuring distances ,direct method of horizontal distance measurements . 4. Explain the principles of Electronic distance measurements. 5. Errors in surveying , types of errors ,Accuracy and precision, Principles of errors scattering theory**.** 6. Obstacles to measuring. 7. Leveling. Types of leveling , Leveling instrumentation , Leveling by taping, Trigonometric leveling , Sources of errors in leveling (vertical, horizontal). 8. Skills of using Level Instrument efficiently 9. The students should be able to make a levelling Survey and calculate the results relative to some chosen datum. 10. The students should be able to make a levelling survey along a predetermined line set out on the ground. Process the data and draw longitudinal sections and cross sections from the results. 11. The students should be able to select the most appropriate method of measuring horizontal and vertical angles. 12. Vertical sections , Longitudinal sections ,Calculation of cut and fill. 13. The students should be able to compute the quantities of cut and fill in any kind of sections for Roads 14. Contour lines: Method of drawing and construction. 15. Areas and volumes: Volume computation from cross-section , Volume from topographic maps and grid net , Volume computation from contour maps.
Indicative Contents	Basic fundamentals of surveying, Using tape and chain in the linear [3 hrs.] measurement and perpendicular construction. [3 hrs.] Details survey by measuring tape and obstacles to measuring. [3 hrs.] Traversing, types of traverses. [3 hrs.] Training how to use leveling instrument. [3 hrs.] Height difference between two points from one station of level. [3 hrs.]

	Height difference between two points from one station of level. [3 hrs.] Trigonometric leveling. [3 hrs.] Trigonometric leveling. [3 hrs.] Close leveling. [3 hrs.] Topographic survey using level instrument. [3 hrs.] Level test by two pegs methods. [3 hrs.] Area computation. [6 hrs.] Details survey by stadia method. [3 hrs.] Details survey using alidade and polarimetry. [3 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on: 1. Exams 2. Student feedback 3. Body language 4. Laboratory reports / studies 5. Movies and pictures.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	123	**Structured SWL (h/w)**	8.2
Unstructured SWL (h/sem)	102	**Unstructured SWL (h/w)**	6.8
Total SWL (h/sem)	225		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
	Quizzes	2	10% (10)	3,5,6,10	

Formative assessment	**Assignments**	2	10% (10)	7, 8	
	Seminar	1	10% (10)	11	
	report	4	10% (10)	continuous	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	General basics of surveying, fundamentals of surveying, units of measurements, Plotting scale.
Week 2	Linear measurements. Means for measuring distances, Direct method of horizontal distances measurement, Target survey, Details, Electronic distance measuring instruments.
Week 3	Errors in surveying. Types of errors, Accuracy and precision, Principles of errors scattering theory.
Week 4	Obstacles to measuring.
Week 5	**Traversing. Types of traverse, Coordinates measurement, Traverse adjustment.**
Week 6	Traversing. Types of traverse, Coordinates measurement, Traverse adjustment.
Week 7	Bearing and angles. Methods of angles measurement and bearing calculation.
Week 8	Leveling. Types of leveling , Leveling instrumentation , Leveling by taping, Trigonometric leveling , Sources of errors in leveling (vertical, horizontal).
Week 9	Vertical sections , Longitudinal sections ,Calculation of cut and fill.
Week 10	Vertical sections , Longitudinal sections ,Calculation of cut and fill.
Week 11	Contour lines: Method of drawing and construction
Week 12	Contour lines: Method of drawing and construction
Week 13	Areas and volumes: Volume computation from cross-section , Volume from topographic maps and grid net , Volume computation from contour maps.
Week 14	Areas and volumes: Volume computation from cross-section , Volume from topographic maps and grid net , Volume computation from contour maps.
Week 15	**Preparing to final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Basic fundamentals of surveying, Using tape and chain in the linear measurement and perpendicular construction.

Week 2	Details survey by measuring tape and obstacles to measuring.
Week 3	**Traversing, types of traverses (Open traverse)**
Week 4	**Traversing, types of traverses (Closed traverse)**
Week 5	Training how to use leveling instrument.
Week 6	Height difference between two points from one station of level.
Week 7	Trigonometric leveling.
Week 8	**Close leveling.**
Week 9	Close leveling.
Week 10	Topographic survey using level instrument.
Week 11	Level test by two pegs methods.
Week 12	Area computation.
Week 13	Area computation.
Week 14	Details survey by stadia method.
Week 15	**Contour maps using leveling instrument**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. المساحة المستوية والمائية د علي شكري – كلية الهندسة –جامعة الاسكندرية 2. المساحة المستوية د فوزي الخالصي – وزارة التعليم العالي والبحث العلمي 3. Text book of surveying / S.K.Husain M.S.Naga Raj. 4. Surveying / Narinder Singh 5. Surveying for construction / William Irvin	
Recommended Texts		
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.

Module Information معلومات المادة الدراسية				
Module Title	**Engineering Geology**		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22023**			
ECTS Credits	**3**			
SWL (hr/sem)	**75**			
Module Level	UGI	**Semester of Delivery**	2	
Administering Department	**Technical building and Construction**	**College**	**Technical College/ Al Mussaib**	
Module Leader	Rusul Jaber Ghayyib	**e-mail**	rusuljaber@atu.edu.iq	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	MSc in construction management	
Module Tutor	None	**e-mail**	E-mail	
Peer Reviewer Name	Prof.dr.Maki Jafar	**e-mail**	maki_jafar@atu.edu.iq	
Scientific Committee Approval Date		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. To understand the Engineering geology and relevance with Civil engineering. 2. To understand the mineral and crystal systems. 3. To understand the earth envelopes, solid earth and rocks cycle in a nature. 4. To understand the types of rocks (Igneous, Sedimentary and Metamorphic). 5. To understand the Soils and the types of Soil in Iraq. 6. To understand the physical and mechanical (engineering) properties. 7. To study the structural geology (folds, components and classification). 8. To recognize the topographic and geologic map. 9. To know the surface and subsurface and its applications. 10. To estimate the water table and Darcy law. 11. To use the site investigation and geological techniques.
Module Learning Outcomes	1. An ability to apply knowledge of mathematics, science, and engineering. 2. An ability to design and conduct experiments and to analyse and interpret data. 3. An ability to design a system, component, or process to meet desired need. 4. An ability to identify, formulates, and solves engineering problems 5. An ability to communicate effectively 6. Understanding the impact of engineering solutions on global and societal context 7. Using the techniques, skills, and modern tools necessary for engineering practice 8. Present laboratory findings in a clear, concise laboratory report.
Indicative Contents	Indicative content includes the following. Introduction to the earth science, crust and interior of the earth, minerals and physical properties. [2 hrs.] Factor effecting on the mineral physical properties, mineral classification [2 hrs.] Clay minerals, mineral expansive soil, rocks, classification of rocks, igneous rocks [2 hrs.] Sedimentary rocks, classification of sedimentary rocks. [2 hrs.] Metamorphic rocks, stabilization of rock slopes, an engineering classification of rock materials. [2 hrs.] Weathering and erosion, weathering agents on structures, soil, soil profile, soil forming processes. [2 hrs.] Properties of engineering soil, properties of engineering rocks. [2 hrs.] Geological structure, dipping layer, folds, conformities and disconformities. [2 hrs.] Faults, joints, effect of faults and joints on structures. [2 hrs.] Surface water and underground water. [2 hrs.] Site investigation [2 hrs.] Mass movement, causes of mass movement, classification of mass movement, creep causes treatment. [2 hrs.] Landslides, causes of landslides, earthquake due to landslides, geological investigation. [2 hrs.] Geological sites of reservoirs, ground reservoirs, underground reservoirs, dams and tunnels, types of dams. [2 hrs.]

	Loads on dams, classification of tunnels and nomenclature, construction of tunnels. [2 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1. Homework problem sets, 2. Exams 3. Lab reports

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	33	**Structured SWL (h/w)**	2.2
Unstructured SWL (h/sem)	42	**Unstructured SWL (h/w)**	2.8
Total SWL (h/sem)	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3, 10	
	Assignments	2	10% (10)	7, 8	
	Seminar	5	10% (10)	11	
	report	1	10% (10)	continuous	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Introduction to the earth science, crust and interior of the earth, minerals and physical properties.
Week 2	Factor effecting on the mineral physical properties, mineral classification
Week 3	Clay minerals, mineral expansive soil, rocks, classification of rocks, igneous rocks
Week 4	Sedimentary rocks, classification of sedimentary rocks.
Week 5	Metamorphic rocks, stabilization of rock slopes, an engineering classification of rock materials.

Week 6	Weathering and erosion, weathering agents on structures, soil, soil profile, soil forming processes.
Week 7	Properties of engineering soil, properties of engineering rocks.
Week 8	Geological structure, dipping layer, folds, conformities and disconformities.
Week 9	Faults, joints, effect of faults and joints on structures.
Week 10	Surface water and underground water.
Week 11	Site investigation
Week 12	Mass movement, causes of mass movement, classification of mass movement, creep causes treatment.
Week 13	Landslides, causes of landslides, earthquake due to landslides, geological investigation.
Week 14	Geological sites of reservoirs, ground reservoirs, underground reservoirs, dams and tunnels, types of dams.
Week 15	Loads on dams, classification of tunnels and nomenclature, construction of tunnels.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Plummer C., Diane H., 2007, “Physical Geology”, Mc-Graw Hill, 11th Edition. 2. نز دنكان. ترجمة كنانة محمد ثابت, 1980, "الجيولوجيا الهندسية وميكانيك الصخور", المكتبة الوطنية بغداد 3. كنانة محمد ثابت و محمد عمر العشو, 1993 "اسس الجيولوجيا للمهندسين" الموصل, جامعة الموصل	
Recommended Texts		
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.

وصفية

Module Information
معلومات المادة الدراسية

Module Title	DESCRIPTIVE GEOMETRY	**Module Delivery**	
Module Type	SUPLEMENT	**Theory** **Lecture** **Tutorial**	
Module Code	ATU22024		
ECTS Credits	4		
SWL (hr/sem)	85		

Module Level	1	**Semester of Delivery**	2
Administering Department	BCETD	**College**	MTC
Module Leader	Hayder Saad Oleiwi	**e-mail**	hayder.rashid@atu.edu.iq
Module Leader's Acad. Title	Assis.lecturer	**Module Leader's Qualification**	MSc.
Module Tutor	L. Hana'a Mahmood Al-kassar	**e-mail**	Inj.han@atu.edu.iq
Peer Reviewer Name	Dr. Hakim Saeed Alkurayshi	**e-mail**	Dr.hakim.alkurayshi@atu.edu.iq
Review Committee Approval	01/06/2023	**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	After successful completion of this course the student will be able to understand:

	1. Descriptive geometry is a science that deals with ways of representing geometric objects graphically on a flat surface such as the surface of a drawing paper. 2. Descriptive geometry aims to solve problems related to the point, the line and the plane in space in a schematic solution. 3. How to represent the point, line, plane and solid in space. 4. He will be able to identify parallelism between two lines, parallelism between two planes, parallelism between a line and a plane. 5. Able to identify perpendicularity between two a line and a plane, perpendicularity between two coplanar lines, and perpendicularity between two planes. 6. Recognize about the intersection between two planes (not parallel) intersection between a plane and a line. 7. Recognize about intersection among solids, solids/plane, solids/line. 8. He will be obtains these solutions by using the basic rules of projection, which are the rules of (vertical projection), in which the three main aspects of projection (horizontal, facial, and lateral) are used, and in addition to these aspects, there are auxiliary levels of projection. 9. Descriptive geometry, in addition to dealing with points, lines, and planes, includes other topics such as the opening of surfaces, the intersection of bodies, the method of rotation in solving descriptive problems, and others. 10. Recognize about orthogonal and oblique axonometric.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The ability to draw geometric shapes and objects descriptively and spatially. Preparing the student to continue self-learning, acquiring skills and developing his potential. Engineering skills development. The ability to choose the appropriate way to draw and express it. The ability to visualize spatially. The ability to address and solve engineering problems descriptively.
Indicative Contents المحتويات الإرشادية	Preparing the student to continue self-learning, acquiring skills and developing his potential.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The ability to choose the appropriate method for designing and solving engineering problems and compare different drawing methods and choose the most appropriate. The wide capacity for spatial imagination.

Student Workload (SWL) الحمل الدراسي للطالب			
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)	37	**Unstructured SWL (h/w)**	2.5

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	85		

Module Evaluation
تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	4% (4)	4,6,10	LO # 4, 5 and 8
	Traditional lecture & In Classroom Activates	14	12%(12)	Continuous	1 -14
	Assignments	8	14% (14)	3- 9	LO # 3, 4,7 and 9
	Projects / Lab.	1	5% (5)	Continuous	
	Report	2	5% (5)	8	LO # 5 - 10
Summative assessment	**Midterm Exam**	1.5 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week	**Syllabus**
1	**Orthogonal projection.**
2	**Correctly implement the representation of a point, line, plane, solid.**
3	**Demonstrates knowledge about particular lays of a line, of a plane.**
4	**Able to identify parallelism between two lines, parallelism between two planes, parallelism between a line and a plane.**
5,6	**Able to identify perpendicularity between two a line and a plane, perpendicularity between two coplanar lines, and perpendicularity between two planes.**
7,8	**Demonstrates knowledge about the intersection between two planes (not parallel) intersection between a plane and a line.**
9	**Demonstrates knowledge about section line-plane, plane- plane.**
10+11	**Demonstrates knowledge about the intersection among solids, solids/plane, solids/line.**
12	**Demonstrates knowledge about orthogonal axonometric.**
13	**Demonstrates knowledge about oblique axonometric.**
14	**Demonstrates knowledge about representation of point, line, plane, solids.**

Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Descriptive Geometry / Jassim Al-Hayani Lectures prepared by the teacher	Yes
Recommended Texts		No
Websites		

APPENDIX:

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.

Module Information معلومات المادة الدراسية					
Module Title	**Computer Principles**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**ATU22025**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		UGI	**Semester of Delivery**		2
Administering Department		**Technical building and Construction**	**College**	**Technical College/ Al Mussaib**	
Module Leader	Mostafa Satea Alhamdany		**e-mail**	mustafasatea894@gmail.com	
Module Leader's Acad. Title			**Module Leader's Qualification**		M.Sc . in civil Enguneering
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name		Assist.prof.dr.Haider fawzi mahmood	**e-mail**	haider.fawzi@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	Students successfully completing this course will be able to: 1. Utilize the computer for fundamental tasks. 2. Identify and discuss the hardware components of the computer system. 3. Creating documents using a word processor and creating presentations. 4. Conducting research on the Internet. 5. An introduction to Artificial Intelligence.
Module Learning Outcomes	Upon completion of the course, students should be able to: 1- Using a computer operating system. 2- Using computer software to solve mathematical problems. 3- Using Microsoft office to write reports, Tables, graphical diagrams and other works. 4- Ability to write basic computer codes (Programming).
Indicative Contents	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1. Exams. 2. Student feedback. 3. Homework's

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	48	**Structured SWL (h/w)**	3.2
Unstructured SWL (h/sem)	27	**Unstructured SWL (h/w)**	1.8
Total SWL (h/sem)	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3,5,6,10	
	Assignments	2	10% (10)	7, 8	
	Projects / Lab.	1	10% (10)	Continuous	
	report	1	10% (10)	13	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	**Introduction to Computer:** Concepts of Hardware and Software with their components; Concept of Computing, Data and Information; Connecting input/output devices, and peripherals to CPU.
Week 2	**Computer components**: computer portions, Hardware parts, I/O units, Memory types.
Week 3	**Computer components(cont.):** Basic CPU components, computer ports,personal computer (features and types) .
Week 4	**Operating system and graphical user interface GUII:** operating system ; Basics of common operating systems; the user interface , using mouse techniques.
Week 5	**Operating system and graphical user interface GUII (Cont):** use common icons, status Bar , using menu and menu-selection ,concept of folders and directories, opening and closing of different windows: creating shorts cuts.
Week 6	**Word processing :** word processing Basic ; Basic features of word processors , opening and closing of documents , text creation and manipulation; formatting text and paragraphs, use templates for document creation.
Week 7	**Word processing (Cont):** creating and managing tables, utilizing style and themes , spell check and grammar tools, using headers and footers.
Week 8	**Spread sheet :** introduction to spreadsheet software, creating and filtering data , using formulas and functions.

Week 9	**Spread sheet(cont.):** using formulas and functions ,using pivot tables for data analysis ,visualization: creating charts and graphs.
Week 10	**Presentation software:** introduction to Presentation software production to presentation software overview of popular presentation tools a creating a new presentation, using tablets and themes inserting and formatting text and images transition and animation effects.
Week 11	**Presentation software (cont**.): using speaker notes and timers ,advanced features: hyperlinks and action buttons ,troubleshooting common presentation issues ,future trends and in presentation technology.
Week 12	**Introduction to internet and Web browsers**: computer networks basic; LAN,WAN; concept of internet and applications; connecting to intrnet.
Week 13	**Introduction to internet and with weep browsers** (Cont.): world wide web ; web browsing software's search engines; understanding URL; domain name IP address.
Week 14	**Communications and Emails:** basics of electronic mail : getting an email account; sending and receiving emails; Accessing sent emails using emails; document collabration.
Week 15	**Introduction to Cloud computing and services:** definition of cloud computing and it is concept ;cloud-based office suites (Office 365 and Google workspace) Google Docs, Google sheets ,google Drive, Google meet.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**

Required Texts	1- Graham Brown ,David Watson, " Cambridge IGCSE information and communication technology" 3rd Edition (2020). 1. Alan evans, Kendall Martin , Mary Anne Poatsy,"Technology in action complete ", 16th Edition 2020. 2. Ahmed Banafa, "introduction to artificial intelligence (AI)", first edition 2024. 3. Microsoft Office 2019 step by step 1st edition by Curtis frye & John Lambert. 4. "اساسيات الحاسوب"الخضر علي الخضر بحاث 2016 5. مدخل الى عالم الذكاء الاصطناعي" الدكتور عادل عبد النور" 2005	
Recommended Texts		
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.

Module Information معلومات المادة الدراسية		
Module Title	**Arabic Language**	**Module Delivery**

Module Type	**Basic learning activity**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU22026**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		UGI	**Semester of Delivery**		2
Administering Department		**Technical building and Construction**	**College**	**Technical College/ Al Mussaib**	
Module Leader	Shaima Haded Dana		**e-mail**		
Module Leader's Acad. Title		lecturer	**Module Leader's Qualification**		PHD in Arabic languge
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name		Assist Prof. Raida Hussain	**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1- تعميق معرفة الطالب بقواعد اللغة والاملاء التي تعلمها سابقا؛ ليتحاشى الوقوع في الأخطاء الغوية والاملائية، وليسهل عليه كتابة التقارير وجميع الأعمال الكتابية بصورة صحيحة نحويا ولغويا. 2- توسيع نطاق الوعي اللغوي والأدبي ليشمل جميع الطلبة والمجتمع المحلي من خلال المحاضرات والندوات والدورات التدريبية المختلفة، والأخذ بيد المبدعين من اصحاب المواهب.
Module Learning Outcomes	المعرفة والفهم والتطبيق من خلال إلقاء المحاضرات النظرية الصفية وحث الطلبة على قراءة كتاب معين في المادة، إضافة إلى تكليف الطلبة بواجبات بحثية و/أو تقارير مكتبية وذلك في مستوى السنة الأولى من الدراسة.
Indicative Contents	يتكون المقرر من جزء واحد يتناول تعليم الطلبة القواعد العامة للكتابة باللغة العربية بما يضمن عدم الاخلال بأساسيات هذه اللغة.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم	
Strategies	واجب بيتي ، اختبارات صفية ، عروض تقديمية ، امتحان.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	18	**Structured SWL (h/w)**	1.2
Unstructured SWL (h/sem)	32	**Unstructured SWL (h/w)**	2.1
Total SWL (h/sem)	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3, 10	
	Assignments	2	10% (10)	7, 8	
	Seminar	1	10% (10)	11	
	report	1	10% (10)	13	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	- مفهوم الاخطاء اللغوية - قواعد كتابة التاء المربوطة والتاء المفتوحة
Week 2	- الالف الممدودة والمقصورة - الحروف الشمسية والقمرية
Week 3	الضاد والظاء
Week 4	كتابة الهمزة: - همزة الوصل والقطع - الهمزة المتوسطة - الهمزة المتطرفة
Week 5	علامات الترقيم

Week 6	الاسم والفعل والتفريق بينهما
Week 7	المفاعيل: - المفعول به - المفعول المطلق - المفعول لأجله - المفعول فيه - المفعول معه
Week 8	العدد
Week 9	تطبيقات الأخطاء اللغوية الشائعة
Week 10	تطبيقات الأخطاء اللغوية الشائعة
Week 11	- معاني حروف الجر - قاعدة الالف الفارقة - قاعدة النون والتنوين
Week 12	الجوانب الشكلية للخطاب الاداري
Week 13	لغة الخطاب الاداري
Week 14	لغة الخطاب الاداري
Week 15	امتحان

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. كتاب الاملاء الفريد: نعوم جرجيس زرازير، نقحه: د. مصطفى جواد – مطابع النعمان النجف الاشرف – ط6- 1973م. 2. كتاب الاملاء للمرحلة المتوسطة: عبد الجبار عبد الله الآلوسي واخرون – وزارة التربية المديرية العامة للمناهج – ط18 – 2014م. 3. دروس فب اللغة والنحو والاملاء لموظفي الدولة: إسماعيل حمود عطوان واخرون – مطبعة وزارة التربية (3) بغداد – ط2 – 1984م. 4. اللغة العربية العامة لأقسام غير الاختصاص: عبد القادر حسن امين واخرون – وزارة التعليم العالي والبحث العلمي – ط2 – 2000م.	نعم
Recommended Texts		
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.

1- Concrete Technology 1

Module Information معلومات المادة الدراسية				
Module Title	**Concrete Technology 1**		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ATU22031			
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	UGII	**Semester of Delivery**	3	
Administering Department	**Technical building and Construction**	**College**	**Technical College/Al Mussaib**	
Module Leader	Dr. Zahraa Fakhri	**e-mail**	Dr_zahraajawad@atu.edu.iq	
Module Leader's Acad. Title	Assist professor	**Module Leader's Qualification**	PHD in Materials engineering	
Module Tutor	None	**e-mail**	E-mail	
Peer Reviewer Name	**Zahraa fakhri**	**e-mail**	Dr_zahraajawad@atu.edu.iq	
Scientific Committee Approval Date		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	1. The student must be to learn the chemical characteristics of the main component of concrete and their effect on the properties of concrete 2. The student must be to learn the physical mechanical and cheical characteristics of the main component of concrete, as well as accomplishing all the related laboratory tests.
Module Learning Outcomes	1. The course is the basis for the use of concrete, with emphasis on requirements and possibilities within the standard for consultants, concrete producers, contractors and owners. 2. Proportioning of concrete including principles for self-compacting concrete taking into account fresh (rheology, stability) and hardened concrete (strength, durability, economy, sustainable development). 3. This also includes giving the student an understanding of the importance of the constituents (cement, pozzolana/additives, admixtures and aggregates/fines including alkali aggregate reactivity) and composite theory (the Particle Matrix model). 4. Introduction to simple calculations of volumetric relations and pore structure (gel/capillary) in hydration products. The basis for the use of curing technology models (maturity, property development etc) for control and verification of hardening at winter concreting will be learnt. 5. Understanding of mechanisms causing volume change from fresh (plastic settlement, -shrinkage), via early age (temperature, autogenous shrinkage) to hardened concrete (drying shrinkage) is also given. 6. The student shall know the mechanisms for volume change in the different phases (stability, bleeding, temperature change, self-desiccation) as basis to understand cracking problems in fresh/young concrete (choice of constituents and proportions, importance of drying/keeping fresh concrete wet, temperature control etc). 7. Concrete strength; know and understand constituent materials and hydration products importance for strength properties, fracture mechanisms and the strength requirements of the standard for structural concrete. 8. Prediction and control of strength during concrete production therefore is central. 9. Finally transport properties and durability issues are treated (frost, corrosion, ASR) 10. .Knowledge: - Understanding of constituent materials for properties of fresh and hardened concrete properties- Composite models for proportioning (particle/patrix) and transport/durability issues (paste/aggregate)- Basic understanding of hydration as well as important physical and chemical properties of the hydration products- Basic curing technology models (maturity, property development)- 11. Know the different mechanisms causing volume change from fresh (plastic settlement, -shrinkage) via young (temperature, autogeneous shrinkage) to hardened concrete (drying shrinkage).

Indicative Contents	Composition of concrete, function of the paste and aggregate, general properties of ordinary cement, Portland cement, making materials, chemical formulas and processes. [4 hrs.] Manufacture of Portland cement ,Chemical analysis of Portland cement, major and minor compounds of Portland cement. [4 hrs.] Properties of Portland cement, Fineness of cement ,Consistency of cement paste, Hydration reactions of cement ,Heat of hydration ,Setting and hardening of cement ,time of setting. [4 hrs.] Soundness of cement, Strength of cement , Influence of the compound composition on properties of cement (strength development). [4 hrs.] Types of cement, Ordinary Portland Cement (TYPE I), Modified Cement (Type II), Rapid-Hardening Portland Cement (Type III), Ultra-High Early Strength Cement, Low Heat Portland Cement (Type IV), Sulfate-Resisting Cement (Type V), White Cement and Pigments, Portland Blast-furnace Cement, Super-Sulfated Cement, Pozzolana, Anti-bacterial cement, Masonry cement, Natural cement, Hydrophobic cement. [8 hrs.] Aggregate, Classification of aggregate, According to the size, According to the source, According to the unit weight, Physical properties of aggregate, Practical shape and texture, Bond of aggregate. [4 hrs.] Specific Gravity, Porosity and Absorption ,Gradation, sieve analysis , max size of aggregate, fineness modulus, Gap- graded aggregate, Oversize and undersize aggregate, All- in aggregate, bulking of sand. [4 hrs.] Soundness of aggregate, Handling and storage aggregate, Deleterious substances organic impurities, Alkali- aggregate reaction , Alkali- carbonate reaction. [4 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 4. Exams. 5. Student feedback. 6. Preparation of scientific reports.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	87	**Unstructured SWL (h/w)**	5.8
Total SWL (h/sem)	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3,5,6,10	
	Assignments	2	10% (10)	7, 8	
	Report	1	10% (10)	11	
	Class work	4	10% (10)	2,4,8,11	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Definition of concrete, constitutes of concrete , function of the concrete's constitutes
Week 2	Cement raw materials of cement .Manufacture of cement ,
Week 3	Chemical analysis of Portland cement, major and minor compounds of Portland cement

Week 4	Properties of Portland cement, Fineness of cement ,Consistency of cement paste, Hydration reactions of cement ,Heat of hydration ,Setting and hardening of cement ,time of setting
Week 5	Soundness of cement, Strength of cement , Influence of the compound composition on properties of cement (strength development)
Week 6	Calculation of gel and hydration product paste
Week 7	Types of cement, Ordinary Portland Cement (TYPE I), Modified Cement (Type II), Rapid-Hardening Portland Cement (Type III), Ultra-High Early Strength Cement, Low Heat Portland Cement (Type IV), Sulfate-Resisting Cement (Type V),
Week 8	White Cement and Pigments, Portland Blast-furnace Cement, Super-Sulfated Cement, Pozzolana, Anti-bacterial cement, Masonry cement, Natural cement, Hydrophobic cement
Week 9	Aggregate, definition, function, requirements, Classification of aggregate,
Week 10	Physical properties of aggregate, Practical shape and texture, Bond of aggregate,
Week 11	Specific Gravity, Porosity and Absorption ,Gradation, sieve analysis , max size of aggregate, fineness modulus, Gap- graded aggregate, Oversize and undersize aggregate, All- in aggregate, bulking of sand
Week 12	Soundness of aggregate, Handling and storage aggregate, Deleterious substances organic impurities, Alkali- aggregate reaction , Alkali- carbonate reaction .
Week 13	Water in concrete, function of water, requirement of water in concrete, impurities limitation and effect
Week 14	Mixing water, curing water, sea water
Week 15	Preparing for final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Cement tests , consistency of cement paste
Week 2	Initial and final setting times of cement paste
Week 3	Compressive strength of cement mortar
Week 4	Fineness of cement by blain method and by sieving
Week 5	Sampling of coarse and fine aggregate

Week 6	Unit weight and voids of coarse aggregate
Week 7	Unit weight and voids of coarse aggregate
Week 8	Sieve analysis for fine aggregate
Week 9	Sieve analysis for coarse aggregate
Week 10	Specific gravity and absorption for fine aggregate
Week 11	Specific gravity and absorption for coarse aggregate
Week 12	Moisture content in coarse and fine aggregate , bulking of sand
Week 13	Los-angeles abrasion test for coarse aggregate
Week 14	Water test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	4. Properties of concrete, A ,M. NEVILLE 5. تكنولوجيا الخرسانة , د احمد علي العريان	
Recommended Texts	1- تكنولوجيا الخرسانة محمود امام	
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.

2- **Strength of Materials 1**

Module Information معلومات المادة الدراسية					
Module Title	**Strength of Materials 1**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ATU22032				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGII		**Semester of Delivery**	3	
Administering Department	**Technical building and Construction**		**College**	**Technical College/Al Mussaib**	
Module Leader	Dr. Ammar Adil Abdulnabe		**e-mail**	ammaralbakry@atu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D. in mechanical Engineer -	
Module Tutor			**e-mail**		
Peer Reviewer Name	Prof.Dr.Hussam Ali		**e-mail**	com.hus@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	1,2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	1. To understand effect of forces and loads on materials. 2. To understand how materials deforms due to external forces 3. to understand the safest way in using material in engineering applications and construction purposes 4. to understand how beams deforms due to loads and what type of stresses occur 5. to understand composite material and its behavior and deformation 6. to realize the meaning of compound stresses on material and to compute it.
Module Learning Outcomes	At the end of this course: 1. Solve engineering problems relating to stress and strain analysis. 2. Develop the student's ability to deal with normal force, shear force and bending moment in statically determinate beam assemblies with internal hinges. 3. An ability to calculate stresses and deformations of object under external forces 4. An ability to analyze a given problem in a simple manner. 5. An ability to apply the knowledge of strength of material on engineering application and design problems. 6. An ability to communicate effectively 7. Understanding the impact of engineering solutions on global and societal context 8. Using the techniques, skills, and modern tools necessary for engineering practice 9. Designing concepts and applications in engineering mechanics of material . 10. Critical Thinking 11. Analytical methods in solving problems
Indicative Contents	Simple stress: Analysis of internal forces, Simple stress, shearing stress, Bearing stress. [8 hrs.] Simple Strain: Stress-strain diagram, Hooke's law, Axial deformation, Poisson's ratio, Biaxial & Tri-axial deformations, statically indeterminate members, Thermal stresses. [8 hrs.] Combined Stresses: Combined axial & flexural loads, Kern of a section, Loads applied off axes of symmetry, Stress at a point, Mohr's circle, Transformation of strain components. [8 hrs.] Torsion: Derivation of torsion formulas, Longitudinal shearing stress, Shear flow. [8 hrs.]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Assessment is based on 7. Exams. 8. Student feedback.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	87	**Unstructured SWL (h/w)**	5.8
Total SWL (h/sem)	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3,5,6,10	
	reports	2	10% (10)	4,10	
	Assignments	2	10% (10)	7, 8	
	Seminar	1	10% (10)	11	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Simple stress: Analysis of internal forces, Simple stress, shearing stress, Bearing stress.
Week 2	Simple stress: Analysis of internal forces, Simple stress, shearing stress, Bearing stress.
Week 3	Simple stress: Analysis of internal forces, Simple stress, shearing stress, Bearing stress.
Week 4	Riveted & Welded Connections: Types of riveted joints , Strength of a simple lap joint , Structural riveted joints , Welded constructions.
Week 5	Riveted & Welded Connections: Types of riveted joints , Strength of a simple lap joint , Structural riveted joints , Welded constructions
Week 6	Riveted & Welded Connections: Types of riveted joints , Strength of a simple lap joint , Structural riveted joints , Welded constructions
Week 7	Simple Strain: Stress-strain diagram, Hooke's law, Axial deformation, Poisson's ratio, Biaxial & Tri-axial deformations, statically indeterminate members, Thermal stresses.
Week 8	Simple Strain: Stress-strain diagram, Hooke's law, Axial deformation, Poisson's ratio, Biaxial & Tri-axial deformations, statically indeterminate members, Thermal stresses.
Week 9	Simple Strain: Stress-strain diagram, Hooke's law, Axial deformation, Poisson's ratio, Biaxial & Tri-axial deformations, statically indeterminate members, Thermal stresses.
Week 10	Simple Strain: Stress-strain diagram, Hooke's law, Axial deformation, Poisson's ratio, Biaxial & Tri-axial deformations, statically indeterminate members, Thermal stresses.

Week 11	Torsion: Derivation of torsion formulas, Longitudinal shearing stress, Shear flow.
Week 12	Torsion: Derivation of torsion formulas, Longitudinal shearing stress, Shear flow.
Week 13	Shear and Moment in Beams: Shear & moment, Shear & moment diagrams, Relations between load ; shear & moment.
Week 14	Shear and Moment in Beams: Shear & moment, Shear & moment diagrams, Relations between load ; shear & moment.
Week 15	Preparing for the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	6. Strength of Materials / Ferdinand L. Singer & Andrew Pytel. 7. Strength of Materials / R. S. Khurmi. 8. Mechanics of Materials" R.C. Hibbeler	
Recommended Texts		
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	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	**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.

3- **Fluid Mechanics 1**

Module Information معلومات المادة الدراسية		
Module Title	**Fluid Mechanics 1**	**Module Delivery**
Module Type	**suport**	☒ **Theory**

Module Code	ATU22033			☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		UGII	**Semester of Delivery**		3
Administering Department		**Technical building and Construction**	**College**	**Technical College/Al Mussaib**	
Module Leader	Maher Abd Al Ameer		**e-mail**	maher Kadim@atu.edu.iq	
Module Leader's Acad. Title		Assist.Prof	**Module Leader's Qualification**		MSc in Water resources engineering
Module Tutor			**e-mail**		
Peer Reviewer Name		Prof.Dr. Issam Isaa	**e-mail**	inm.asm@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	1. To understand the science of fluid in rest and motion 2. To understand the types and methods of pressure measurement 3. To understand the behaviors of forces on submerged gates 4. To determine the behavior of fluid in rigid body movement 5. To understand flow of ideal fluid 6. To derive the continuity equation 7. To derive the energy equation for real fluid 8. To classified the type of the flow in pipes. 9. To determine the losses in pipes 10. study the momentum equation and dimensional analysis with model simulates 11. Study the open channel flow with their characteristics

Module Learning Outcomes	1. An ability to apply knowledge of mathematics, science, and engineering. 2. An ability to design and conduct experiments and to analyze and interpret data. 3. An ability to design a system, component, or process to meet desired need. 4. An ability to identify, formulate, and solve engineering problems. 5. An ability to communicate effectively 6. Understanding the impact of engineering solutions on global and societal context 7. Using the techniques, skills, and modern tools necessary for engineering practice 8. Present laboratory findings in a clear, concise laboratory report. 9. Statistical concepts and applications in fluid mechanics engineering 10. Critical Thinking 11. Analytical methods in solving problems 12. Identify operational problems to carry out fluid mechanics engineering studies and evaluate alternative solutions.
Indicative Contents	SI Units, dimensions, symbols , abbreviations [2 hrs.] Development of fluid mechanics, properties of fluids; density, specific weight, viscosity, compressibility, surface tension, capillarity etc. Characteristics of flow; discharge, velocity, pressure, shear etc. [3 hrs.] Fluid static's; absolute and gauge pressure, pressure measurement; Bourdon gauge, piezometer column, simple manometer, differential manometers. Hydrostatic forces on plane and curved surfaces, center of pressure. [3 hrs.] Fluid static's; absolute and gauge pressure, pressure measurement; Bourdon gauge, piezometer column, simple manometer, differential manometers. Hydrostatic forces on plane and curved surfaces, center of pressure. [3 hrs.] Energy equation for steady flow; potential, kinetic and flow energy; hydraulic grade line and energy line; cavitations; power; solution of flow problems; jet trajectory. [3 hrs.] . Momentum in fluid flow; impulse momentum principle; momentum correction factor ; forces on pressure conduits ; forces on stationary blades ; forces on moving blades ;jet reaction ; application of momentum equation to fluid flow problems . [3 hrs.] Steady flow in pressure conduits ; laminar and turbulent flow; critical flow ; general equation for conduit friction ;friction for laminar flow ; friction for turbulent flow ; pipe roughness ; friction factor charts ; empirical equations for pipe flow; economical diameter of pipes. [3 hrs.]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 9. Exams. 10. Student feedback.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	62	**Unstructured SWL (h/w)**	4.1
Total SWL (h/sem)	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3,5,6,10	
	Assignments	2	10% (10)	7, 8	
	reports	2	10% (10)		
	Seminar	1	10% (10)	11	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	SI Units, dimensions, symbols , abbreviations

Week 2	SI Units, dimensions, symbols , abbreviations
Week 3	Development of fluid mechanics, properties of fluids; density, specific weight, viscosity, compressibility, surface tension, capillarity etc. Characteristics of flow; discharge, velocity, pressure, shear etc.
Week 4	Development of fluid mechanics, properties of fluids; density, specific weight, viscosity, compressibility, surface tension, capillarity etc. Characteristics of flow; discharge, velocity, pressure, shear etc.
Week 5	Fluid static's; absolute and gauge pressure, pressure measurement; Bourdon gauge, piezometer column, simple manometer, differential manometers. Hydrostatic forces on plane and curved surfaces, center of pressure.
Week 6	Fluid static's; absolute and gauge pressure, pressure measurement; Bourdon gauge, piezometer column, simple manometer, differential manometers. Hydrostatic forces on plane and curved surfaces, center of pressure.
Week 7	Fluid static's; absolute and gauge pressure, pressure measurement; Bourdon gauge, piezometer column, simple manometer, differential manometers. Hydrostatic forces on plane and curved surfaces, center of pressure. Fluid static's; absolute and gauge pressure, pressure measurement; Bourdon gauge, piezometer column, simple manometer, differential manometers. Hydrostatic forces on plane and curved surfaces, center of pressure.
Week 8	Fluid static's; absolute and gauge pressure, pressure measurement; Bourdon gauge, piezometer column, simple manometer, differential manometers. Hydrostatic forces on plane and curved surfaces, center of pressure.
Week 9	Energy equation for steady flow; potential, kinetic and flow energy; hydraulic grade line and energy line; cavitations; power; solution of flow problems; jet trajectory.
Week 10	Energy equation for steady flow; potential, kinetic and flow energy; hydraulic grade line and energy line; cavitations; power; solution of flow problems; jet trajectory.
Week 11	Momentum in fluid flow; impulse momentum principle; momentum correction factor ; forces on pressure conduits ; forces on stationary blades ; forces on moving blades ;jet reaction ; application of momentum equation to fluid flow problems .
Week 12	Momentum in fluid flow; impulse momentum principle; momentum correction factor ; forces on pressure conduits ; forces on stationary blades ; forces on moving blades ;jet reaction ; application of momentum equation to fluid flow problems .
Week 13	Steady flow in pressure conduits ; laminar and turbulent flow; critical flow ; general equation for conduit friction ;friction for laminar flow ; friction for turbulent flow ; pipe roughness ; friction factor charts ; empirical equations for pipe flow; economical diameter of pipes.
Week 14	Steady flow in pressure conduits ; laminar and turbulent flow; critical flow ; general equation for conduit friction ;friction for laminar flow ; friction for turbulent flow ; pipe roughness ; friction factor charts ; empirical equations for pipe flow; economical diameter of pipes.
Week 15	Preparing to final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	General looking for the instruments in the fluid laboratory; How to write the practical report.
Week 2	Properties of fluid; a- density measurement b- viscosity measurement
Week 3	Pressure measurement devices ; a- barometers b- Manometers; 1.piezometers, 2.open U-tube manometer, 3.inclined manometer, 4. Differential manometer. c- Balancing of the force; 1.piston type, 2.bell type, 3.ring type. d- Borden gauge.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Douglas, J.F. et al; 2011 (Fluid Mechanics). Prentice Hall. 2. Durgaiah D. R.; 2002 (Fluid Mechanics and Machinery). New Age international publishers. 3. White, F. M.; 1994 (Fluid Mechanics).3rd ed. McGraw-Hill, New York. 4. Khurmi, R.S.; 1994 (Hydraulics, Fluid Mechanics and Hydraulic Machines). S. Chand and Co. Ltd.	
Recommended Texts		
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.

4- Applied surveying

Module Information معلومات المادة الدراسية					
Module Title	**Applied Survey 1**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	ATU22034				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		UGII	**Semester of Delivery**		3
Administering Department		**Technical building and Construction**	**College**	**Technical College- Al Mussaib**	
Module Leader	Fatin mizher radhi		**e-mail**	faten.mz@atu.edu.iq	
Module Leader's Acad. Title		Assis. lecturer	**Module Leader's Qualification**		M.Sc . in survey engineering
Module Tutor	None		**e-mail**	E-mail	

Peer Reviewer Name	Porf.Dr.Maki Jafar	**e-mail**	maki_jafar@atu.edu.iq
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22023	**Semester**	1
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	The students should be able to: a- Measuring angles : Select the most appropriate method of measuring horizontal and vertical angles. b- Measuring and record these angles and determine their most probable values. c- Understand the errors that affect angle measurement and minimize their effects. d- Measuring corrected coordinates of points and setting out of different lands. e- Learning traversing and computations for different type of traverses f- Tacheometry , stadia tacheometry , Inclined sights g- Skills of using theodolite efficiently h- Electromagnetic distance measurement(EDM), basic concept, systems.
Module Learning Outcomes	The student will be able to: 13. Measuring angles : a. Select the most appropriate method of measuring horizontal and vertical angles. b. Measuring and record these angles and determine their most probable values. c. Understand the errors that affect angle measurement and minimize their effects. d. Measuring directions ,whole circle bearing ,reduce bearing. e. Measuring corrected coordinates of points and setting out of different lands.

	14. Skills of using theodolite efficiently 15. Traversing : types of traversing (closed and open traverse) 16. Tacheometry , stadia tacheometry , Inclined sights 17. Electromagnetic distance measurement(EDM), basic concept, systems.
Indicative Contents	Theodolites , Principle of construction [8 hrs.] Measuring Horizontal angles [2 hrs.] Measuring angles in vertical plane [2 hrs.] Directions , Whole circle bearing , Reduce Bearing [2 hrs.] Traverse Surveys , Bearings , forward & Back bearing [2 hrs.] Close circle traverse, coordinates calculations [2 hrs.] Close connected traverse , coordinates calculations [2 hrs.] Tacheometry , stadia tacheometry , Inclined sights [2 hrs.] Electromagnetic distance measurement(EDM), basic concept, systems [2 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 11. Exams. 12. Student feedback.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	78	**Structured SWL (h/w)**	5.2
Unstructured SWL (h/sem)	47	**Unstructured SWL (h/w)**	3.1
Total SWL (h/sem)	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	3,5,6,10	
	Assignments	2	10% (10)	7, 8	
	Seminar	1	10% (10)	11	
Summative assessment	Midterm Exam	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Theodolites , Principle of construction
Week 2	Measuring Horizontal angles , Measuring angles in vertical plane
Week 3	Directions , Whole circle bearing , Reduce Bearing
Week 4	Traverse Surveys , Bearings , forward & Back bearing
Week 5	Close circle traverse, coordinates calculations
Week 6	Close connected traverse , coordinates calculations
Week 7	Tacheometry , stadia tacheometry , Inclined sights
Week 8	Electromagnetic distance measurement(EDM), basic concept, systems
Week 9	Total station, Field Techniques, point location, missing line measurements

Week 10	Resection , Azimuth, elevation , Layout Positions and area computation ,Motorized Total stations, Automatic ,remote control, computerized
Week 11	Horizontal Curves , Kinds , computations
Week 12	Horizontal Curves , Kinds , computations
Week 13	Setting out of horizontal curves.
Week 14	Setting out of horizontal curves
Week 15	Preparing to final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Measuring horizontal & vertical angles by using different kinds of theodolites.
Week 2	Construct close connected & close circle traverses to survey small area.
Week 3	Computations of the coordinates of stations traverse & plotting a traverse , Problems in inverse computation.
Week 4	Measuring H. distances & vertical distances by using tachometer .
Week 5	Measuring slope , Horizontal & vertical distances, Resection , Azimuth, elevation , Layout Positions and motorized Total stations, Automatic ,remote control, computerized and by using Total station instrument.
Week 6	Measuring area by using total station , Solve problems , Standard deviation.
Week 7	Setting out curves & calculation , Curves field work surveying.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**

Required Texts	5. Surveying for construction / William Irvine , FRICS. 6. Text book of surveying / S.K. Husain , M.S. Naga. Raj. 7. Elements of photogrammetry / Wolf , Pual R. 8. المساحة المستوية / د . فوزي الخالصي 9. المساحة المستوية والمائية / د . علي شكري	
Recommended Texts		
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.

5- Probability & Statistics

Module Information معلومات المادة الدراسية					
Module Title	Probability & Statistics			**Module Delivery**	
Module Type	suport			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ATU22035				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		**JGII**	**Semester of Delivery**		3
Administering Department		Engineering Building and Construction Technique	**College**	Technical College/Al Mussaib	
Module Leader	**Dr.Hayer fawzi**		**e-mail**	Haider.fawzi@atu.edu.iq	
Module Leader's Acad. Title		**Assist. Prof.**	**Module Leader's Qualification**		**PHD in.**
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Prof.Dr.Nabeel Hameed	**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	This course description provides a brief summary of the most important characteristics of the course and the expected learning outcomes of students to

أهداف المادة الدراسية	demonstrate whether they have made the most of the available learning opportunities. It must be linked to the description of the program.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 1- distinguish types of studies and their limitations and strengths, Describe a data set including both categorical and quantitative variables to support or refute a statement. 2- Apply laws of probability to concrete problems. 3- Perform statistical inference in several circumstances and interpret the results in an applied context. 4- Use mathematical tools, including calculus and linear algebra. 5- study probability and mathematical statistics and in the description and development of statistical procedures. 6- Use a statistical software package for computations with data. 7- Use a computer for the purpose of simulation in probability and statistical inference. 8- Communicate concepts in probability and statistics using both technical and non-technical language.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Statistics-Types of Statistics [2hr] Data-Population-Sample-Variable[2hr] Frequency Distribution [2hr] Class boundaries-Class Width-Class Mark[2hr] Relative and Percentage Frequency[2hr] Graphical Presentation I[2hr] Graphical Presentation II[2hr] Statistical Notations I[2hr] Statistical Notations II[2hr] Measures of Central Tendency I[2hr] Measures of Central Tendency II[2hr] Measures of Variation I[2hr]

	Measures of Variation II[2hr] Measures of Skewed [2hr] Correlation[2hr]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Qu**izzes** 2- Student feedback. 3- Seminars

Student Workload (SWL) الحمل الدراسي للطالب			
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7

	Projects / Lab.	1	10 % (10)		
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Statistics-Types of Statistics
Week 2	Data-Population-Sample-Variable
Week 3	Frequency Distribution
Week 4	Class boundaries-Class Width-Class Mark
Week 5	Relative and Percentage Frequency
Week 6	Graphical Presentation I
Week 7	Graphical Presentation II
Week 8	Statistical Notations I
Week 9	Statistical Notations II
Week 10	Measures of Central Tendency I
Week 11	Measures of Central Tendency II
Week 12	Measures of Variation I
Week 13	Measures of Variation II
Week 14	Measures of Skewed. Correlation
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1-Elementary Statistics, Author Allan G. Bluman, Printed by McGraw-Hill, 1997. 2- المدخل الى الاحصاء- تأليف د.خاشع محمود الراوي- طباعة جامعة الموصل	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.

6- Advanced mathematics

Module Information

معلومات المادة الدراسية

Module Title	**Advanced Mathematics**	**Module Delivery**	
Module Type	**suport**		☒ **Theory**
Module Code	ATU22036		☒ **Lecture**
ECTS Credits	**4**		☐ **Lab**
SWL (hr/sem)	**100**		☒ **Tutorial**
			☐ **Practical**
			☐ **Seminar**

Module Level	UGII	**Semester of Delivery**	3
Administering Department	**Technical building and Construction**	**College**	**Technical College/ Al Mussaib**
Module Leader	Dr. Abbas K.Alrekabi	**e-mail**	Dr.abbas.rikabi@atu.edu.iq
Module Leader's Acad. Title	Assist. Professor	**Module Leader's Qualification**	PHD in chemical engineering
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**Applied Mathematics**	**Semester**	L 1 S1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	The student must know the advanced theories in mathematics needed in construction engineering .

Module Learning Outcomes	Upon completion of the course, students should be able to: 14. Skill of thinking 15. Skill of conclusion and evaluation 16. Skill analysis 17. The skill of observation 18. The student's ability to excel and cognitive perception to diagnose theories and general 19. Principles in the study. 20. Future planning to link, what students learn in daily life. 21. Practice different patterns in mathematical proofs. 22. Self-reliance in getting to the idea and how to manage solving the scientific problem. 23. Statistical concepts and applications in civil engineering. 24. Critical Thinking 25. Analytical methods in solving problems 26. Identify operational problems to carry out civil engineering studies and evaluate alternative solutions.
Indicative Contents	Multiple integrals ,double integrals , area by double integration , triple integrals , volume by double and triple integrations. [4 hrs.] Polar coordinates , curves by polar coordinates ,area by polar double integrations , cylindrical and spherical coordinates, equations of solids Ordinary differential equations of first order ,separable , homogeneous , exact and not exact , linear and Bernoulli first order equations , general and condition solutions , applications. [4 hrs.] Linear differential equations with constant coefficients, homogeneous and non-homogeneous equations , equation of higher order , general and condition solutions , applications. [4 hrs.] Partial derivatives with two and more two variables , higher- order partial derivatives , chain rule for partial derivatives , maxima & minima of function of two variables , saddle point and relative extrema. [4 hrs.] Vector analysis , dot and cross product of vector functions , velocity and acceleration ,gradient of vector fields,divergance and curl of vector fields . Equations of the lines and surfaces in space , intersection of lines and surfaces using vectors , lagrange multipliers with two and more constraints. Complex numbers and functions , demoivres theorem, roots ,argand diagram, cauchy – rehmann equations. [4 hrs.]

	Limits , Infinite sequences , convergence and divergence , infinite series , geometric and ordinary series , positive and alternative series , test of convergences. [4 hrs.] Power series , maclaurin series taylor and trigonometric series . Fourier series for periodic function , euler coefficients , applications Green,s theorem for enclosed curves , line integral. [4 hrs.] Matrices , Adjoins & inverses , solving linear equations using the inverse of matrix , determinants and cramer method to solve linear equations , Gaussian elimination and gauss-seidel elimination. [4 hrs.] Improper integration and Laplace transform of some common functions , properties of Laplace transform. [4 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 13. Exams. 14. Student feedback. 15. Preparation of scientific reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	37	**Unstructured SWL (h/w)**	2.5
Total SWL (h/sem)	100		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**

Formative assessment	**Quizzes**	4	10% (10)	3,5,6,10	
	reports	1	10% (10)	10	
	Assignments	2	10% (10)	7, 8	
	Seminar	1	10% (10)	11	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Multiple integrals ,double integrals , area by double integration , triple integrals , volume by double and triple integrations.
Week 2	Polar coordinates , curves by polar coordinates ,area by polar double integrations , cylindrical and spherical coordinates, equations of solids
Week 3	Ordinary differential equations of first order ,separable , homogeneous , exact and not exact , linear and Bernoulli first order equations , general and condition solutions , applications
Week 4	Linear differential equations with constant coefficients, homogeneous and non-homogeneous equations , equation of higher order , general and condition solutions , applications.
Week 5	Partial derivatives with two and more two variables , higher- order partial derivatives , chain rule for partial derivatives , maxima & minima of function of two variables , saddle point and relative extrema.
Week 6	Vector analysis , dot and cross product of vector functions , velocity and acceleration ,gradient of vector fields,divergance and curl of vector fields .
Week 7	Equations of the lines and surfaces in space , intersection of lines and surfaces using vectors , lagrange multipliers with two and more constraints.
Week 8	Complex numbers and functions , demoivres theorem, roots ,argand diagram, cauchy – rehmann equations.
Week 9	Limits , Infinite sequences , convergence and divergence , infinite series , geometric and ordinary series , positive and alternative series , test of convergences
Week 10	Power series , maclaurin series taylor and trigonometric series .
Week 11	Fourier series for periodic function , euler coefficients , applications

Week 12	Green's theorem for enclosed curves , line integral
Week 13	Matrices , Adjoins & inverses , solving linear equations using the inverse of matrix , determinants and cramer method to solve linear equations , Gaussian elimination and gauss-seidel elimination.
Week 14	Improper integration and Laplace transform of some common functions, properties of Laplace transform.
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	9. Advanced Engineering Mathematics /C. Ray Wylie 10. Engineering mathematics / G. S . Sharma &I . J. S . Sarna 11. Applied Mathematics for Engineers & physicists / Pipes & Harvill .	
Recommended Texts		

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.

7- Strength of Materials 2

Module Information معلومات المادة الدراسية					
Module Title	**Strength of Materials 2**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ATU22041				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		UGII	**Semester of Delivery**		4
Administering Department		**Technical building and Construction**	**College**	**Technical College/ Al Mussaib**	
Module Leader	Dr. Ammar Adil Abdulnabe		**e-mail**	ammaralbakry@atu.edu.iq	

Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D. in mechanical Engineer -
Module Tutor		**e-mail**	
Peer Reviewer Name	Prof.Dr.Hussam Ali	**e-mail**	com.hus@atu.edu.iq
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22032	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. To understand effect of forces and loads on materials. 2. To understand how materials deforms due to external forces 3. to understand the safest way in using material in engineering applications and construction purposes 4. to understand how beams deforms due to loads and what type of stresses occur 5. to understand composite material and its behavior and deformation 6. to realize the meaning of compound stresses on material and to compute it.
Module Learning Outcomes	At the end of this course: 1. Solve engineering problems relating to stress and strain analysis. 2. Develop the student's ability to deal with normal force, shear force and bending moment in statically determinate beam assemblies with internal hinges. 3. An ability to calculate stresses and deformations of object under external forces 4. An ability to analyze a given problem in a simple manner. 5. An ability to apply the knowledge of strength of material on engineering application and design problems. 6. An ability to communicate effectively

	7. Understanding the impact of engineering solutions on global and societal context 8. Using the techniques, skills, and modern tools necessary for engineering practice 9. Designing concepts and applications in engineering mechanics of material . 10. Critical Thinking 11. Analytical methods in solving problems
Indicative Contents	Stresses in Beams: Derivation of flexure formulas, Economic sections, Unsymmetrical beams, Analysis of flexure action, Formula for horizontal shear stress. [8 hrs.] Beams Deflections: Theorem of area-moment method, Double integration method. [8 hrs.] Stresses: Combined axial & flexural loads , Kern of a section , Loads applied off axes of symmetry , Stress at a point , Mohr's circle , Transformation of strain components. [8 hrs.] Columns: Critical loads , Long columns by Euler's formula , Intermediate columns , Empirical formulas. [8 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1. Exams. 2. Student feedback.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	87	**Unstructured SWL (h/w)**	5.8

Total SWL (h/sem)	150

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3,5,6,10	
	Assignments	2	10% (10)	7, 8	
	reports	2	10 % (10)	4,9	
	Seminar	1	10% (10)	11	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Stresses in Beams: Derivation of flexure formulas, Economic sections, Unsymmetrical beams, Analysis of flexure action, Formula for horizontal shear stress.
Week 2	Stresses in Beams: Derivation of flexure formulas, Economic sections, Unsymmetrical beams, Analysis of flexure action, Formula for horizontal shear stress.
Week 3	Stresses in Beams:

	Derivation of flexure formulas, Economic sections, Unsymmetrical beams, Analysis of flexure action, Formula for horizontal shear stress.
Week 4	Stresses in Beams: Derivation of flexure formulas, Economic sections, Unsymmetrical beams, Analysis of flexure action, Formula for horizontal shear stress.
Week 5	Beams Deflections: Theorem of area-moment method, Double integration method.
Week 6	Beams Deflections: Theorem of area-moment method, Double integration method.
Week 7	Beams Deflections: Theorem of area-moment method, Double integration method.
Week 8	Beams Deflections: Theorem of area-moment method, Double integration method.
Week 9	Combined Stresses: Combined axial & flexural loads , Kern of a section , Loads applied off axes of symmetry , Stress at a point , Mohr's circle , Transformation of strain components.
Week 10	Combined Stresses: Combined axial & flexural loads , Kern of a section , Loads applied off axes of symmetry , Stress at a point , Mohr's circle , Transformation of strain components.
Week 11	Combined Stresses: Combined axial & flexural loads , Kern of a section , Loads applied off axes of symmetry , Stress at a point , Mohr's circle , Transformation of strain components.
Week 12	Columns: Critical loads , Long columns by Euler's formula , Intermediate columns , Empirical formulas.
Week 13	Columns: Critical loads , Long columns by Euler's formula , Intermediate columns , Empirical formulas.
Week 14	Columns: Critical loads , Long columns by Euler's formula , Intermediate columns , Empirical formulas.
Week 15	Preparing for the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Strength of Materials / Ferdinand L. Singer & Andrew Pytel. 2. Strength of Materials / R. S. Khurmi. 3. Mechanics of Materials" R.C. Hibbeler	
Recommended Texts		
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.

8- **Engineering Surveying**

Module Information معلومات المادة الدراسية					
Module Title	**Applied surveying 2**			**Module Delivery**	
Module Type	**suport**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	ATU22042				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		UGII	**Semester of Delivery**		4
Administering Department		**Technical building and Construction**	**College**	**Technical College/Al Mussaib**	
Module Leader	**Faten Mezher Radhi**		**e-mail**	faten.mz@atu.edu.iq	
Module Leader's Acad. Title		Assist.Lecturer	**Module Leader's Qualification**		MSc. in survey engineering
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name		Porf.Dr.Maki Jafar	**e-mail**	maki_jafar@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22034	**Semester**	3
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. Introducing the fundamentals of horizontal and vertical curves ,elements ,the required calculations, types of horizontal curves . Skills of using Total Station Instrument efficiently .Setting out constructions, small &large building .&methods of setting out . Explain Arial photogrammetric surveying , Global Positioning System (GPS) and geographic information system(GIS)
Module Learning Outcomes	upon completion of this course the students will: 2. To apply the knowledge of horizontal and vertical curves. 3. Types Horizontal curves , Kinds (simple ,compound reverse and transition curve), Computations 4. Vertical Curves , Kinds , Computations 5. Tunnel surveying . 6. Setting out of horizontal curves 7. Skills of using Total Station Instrument efficiently 8. Setting out constructions, small &large building . 9. Arial photogrammetric surveying 10. Photogrammetric traditional surveying 11. Photogrammetric Instruments &Flight design 12. Global Positioning System (GPS)
Indicative Contents	Horizontal curves , Kinds , Computations [3 hrs.] Vertical Curves , Kinds , Computations [6 hrs.] Tunnel surveying [3 hrs.] Total station principles , intersections , distance measurements (2hrs) Total station, Field Techniques, point location, missing line measurements [2 hrs.] Resection , Azimuth, elevation , Layout Positions and area computation [2 hrs.] Motorized Total stations, Automatic ,remote control, computerized [2 hrs.] Arial photogrammetric surveying [3 hrs.] Photogrammetric traditional surveying [3 hrs.] Photogrammetric Instruments &Flight design [3 hrs.] Global Positioning System (GPS) [3 hrs.] Geographic Information system (GIS) [3 hrs.] Field measurements by using total station and calculations, for for certain pro

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Assessment is based on 3. Exams. 4. Student feedback.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	62	**Unstructured SWL (h/w)**	4.1
Total SWL (h/sem)	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3,5,6,10	
	Assignments	2	10% (10)	7, 8	
	reports	5	10% (10)	2,4,6,8,10	
	Seminar	1	10% (10)	11	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Vertical Curves , Kinds , Computations
Week 2	Vertical Curves , Kinds , Computations
Week 3	Setting out construction , small & large building
Week 4	Tunnel surveying
Week 5	Arial photogrammetric surveying
Week 6	Photogrammetric traditional surveying
Week 7	Photogrammetric Instruments &Flight design
Week 8	Terrestrial Photogrammetry
Week 9	Global Positioning System (GPS)
Week 10	Global Positioning System (GPS)
Week 11	Geographic Information system (GIS)
Week 12	Applications of the photogrammetry
Week 13	Field measurements by using total station and calculations, for for certain projects
Week 14	Field measurements by using total station and calculations, for for certain projects
Week 15	Preparing to final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Setting out of the vertical curves
Week 2	Setting out small building & roadway.
Week 3	**Practical problems in tunnel surveying.**

Week 4	Basic measurements of photograph using pocket stereo-scope , Using mirror stereoscope.
Week 5	**Global Poisoning system (GPS) basic concept, systems**
Week 6	**Appling Arc Map (GIS)**
Week 7	Field measurements or lab calculation for certain project.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Surveying for construction / William Irvine , FRICS. 2. Text book of surveying / S.K. Husain , M.S. Naga. Raj. 3. Elements of photogrammetry / Wolf , Pual R. 4. المساحة المستوية / د . فوزي الخالصي 5. المساحة المستوية والمائية / د . علي شكري	

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.

9- **Building Constructions**

Module Information معلومات المادة الدراسية				
Module Title	**Building Constructions**		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ATU22043			
ECTS Credits	**10**			
SWL (hr/sem)	250			
Module Level	UGII	**Semester of Delivery**	4	
Administering Department	**Technical building and Construction**	**College**	**Technical College/Al Mussaib**	
Module Leader	Zainab Sabah Rasoul	**e-mail**	zainab.rasoul@atu.edu.iq	
Module Leader's Acad. Title	Assis. lecturer	**Module Leader's Qualification**	M.Sc in civil engineering (construction materials)	
Module Tutor		**e-mail**		
Peer Reviewer Name	Dr. Zahraa Fakhri	**e-mail**	Dr_zahraajawad@atu.edu.iq	
Scientific Committee Approval Date		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. In this subject student will learn soil investigation and soil bearing capacity, foundation types, building of wall by many types of materials, types of beam and columns, isolation location and materials, finishing works. 2. To prepare them to carry out experimental investigation and analysis at later stages of graduation.
Module Learning Outcomes	The student will able to explain basic concepts related building. 1. The student explains type of buildings and their usage aims. 2. The student explains construction stages. 3. The student explains functions of building elements. 4. The student explains types and properties of foundations . 5. The student prepares foundation plans of buildings. 6. The student expresses properties of different structures walls. 7. The student expresses properties of different structures floors. 8. The student draws details of foundation, walls and floors. 9. The student explains properties of mass buildings. 10. The student defines building elements of mass building. 11. The student explains principles of mass building and uses them in project drawings. 12. The student defines isolation materials using for heat, water, noise and fire insulation and explains their usage place.
Indicative Contents	Site investigation and methods. Bearing capacity of soil and filed test. [2 hrs.] Excavation and supporting. [2 hrs.] Types of Foundation, excavation .reinforcing and concrete casting, dry of site ,Pile foundation, sheet piles and capping. [2 hrs.] Masonry stone work ,stone building,under ground and above. [2 hrs.] Brick and block works ,British and Flemish arrangements. [2 hrs.]

	Thermal insulation materials ,types and specifications and component. [2 hrs.] Concrete Forms, Timber forms , bracing for roofs and columns. [2 hrs.] Scaffolding types ,components. [2 hrs.] Columns classification and shape of failures. [2 hrs.] Beams types steel and timber,pre-cast, pre-stress. [2 hrs.] Damp proofing materials ,application and treatment of roof ,basement, wall. [2 hrs.] Floor and Finishing. [2 hrs.] Inner wall finishing by Gypsum ,paints ..etc. External wall finishing materials ;cement, stone, painting. [2 hrs.] Doors and windows and upstairs [2 hrs.] Type of maintenances, type of failure in building and treatment failures of building[2 hrs.].

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 5. Exams. 6. Student feedback.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	123	**Structured SWL (h/w)**	8.2
Unstructured SWL (h/sem)	127	**Unstructured SWL (h/w)**	8.5
Total SWL (h/sem)	250		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)	3,5,6,10	
	Assignments	2	10% (10)	7, 8	
	Seminar	1	10% (10)	11	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Site investigation and methods. Bearing capacity of soil and filed test. Excavation and supporting.
Week 2	Types of Foundation, excavation .reinforcing and concrete casting, dry of site
Week 3	,Pile foundation, sheet piles and capping
Week 4	Masonry stone work ,stone building,under ground and above
Week 5	Brick and block works ,British and Flemish arrangements
Week 6	Thermal insulation materials ,types and specifications and component
Week 7	Concrete Forms, Timber forms , bracing for roofs and columns
Week 8	Scaffolding types ,components
Week 9	Columns classification and shape of failures
Week 10	Beams types steel and timber,pre-cast, pre-stress

Week 11	Damp proofing materials ,application and treatment of roof ,basement, wall.
Week 12	Floor and Finishing
Week 13	Inner wall finishing by Gypsum ,paints ..etc.External wall finishing materials ;cement,stone,painting.
Week 14	Doors and windows and upstairs
Week 15	Type of maintenances, type of failure in building and treatment failures of building

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. زهير زاكو/انشاء المباني 2. Handbook of building construction 2006 3. Internet s references	
Recommended Texts		
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.

Module Information

معلومات المادة الدراسية

Module Title	**English language 2**	**Module Delivery**	
Module Type	basic	☒ **Theory** ☐ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ATU22044		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGII	**Semester of Delivery**	**4**
Administering Department	**Technical building and Construction**	**College**	**Technical College/Al Mussaib**
Module Leader	Saif abd alkareem	**e-mail**	
Module Leader's Acad. Title	Assist.Lecturer	**Module Leader's Qualification**	MSc in English language
Module Tutor		**e-mail**	
Peer Reviewer Name	Dr. Abass Kadhem	**e-mail**	
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Advanced English skills	**Semester**	L 1 S1

Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The goal is to study English language and gain knowledge of it as benefit engineers in general, and to develop speaking skills and understand its basic rules taking the way to the acquisition of the ability to use technical key words in their work and the capability of communicating with other engineers correctly
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Developing speaking skills and understanding its basic rules to take the way to the acquisition of the ability to use technical keywords in their work and the capability of communicating with other engineers correctly .
Indicative Contents المحتويات الإرشادية	Revision, vocabulary and comprehension [2 hrs.] Present continuous, comparative and superlative adjective, vocabulary. [2 hrs.] Time clauses, this and that, vocabulary and comprehension. [2 hrs.] If clauses, vocabulary and comprehension. [2 hrs.] This and that, expletive there, prepositions. [2 hrs.] Past perfect, past perfect continuous , vocabulary and comprehension. [2 hrs.] Relative pronouns, relative clauses. [2 hrs.] Past perfect, Past perfect continuous, vocabulary and comprehension. [2 hrs.] Used to, Infinitives, passive voice. [2 hrs.] Passive voice, coordinating conjunctions, subordinating conjunction. [2 hrs.] Future perfect, future perfect continuous, vocabulary and comprehension. [2 hrs.] Writing a composition, comprehension. [2 hrs.] Technical English (1), Keywords, English use. [2 hrs.]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم	
Strategies	Type something like: 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

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	29	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	60		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Revision, vocabulary and comprehension
Week 2	Present continuous, comparative and superlative adjective, vocabulary.
Week 3	Time clauses, this and that, vocabulary and comprehension.
Week 4	If clauses, vocabulary and comprehension
Week 5	This and that, expletive there, prepositions
Week 6	Past perfect, past perfect continuous , vocabulary and comprehension
Week 7	Relative pronouns, relative clauses
Week 8	Past perfect, Past perfect continuous, vocabulary and comprehension
Week 9	Used to, Infinitives, passive voice
Week 10	Passive voice, coordinating conjunctions, subordinating conjunction
Week 11	Future perfect, future perfect continuous, vocabulary and comprehension
Week 12	Writing a composition, comprehension
Week 13	Technical English (1), Keywords, English use
Week 14	**Revision**
Week 15	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Headway plus for beginners	Yes
Recommended Texts	Any Grammar and comprehension for technical learning	No
Websites	1- https://www.coursera.org/browse/physical-science-and-engineering/electrical-e ngineering 2- https://link.springer.com/book/10.1007/978-981-10-8624-3 3- https://progressivecollege.ie/courses/early-learning-and-care-qqi-level-5-major-award/?gad=1&gclid=EAIaIQobChMI_Nqu2tqA_wIVZ4VoCR2O0woLEAAYASAAEgI9WvD_BwE	

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.

Module Information معلومات المادة الدراسية			
Module Title	**Computer application**	**Module Delivery**	
Module Type	Basic	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ATU22045		
ECTS Credits	**3**		
SWL (hr/sem)	**75**		
Module Level	**UGII**	**Semester of Delivery**	4

Administering Department	Engineering Building and Construction Technique	**College**	Technical College/Al Mussaib
Module Leader		**e-mail**	
Module Leader's Acad. Title	**lecturer**	**Module Leader's Qualification**	**PHD in Arabic languge**
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Computer principles	**Semester**	L1 s2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Students successfully completing this course will be able to: 1. Utilize the computer for fundamental tasks. 2. Identify and discuss the hardware components of the computer system. 3. Creating documents using a word processor and creating presentations. 4. Conducting research on the Internet. 5. An introduction to Artificial Intelligence.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will:
Indicative Contents	Indicative content includes the following.

المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Quizzes 2- Student feedback. 3- Seminars

Student Workload (SWL) الحمل الدراسي للطالب			
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	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	10	
	Report	1	10% (10)	13	LO # 5, 8 and 10

Summative assessment	**Midterm Exam**	2 hr	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	**Security and Networking** : what is a Network ? types of Networks basic Network components
Week 2	**Security and Networking** (cont.): Network security basics understanding Network threats.
Week 3	**e-commerce** : concepts of electronic banking services this include online banking ATM and debit card services phone banking SMS banking Electric mobile banking
Week 4	**Computer Troubleshooting** : identifying and solving come on Hardware and software problem that computer users encounter
Week 5	**Computer Troubleshooting** (Cont.): basic troubleshooting Technic use and tools or diagnostic and resolving issues
Week 6	**introduction to AI : definition of AI history of AI , AI Techniques and approaches.**
Week 7	**introduction to AI (cont.) :** key card characteristics of AI benefits of AI challenge and ethical considerations
Week 8	**THE RULE of AI in modern smartphones:** AI is driven mobile technologies virtual assistant Siri Google Assistant Alexa
Week 9	**THE RULE of AI in modern smartphones:** adaptive learning real time translation services
Week 10	**Applications and tools of AI** :overview of AI applications and various Industries education and Healthcare
Week 11	**Applications and tools of AI** (Cont.)transportation marketing and advertising

Week 12	**Applications and tools of AI** (Cont.): Finance robotics and automation Technologies
Week 13	**AI and Society** : how AI affects social ,AI and International relations, AI and the future of humanity
Week 14	**Ethical challenges in AI** : AI ethics privacy and surveillance the inbox of AI on the job market
Week 15	**The future of AI** :future trends and AI recent research and emerging Technologies

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1- Graham Brown ,David Watson, " Cambridge IGCSE information and communication technology" 3rd Edition (2020). 1- Alan evans, Kendall Martin , Mary Anne Poatsy,"Technology in action complete ", 16th Edition 2020. 2- Ahmed Banafa, "introduction to artificial intelligence (AI)", first edition 2024. 3- Microsoft Office 2019 step by step 1st edition by Curtis frye & John Lambert. 4- 2016 اساسيات الحاسوب"الخضر علي الخضر بحاث" 5- 2005 " الدكتور مدخل الى عالم الذكاء الاصطناعي" عادل عبد النور	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.

6	ATU22046	arabic language	لغة عربية

13- The crimes of the extinct Baath Party

Module Information معلومات المادة الدراسية					
Module Title	**The crimes of the extinct Baath Party**			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ATU22047				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	**UGII**		**Semester of Delivery**	4	
Administering Department	Engineering Building and Construction Technique		**College**	Technical College/Al Mussaib	
Module Leader	**Shaimaa Haded**		**e-mail**	Shaimaahaded@atu.edu.iq	
Module Leader's Acad. Title	**lecturer**		**Module Leader's Qualification**	**PHD in Arabic languge**	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Prof.Dr.Nabeel Hameed		**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	إن الجرائم الشنيعة التي اقترفها نظام البعث في العراق لاتكاد تحصى ولو ان اقلام الباحثين تعقبتها بالتوثيق والتحليل والدراسة لما اتت على حقيقة ما جرى في بلدنا الجريح لذا كان الهدف من هذا المنهاج تبصرة الشباب الجامعي بحقيقة نظام البعث ومنهجه المحاط بمختلف الجرائم الانسانية لكل لا يضللوا بالاكاذيب الاعلامية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will:
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Qu**izzes** 2- Student feedback. 3- Seminars

Student Workload (SWL) الحمل الدراسي للطالب			
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)	17	**Unstructured SWL (h/w)**	1.1

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	10	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	
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		Yes
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.

1	ATU22051	Reinforced Concrete (1)	**الخرسانة المسلحة (1)**

Module Information معلومات المادة الدراسية		
Module Title	**(Reinforced Concrete (1**	**Module Delivery**
Module Type	**Core**	**☒Theory** **☒Lecture** **☐Lab** **☒ Tutorial** **☐Practical** **☐Seminar**
Module Code	ATU22051	
ECTS Credits	**5**	
SWL (hr/sem)	**125**	

Module Level	**UGIII**	**Semester of Delivery**	5
Administering Department	**Technical building and Construction**	**College**	**Technical College/ Al-Mussaib**
Module Leader	Hussam Ali Mohammed	**e-mail**	com.hus@atu.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D in Structural-Civil Engineering
Module Tutor		**e-mail**	
Peer Reviewer Name	Mohammed Jasim Hussain	**e-mail**	Com.hj.mohamad@atu.edu.iq
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	The aims of course to develop an understanding of performance and design methodology for basic reinforced concrete structural elements.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course. Student should be able to: 1- To calculate loads and apply it on structures. 2- To analysis and design of different types of reinforced concrete members. 3- To understand bond, anchorage, development length, and serviceability. 4- Recognize the design philosophy of reinforced concrete structures. 5- Understand the difference between the structural behavior of different reinforced concrete structural elements through demonstration experiments and data analysis. 6- Be able to design different elements of reinforced concrete structural systems subjected to gravity and lateral loads. 7- Be able to analyze and design a complete structural system through a comprehensive design project. 8- Be able to produce a complete project document and present in a concise and complete manner to include structural drawings and structural calculations.

	9- Summaries the fundamental mechanics of reinforced concrete and the empirical assumptions made for analysis. 10- Design basic structural elements (beams, columns and slabs) according to the design approach. 11- Apply fundamental mechanics to the design of reinforced concrete beams and slabs at the serviceability limit state including determination of short and long term deflection and crack widths.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** Loads, Load Combinations, Safety provisions of the ACI code, Analysis of beams and frames, Arrangement of live loads [3hrs] Properties of concrete in compression, Modulus of elasticity, Stiffness, Properties of concrete in tension, Shrinkage and temperature, Reinforcing steel. [3hrs] Flexural analysis and design of beams (1): Reinforced concrete beam behavior, Analysis of tension reinforced rectangular beam. [3hrs] Flexural analysis and design of beams (2): Design of rectangular beams, Design aids, Practical consideration in design of beams. [3hrs] Flexural analysis and design of beams (3): Rectangular beam with tension and compression reinforcement[3hrs] Flexural analysis and design of beams (4): T-beams. [3hrs] Shear and diagonal torsion in beams. [3hrs] Analysis and design for shear and torsion. [3hrs] Design of one-way slab. [2hrs] Bond, anchorage, and development length. [2hrs] Short columns. [2hrs] Serviceability[2hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams. 2- Student feedback. 3- Seminars.

Student Workload (SWL) الحمل الدراسي للطالب			
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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Loads, Load Combinations, Safety provisions of the ACI code, Analysis of beams and frames, Arrangement of live loads
Week 2	Properties of concrete in compression, Modulus of elasticity, Stiffness, Properties of concrete in tension, Shrinkage and temperature, Reinforcing steel.
Week 3	Flexural analysis and design of beams (1): Reinforced concrete beam behavior, Analysis of tension reinforced rectangular beam.
Week 4	Flexural analysis and design of beams (2): Design of rectangular beams, Design aids, Practical consideration in design of beams.
Week 5	Flexural analysis and design of beams (3): Rectangular beam with tension and compression reinforcement
Week 6	Flexural analysis and design of beams (4): T-beams.
Week 7	Shear and diagonal torsion in beams.
Week 8	Analysis and design for shear and torsion.
Week 9	Design of one-way slab.

Week 10	Bond, anchorage, and development length.
Week 11	Bond, anchorage, and development length.
Week 12	Short columns
Week 13	Short columns
Week 14	Serviceability.
Week 15	**Final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- ACI 318-19(22): Building code requirements for structural concrete and commentary.“design of concrete structures” by A.H. Nilson, D. Darwin, C.W. Dolan, 15th Ed., McGraw-Hill 2- Design of reinforced concrete ACI 318-05 Code edition” J.C McCormac and James Nelson, 7th Ed, Wiley 3- “Design of reinforced concrete: A fundamental approach” by E.G. Nawy, 5th Ed., Prentice Hall. 4- “Structural Concrete: Theory and design” by M.N. Hasson, Addison Wesley.	Yes
Recommended Texts	“Reinforced concrete design” by Chu-Kia Wand and Charles G. Salmon.	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.

Module Information معلومات المادة الدراسية			
Module Title	Structural analysis theory (1)	**Module Delivery**	
Module Type	**Core**		☒**Theory** ☒**Lecture** ☐ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**
Module Code	ATU22052		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		
Module Level	1 **UGIII**	**Semester of Delivery**	5

Administering Department	Engineering Building and Construction Technique	**College**	Technical College/ Al-Mussaib
Module Leader	Mohammed Jasim Hussein	**e-mail**	Com.hj.mohamad@atu.edu.iq
Module Leader's Acad. Title	Assis. lecturer	**Module Leader's Qualification**	M.Sc in Structural engineering
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ATU22036, ATU22043	**Semester**	3,4
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The student will be able to 1. define all types of structures and their stability, 2. define the methods of determination of the structure deformation under the load, 3. study the methods of analysis and internal forces determination of determinate and indeterminate structures, study the methods used for analysis of structural elements due to moving loads using the influence lines.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 1- The student will learn the methods of structural analysis and predict the internal forces and compute the external forces for different types of structures. 2- Apply different techniques of structural analysis and the methods of presenting the actual structure, connection between the theoretical analysis and the actual engineering structures. 3- To apply appropriate engineering solutions to solve the problems of stability, safety of structural elements.

	4- Perform engineering work in accordance with health, safety and economic constraints related to the analyses of structures. 5- Ability to apply knowledge of basic mathematics through differential equations, science, and engineering to solving civil engineering problems.. 6- Demonstrate proficiency in the structural analysis of statically determinate structures, including deflection calculations.
Indicative Contents المحتويات الإرشادية	Introduction (6 hr) • Definition of engineering structures • Classification of engineering structures • Forces applied on engineering structures • Types of loads and supports Stability and determinacy of structures (6 hr) • Method used for stability of engineering structure • Stability and determinacy of beams • Stability and determinacy of trusses • Stability and determinacy of rigid frames • Stability and determinacy of composite structures Statically determinate structures(18hr) • Statically determinate beams Drawing of shear force and bending moments diagram • Analysis of statically determinate truss • Statically determinate rigid frames Drawing of shear force and bending moments diagram Influence line for statically determinate structures (9hr) Moving concentrated loads (9hr) • Criteria for maximum • Absolute maximum bending moment Approximate analysis for statically indeterminate structures (6hr) Elastic deformation of structures (Beams, Truss, Rigid frames) (9hr) • Double-integration method. • Virtual work method (Unit load method) Slope-deflection method for statically indeterminate beams and rigid frames (12hr) • Without joint translation • With joint translation Moment distribution method without joint translation (12hr)

	• Fixed-end moment • Element stiffness • Distribution factor, carry-over factor • Distribution of external moment applied to a joint • The process of locking and unlocking :one joint • The process of locking and unlocking :two joint • Modified stiffness factor Moment distribution method with joint translation • Analysis of statically indeterminate rigid frames with one degree of freedom

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on 1- Exams. 2- Student feedback. 3- Seminars.

Student Workload (SWL)
الحمل الدراسي للطالب

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	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2hr	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	Introduction (1) • Definition of engineering structures • Classification of engineering structures
Week 2	Introduction (2) • Forces applied on engineering structures • Types of loads and supports
Week 3	Stability and determinacy of structures (1) Method used for stability of engineering structure • Stability and determinacy of beams • Stability and determinacy of trusses
Week 4	Stability and determinacy of structures (2) • Stability and determinacy of rigid frames • Stability and determinacy of composite structures
Week 5	Statically determinate structures(1) • Statically determinate beams Drawing of shear force and bending moments diagram
Week 6	Statically determinate structures(2) • Statically determinate beams Drawing of shear force and bending moments diagram
Week 7	Statically determinate structures(3) • Analysis of statically determinate truss
Week 8	Statically determinate structures(4) • Statically determinate rigid frames Drawing of shear force and bending moments diagram
Week 9	Statically determinate structures(5) • Statically determinate rigid frames Drawing of shear force and bending moments diagram

Week 10	Statically determinate structures(6) • Statically determinate rigid frames Drawing of shear force and bending moments diagram
Week 11	Influence line for statically determinate structures (1)
Week 12	Influence line for statically determinate structures (2) Influence line for statically determinate structures (3)
Week 13	Moving concentrated loads (1) • Criteria for maximum • Absolute maximum bending moment
Week 14	Moving concentrated loads (2) • Criteria for maximum • Absolute maximum bending moment
Week 15	Moving concentrated loads (3) • Criteria for maximum • Absolute maximum bending moment
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1. Elementary theory of structures / Yuan Y. Hsieh 2. Structural analysis / Russell C. Hibbeler 3. Structural and Stress Analysis / T.H.G. Megson 4. Fundamentals of structural analysis/ Kenneth M. Leet, Chia Ming Hang and Anne M. Giberl	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.

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3	ATU22053	Soil mechanics(1)	**ميكانيك التربة(1)**

Module Information معلومات المادة الدراسية					
Module Title	**Soil Mechanics 1**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22053				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		**UGIII**	**Semester of Delivery**		5
Administering Department		**Technical building and Construction**	**College**	**Technical College/ Al-Mussaib**	
Module Leader	Maysa Salem Fleih		**e-mail**	maysasalem@atu.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc. in soil and foundation
Module Tutor			**e-mail**		
Peer Reviewer Name		Maki Jafar Mohammed	**e-mail**	maki_jafar@atu.edu.iq	
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	1. This course aims to provide a good understanding to soil nature and to understand, soil classification, permeability, compaction, consolidation and shear strength. 2. To prepare them to carry out experimental investigation and analysis at later stages of graduation.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 1- To apply the knowledge of soil nature and its formation. 2- To identify soil classification for different types of soil. 3- To learn the method of soil compaction in the field and lab and to compare with standard. 4- To investigate the effective stresses without seepage, with seepage and under the different external loads 5- To estimate settlement under different types of loading. 6- Identify the mechanism of soil formation. 7- Order the formation of different soil formation mechanisms. 8- Explain the factors affecting the formation mechanic 9- Explain factors affecting the grain structure of soil properties . 10- Explain the physical and index properties of soil. 11- Change the shape of the specified plane to the other under the effect of the stresses. 12- Interpret the ground-water relations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Soil Information, Types of soil [4 hrs] Soil-Particle Size, clay Mineral [2 hrs] Physical Properties of Soil [6 hrs] Soil Classification [6 hrs] Hydraulic Conductivity, Darcy law [4 hrs] Seepage and Flow Nets [6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams. 2- Student feedback. 3- Seminars. 4- Application in lab.

Student Workload (SWL) الحمل الدراسي للطالب			
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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Soil Information, Types of soil
Week 2	Soil Information, Types of soil
Week 3	Soil-Particle Size, clay Mineral
Week 4	Physical Properties of Soil
Week 5	Physical Properties of Soil
Week 6	Physical Properties of Soil
Week 7	Introduction to Soil Classification
Week 8	Soil Classification by Unified System
Week 9	Soil Classification by AASHTO
Week 10	Hydraulic Conductivity, Darcy law
Week 11	Measurement of Hydraulic Conductivity in Laboratory and Field
Week 12	Introduction to Flow in Soil
Week 13	Seepage in Soil
Week 14	Construction of Flow Nets
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Field collection of a soil sample
Week 2	Lab 2: Water content determination
Week 3	Lab 3: Liquid &Plastic limits test
Week 4	Lab 4: Shrinkage limit test
Week 5	Lab 5: Specific gravity of soil solids
Week 6	Lab 6: Total soluble salts & Organic matter content
Week 7	Lab 7: Particle size analysis (Mechanical method)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Lambe T. W. and Whitman R. V.," **Soil Mechanics** ",John Wiely and Sons.Inc., New York ,1979. 2. Terzaghi, K. and Peck, R.B., (1967), "Soil Mechanics in Engineering Practice", 2nd Edition, John Wiley & Sons, New York. 3. Das M. B . " Principles of Geotechnical Engineering" California state university ,2007. 4. Gamal-Eldin A. K. " Soil Mechanics and Foundation Engineering" 1982. 5. Uniform building code volume 2 chapter 16 , 1997. 6. Head K. H. " **Manual of Soil Laboratory testing** " , Vol.3 Prentch Press,London,1986. 7. British standard Institute (1975) " **Method of Testing soil for civil Engineering Purpose**" , B.S.1377. 8. American Society for Testing Materials (ASTM), (1989).	Yes
Recommended Texts	1. Braja M. Das, (2011), "Principles of Foundation Engineering", 7th Edition, Cengage Learning, pages (284 – 285) .	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.

4	ATU22054	Computer Application of structural	تطبيقات الحاسبة الانشائية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Application of structural**			**Module Delivery**	
Module Type	**Basic**			☒**Theory** ☐**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**ATU22054**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	**UGIII**		**Semester of Delivery**		5
Administering Department	**Technical building and Construction**		**College**	**Technical College/ Al-Mussaib**	

Module Leader	Rusul jabber ghayyib	**e-mail**	Rusuljaber@atu.edu.iq
Module Leader's Acad. Title	lecturer	**Module Leader's Qualification**	M.Sc. in construction management
Module Tutor		**e-mail**	
Peer Reviewer Name	Hssam Ali Mohammed	**e-mail**	com.hus@atu.edu.iq
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22033	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The students at the end of the year will be able to: 1- complete all steps of creating the project plan 2- setting the Primavera program and creating new projects 3- defining the calendar system, creating activity codes, adding and organizing 4- activities, adding logic to activities, Creating and supporting resources, Evaluating the projects with resources and printing the records. 5- use the engineering software programs related to its rules and theories has been taught to student previously
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completion of this course students will be able to 1- Ability to create and manage project enterprise structure within Primavera P6 database 2- Create project work breakdown structure 3- Develop resource loaded or simple project schedule 4- Manage the project time frame related constraints 5- Estimate the required man-hours for various activities up to total project by resource assignment 6- Reporting critical tasks and developing various structured reports 7- obtain comprehensive knowledge on the CSI software (ETABS , SAP, SAFE)and its applications 8- Analyses & design of structures. 9- Rapid and accurate design of different types of structures.

	10-Use spreadsheet software to solve a variety of business problems requiring mathematical solutions;
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Instilling Primavera Software, open a previous project, adding a new project, Describing the program screen, Adding activities to a project, Logic relationship, activity codes, Creation and Deleting Codes. [2hrs] dictionaries, Creating and Deleting Activity and Default Activity code[2hrs] DEFININGCALENDARS: Daily Calendar, Daily Base Calendar, adding colander to activities, Activity Types. [2hrs] Adding the Logic: Adding Relationship to the activities, Auto Link, Deleting Relationship, PERT View, Formatting your PERT View[2hrs]. Scheduling the project and layouts. [2hrs] Creating & Using Resources : Resources definition, Creating Resource, Assigning Resources to Activities, Resources dialog block, Costs dialog block, Assign Resources Against Multiple Activities, Summary Percent Calculation, Editing Resources Calendar, [2hrs] Editing a Resource Calendar, Resource Histogram, Resources Table, Printing tables and Layouts Introduction to CSI software[Etabs, Sap and Safe] [2hrs] Review theories and formulas using in analysis and design of beams and columns. [2hrs] Explain of the program interface and use the program to analysis and design of beams, columns and footings[2hrs] Explain of icons and description of input data. Discussion of the program results based on input data. [2hrs] Examples and assignments with discuss the procedure of analysis and design different types of beams with Etabs[2hrs] Examples and assignments with discuss the procedure of analysis and design of columns with Etabs[2hrs] Examples and assignments with discuss the procedure of analysis and design of various types of footings with Safe Examples and assignments with discuss the procedure of analysis and design of one way slabs in Etabs[2hrs] Examples and assignments with discuss the procedure of analysis and design of a small building using Etabs and Safe [2hrs] A report project assignment[2hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم	
Strategies	1- Exams. 2- Student feedback. 3- Homework's 4- Application in lab.

Student Workload (SWL) الحمل الدراسي للطالب			
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	12	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي

	Material Covered
Week 1	Instilling Primavera Software, open a previous project, adding a new project, Describing the program screen, Adding activities to a project, Logic relationship, activity codes, Creation and Deleting Codes dictionaries, Creating and Deleting Activity and Default Activity code

Week 2	DEFINING CALENDARS: Daily Calendar, Daily Base Calendar, adding colander to activities, Activity Types
Week 3	Adding the Logic: Adding Relationship to the activities, Auto Link, Deleting Relationship, PERT View, Formatting your PERT View Scheduling the project and layouts
Week 4	Creating & Using Resources : Resources definition, Creating Resource, Assigning Resources to Activities, Resources dialog block, Costs dialog block, Assign Resources Against Multiple Activities, Summary Percent Calculation, Editing Resources Calendar,
Week 5	Editing a Resource Calendar, Resource Histogram, Resources Table, Printing tables and Layouts
Week 6	Introduction to CSI software[Etabs, Sap and Safe]
Week 7	Review theories and formulas using in analysis and design of beams and columns.
Week 8	Explain of the program interface and use the program to analysis and design of beams, columns and footings
Week 9	Explain of icons and description of input data. Discussion of the program results based on input data.
Week 10	Examples and assignments with discuss the procedure of analysis and design different types of beams with Etabs
Week 11	Examples and assignments with discuss the procedure of analysis and design of columns with Etabs
Week 12	Examples and assignments with discuss the procedure of analysis and design of various types of footings with Safe
Week 13	Examples and assignments with discuss the procedure of analysis and design of one way slabs in Etabs
Week 14	Examples and assignments with discuss the procedure of analysis and design of a small building using Etabs and Safe A report project assignment
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 7:
Week 2	Lab 7:

Week 3	Lab 7:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-Primavera P6 Resource Management 2- CSI Analysis Reference Manual	Yes
Recommended Texts		No
Websites	P6 EPPM Web Services Reference Guide Version 20	

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.

5	ATU22055	Pavement Engineering	هندسة رصف الطرق

Module Information معلومات المادة الدراسية		
Module Title	**Pavement Engineering**	**Module Delivery**
Module Type	**Core**	☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☒**Practical** ☐**Seminar**
Module Code	ATU22055	
ECTS Credits	**4**	
SWL (hr/sem)	**100**	

Module Level	**UGIII**	**Semester of Delivery**	5
Administering Department	**Technical building and Construction**	**College**	Technical College/ Al-Mussaib
Module Leader	Ali Fadhil Naser	**e-mail**	com.ali3@atu.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.in Civil Engineering /bridges and Highways Engineering
Module Tutor		**e-mail**	
Peer Reviewer Name	Zainab Sabah Rasoul	**e-mail**	Zaina1.sabah@gmail.com
Scientific Committee Approval Date		**Version Number**	

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	1. This course aims to provide a good understanding to highway design to understand, roadway classification, pavements types 2. To prepare them to carry out practical investigation and analysis at later stages of graduation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 1- To apply the knowledge of horizontal and vertical curves. 2- To identify sight distance for different types of curves. 3- To learn superelevation on horizontal curve. 4- To learn the method of design the rigid and flexible pavement. 5- To identify AADT, ADT and DHV 6- Perform road pavement design and analysis classifies mass movements, describe factors causing mass movements and propose. 7- Analyze and design various earth retaining structures for internal and external stability. 8- Identify the reason for real field slope and retaining wall failures and

	propose measures to mitigate such failures in the future. 9- To learn about drainage systems, culverts, siphon, ditches and filters. 10- To learn about highway furniture and control devices
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Highways classification according their function, locations and pavements types [3hrs] Highway alignments and alternatives, points of inflections, topography terrain maps, cross-section elements, profiles, and horizontal and vertical curves [3hrs] Horizontal curve, angle of inflection. [3hrs] Super elevation concepts. [3hrs] Vertical curves, crest and sag curves, under crossing clear distance, minimum length and grades. [3hrs] Sight distances, stopping and passing, at grade intersection, at vertical curves, relation between length of curve and required sight distance and between middle ordinate distances. [3hrs] Traffic volumes, counting, traffic volume correction factors, level of service (LOS) , AADT, ADT , DHV. [3hrs] Traffic loads, equivalent single axle load (ESALs), tandem axle load, load damage factor, growth factor, and stresses on pavements. [3hrs] Design of flexible pavement, pavement layers[2hrs] Examples for design of flexible pavement[3hrs] Design of rigid pavement, pavement layers, chart for design[3hrs] Examples for design of the rigid pavement[3hrs] Drainage systems , culverts , siphon , ditches and filters [2hrs] Highway furniture and control devices [3hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams. 2- Student feedback. 3- Seminars. 4- report in Lab.

Student Workload (SWL) الحمل الدراسي للطالب			
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)	37	**Unstructured SWL (h/w)**	2.5

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Pract.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Highways classification according their function, locations and pavements types
Week 2	Highway alignments and alternatives, points of inflections, topography terrain maps, cross-section elements, profiles, and horizontal and vertical curves.
Week 3	Horizontal curve, angle of inflection.
Week 4	Super elevation concepts.
Week 5	Vertical curves, crest and sag curves , under crossing clear distance , minimum length and grades.
Week 6	Sight distances, stopping and passing, at grade intersection, at vertical curves, relation between length of curve and required sight distance and between middle ordinate distances.
Week 7	Traffic volumes , counting , traffic volume correction factors , level of service (LOS) , AADT, ADT , DHV
Week 8	Traffic loads, equivalent single axle load (ESALs), tandem axle load, load damage factor, growth factor, and stresses on pavements.
Week 9	Design of flexible pavement, pavement layers

Week 10	Examples for design of flexible pavement
Week 11	Design of rigid pavement, pavement layers, chart for design
Week 12	Examples for design of the rigid pavement
Week 13	Drainage systems , culverts , siphon , ditches and filters
Week 14	Highway furniture and control devices
Week 15	**Preparatory week before the final Exam**
Week 16	**Final exam**

Delivery Plan (Weekly Practical. Syllabus) المنهاج الاسبوعي للعملي	
	Material Covered
Week 3	Pract. 1: Visiting for road projects
Week 4	Pract. 2: Visiting for asphalt plants
Week 5	Pract. 3: Visiting for highways companies offices.
Week 4	Pract. 4: Damage inspection of highways and preparing inspection reports.
Week 5	Pract. 3:: Core test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1. Traffic & Highway Engineering - Garber & Hoel 2009(1) 2. The_Handbook_of_Highway_engineering 3. Pavement Analysis and Design by Yang H Huang - www- By EasyEngineering.net 4. Pavement Engineering Principles And Practice By Rajib B. Mallick And Tahar El-Korchi, 2 Nd Edition, 2013. 5. A Policy On Geometric Design Of Highway And Streets, The Green Book, 6Th Edition, 2011. 6. Principles of Highway Engineering And Traffic Analysis, Fred L. Mannering And Scott S. Washburn,5 Edition,2012 7. Transportation Infrastructure Engineering A Multimodal Integration SI Edition, 2011, Lester A. Hoel, Nicholas J. Garber And Adel W. S Adek	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.				

ATU22056	Advanced Concrete Technology	**تقنية الخرسانة متقدم**

Module Information معلومات المادة الدراسية		
Module Title	Advanced Concrete Technology	**Module Delivery**
Module Type	**Core**	☒**Theory** ☒**Lecture** ☒**Lab**
Module Code	ATU22056	
ECTS Credits	**8**	

SWL (hr/sem)	**200**		☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Level	**UGIII**	**Semester of Delivery**		5
Administering Department	**Technical building and Construction**	**College**	Technical College/ Al-Mussaib	
Module Leader	Lamyaa Ghaim Salim	**e-mail**	lamyaa@atu.edu.iq	
Module Leader's Acad. Title	Ass.lecture	**Module Leader's Qualification**		M.Sc. in construction materials
Module Tutor		**e-mail**		
Peer Reviewer Name	Zahraa Fakhri Jawad	**e-mail**	dr_zahraajawad@atu.edu.iq	
Scientific Committee Approval Date		**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ATU22041	**Semester**	4
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Gain information about properties of fresh and hardened concrete, durability of concrete, concrete mix design, special types of concrete, and in-situ tests.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 1- Discuss the concrete ingredients and its influence at gaining strength. 2- Design of concrete mix and grade as per IS codes. 3- Summaries the concepts of conventional concrete and its differences with other concretes like no fines, light weight etc. 4- Describe the application and use of fiber reinforced concrete. 5- Design and develop the self compacting and high performance concrete.

	6- Explain the properties of the constituent materials of concrete. 7- Describe the physical & mechanical properties of aggregates. 8- Study the behavior of concrete at its fresh and hardened state, describe and carry out tests relevant to the use of concrete on site. 9- Explain factors affecting strength of concrete. 10- Understand the factors influencing concrete mix & know the BIS method of mix design. 11- Define special concretes, their application for practice. 12- Concrete mix design, Properties of hardened concrete
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. General information about composition of concrete and properties of fresh concrete, properties of hardened concrete.[2hrs] Types of strength. .[2hrs] Factors affecting strength of hardened concrete. .[2hrs] Factors affecting test results of strength of hardened concrete. .[2hrs] Concrete mix design. .[6hrs] Field adjustment. .[2hrs] Elasticity, dimensional stability (shrinkage and creep). .[2hrs] Durability of concrete. .[4hrs] Special types of concrete. .[4hrs] In-situ tests. .[2hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams. 2- Student feedback. 3- Seminars. 4- Test in lab.

Student Workload (SWL) الحمل الدراسي للطالب			
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	107	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.1
Total SWL (h/sem)	200		

الحمل الدراسي الكلي للطالب خلال الفصل	

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General information about composition of concrete and properties of fresh concrete, properties of hardened concrete.
Week 2	Types of strength.
Week 3	Factors affecting strength of hardened concrete.
Week 4	Factors affecting test results of strength of hardened concrete.
Week 5	Concrete mix design.
Week 6	Concrete mix design.
Week 7	Concrete mix design.
Week 8	Field adjustment.
Week 9	Elasticity, dimensional stability (shrinkage and creep).
Week 10	Durability of concrete.
Week 11	Durability of concrete
Week 12	Special types of concrete.
Week 13	Special types of concrete.
Week 14	In-situ tests.

Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1; Review about cement and aggregates tests.
Week 2	Lab2: Fresh concrete Tests: (Air content, Slump test, compacting factor test, and V-B test).
Week 3-7	Lab3: Factor affecting compressive strength of concrete: 1- Effect of water/cement ratio. 2- Effect of cement content. 3- Effect of age. 4- Effect of end condition of specimen and capping. 5- Effect of dimension of specimen. 6- Effect of curing conditions. 7- Effect of shape of specimen.
Week 8	Lab 4: Indirect splitting tensile strength of concrete, flexural test (Modulus of rupture) of concrete
Week 9	Lab 5: Modulus of elasticity and Poisson's ratio of concrete.
Week 10-11	Lab 6: Project about mix design of concrete using (ACI, British, and CP: 110) methods.
Week 12-13	Lab 7: Special types of concrete.
Week 14	Lab 8: In-situ tests.
Week 15	**final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1- A.M. Neville, "Properties of concrete", 3rd Ed., A Pitman International Text (1998). 2- Troxell, Davis and Kelly, "Construction and properties of concrete", McGraw-Hill book company (1986). 3- Iraqi (IS), British (BS), and American (ASTM) standards for concrete testing.	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.

1	ATU22061	Reinforced Concrete (2)	**الخرسانة المسلحة (2)**

Module Information معلومات المادة الدراسية		
Module Title	(Reinforced Concrete (2	**Module Delivery**
Module Type	**Core**	**☒Theory** **☒Lecture** **☐Lab** **☒ Tutorial**
Module Code	ATU22061	
ECTS Credits	**5**	
SWL (hr/sem)	**125**	

			☐**Practical** ☐**Seminar**	
Module Level	**UGIII**	**Semester of Delivery**		6
Administering Department	**Technical building and Construction**	**College**	**Technical College/ Al-Mussaib**	
Module Leader	Hussam Ali Mohammed	**e-mail**	com.hus@atu.edu.iq	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**		Ph.D in Structural-Civil Engineering
Module Tutor		**e-mail**		
Peer Reviewer Name	Mohammed Jasim Hussain	**e-mail**	Com.hj.mohamad@atu.edu.iq	
Scientific Committee Approval Date		**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ATU22052	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Students will build on their knowledge of reinforced concrete design to understand the behavior of reinforced concrete and to design practical reinforced concrete components.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 12. Learn the concept of analysis and design of concrete members, 13. Understand contemporary structural design concepts, critically evaluate design options and perform ACI code calculations. 14. Learn the concept of analysis and design of concrete members, 15. Understand contemporary structural design concepts, critically 16. Design RC Columns with due consideration of slenderness and biaxial effects 17. Design RC two-way slab systems using Direct Design Method 18. Design combined RC footings and retaining walls 19. Design Deep beams and Corbels

	20. Identify the necessity of deflection and crack control in satisfying serviceability 21. Apply relevant ACI Code provisions to ensure safety and serviceability of structural elements. 22. Identify and compute the main mechanical properties of concrete and steel. 23. Apply the strength method to design R.C. structural Members. 24. Analyze and design R.C. beams for flexure and shear. Analyze and design short and slender R.C. columns. 6. Analyze and design R.C. slabs. 25. Utilize advanced computer software packages (SAP2000 and/or ETABS) for the analysis and design of steel structures.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Analysis and design of slabs[2hrs] Types of slabs, Temperature and shrinkage reinforcement, Behavior of two-way edge supported slabs, Two-way column supported slabs, Direct design method for column supported slabs, Depth limitation of the ACI code, Shear design in flat plates and flat slabs. [10hrs] Yield line analysis for slabs[5hrs] Design and analysis of compression members[2hrs] Prestressed Concrete: Principles of prestressed concrete, Methods of prestressing, prestressing steel, concrete for prestressed construction; elastic flexural analysis, Flexural strength, Flexural design based on concrete stress limits; Shape selection, Tendon profiles. Loss of prestress; shear, diagonal tension and web reinforcement. [10hrs] Strut and tie models: Strut and tie methodology, ACI provisions for strut and tie models, Applications. [6hrs] Seismic design: Structural response, Seismic loading criteria, ACI special provisions for seismic design. [6hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1-Exams 2-Student feedback. 3- Tutorial

Student Workload (SWL) الحمل الدراسي للطالب

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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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 1-4	Analysis and design of slabs: Types of slabs, Temperature and shrinkage reinforcement, Behavior of two-way edge supported slabs, Two-way column supported slabs, Direct design method for column supported slabs, Depth limitation of the ACI code, Shear design in flat plates and flat slabs.
Week 5-6	Yield line analysis for slabs
Week 7	Design and analysis of compression members
Week 8-10	Prestressed Concrete: Principles of prestressed concrete, Methods of prestressing, prestressing steel, concrete for prestressed construction; elastic flexural analysis, Flexural strength, Flexural design based on concrete stress limits; Shape selection, Tendon profiles. Loss of prestress; shear, diagonal tension and web reinforcement.
Week 11-13	Strut and tie models: Strut and tie methodology, ACI provisions for strut and tie models, Applications.
Week 14	Seismic design:

	Structural response, Seismic loading criteria, ACI special provisions for seismic design.
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1. ACI 318 M-2014: Building Code Requirements for Structural Concrete and Commentary 2. "Design of Concrete Structures" by A.H. Nilson, D. Darwin, C.W. Dolan, 14th Ed., McGraw-Hill. 3. "Design of Reinforced Concrete ACI 318-05 Code Edition." J.C. McCormac and James Nelson, 7th Ed, Wiley.	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.

2	ATU22062	Soil mechanics(2)	ميكانيك تربة (2)

Module Information
معلومات المادة الدراسية

Module Title	**Soil Mechanics 2**	**Module Delivery**	
Module Type	**Core**	☒**Theory** ☒**Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22062		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		
Module Level	**UGIII**	**Semester of Delivery**	6
Administering Department	**Technical building and Construction**	**College**	**Technical College/ Al-Mussaib**

Module Leader	Maysa Salem Fleih	**e-mail**	maysasalem@atu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc. in soil and foundation
Module Tutor		**e-mail**	
Peer Reviewer Name	Maki Jafar Mohammed	**e-mail**	maki_jafar@atu.edu.iq
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ATU22053	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. This course aims to provide a good understanding to soil nature and to understand, soil classification, permeability, compaction, consolidation and shear strength. 2. To prepare them to carry out experimental investigation and analysis at later stages of graduation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 5- To apply the knowledge of soil nature and its formation. 6- To identify soil classification for different types of soil. 7- To learn the method of soil compaction in the field and lab and to compare with standard. 8- To investigate the effective stresses without seepage, with seepage and under the different external loads 9- To estimate settlement under different types of loading. 10- Identify the mechanism of soil formation. 11- Order the formation of different soil formation mechanisms. 12- Explain the factors affecting the formation mechanic 13- Explain factors affecting the grain structure of soil properties . 14- Explain the physical and index properties of soil. 15- Change the shape of the specified plane to the other under the effect of the stresses. 16- Interpret the ground-water relations.
Indicative Contents	Indicative content includes the following.

المحتويات الإرشادية	Field Compaction, specification ,Determination [8 hrs.] Stresses in Soil Mass, stress without seepage , stress with seepage[4 hrs.] Vertical stress Increase Due to Various Types of Soil [8 hrs.] Soil compressibility and consolidation, Coefficient of consolidation [8 hrs.] Time rate of consolidation, Settlement Analysis [8 hrs.] Shear strength of soil, Mohr – Coulomb theory, [8 hrs.] Laboratory Determination of shear strength parameters[8 hrs] Special types of soils, collapsing & swelling soil[4 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams. 2- Student feedback. 3- Seminars 4- Application in Lab.

Student Workload (SWL) الحمل الدراسي للطالب			
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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	

	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Field Compaction, specification ,Determination
Week 2	Field Compaction, specification ,Determination
Week 3	Stresses in Soil Mass, stress without seepage , stress with seepage
Week 4	Vertical stress Increase Due to Various Types of Soil
Week 5	Vertical stress Increase Due to Various Types of Soil
Week 6	Introduction Soil compressibility and consolidation
Week 7	Soil compressibility and consolidation, Coefficients of consolidation
Week 8	Time rate of consolidation, Settlement Analysis
Week 9	Time rate of consolidation, Settlement Analysis
Week 10	Shear strength of soil
Week 11	Shear strength of soil, Mohr – Coulomb theory,
Week 12	Laboratory Determination of shear strength parameters
Week 13	Laboratory Determination of shear strength parameters
Week 14	Special types of soils, collapsing & swelling soil
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Particle size analysis (Hydrometer method)
Week 2	Lab 2: Moisture- unit weight relationship (Compaction test)
Week 3	Lab 3: Permeability tests (Constant & Falling head)
Week 4	Lab 4: Consolidation test

Week 5	Lab 5: Consolidation test
Week 6	Lab 6: Unconfined compression test
Week 7	Lab 7: Direct shear test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Lambe T. W. and Whitman R. V.," **Soil Mechanics** ",John Wiely and Sons.Inc., New York ,1979. 2. Terzaghi, K. and Peck, R.B., (1967), "Soil Mechanics in Engineering Practice", 2nd Edition, John Wiley & Sons, New York. 3. Das M. B . " Principles of Geotechnical Engineering" California state university ,2007. 4. Gamal-Eldin A. K. " Soil Mechanics and Foundation Engineering" 1982. 5. Uniform building code volume 2 chapter 16 , 1997. 6. Head K. H. " **Manual of Soil Laboratory testing** " , Vol.3 Prentch Press,London,1986. 7. British standard Institute (1975) " **Method of Testing soil for civil Engineering Purpose**" , B.S.1377. 8. American Society for Testing Materials (ASTM), (1989).	Yes
Recommended Texts	1- الوائلي، مكي جعفر،" اساسيات ميكانيك التربة وتطبيقاتها الهندسية" دار دجلة، الطبعة الثالثة، 2023	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	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.

3	ATU22063	Construction Management	الأدارة الهندسية

Module Information
معلومات المادة الدراسية

Module Title	**Construction Mangement**	**Module Delivery**
Module Type	**Core**	☒**Theory** ☒**Lecture** ☐ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**
Module Code	ATU22063	
ECTS Credits	**7**	
SWL (hr/sem)	**175**	

Module Level	**UGIII**	**Semester of Delivery**	6

Administering Department	**Technical building and Construction**	**College**	Technical College/ Al-Mussaib
Module Leader	Rusul Jaber Ghayyib	**e-mail**	rusuljaber@atu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.in Construction Management
Module Tutor	Rusul Jaber Ghayyib	**e-mail**	rusuljaber@atu.edu.iq
Peer Reviewer Name	Ali Fadhil Naser	**e-mail**	com.ali3@atu.edu.iq
Scientific Committee Approval Date		**Version Number**	

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	1. This course aims to provide a good platform to construction engineering students to understand, appreciate concept of construction equipment projects. 2. To prepare them to carry out experimental and technical skills at later stages of graduation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of this course students will demonstrate the ability to: **1-** To apply the knowledge of construction equipment and methods, science and engineering fundamentals. **2-** To identify what is contracts management concepts. **3-** To instill upon to Important of value engineering. **4-** To investigate the effectiveness of excavation Equipment and which one is more suitable for a specific project. **5-** To appreciate concepts learn of pumping equipment. **6-** To communicate effectively the concepts accident prevention in construction industry**.** **7-** Analyse the techniques of Erection of Construction units. **8-** Demonstrate basic knowledge about Construction equipment and machinery. **9-** Understand standard designations, sizes, and graduations of equipment.

	10- apply optimization and productivity techniques to a construction project. **11-** Understand standard designations, sizes, and graduations of equipment
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction [2hrs] Value engineering[2hrs] Factors affecting the selection and owning of machines and calculating the working cost [4hrs] Engineering Fundamental : Factors affecting the efficiency during work [4hrs] Tractors and Related Equipment [4hrs] Excavation Equipment: Front Shovel, backhoes, loaders, DRAGLINE, CLAMSHELL EXCAVATORS [4hrs] Road excavator equipment: shovel, grader , bulldozer ,and scraper [2hrs] Formwork for Concrete Structures [2hrs] Excavation Equipment[2hrs] Formwork for Concrete Structures[2hrs] Piles and Pile-Driving Equipment ,Pumping Equipment [2hrs] Trucks and Hauling Equipment:2hrs] Soil Stabilization and Compaction [2hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams. 2- Student feedback.

Student Workload (SWL) الحمل الدراسي للطالب			
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	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Introduction: the role of equipment in various projects and its important in economic constructions , the controlling of material and equipment during construction stages
Week 2	Value engineering
Week 3+4	Factors affecting the selection and owning of machines and calculating the working cost
Week 5+6	Engineering Fundamental : Factors affecting the efficiency during work
Week 7+8	Tractors and Related Equipment
Week 9+10	Excavation Equipment: Hydraulic Excavators, Front Shovel, backhoes, loaders, DRAGLINE, CLAMSHELL EXCAVATORS
Week 11	Road excavator equipment: shovel, grader , bulldozer ,and scraper
Week 12	Formwork for Concrete Structures
Week 13	Piles and Pile-Driving Equipment ,Pumping Equipment
Week 14	Trucks and Hauling Equipment:
Week 15	Soil Stabilization and Compaction
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered

Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1. "Construction Planning, Equipment, and Methods," by Peurifoy, R., and Schexnayder, C., 2002. 2. "Modern Construction & Ground Engineering Equipment & Methods," by Harris, F., 1994. Also, Instructor's Notes and Handouts.	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.

4	ATU22064	Engineering & Numerical analysis	التحليلات الهندسية و العددية

Module Information معلومات المادة الدراسية			
Module Title	**Engineering & Numerical analysis**		**Module Delivery**
Module Type	suport		☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	ATU22064		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		
Module Level	UGIII	**Semester of Delivery**	6

Administering Department	**Technical building and Construction**	**College**	Technical College/ Al-Mussaib
Module Leader	maher Abd Alameer Kadim	**e-mail**	maher. mahmmod@atu.edu.iq
Module Leader's Acad. Title	Assis. Professor	**Module Leader's Qualification**	M.Sc. in in hydrology
Module Tutor	maher Abd Alameer Kadim	**e-mail**	maher. mahmmod@atu.edu.iq
Peer Reviewer Name	Nabil Hamid Abdel Majeed	**e-mail**	Inm.nbl@atu.edu.iq
Scientific Committee Approval Date		**Version Number**	

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	This course covers interpolation, Newtons forward difference formula. Interpolation, Newtons backward difference formula. Lagrangian Interpolation. Numerical methods in linear algebra, system of linear eq. Gauss elimination. Numerical methods in linear algebra, system of linear eq. Gauss-Jordan elimination. System of linear eq. solution by iteration: Jacobi method iteration, Eigen value and Eigen vector. Numerical methods for differential equation, Euler method, Rung-Kutta method.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 1- Acquire basic knowledge in solving interpolation with equal interval problems by various numerical methods. Estimate the missing terms through interpolation methods. 2- Develop skills in analyzing the methods of interpolating a given data, properties of interpolation with unequal intervals and derive conclusions, approximate a function using an appropriate numerical method. 3- Implement numerical methods for a variety of multidisciplinary applications and a variety of numerical algorithms using appropriate technology. 4- Use relevant numerical techniques for interpolation with equal and unequal intervals by using various central difference formulae and code a numerical method in a modern computer language.

	5- Apply appropriate numerical methods to solve the problem with most accuracy. 6- Be able to derive Least – Squares curve fitting procedures, fitting a straight line, fitting a parabola, nonlinear curve fitting, Curve fitting by a sum of exponentials. 7- Be able to find the derivatives using Newton's forward difference formula, Newton's backward difference formula, Derivatives using central difference formulae, Stirling's interpolation formula, Newton's divided difference formula, Maximum and minimum values of a tabulated function. 8- Be able to derive Trapozoidal rule, Simpson's 1/3 – rule, Simpson's 3/8 – rule, and Weddle's rules from General Quadrature formula and find the Euler – Maclaurin Formula of summation and The Euler transformation. 9- Be able to find the solution of linear systems by using Direct methods, Matrix inversion method, Gaussian elimination methods, Gauss-Jordan Method, Method of factorization, Solution of Tridiagonal Systems, 10- Be able to find the find the solution of ordinary differential equation of first order by Euler, Taylor and Runge-Kutta methods 11- Compare different methods in numerical analysis with accuracy and efficiency of solution
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Interpolation, Newtons forward difference formula [2hrs] Interpolation, Newtons backward difference formula[2hrs] Lagrangian Interpolation [2hrs] Numerical methods in linear algebra, system of linear eq. Gauss elimination [2hrs] Numerical methods in linear algebra, system of linear eq. Gauss- Jordan elimination[2hrs] System of linear eq. solution by iteration: Jacobi method iteration, Eigen value and Eigen vector. [2hrs] Numerical methods for differential equation, Euler method, [2hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1-Exams. 2-Student feedback.

Student Workload (SWL)

الحمل الدراسي للطالب			
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0		
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	20% (20)	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	Systems of linear algebraic equations, row operations, scaling, pivoting, elimination, Direct elimination methods, Cramer's Rule.
Week 2	Systems of linear algebraic equations, Gauss Elimination, Back substitution, Simple elimination, Gauss-Jordan Elimination.
Week 3	The Jacobi Iteration Method, The Gauss-Seidel Iteration Method.
Week 4	Interpolation and curve fitting, Direct Fit Polynomials, Least Squares Approximation, The Straight Line Approximation, High-Degree Polynomial Approximation, Multivariate Polynomial Approximation.
Week 5	Numerical Integration, The simple trapezium rule, The composite trapezium rule.
Week 6	Numerical Integration, Simpson's rule, Engineering Examples.

Week 7	Numerical Differentiation , Solution of a differential equation, single-step methods, step-by-step methods, Initial and boundary conditions, boundary value problem, Picard's Method, Taylor's Series Method, Examples, Exercises.
Week 8	Numerical Differentiation, Euler's Method, Modified Euler's Method, Runge's Method, Examples, Exercises.
Week 9	Numerical Differentiation, Runge-Kutta Method, Examples, Exercises.
Week 10	Numerical Differentiation, Predictor-Corrector Methods, Milne's Method, Adams-Bashforth Method,
Week 11	Numerical Differentiation, Simultaneous First Order Differential Equations, Examples, Exercises.
Week 12	Finite Difference Method, Initial Value ODE's.
Week 13	Optimization, Formulation of Projects, What is Linear Programming, How to Solve Linear Programming Problems, Identifying Variables, Identify the Objective Function, Graphing, Constraints.
Week 14	Optimization, Finding the Maximum, The Vertices, Finding the Minimum, Practice Questions.
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Advanced engineering mathematics/Erwin kreyszig 2.Applied mathematics for engineering and physicists/pipes and harvill 3. Numerical methods for engineers/S.C.Chapra andR.P.	Yes

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.

5	ATU22065	Transportation Engineering	هندسة الطرق

Module Information معلومات المادة الدراسية		
Module Title	**Transportation Engineering**	**Module Delivery**
Module Type	**Core**	☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical**
Module Code	ATU22065	
ECTS Credits	**4**	
SWL (hr/sem)	**100**	

			☐**Seminar**		
Module Level		**UGIII**	**Semester of Delivery**		6
Administering Department		**Technical building and Construction**	**College**	Technical College/ Al-Mussaib	
Module Leader	Ali Fadhil Naser		**e-mail**	com.ali3@atu.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.in Civil Engineering /bridges and Highways Engineering
Module Tutor			**e-mail**		
Peer Reviewer Name		Zainab Sabah Rasoul	**e-mail**	Zaina1.sabah@gmail.com	
Scientific Committee Approval Date			**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22054	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course aims to provide a good understanding to hot mixtures asphalt design and properties of asphalt materials. 2. To prepare them to carry out experimental investigation and analysis at later stages of graduation. 3. To provide suitable information about construction of flexible and rigid pavement. 4. To provide good information about railway and airport engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 11- To apply the knowledge of asphalt materials and their tests. 12- To identify methods of hot mixture asphalt design. 13- To classify subgrade materials by AASHTO, USCS. 14- To examine the specification of Asphalt mixture

	15- Selecting the appropriate materials for use in different road layers. 16- To evaluate the quality and performance of unbound and bound road materials. 17- Perform road pavement design and analysis classify mass movements, describe factors causing mass movements and propose. 18- Analyze and design various earth retaining structures for internal and external stability. 19- Identify the reason for real field slope and retaining wall failures and propose measures to mitigate such failures in the future. 20- To learn about railway and airport engineering.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Asphalt materials and tests. [6hrs] Sub-grade works , grading , cut and fill sections , soil classification (AASHTO , UCS) , Leveling and compactions [3hrs] Sub-base works, stockpiles, specifications, spreading, leveling and compactions. [3hrs] Base works, macadam and untreated base, stabilized base (bitumen , lime , cement treated base). [6hrs] Prime and tack coats, specifications and applications. [3hrs] Asphalt plants (types and units) , crushers. [3hrs] Asphalt mixtures (Hot and Cold) , specifications. [3hrs] Asphalt pavement constructions, placing, spreading, pavers, rollers, field tests, leveling and thickness controlling.[6hrs] Rigid pavement, layers, fixed and slip forms, joints and reinforcing, control of leveling, and finishing. [6hrs] Railway cross section, embankment specification, Airport orientation , runway and taxiway specification[3hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams. 2- Student feedback. 3- Seminars. 4- report in Lab.

Student Workload (SWL) الحمل الدراسي للطالب			
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1&2	Asphalt materials and tests.
Week 3	Sub-grade works , grading , cut and fill sections , soil classification (AASHTO , UCS) , Leveling and compactions.
Week 4	Sub-base works , stockpiles , specifications , spreading , leveling and compactions.
Week 5 & 6	Base works, macadam and untreated base , stabilized base (bitumen , lime , cement treated base).
Week 7	Prime and tack coats, specifications and applications.
Week 8	Asphalt plants (types and units) , crushers.
Week 9	Asphalt mixtures (Hot and Cold) , specifications.
Week 10&11	Asphalt pavement constructions, placing, spreading, pavers, rollers, field tests, leveling and thickness controlling.
Week 12&13	Rigid pavement, layers, fixed and slip forms, joints and reinforcing, control of leveling, and finishing.

Week 14	Railway cross section, embankment specification, Airport orientation , runway and taxiway specification
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Fine and coarse aggregate tests
Week 2	Lab 2: Asphalt sampling, Penetration Test, Ductility Test
Week 3	Lab 3: Loss on Heating Test, Softening Point Test
Week 4	Lab 4: Saybolt Viscosity Test, Flash and Fire Points Test
Week 5	Lab 5: California Bearing Ratio (CBR) Test
Week 6	Lab 6: Extraction test, Theoretical Maximum Specific Gravity of HMA (Gmm)
Week 7	Lab 7: Marshall Test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	8. Pavement Engineering Principles And Practice By Rajib B. Mallick And Tahar El-Korchi, 2 Nd Edition, 2013. 9. A Policy On Geometric Design Of Highway And Streets, The Green Book, 6Th Edition, 2011. 10. Principles of Highway Engineering And Traffic Analysis, Fred L. Mannering And Scott S. Washburn,5 Edition,2012 11. Transportation Infrastructure Engineering A Multimodal Integration SI Edition, 2011, Lester A. Hoel, Nicholas J. Garber And Adel W. S Adek. 12. Traffic & Highway Engineering - Garber & Hoel 2009 13. The_Handbook_of_Highway_engineering. 14. Pavement Analysis and Design by Yang H Huang - www- By EasyEngineering.net 15. Road design manual / 2007 16. A Policy on geometric design of highway and streets / 2001	No

	17. The handbook of highway engineering / 2006 18. Super pave fundamentals , FHWA , NHI # 131053 19. Internet's references.	
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.

6	ATU22066	Structural analysis theory	**نظرية تحليل الأنشاءات (2)**

Module Information معلومات المادة الدراسية		
Module Title	Structural analysis theory	**Module Delivery**
Module Type	**Core**	**☒Theory** **☒Lecture**
Module Code	ATU22066	

ECTS Credits	**5**		☐ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
SWL (hr/sem)	**125**			
Module Level	1 UGIII	**Semester of Delivery**	6	
Administering Department	Engineering Building and Construction Technique	**College**	Technical College/ Al-Mussaib	
Module Leader	Mohammed Jasim Hussein	**e-mail**	Com.hj.mohamad@atu.edu.iq	
Module Leader's Acad. Title	Assis. lecturer	**Module Leader's Qualification**	M.Sc in Structural engineering	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
Scientific Committee Approval Date		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22036, ATU22043	**Semester**	3,4
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The student will be able to 4. define all types of structures and their stability, 5. define the methods of determination of the structure deformation under the load, 6. study the methods of analysis and internal forces determination of determinate and indeterminate structures, study the methods used for analysis of structural elements due to moving loads using the influence lines.
Module Learning Outcomes	upon completion of this course the students will: 7- The student will learn the methods of structural analysis and predict

مخرجات التعلم للمادة الدراسية	the internal forces and compute the external forces for different types of structures. 8- Apply different techniques of structural analysis and the methods of presenting the actual structure, connection between the theoretical analysis and the actual engineering structures. 9- To apply appropriate engineering solutions to solve the problems of stability, safety of structural elements. 10- Perform engineering work in accordance with health, safety and economic constraints related to the analyses of structures. 11- Ability to apply knowledge of basic mathematics through differential equations, science, and engineering to solving civil engineering problems.. 12- Demonstrate proficiency in the structural analysis of statically determinate structures, including deflection calculations.
Indicative Contents المحتويات الإرشادية	Introduction (6 hr) • Definition of engineering structures • Classification of engineering structures • Forces applied on engineering structures • Types of loads and supports Stability and determinacy of structures (6 hr) • Method used for stability of engineering structure • Stability and determinacy of beams • Stability and determinacy of trusses • Stability and determinacy of rigid frames • Stability and determinacy of composite structures Statically determinate structures(18hr) • Statically determinate beams Drawing of shear force and bending moments diagram • Analysis of statically determinate truss • Statically determinate rigid frames Drawing of shear force and bending moments diagram Influence line for statically determinate structures (9hr) Moving concentrated loads (9hr) • Criteria for maximum • Absolute maximum bending moment Approximate analysis for statically indeterminate structures (6hr) Elastic deformation of structures (Beams, Truss, Rigid frames) (9hr) • Double-integration method.

	• Virtual work method (Unit load method) Slope-deflection method for statically indeterminate beams and rigid frames (12hr) • Without joint translation • With joint translation Moment distribution method without joint translation (12hr) • Fixed-end moment • Element stiffness • Distribution factor, carry-over factor • Distribution of external moment applied to a joint • The process of locking and unlocking :one joint • The process of locking and unlocking :two joint • Modified stiffness factor Moment distribution method with joint translation • Analysis of statically indeterminate rigid frames with one degree of freedom
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams. 2- Student feedback. 3- Seminars.

Student Workload (SWL) الحمل الدراسي للطالب			
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	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11

Formative assessment	**Assignments**	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2hr	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	Approximate analysis for statically indeterminate structures
Week 2	Approximate analysis for statically indeterminate structures
Week 3	Elastic deformation of structures (Beams, Truss, Rigid frames) (1) • Double-integration method.
Week 4	Elastic deformation of structures (Beams, Truss, Rigid frames) (2) • Virtual work method (Unit load method)
Week 5	Elastic deformation of structures (Beams, Truss, Rigid frames) (3) • Virtual work method (Unit load method)
Week 6	Slope-deflection method for statically indeterminate beams and rigid frames • Without joint translation
Week 7	Slope-deflection method for statically indeterminate beams and rigid frames • Without joint translation
Week 8	Slope-deflection method for statically indeterminate beams and rigid frames • With joint translation
Week 9	Slope-deflection method for statically indeterminate beams and rigid frames • With joint translation
Week 10	Moment distribution method without joint translation • Fixed-end moment • Element stiffness • Distribution factor, carry-over factor

	• Distribution of external moment applied to a joint
Week 11	Moment distribution method without joint translation • Fixed-end moment • Element stiffness • Distribution factor, carry-over factor • Distribution of external moment applied to a joint • The process of locking and unlocking :one join
Week 12	Moment distribution method without joint translation • The process of locking and unlocking :two joint • Modified stiffness factor Moment distribution method with joint translation • Analysis of statically indeterminate rigid frames with one degree of freedom
Week 13	Moment distribution method without joint translation • The process of locking and unlocking :two joint • Modified stiffness factor Moment distribution method with joint translation • Analysis of statically indeterminate rigid frames with one degree of freedom
Week 14	Moment distribution method without joint translation • The process of locking and unlocking :two joint • Modified stiffness factor Moment distribution method with joint translation • Analysis of statically indeterminate rigid frames with one degree of freedom
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1. Elementary theory of structures / Yuan Y. Hsieh 2. Structural analysis / Russell C. Hibbeler 3. Structural and Stress Analysis / T.H.G. Megson 4. Fundamentals of structural analysis/ Kenneth M. Leet, Chia Ming Hang and Anne M. Giberl	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.

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1	ATU22071	Design of Reinforced Concrete buildings (1)	**تصميم المنشآت الخرسانية المسلحة (1)**

Module Information

معلومات المادة الدراسية					
Module Title	Design of Reinforced Concrete buildings (1)			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐**Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22071				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		**UGIV**	**Semester of Delivery**		7
Administering Department		Engineering Building and Construction Technique	**College**	**Technical College/ Al-Mussaib**	
Module Leader	Hussam Ali Mohammed		**e-mail**	com.hus@atu.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D in Structural-Civil Engineering
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		01/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22052, ATU22062	**Semester**	5,6
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Students will build on their knowledge of reinforced concrete design to understand the behavior of reinforced concrete and to design practical reinforced concrete components.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 26. Learn the concept of analysis and design of concrete members, 27. Understand contemporary structural design concepts, critically evaluate design options and perform ACI code calculations.

	28. Learn the concept of analysis and design of concrete members, 29. Understand contemporary structural design concepts, critically 30. Design RC Columns with due consideration of slenderness and biaxial effects 31. Design RC two-way slab systems using Direct Design Method 32. Design combined RC footings and retaining walls 33. Design Deep beams and Corbels 34. Identify the necessity of deflection and crack control in satisfying serviceability 35. Apply relevant ACI Code provisions to ensure safety and serviceability of structural elements. 36. Identify and compute the main mechanical properties of concrete and steel. 37. Apply the strength method to design R.C. structural Members. 38. Analyze and design R.C. beams for flexure and shear. Analyze and design short and slender R.C. columns. 6. Analyze and design R.C. slabs. 39. Utilize advanced computer software packages (SAP2000 and/or ETABS) for the analysis and design of steel structures.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Analysis and design of slabs[2hrs] Types of slabs, Temperature and shrinkage reinforcement, Behavior of two-way edge supported slabs, Two-way column supported slabs, Direct design method for column supported slabs, Depth limitation of the ACI code, Shear design in flat plates and flat slabs. [10hrs] Yield line analysis for slabs[5hrs] Design and analysis of compression members[2hrs] Strut and tie models: Strut and tie methodology, ACI provisions for strut and tie models, Applications. [6hrs] Seismic design: Structural response, Seismic loading criteria, ACI special provisions for seismic design. [6hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1-Exams 2-Student feedback. 3- Tutorial

Student Workload (SWL)

الحمل الدراسي للطالب			
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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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 1-4	Analysis and design of slabs: Types of slabs, Temperature and shrinkage reinforcement, Behavior of two-way edge supported slabs, Two-way column supported slabs, Direct design method for column supported slabs, Depth limitation of the ACI code, Shear design in flat plates and flat slabs.
Week 5-6	Yield line analysis for slabs
Week 7-8	Design and analysis of compression members
Week 9-11	Strut and tie models: Strut and tie methodology, ACI provisions for strut and tie models, Applications.
Week 12-14	Seismic design: Structural response, Seismic loading criteria, ACI special provisions for seismic design.
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	**4.** ACI 318 M-2014: Building Code Requirements for Structural Concrete and Commentary **5.** "Design of Concrete Structures" by A.H. Nilson, D. Darwin, C.W. Dolan, 14th Ed., McGraw-Hill. **6.** "Design of Reinforced Concrete ACI 318-05 Code Edition." J.C. McCormac and James Nelson, 7th Ed, Wiley. **7.** "Analysis and Design of Reinforced Concrete Structures" by Hussam A. Mohammed	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.

2	ATU22072	Foundation Engineering(1)	**الاسس (1)**

Module Information
معلومات المادة الدراسية

Module Title	Foundation Engineering 1	**Module Delivery**
Module Type	**Core**	**☒Theory**
Module Code	ATU22072	

ECTS Credits	**6**		**☒Lecture**	
SWL (hr/sem)	**150**		**☐Lab**	
			☒Tutorial	
			☐Practical	
			☐Seminar	
Module Level	**UGIV**	**Semester of Delivery**	7	
Administering Department	**Technical building and Construction**	**College**	Al-Musaib Technical College	
Module Leader	Maki Jafar Mohammed	**e-mail**	maki_jafar@atu.edu.iq	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D. in Geotechnical engineering	
Module Tutor		**e-mail**		
Peer Reviewer Name	Maysa Salem Fleih	**e-mail**	maysasalem@atu.edu.iq	
Scientific Committee Approval Date		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22053, ATU22063	**Semester**	5 and 6
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Foundation engineering discusses practical concepts of soil behavior, develop mechanistic methods of analysis, and applies our knowledge of soil properties and basic mechanics to the design of earth structures and foundations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of this course, the students will acquire: 1- Basic engineering knowledge and understanding. 2- Cognitive skills. 3- Practical engineering and professional skills. 4- Basic Mathematical skills. 5- Enhanced English language skills. 6- Interested in finding out more about a foundation route in engineering. 7- Determine the aims of the ground Investigation.

	8- Reveal the theories of drilling locations, numbers, and depths and explain the methods of drilling. Interpret the Soil investigation report 9- Explain foundation types, and determine the type of foundation, 10- Calculations bearing capacity and settlement of shallow foundation using various methods. 11- Design of shallow foundations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Material behavior and site characterization: Plan a subsurface Exploration. Select drilling, sampling, and field property measurement tools Specify necessary laboratory tests Interpret field and laboratory data to get design properties[6 hrs] Bearing capacity theories , Factors affecting bearing capacity Use bearing capacity equations correctly. Determination of correction factors. Evaluate the effects of water and layered soil systems on foundation performance. [8 hrs.] Predict foundation settlement (consolidation, elastic) [6 hrs] Design Shallow Foundation[8 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams 2- Student feedback. 3- Seminars

Student Workload (SWL) الحمل الدراسي للطالب			
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	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
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**	2	10 % (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10 % (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0 % (10)		

	Report	1	10 % (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Site investigation
Week 2	Collecting samples , No. of holes , Depth of bore holes
Week 3	Laboratory tests , Report writing
Week 4	Bearing capacity of soil theories
Week 5	Factors affecting bearing capacity
Week 6	Bearing capacity in case of eccentric load
Week 7	Bearing capacity layered soil
Week 8	Soil settlement
Week 9	Elastic settlement
Week 10	Consolidation settlement
Week 11	Introduction for foundation design
Week 12	Deign of shallow foundation (Isolated footing)
Week 13	Design of rectangular combined footings
Week 14	Design of trapezoidal combined footings.
Week 15	**Preparing to final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	

Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Das, B. M., (2015). Principles of foundation. 8th Edition engineering. Cengage learning.	Yes
Recommended Texts	2- Bowles, J. E. (1996). Foundation Analysis & Design 5th Edition McGraw-Hill Companies. 3- Coduto, D. P. (2014). Foundation design: principles and practices. Pearson Education Limited. 4- الوائلي، مكي جعفر. "مباديء هندسة الأسس" دار دجلة، الطبعة الرابعة 2023	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

3	ATU22073	Ethic	اخلاقيات المهنة

Module Information معلومات المادة الدراسية				
Module Title	Ethic		**Module Delivery**	
Module Type	**Basic**		☒**Theory** ☒**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	**ATU22073**			
ECTS Credits	**2**			
SWL (hr/sem)	**50**			
Module Level	**UGIV**	**Semester of Delivery**	**7**	
Administering Department	**Technical building and Construction**	**College**	**Technical College/ Al-Mussaib**	
Module Leader	Hassan Omran Keif	**e-mail**	amm hasanalkeif@gmail.com	
Module Leader's Acad. Title	Ass.Lecturer	**Module Leader's Qualification**	M.Sc.in plastic Arts	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
Scientific Committee Approval Date		**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	لا يوجد	**Semester**	
Co-requisites module	لا يوجد	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	* تعريف الطلبة بالخلاقيات العامة واخلاقيات المهنة الهندسية.

	* الارتقاء بمستوى وعي الطلبة ليتمكنوا من ادراك الابعاد الاخلاقية المحيطة بممارسة مهنهم المستقبلية. * تطوير قناعة حقيقية لدى الطلبة باهمية الالتزام الخلقي.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	المعرفة والفهم والتطبيق * شرح مبادىء التحليل الاخلاقي والتفكير في مختلف المواقف المهنية. * تنمية فرص الحوار والمناقشة حول المفاهيم الاخلاقية. * حل المشكلات الاخلاقية التي تواجه الخريج في العمل. * تنمية مهارة الحكم الاخلاقي للطلبة واستعدادهم للالتزام الاخلاقي بعد التخرج. * الارتقاء بمستوى وعي الطلبة ليتمكنوا من إدراك كافة الابعاد الاخلاقية المحيطة بممارسة مهنهم المستقبلية. * تقديم المعرفة العلمية والعملية. *اعداد خريجين مؤهلين مهنياً واخلاقياً وتمكينهم من القيام بمهام المهنة العملية بعد التخرج بجودة عالية.
Indicative Contents المحتويات الإرشادية	يتكون المقرر من مجموعة من القواعد والمبادئ السلوكية والأخلاقيّة التي يجب أن يلتزم بها اصحاب المهن الهندسية تجاه العمل والمتعاملين معهم من الزبائن والزملاء والمرؤوسين والرؤساء والمجتمع، فضلا عن ضمان حقوق الجميع ومنع الممارسات الخاطئة، واحترام حياة الانسان ورفاهيته مع مراعاة المحافظة على البيئة ومبادئ التنمية المستدامة.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	اعطاء الدروس النظرية ، تفعيل المناقشة والحوار والعصف الذهني وتمثيل الادوار، مهارات التفكير النقدي، كتابة التقارير الخاصة بالمادة العلمية، عرض التجارب المستمدة من واقع الحياة المهنية ، الامتحانات اليومية و الاسبوعية.

Student Workload (SWL)
الحمل الدراسي للطالب

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	1.1
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**	**2**	**20%(20)**	**5 . 10**	
	Assignments	**2**	**10% (10)**	**3 , 9**	

	Projects / Lab.		**-**	**-**	
	Report	**1**	**10% (10)**	**14**	
Summative assessment	**Midterm Exam**	**-**	**-**	**-**	
	Final Exam	**3hr**	**60%(60)**	**15**	
Total assessment			**100%(100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة وتعريف بالأخلاق ومنشأها ومصادرها.
Week 2	مقدمة وتعريف القيم الاخلاقية، اهمية الاخلاق للفرد والمجتمع.
Week 3	مقدمة وتعريف عن العمل و المهنة.
Week 4	اخلاقيات المهنة.
Week 5	القيم و اخلاقيات المهنة.
Week 6	القيم و اخلاقيات المهنة.
Week 7	أنماط السلوك غير الأخلاقي في المهنة (الفساد الاداري).
Week 8	أنماط السلوك غير الأخلاقي في المهنة (الرشوة والغش).
Week 9	وسائل واساليب ترسيخ قيم اخلاقيات المهنة.
Week 10	وسائل واساليب ترسيخ قيم اخلاقيات المهنة.
Week 11	اخلاقيات ممارسة المهن الهندسية.
Week 12	اخلاقيات ممارسة المهن الهندسية.
Week 13	اخلاقيات ممارسة المهن الهندسية.
Week 14	ميثاق اخلاق مهنة الهندسة لاتحاد المهندسين العرب (نموذج اخلاقيات مهنة الهندسة).
Week 15	ميثاق اخلاق مهنة الهندسة لاتحاد المهندسين العرب (نموذج اخلاقيات مهنة الهندسة).

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	

Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• أ.د. يحيى خليف (مدخل الى اخلاقيات مهنة الهندسة)، جامعة الكلك فهد للبترول والمعادن، 2000. • د.احمد جابر حسنين (اخلاقيات العمل بين الدين والمجتمع)،2011. • اتحاد المهندسين العرب: ميثاق اخلاق مهنة الهندسة، 2018	نعم
Recommended Texts	مدونة اخلاقيات ممارسة المهنة الهندسية ، وزارة الاعمار والاسكان والبلديات والاشغال العامة، الطبعة الاولى، 2017.	نعم
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.

4	ATU2207 4	Computer Aided design of structure	تطبيقات الحاسبة لتصميم المنشآت

Module Information معلومات المادة الدراسية					
Module Title	Computer Aided design of structure			**Module Delivery**	
Module Type	**Basic**			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22074				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		**UGIV**	**Semester of Delivery**		7
Administering Department		**Technical building and Construction**	**College**	Technical College/ Al-Mussaib	
Module Leader	Mohammed Jasim Hussain		**e-mail**	Com.hj.mohamad@atu.edu.iq	
Module Leader's Acad. Title		Assis. lecturer	**Module Leader's Qualification**		M.Sc in Structural engineering
Module Tutor			**e-mail**		
Peer Reviewer Name		Mohamed Hamza Mussa	**e-mail**	mohamed.mussa@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22057	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The student must learn the structural analysis & design for all structures types using the most recent methods including programs such as: 1. STAAD. Pro V8i and Staad Foundation. 2. ETABS & SAFE.

	3. CSI Bridge. 4. Prokon software. 5. Interaction between structural software and AutoCAD.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course. Student should be able to: 1. Describe the types of computer software in structural engineering and its usefulness range. 2. Explain the basic theories of computer software for structural analysis. 3. Use the software in structural engineering in accordance with the requirements. 4. Solve structural problems using sophisticated software 5. Graduates apply the knowledge of mathematical and physical sciences to solve problems in structural engineering. 6. construction engineering management, geotechnical engineering, water resources engineering, environmental engineering and transportation engineering. 7. Graduates are capable of handling and applying modern engineering tools, software, Remote Sensing and GIS for solving civil engineering related problems. 8. Graduates are capable of working in teams in laboratory and industrial environment and carrying out major design projects 9. Modeling of multi story building, analysis and design of the building components. 10. making details for civil drawing and documentation of the results. 11. Produce a presentation on information and communication technology as used within the civil engineering industry
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. General description of the STAAD. pro structural program, Starting the Programs, Creating a new Structure. Creating the Model (Beam, Column, Slab or plate, wall or surface and solid) using Graphical Interface. Menus bar (file, edit, view, tools, select, geometry) [4hrs] Application of loads (gravity and lateral), Assigning of supports, and member specification. [4hrs] Analysis and Design of beam types and frames by Staad Pro structural software. [3hrs] Analysis and design of concrete multistory building by Staad Pro structural software under both gravity and lateral loads[3hrs] Analysis and design of steel multistory building by Staad Pro structural software under both of gravity and lateral loads. [4hrs]

	Analysis and design of foundation (isolated, strip raft and pile footing using Saad pro and Staad foundation programs) [4hrs] Interaction of Staad Pro with AutoCAD software for structural analysis and design. [3hrs] SAFE program for analysis and design of solid slab beam system. [3hrs] SAFE program for analysis and design for flat slab system. [2hrs] CSI Bridge for analysis and design of various types of bridges[2hrs] CSI Bridge for analysis and design of various types of bridges[2hrs] Structural analysis and design by Prokon structural software. [4hrs] Water supply network system software application[4hrs] AutoCAD land development desktop for roads design. [4hrs] Application Project. [4hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment for this course is based on 1- Quizzes. 2- homework. 3- Report in Lab.

Student Workload (SWL) الحمل الدراسي للطالب			
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	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	General description of the STAAD. pro structural program, Starting the Programs, Creating a new Structure. Creating the Model (Beam, Column, Slab or plate, wall or surface and solid) using Graphical Interface. Menus bar (file, edit, view, tools, select, geometry)
Week 2	Application of loads (gravity and lateral), Assigning of supports, and member specification.
Week 3	Analysis and Design of beam types and frames by Staad Pro structural software.
Week 4	Analysis and design of concrete multistory building by Staad Pro structural software under both gravity and lateral loads
Week 5	Analysis and design of steel multistory building by Staad Pro structural software under both of gravity and lateral loads.
Week 6	Analysis and design of foundation (isolated, strip raft and pile footing using Saad pro and Staad foundation programs)
Week 7	Interaction of Staad Pro with AutoCAD software for structural analysis and design.
Week 8	SAFE program for analysis and design of solid slab beam system.
Week 9	SAFE program for analysis and design for flat slab system.
Week 10	CSI Bridge for analysis and design of various types of bridges
Week 11	CSI Bridge for analysis and design of various types of bridges
Week 12	Structural analysis and design by Prokon structural software.

Week 13	Water supply network system software application
Week 14	AutoCAD land development desktop for roads design.
Week 15	Application Project.
Week 16	**final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1: General description of the STAAD. pro structural program, Starting the Programs, Creating a new Structure. Creating the Model (Beam, Column, Slab or plate, wall or surface and solid) using Graphical Interface. Menus bar (file, edit, view, tools, select, geometry)
Week 2	Lab2: Interaction of Staad Pro with AutoCAD software for structural analysis and design.
Week 3	Lab3: SAFE program for analysis and design of solid slab beam system.
Week 4	Lab 4: SAFE program for analysis and design for flat slab system.
Week 5	Lab5 :CSI Bridge for analysis and design of various types of bridges
Week 6	Lab 6: CSI Bridge for analysis and design of various types of bridges
Week 7	Lab 7: Structural analysis and design by Prokon structural software.
Week 8	Lab 8: Water supply network system software application
Week 9	Lab 9: AutoCAD land development desktop for roads design.
Week 10	Lab 10:Application Project.
Week 16	**final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Structural Analysis / R.C. Hibbeler. **2.** نظرية الانشاءات / د. عبدالفتاح ديوان و أحمد فهمي **3.** تصميم المنشآت الخرسانية والمنشآت مسبقة الجهد / د. علاء محمود حسين النجمي	**Yes**
Recommended Texts	1. STAAD. pro 2012 Getting Started & Examples Manual / esearch Engineer .	No

	2. ETABS & SAFE Manual. 3. CSI Bridge Manual. 4. Prokon Manual.	
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.

5	ATU22075	Design of steel structures (1)	تصميم المنشآت الفولاذية **(1)**

Module Information
معلومات المادة الدراسية

Module Title	**Design of Steel Structures 1**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22075				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		**UGIV**	**Semester of Delivery**		7
Administering Department		Engineering Building and Construction Technique	**College**	Technical College/ Al-Mussaib	
Module Leader	Mohamed Hamza Mussa		**e-mail**	mohamed.mussa@atu.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D. in Structural engineering
Module Tutor			**e-mail**		
Peer Reviewer Name		Hussam Ali Mohammed	**e-mail**	com.hus@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ATU22071	**Semester**	7
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	After successful completion of this course the student will be able to understand the behavior and design of different types of structural steel members and connections. He will gain an educational experience in the design of simple steel structures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course. Student should be able to: 1- To understanding basic of the AISC specifications for design of steel structures. 2- To Knowledge of the design of steel members including connections. 3- To Knowledge of serviceability issues in design. 4- The students will gain an experience in the implementation of Design of Steel Structures on engineering concepts which are applied in field Structural Engineering. 5- The students will get a diverse knowledge of Design of Steel engineering practices applied to real life problems. 6- The students will learn to understand the theoretical and practical aspects of Design of Steel Structure along with the planning and design aspects. 7- Identify and compute the design loads on a typical steel building 8- Identify the different failure modes of steel tension and compression members and beams, and compute their design strengths. 9- Design bolted and welded connections for tension and comp. members and beams. 10- Apply relevant AISC provisions to ensure safety and serviceability of structural steel elements.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. beam- column: Introduction, intersection formula, moment amplification {2hr} Braces versus unbraced frames Members in braced frames{2hr} Members in unbraced frames {2hr} Design of beam- column members{2hr} Simple connections :Introduction, bolted shear connections, failure modes{2hr} Bearing strength, spacing and edge distance requirements, shear strength {2hr} Welded connections {2hr} Eccentric connections{8hr} plate girders : Introduction, general considerations , AISC requirements for proportions of plate girders {2hr} Flexural strength , shear strength {2hr} Bearing stiffeners {2hr} Design of plate girders{2hr}

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment for this course is based on 1. Quizzes. 2. Two examinations. 3. Homework .

Student Workload (SWL) الحمل الدراسي للطالب			
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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Chapter six beam- column: Introduction, intersection formula, moment amplification
Week 2	Braces versus unbraced frames Members in braced frames
Week 3	Members in unbraced frames

Week 4	Design of beam- column members
Week 5	Chapter seven Simple connections :Introduction, bolted shear connections, failure modes
Week 6	Bearing strength, spacing and edge distance requirements, shear strength
Week 7	Welded connections
Week 8	chapter eight Eccentric connections: Eccentric bolted connections: shear only
Week 9	Eccentric bolted connections: shear plus tension
Week 10	Eccentric welded connections : shear only
Week 11	Eccentric welded connections: shear plus tension
Week 12	Chapter Nine plate girders : Introduction, general considerations , AISC requirements for proportions of plate girders
Week 13	Flexural strength , shear strength
Week 14	Bearing stiffeners
Week 15	Design of plate girders
Week 16	**final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Steel Design, fourth edition by William T. Segui, , 2007 (link: http://library.lol/main/83302456566BD7CE0106450FF038F3EE)	no

	2. Structural Steel Design, fourth edition by Jack C. McCormac, Prentice Hall (link: http://library.lol/main/E58650A5C818C5D5F88DB39B8C2347E7) 3. Steel Structures: Design and Behavior. 5th ed. by Salmon, G. Charles, Johnson, E. John and Malhas A. Faris, Prentice Hall, 2008 (link: http://library.lol/main/ABD16B5E9B60ACF79AD7E0EA943DD300) 4. Specification for Structural Steel Buildings, AISC 2005	
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.

6	ATU22076	Environmental Engineering	**هندسة البيئة**

Module Information معلومات المادة الدراسية					
Module Title	Environmental Engineering			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒**Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☒ **Seminar**	
Module Code	ATU22076				
ECTS Credits	**9**				
SWL (hr/sem)	**225**				
Module Level		**UGIV**	**Semester of Delivery**		7
Administering Department		**Technical building and Construction**	**College**	Technical College/ Al-Mussaib	
Module Leader	Issam Issa Omran		**e-mail**	Inm.asm@atu.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D. in in environmental and sanitary engineering
Module Tutor			**e-mail**		
Peer Reviewer Name		Alaa Adnan Obayes	**e-mail**	alaa2011.engineering@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22068	**Semester**	6
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	The student should have sufficient knowledge of the following details:

أهداف المادة الدراسية	1- Water Quality. 2- Applications of water supply networks. 3- Applications of water treatment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student will be able to analyze, design, and implement the following: 1- Water Quality: Sampling, Physical, Chemical and Bacteriological characteristics 2- Water Supply: Ground and Surface Water Supplies, Water Transmission. 3- Water Treatment: primary, secondary, and tertiary stages. 4-Water supply and distribution networks in cities, and internal networks for buildings.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Water quality, sampling and testing [2hrs] 2-Water supply: ground and surface water [2hrs] 3- Water Treatment plant[2hrs] 4- Water distribution networks [2hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment for this course is based on 1- Quizzes. 2- homework. 3- Report in Lab.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	123	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.2
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	225		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11

Formative assessment	**Assignments**	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Water Quality: Sampling, Physical, Chemical and Bacteriological characteristics
Week 2+3	Water Supply: The hydrologic cycle, Rainfall, Distribution, Measurement and Quantity.
Week 4+5	Water Supply: Ground Water Supplies.
Week 6	Water Supply: Surface Water Supplies, Water Transmission.
Week 7+8	Water Treatment: Screening, Plain sedimentation, Sedimentation aided with coagulation, Filtration.
Week 9+10+11	Water Treatment: Disinfection, Aeration, Softening, Miscellaneous treatments like de-fluoridation, re-carbonation, desalination, etc.
Week 12+13	Water Supply and Distribution Networks: Types, Influencing factors, Design methods, Hardy cross method.
Week 14+15	Water Distribution Systems in Buildings: Direct and Indirect Feeding Systems.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Occupational safety principles, quality control, techniques and methods of laboratory testing, methods of dealing with chemicals and laboratory equipment, and disposal of laboratory wastes.
Week 2	Lab2: Techniques of testing samples, methods of collecting test samples (water, soil, air), methods of preservation, transportation, and storage, solutions (standard, partial, normal).
Week 3	Lab3: Tests of temperature, taste, odor in the water
Week 4	Lab4: Color test in water.
Week 5	Lab5: Turbidity test in water.

Week 6	Lab6: Solids test (total, suspended, and dissolved), volatile and nonvolatile solids, and settling solids in water.
Week 7	Lab7: Acidity test of the water.
Week 8	Lab8: Alkalinity test of the water.
Week 9	Lab9: Hydrogen ion concentration (pH) test of the water.
Week 10	Lab10: Calcium and magnesium concentration test in water.
Week 11	Lab11: Sodium concentration test in water.
Week 12	Lab12: Chloride salts concentration test in water.
Week 13	Lab13: Sulfate salts concentration test in water.
Week 14	Lab14: Test elements of the halogen group: (fluorine, iodine) in water.
Week 15	Lab15: Test elements of the halogen group: (chlorine) in water.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		Yes
1- Recommended Texts	-1Kutz, M., "Handbook of Environmental Engineering", Myer Kutz Associates, Delmar, NY, John Wiley & Sons, Inc., 1st, 2018, USA. 2- Manahan, S. E., "Fundamentals of Environmental Chemistry", Boca Raton: CRC Press LLC, 2001, USA. 3- Peirce, j. j., Vesilind, P.A. and Weiner, R. F., "Environmental Pollution and Control" Publisher: Elsevier Science & Technology Books, 1997, USA. 4- Weiner, R.F. and Matthews, R.A.,"ENVIRONMENTAL ENGINEERING", Butterworth-Heinemann is an imprint of Elsevier Science, 4th edition, 2003, USA	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.

Module Information
معلومات المادة الدراسية

Module Title	Design of Reinforced Concrete buildings (2)		**Module Delivery**	
Module Type	**Core**		☒**Theory** ☒**Lecture** ☐**Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22081			
ECTS Credits	**5**			
SWL (hr/sem)	**125**			
Module Level	**UGIV**	**Semester of Delivery**	8	
Administering Department	Engineering Building and Construction Technique	**College**	**Technical College/ Al-Mussaib**	
Module Leader	Hussam Ali Mohammed	**e-mail**	com.hus@atu.edu.iq	

Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D in Structural-Civil Engineering
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22052, ATU22062, ATU22072	**Semester**	5,6,7
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Students will build on their knowledge of prestressed concrete design to understand the behavior of prestressed concrete and to design practical prestressed concrete components.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successful completion of the course, the student is expected to: • Have knowledge of the prestressing steel material properties • Have knowledge of the structural effect of prestressing, and practical performance • Have knowledge of design of prestressed concrete structures in the service and ultimate limit states • Have knowledge of general performance of concrete element structures • Have knowledge of distribution of horizontal loads to bracing systems • Have knowledge of design of horizontal and vertical composed concrete element plates • Have knowledge of design and performance of different types of precast concrete elements • Be able to design and verify that different types of prestressed concrete structures have sufficient capacity • Be able to design bracing systems for precast concrete buildings • Be able to design the most common types of precast concrete elements and the connections between them • Understand how prestressed reinforcement work in different structures • Understand the design basis of prestressed concrete and precast concrete elements
Indicative Contents	Indicative content includes the following.

المحتويات الإرشادية	Prestressed Concrete: Principles of prestressed concrete, Methods of prestressing, prestressing steel, concrete for prestressed construction; Elastic flexural analysis, Flexural strength, Flexural design based on concrete stress limits; Shape selection, Tendon profiles. Loss of prestress; shear, diagonal tension and web reinforcement.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on 1-Exams 2-Student feedback. 3- Tutorial

Student Workload (SWL)
الحمل الدراسي للطالب

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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10

Summative assessment	**Midterm Exam**	2 hr	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 1-2	Overview Prestressed Concrete
Week 3-4	Materials for Prestressing
Week 5-6	Roof & Flooring Framing System
Week 7-9	Flexural Analysis
Week 10-11	Flexural Design
Week 12-13	Shear Analysis and Design
Week 14	Erection of Precast Members
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes

Recommended Texts	• **Analysis and Design of Prestressed Concrete** : by: Di Hu • **Design of Prestressed Concrete Structures** : by: T Y Lin and N H Burns • **Prestressed Concrete Analysis and Design: Fundamentals** : by: A E Naaman • **Prestressed Concrete Design**: by: Nagarajan • **Analysis and Design of Prestressed Concrete structures**: by: Hussam A. Mohammed	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.

Module Information معلومات المادة الدراسية					
Module Title	**Quantity surveying & Estimation**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22082				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		**UGIV**	**Semester of Delivery**		8
Administering Department		**Technical building and Construction**	**College**	Technical College/ Al-Mussaib	
Module Leader	Alaa Adnan Obayes		**e-mail**	alaa2011.engineering@atu.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc. . in Environmental Engineering
Module Tutor			**e-mail**		
Peer Reviewer Name		Ali Fadhil Naser	**e-mail**	com.ali3@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22075	**Semester**	7
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	To understand the principals of estimation for various engineering work and obtain knowledge on the types of contacts and specifications.
Module Learning Outcomes	Upon completion of the course. Student should be able to: 1- To make approximate and detailed estimates of buildings.

مخرجات التعلم للمادة الدراسية	2- To specify the proper method of measurement. 3- To perform the rate analysis for different items of works. 4- To write the technical specification for various civil engineering works. 5- To provide the student adequate knowledge to prepare the Estimate and find the cost of overall project of works. 6- Ascertain the quantity of materials required for Civil engineering works as per specifications. 7- Prepare cost estimate and valuation of civil engineering works. 8- Prepare tenders & contract documents. Evaluate contracts and tenders in construction practice. 9- Determine direct job overhead applicable to a construction project. 10- Use computer applications to compile and organize a construction estimate.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction, engineering projects and estimation, definition of estimation, factors affecting cost estimation, types of estimation, practical examples on approximate estimation, [4hrs] Principles in selecting units of measurements for items, various units and modes of measurements, details of quantities measuring, rate analysis, factor affecting the cost of materials and labor, rate for various items of construction of civil engineering work. Method of working quantities, excavation and fill works for wall foundation, estimation of walls and other types of building items, method used to calculate length in various works, examples and problems. [4hrs] Earth work for various engineering projects. [4hrs] Estimation of masonry works. [2hrs] Estimation of concrete work (1): primary materials used, mixing of concrete materials, types of concrete mixtures, calculation quantities of concrete, materials, examples and problems. [3hrs] Estimation of concrete work (2): Spread and combined foundation. [3hrs] Estimation of concrete work (3): lintels, beams, roofs, columns, arches, and stairs. Estimation of tiles works. [4hrs] Estimation of sanitary, sewage, plumbing, and electrical works. [3hrs] Estimation of materials used in flexible and rigid pavement[4hrs] Estimation of materials used in steel structures. [3hrs] Technical specifications: definitions, resources and types of specifications, role of specification in engineering project quality and estimated cost, technical specification for various work. [4hrs] Valuation and contracts. [2hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment for this course is based on 1- Quizzes. 2- homework.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Introduction, engineering projects and estimation, definition of estimation, factors affecting cost estimation, types of estimation, practical examples on approximate estimation,
Week 2	Principles in selecting units of measurements for items, various units and modes of measurements, details of quantities measuring, rate analysis, factor affecting the cost of materials and labor, rate for various items of construction of civil engineering work.

Week 3	Method of working quantities, excavation and fill works for wall and raft foundation, and other types of building items are used to calculate length in various works, examples, and problems.
Week 4	Earth work for various engineering projects, and Crushed stone layer under the foundation.
Week 5	Estimation of concrete work : primary materials used, mixing of concrete materials, types of concrete mixtures, calculation quantities of concrete, construction materials, examples and problems.
Week 6	Estimation the amount of stone, blocks, or bricks under the DPC layer , pouring the DPC layer and estimation the construction materials of DPC layer.
Week 7	Estimating the amount of building the walls with bricks or concrete blocks and estimating the amount of construction material for cement mortar
Week 8	Wood mold works
Week 9- 10	Estimation of concrete work: lintels, beams, roofs, columns, arches, and stairs.
Week 11	Estimation of sanitary, sewage, plumbing, and electrical works and Estimation the amount of finishing work: cement rendering, plastering with gypsum, floor tiling, ceramic work, doors, windows, etc.
Week 12	Estimation of materials used in Culvert Box, channel and water tank.
Week 13	Estimation of Earthworks for the road and materials used in flexible and rigid pavement
Week 14	Preparing bills of quantities for different construction items.
Week 15	Technical specifications: definitions, resources and types of specifications, role of specification in engineering project quality and estimated cost, technical specification for various work, Valuation and contracts
Week 16	**Final Exam.**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		Yes
Recommended Texts	1- Construction planning and technology, Rajiv Gupta, 1984. 2- Construction, planning equipment and methods, R. L. Peurifoy etal, 7th Ed., 2006. 3- Building construction handbook, R. Chudley and R. Greeno, 5th Ed., Elisevier Butterworth-Heinemann, 2004. 4- تخمين ومواصفات الاعمال الانشائية, المهندس غانم عبد الرحمن بكر 5- التخمين والمواصفات, مدحت فضيل فتح الله 6- شروط المقاولات لاعمال الهندسة المدنية بقسميها الاول والثاني, وزارة التخطيط والتعاون الانمائي, 2005.	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.

Module Information
معلومات المادة الدراسية

Module Title	**Design of Steel Structures 2**	**Module Delivery**	
Module Type	**Core**	☒**Theory** ☒**Lecture** ☐**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22083		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		

Module Level	**UGIV**	**Semester of Delivery**	8
Administering Department	Engineering Building and Construction Technique	**College**	Technical College/ Al-Mussaib
Module Leader	Mohamed Hamza Mussa	**e-mail**	mohamed.mussa@atu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D. in Structural engineering
Module Tutor		**e-mail**	
Peer Reviewer Name	Hussam Ali Mohammed	**e-mail**	com.hus@atu.edu.iq
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ATU22071	**Semester**	7
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	After successful completion of this course the student will be able to understand the behavior and design of different types of structural steel

	members and connections. He will gain an educational experience in the design of simple steel structures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course. Student should be able to: 11- To understanding basic of the AISC specifications for design of steel structures. 12- To Knowledge of the design of steel members including connections. 13- To Knowledge of serviceability issues in design. 14- The students will gain an experience in the implementation of Design of Steel Structures on engineering concepts which are applied in field Structural Engineering. 15- The students will get a diverse knowledge of Design of Steel engineering practices applied to real life problems. 16- The students will learn to understand the theoretical and practical aspects of Design of Steel Structure along with the planning and design aspects. 17- Identify and compute the design loads on a typical steel building 18- Identify the different failure modes of steel tension and compression members and beams, and compute their design strengths. 19- Design bolted and welded connections for tension and comp. members and beams. 20- Apply relevant AISC provisions to ensure safety and serviceability of structural steel elements.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. beam- column: Introduction, intersection formula, moment amplification {2hr} Braces versus unbraced frames Members in braced frames{2hr} Members in unbraced frames {2hr} Design of beam- column members{2hr} Simple connections :Introduction, bolted shear connections, failure modes{2hr} Bearing strength, spacing and edge distance requirements, shear strength {2hr} Welded connections {2hr} Eccentric connections{8hr} plate girders : Introduction, general considerations , AISC requirements for proportions of plate girders {2hr} Flexural strength , shear strength {2hr} Bearing stiffeners {2hr} Design of plate girders{2hr}

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment for this course is based on 4. Quizzes. 5. Two examinations. 6. Homework .

Student Workload (SWL) الحمل الدراسي للطالب			
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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Tutorial	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Chapter six beam- column: Introduction, intersection formula, moment amplification
Week 2	Braces versus unbraced frames Members in braced frames
Week 3	Members in unbraced frames

Week 4	Design of beam- column members
Week 5	Chapter seven Simple connections :Introduction, bolted shear connections, failure modes
Week 6	Bearing strength, spacing and edge distance requirements, shear strength
Week 7	Welded connections
Week 8	chapter eight Eccentric connections: Eccentric bolted connections: shear only
Week 9	Eccentric bolted connections: shear plus tension
Week 10	Eccentric welded connections : shear only
Week 11	Eccentric welded connections: shear plus tension
Week 12	Chapter Nine plate girders : Introduction, general considerations , AISC requirements for proportions of plate girders
Week 13	Flexural strength , shear strength
Week 14	Bearing stiffeners
Week 15	Design of plate girders
Week 16	**final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Steel Design, fourth edition by William T. Segui, , 2007 (link: http://library.lol/main/83302456566BD7CE0106450FF038F3EE)	no

	2. Structural Steel Design, fourth edition by Jack C. McCormac, Prentice Hall (link: http://library.lol/main/E58650A5C818C5D5F88DB39B8C2347E7) 3. Steel Structures: Design and Behavior. 5th ed. by Salmon, G. Charles, Johnson, E. John and Malhas A. Faris, Prentice Hall, 2008 (link: http://library.lol/main/ABD16B5E9B60ACF79AD7E0EA943DD300) 4. Specification for Structural Steel Buildings, AISC 2005	
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.

Module Information معلومات المادة الدراسية					
Module Title	Foundation Engineering 2			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22084				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		**UGIV**	**Semester of Delivery**		8
Administering Department		**Technical building and Construction**	**College**	Al-Musaib Technical College	
Module Leader	Maki Jafar Mohammed		**e-mail**	maki_jafar@atu.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D. in Geotechnical engineering
Module Tutor			**e-mail**		
Peer Reviewer Name		Maysa Salem Fleih	**e-mail**	maysasalem@atu.edu.iq	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU22073	**Semester**	7
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Foundation engineering discusses practical concepts of soil behavior, develop mechanistic methods of analysis, and applies our knowledge of soil properties and basic mechanics to the design of earth structures and foundations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of this course, the students will acquire: 12- Basic engineering knowledge and understanding. 13- Cognitive skills. 14- Practical engineering and professional skills. 15- Basic Mathematical skills. 16- Enhanced English language skills. 17- Calculations Bearing capacity and Settlement of piles of single and group pile(s) in cohesive and granular soils. 18- Design of concrete retaining walls. 19- Methods of Slope stability analysis for clays & sand. 20- Methods of Soil improvement techniques. 21- Using Plaxis 2D and 3 D in simulations the soil and structures.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Deep foundations ,Types of piles , Method of execution, Bearing capacity of single pile , Bearing capacity of pile group , Design of piles , Design of piles cap. Settlement of piles . [8 hrs] Lateral earth pressure. Design of concrete retaining walls [4 hr] Slope stability analysis [6 hrs] Soil improvement and reinforcement [4 hrs] Plaxis 2 D and 3D program [6 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams 2- Student feedback. 3- Seminars

Student Workload (SWL) الحمل الدراسي للطالب			
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	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8

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**	2	10 % (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10 % (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0 % (10)		
	Report	1	10 % (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	Introduction to pile foundation
Week 2	Bearing capacity and settlement of single pile in clay
Week 3	Bearing capacity and settlement of single pile in sand
Week 4	Bearing capacity and settlement of pile group.
Week 5	Retaining wall structures
Week 6	Design of retaining wall structures
Week 7	Introduction to slope stability analysis
Week 8	Stability of infinite slope
Week 9	Stability of finite slopes
Week 10	Soil improvement techniques
Week 11	Soil reinforcement techniques
Week 12	Introduction to Plaxis 2 D and 3 D
Week 13	Analysis case study using Plaxis 2 D
Week 14	Analysis case study using Plaxis 3 D
Week 15	**Preparing to final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	5- Das, B. M., (2015). Principles of foundation. 8th Edition engineering. Cengage learning. 6- PLAXIS (2019) PLAXIS 2D, 3D Reference Manual. Bentley Systems International Limited, Dublin	Yes
Recommended Texts	7- Bowles, J. E. (1996). Foundation Analysis & Design 5th Edition McGraw-Hill Companies. 8- Coduto, D. P. (2014). Foundation design: principles and practices. Pearson Education Limited. 9- الوائلي، مكي جعفر. "مباديء هندسة الأسس" دار دجلة، الطبعة الرابعة 2023	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

Module Information
معلومات المادة الدراسية

Module Title	Construction Drawing		**Module Delivery**	
Module Type	**Core**		☐ **Theory** ☒ **Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22085			
ECTS Credits	**3**			
SWL (hr/sem)	**75**			
Module Level	**UGIV**	**Semester of Delivery**		
Administering Department	**Technical building and Construction**	**College**	Technical College/ Al-Mussaib	
Module Leader	sarah silan hussain	**e-mail**	sarah.saker@atu.edu.iq	
Module Leader's Acad. Title	Ass.lecture	**Module Leader's Qualification**	M.Sc.in architecture design	
Module Tutor		**e-mail**		
Peer Reviewer Name	Ali Fadhil Naser	**e-mail**	com.ali3@atu.edu.iq	
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	The student will learn to draw all kinds of details related to civil works (structural maps for concrete & steel) as well as to read & execute the projects & plans which were drawn previously.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	upon completion of this course the students will: 1- Drawings are identified in terms of type and application for a construction process. 2- Key functions of the drawing are explained in terms of the finished product. 3- Key users of the drawing are identified in terms of work responsibilities. 4- Specifications and notes are explained in terms of work requirements. 5- Symbols and abbreviations are interpreted in terms of their functions and meanings. 6- The layout is interpreted in terms of the different views shown. 7- The purpose of each view is explained in terms of the result of the end product. 8- Apply the building bye laws and principles of planning for residential and public buildings. 9- Prepare detail drawings for residential and public buildings. 10- Explain the design and drawing of economical buildings
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Reinforced concrete slabs (Types of slabs) : One way slabs, Two way slabs, Flat slabs, Ribbed & hollow – block slabs with all reinforcement details.[8hrs] Reinforced concrete beams : Simple beam, simple beam with cantilever, fixed beam, Continuous beam, Girder, type of reinforcement cut-of and bent-up method. .[8hrs] Reinforced concrete columns and cross sections. .[4hrs] Reinforced concrete footings, Wall footing, Isolated, Combined, Strap, Continuous, Raft foundations. .[6hrs] Introduction to define the steel drawing, steel column base plat connection Beam – column connections (Riveted , Welded , Bolts) .[8hrs] Municipal engineering drawing: Water distribution systems: Internal water networks for building (cold & hot) , Water treatment station , Irrigation works drawing: Regulators, Pipes, Box culverts, Siphon, Weirs, and Bridges. .[8hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on 1- Exams 2- Student feedback. 3- application in lab .

Student Workload (SWL) الحمل الدراسي للطالب			
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	12	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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

Delivery Plan (Weekly Lab Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-4	Lab1: Reinforced concrete slabs (Types of slabs) : One way slabs, Two way slabs, Flat slabs, Ribbed & hollow – block slabs with all reinforcement details.
Week 5-7	Lab 2: Reinforced concrete beams : Simple beam, simple beam with cantilever, fixed beam, Continuous beam, Girder, type of reinforcement cut-of and bent-up method.

Week 8	Lab 3:Reinforced concrete columns and cross sections.
Week 9-10	Lab 4: Reinforced concrete footings, Wall footing, Isolated, Combined, Strap, Continuous, Raft foundations.
Week 11	Lab 5 :Introduction to define the steel drawing, steel column base plat connection
Week 12	Lab 6: Beam – column connections (Riveted , Welded , Bolts)
Week 13	Lab 7: Municipal engineering drawing: Water distribution systems: Internal water networks for building (cold & hot) , Water treatment station ,
Week 14	Lab 8: Irrigation works drawing: Regulators, Pipes, Box culverts, Siphon, Weirs, and Bridges.
Week 15	**Preparatory week before the final Exam**
Week 16	**final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1
Week 2	Lab2
Week 3	Lab3
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts	1- Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315-747). 2- Reinforced Concrete Designer's Handbook / Reynolds, C.E. &Steed Man. J.C. 3- Foundation Analysis & Design / Bowles J.E. 4- A Manual of Engineering Drawing for Students & Drafts / French. T.E. 5- Structural Details in Concrete / M.Y.H. Bangash 6- Irrigation Principles & Practices / Israclson .	No

	7- The design of prestressed concrete bridges / ROBERT BENIM 8- Detailing for steel construction, second edition, AISC.	
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.

Module Information معلومات المادة الدراسية				
Module Title	Innovative project		**Module Delivery**	
Module Type	**suport**		☐ **Theory** ☐ **Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU22086			
ECTS Credits	**4**			
SWL (hr/sem)	**100**			
Module Level	**UGIV**	**Semester of Delivery**		
Administering Department	**Technical building and Construction**	**College**	Technical College/ Al-Mussaib	
Module Leader	Name	**e-mail**	E-mail	
Module Leader's Acad. Title		**Module Leader's Qualification**		
Module Tutor	Name (if available)	**e-mail**		
Peer Reviewer Name		**e-mail**		
Scientific Committee Approval Date	01/06/2023	**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	This course comprises a supervised research project supported and complemented by class and supervisory discussions. In this course, students will take an opportunity to perform a research project under supervision according to an individual study plan, to summarize the results in a research report and present the results of the project.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	In general, upon completion of the GP, students are expected to: 1- Ability to collect and analyze data, and finally draw conclusions through experimentation and simulation. 2- Ability to identify, formulate and solve engineering problems 3- Ability to design a system, component or process with defined constraints. 4- Ability to implement designed solutions 5- Ability to conduct literature review in the project domain. 6- Ability to communicate effectively through written reports and oral presentations 7- Ability to function in multidisciplinary teams. 8- learn the skilled needed by a System Analyst to be , professional and a successful 9- Learn Positive thinking 10- Use current techniques, skills, and tools necessary for computing Practices.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Techniques , skills, and tools necessary for computing Practices.

Student Workload (SWL) الحمل الدراسي للطالب			
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**				
	Assignments				
	Projects / Lab.	2hr	50% (50)	Continuous	
	Report				
Summative assessment	**Midterm Exam**				
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1-14	Different projects supervised by staff members .
Week 15	First dissection

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1:
Week 2	Lab2:
Week 3	Lab3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		No

Websites	

Grading Scheme مخطط الدرجات				
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