Module Information معلومات المادة الدراسية					
Module Title	**Transportation Engineering**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical**	
Module Code	UOMU023065				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		**UGIII**	**Semester of Delivery**		5
Administering Department		**Building and Construction Techniques Engineering**	**College**	Al-Mustaqbal university	
Module Leader	Tameem M. Hashim		**e-mail**	tameemmohammed@uomus.edu.iq	
Module Leader's Acad. Title		Senior Lecture	**Module Leader's Qualification**		MSc.in Civil Engineering /Road and Transportation
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	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 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 171 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- Reports 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 / 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 & 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 Practical. Syllabus) المنهاج الاسبوعي للعملي	
	Material Covered
Week 1 & 2	Ductility of Bitumen
Week 3 & 4	Thin Film Oven Test
Week 5 & 6 & 7	Aging Test of Bitumen
Week 8 & 9	Marshall Mix Design
Week 10 & 11	Stability Test of HMA Mixture

Week 12 & 13	Flow Test of HMA Mixture
Week 14 & 15	Air Voids Test of HMA Mixture

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