	Ministry of Higher Education and Scientific Research - Iraq Al-Mustaqbal University College of Sciences Cyber Security Science Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	NUMBER THEORY			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOMU03324				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval	01/04/2024		**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 أهداف المادة الدراسية	1. To develop problem solving skills and understanding of Number theory and how this important for computer security. 2. To understand how the importance of theory of numbers and related to cryptography and computer and cybersecurity. 3. This course deals with the basic concept of mathematical of cryptography. 4. This is the basic subject for cryptographic technique and cyber security methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A- Knowledge and Understanding** 1: Qualifying students to explore the importance of number theory and its applications 2: Qualifying students to deal with the mathematical background of cryptography. 3: Qualifying students to solve security issues of some encryption methods by using specific mathematical modules that deal with number theory. **B- Subject-specific skills** 1: Enable students to identify the mathematical theories of cryptographic methods 2: Give the means to students for linking encryption algorithms with number theory 3: Enable students to understand the mathematical theories of advanced cryptographic methods
Indicative Contents المحتويات الإرشادية	1: Clarify some mathematical concepts of computer security 2: Clarify the importance of number theory in information security applications 3: Clarify the importance of employing the science of number theory in computer security
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	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.9
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.4
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	5% (5)	5, 10	LO # A&B
	Assignments	2	5% (5)	2, 12	LO # A&B
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	5% (5)	13	LO # A&B
Summative assessment	**Midterm Exam**	2 hr	15% (15)	7	LO # A&B
	Final Exam	2hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General introduction
Week 2	Divisibility and Prime numbers
Week 3	Algebra preliminaries
Week 4	Prime numbers
Week 5	The group and ring
Week 6	Finite Galois field
Week 7	Great common divisor and Euclidean algorithm

Week 8	Messene primes
Week 9	Theory of Congruence's
Week 10	Congruent modulo
Week 11	Fermat little theorem
Week 12	Divisibility tests
Week 13	Properties of congruence's
Week 14	Residue classes and Carmichael theorem
Week 15	The Chinese remainder theorem
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Linux programming
Week 2	Lab 2: terminal commands
Week 3	Lab 3: terminal commands
Week 4	Lab 4: terminal commands
Week 5	Lab 4: Prime factorization in C++
Week 6	Lab 5: GCD
Week 7	Lab 6: LCM
Week 8	Lab 7: Classical cryptography techniques
Week 9	Lab 8: Classical cryptography techniques
Week 10	Lab 9: Classical cryptography techniques
Week 11	Lab 10: Classical cryptography techniques

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Elementary Number Theory ,William Stein, 2004.	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.