المعايير الأكاديمية المرجعية ARS المتبناه من برنامج الرياضيات البحتة وعلوم الحاسب

1. Attributes of the graduate student

1.1 Postulate concepts and choose appropriate solutions to solve problems on a scientific basis.

1.2 Demonstrate the ability to self-learn, learn lifelong and actively participate in research activities.

1.3 Apply different types of reasoning and methods of proof.

1.4 Understand how mathematical ideas interconnect and build on one another.

1.5 Apply the fundamental theories and principles of computing and information applications.

1.6 Design a computing system, component and process to meet the required needs within realistic constraints.

1.7 Exploit the techniques, skills and up-to-date computing tools necessary for computing and information practice

1.8 Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design, implementation, evaluation and evolution of computer-based systems.

1.9 Apply knowledge of mathematics and science to real world problems; as well as to analyze and interpret data.

1.10 Have a solid understanding of the concepts used in computer science to be able to pursue further learning, whether as graduate students or on their own.

2. ILOs

2.1 Knowledge and Understanding

2.1.1 Acquire knowledge and understanding of numerical mathematics, and the different ways in which numerical information is used.

2.1.2 Acquire knowledge and understanding of mathematical methods and techniques that deal with differential equations and their applications.

2.1.3 Acquire knowledge and understanding of the concept of function, and its role in mathematical analysis.

2.1.4 Acquire knowledge and understanding of the deductive nature of mathematics, and the roles of definitions, axioms, and theorems to identify and construct valid deductive arguments.

2.1.5 Acquire knowledge and understanding of theories and applications of other mathematical trends and/or applied mathematics and/or mathematical statistical and/or computer science.

2.1.6 Understand the essential mathematics relevant to computer science.

2.1.7 Acquire knowledge and understanding of use the high-level programming languages.

2.1.8 Demonstrate basic knowledge and understanding of the core of analysis, algebra, applied mathematics and statistics.

2.1.9 Understand the fundamental topics in Computer Science, including hardware and software architecture, software engineering principles and methodologies, operating systems, compilers, parallel and distributed computing, systems and software tools.

2.1.10 Select advanced topics to provide a deeper understanding of some aspects of the subject, such as hardware systems design, object-oriented analysis and design, and artificial intelligence, and parallel and concurrent computing.

2.2 Intellectual Skills

2.2.1   Formulate mathematical ideas and procedures using appropriate mathematical vocabulary and notation.

2.2.2   Construct symbolic forms of problem situations through modeling real-world situations, develop and use the models to make predictions and informed decisions.

2.2.3   Develop connections within branches of mathematics and between mathematics and other disciplines.

2.2.4   Identify attributes, components, relationships, patterns, main ideas, and errors.

2.2.5   Identify a range of solutions and critically evaluate and justify proposed design solutions.

2.2.6   Solve computer science problems with pressing commercial or industrial constraints.

2.3 Professional and Practical Skills

2.3.1   Identify required mathematics and other technical information independently.

2.3.2   Use technology to enhance mathematical thinking and understanding.

2.3.3   Develop and reinforce tenacity and confidence in their abilities to use mathematics.

2.3.4   Use appropriate programming languages, web-based systems and tools, design methodologies, and knowledge and database systems.

2.3.5   Perform independent information acquisition and management, using scientific literature and Web sources.

2.3.6   Specify, design, and implement computer-based systems.

2.3.7   Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.

2.4 General and Transferable skills

2.4.1   Use information and communication technology effectively.

2.4.2   Work in groups effectively; manage time, collaborate and communicate with others positively.

2.4.3   Apply scientific models, systems, and tools effectively.

2.4.4   Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.

2.4.5   Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.

2.4.6   Reveal communication skills, public speaking and presentation skills, and delegation, writing skills, oral delivery, and effectively using various media for a variety of audiences.

2.4.7   Show the use of general computing facilities.

2.4.8   Demonstrate an appreciation of the need to continue professional development in recognition of the requirement for life-long learning.

Matrices of ARS

a- **Matching matrix between ARS attributes of the graduate student with NARS attributes of the graduate student**

ARS Attributes of the graduate student	NARS Attributes of the graduate student									
	Basic Sciences (Mathematics)				Computing and Information Disciplines (Computer Science)					
	(1.1.5)	(1.1.8)	(2.1.5)	(2.1.7)	(6.1.1)	(6.1.4)	(6.1.5)	(2.2.2)	(2.2.3)	(2.2.7)
1.1	✓									
1.2		✓								
1.3			✓							
1.4				✓						
1.5					✓					
1.6						✓				
1.7							✓			
1.8								✓		
1.9									✓	
1.10										✓

ARS ILOs	NARS ILOs Knowledge and understanding										NARS ILOs Intellectual Skills						NARS ILOs Professional and Practical Skills							NARS ILOs General and Transferable skills							
	Basic Sciences (Mathematics)					Computing and Information (Computer Science)					Basic Sciences (Mathematics)			Computing and Information (Computer Science)			Basic Sciences (Mathematics)			Computing and Information (Computer Science)				Basic Sciences (Mathematics)			Computing and Information (Computer Science)				
	(2.2.1)	(2.2.3)	(2.2.5)	(2.2.9)	(2.2.10)	(2.4.1.1)	(2.4.1.2)	(2.4.1.3)	(2.4.1.7)	(2.4.1.8)	(2.4.1)	(2.4.2)	(2.4.5)	(2.4.2.4)	(2.4.2.8)	(2.4.2.9)	(2.3.3)	(2.3.4)	(2.3.6)	(2.4.3.1)	(2.4.3.3)	(2.4.3.7)	(2.4.3.12)	(1.5.1)	(1.5.4)	(1.5.7)	(6.2.4.1)	(6.2.4.5)	(6.2.4.6)	(6.2.4.7)	(6.2.4.8)
2.1.1	✓																														
2.1.2		✓																													
2.1.3			✓																												
2.1.4				✓																											
2.1.5					✓																										
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2.1.8								✓																							
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2.4.6																													✓		
2.4.7																														✓	
2.4.8																															✓

b- Matching matrix between ARS ILOs with NARS ILOs

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