ASSIUT UNIVERSITY



Information Systems Undergraduate Program 2017-2018





Faculty of Computers and Information

Dept. of Information Systems





Assiut University

Faculty of Computers & Information

Information Systems Undergraduate Program

(Credit Hours System)

2017-2018

Program Specifications



Assiut University Faculty of Computers & Information Department of Information Systems Quality Assurance Unit



IS Undergraduate Program

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Assiut University Faculty of Computers & Information Quality Assurance Unit

IS Program Specifications



A. Basic Information

- 1. **Program Title:** Information Systems
- 2. Program Type: Single
- 3. Faculty (Faculties): Faculty of Computers and Information
- 4. **Department:** Information Systems
- 5. Assistant Coordinator: Dr. Ahmed Taloba
- 6. Coordinator: Prof. Taysir H. Abdel-Hamid
- 7. Last date of program specifications approval: 2017-2018

B. Professional Information

1. Program Aims and Objectives

The program aims to provide the student with both breadth and depth of knowledge in the concepts and techniques related to the design, programming, and application of computing systems. Specifically, based on the constitutions of the Computing Curricula (ACM/IEEE IS2010 and IS2002) the IS program aims to provide the student with the ability to:

- I. Improve Organizational Processes
- II. Exploit Opportunities Created by Technology Innovations
- III. Address Information Requirements
- IV. Design and Manage Enterprise Architecture
- V. Design, Develop, and Evaluate Solution and Sourcing Alternatives
- VI. Securing Data and Infrastructure
- VII. Manage and Control IT Risks

2. Graduate attributes

The Information Systems program is designed to provide the student with the foundations of the discipline as well as the opportunity for specialization. After successfully completing the Information systems program, the graduate should be able to:

- I. Recognize problems that are amenable to computer information systems, and knowledge of the tools necessary for solving such problems.
- II. Understand fundamentals of systems development life cycle (SDLC), information networks, information security, data mining, e-commerce, geographical information systems, and crisis management.
- III. Manage and exploit organizational data and information; design data and information models, manage information systems development resources and projects.
- IV. Implement solutions, including use of appropriate programming languages, web-based systems and tools, design methodologies, and database systems.

- V. Apply the principles of effective information management, information organizations, information mining, and information-retrieval skills to information of various kinds, including text, images, sound, and video.
- VI. Know the fundamentals of intelligent information systems technologies.
- VII. Specify, design, and implement computer-based information systems, and evaluate them in terms of general quality attributes and possible tradeoffs presented within the given problem.
- VIII. Apply IS solutions to functional, inter-organizational, operational, managerial, and executive problems and opportunities.
- IX. Describe characteristics of various components of information systems, use the appropriate tools and techniques to analyze, design, and construct information systems.
- X. Communicate effectively by oral, written and visual means.
- XI. Work effectively as an individual and as a member of a team.
- XII. Perform independent and efficient time management.
- XIII. Recognize key ethical issues affecting information systems and their responsibilities as information science professionals.

3. Intended Learning Outcomes (ILOs)

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

- a1. Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics.
- a2. Demonstrate strong knowledge of information systems.
- a3. Demonstrate strong skills of database management systems.
- a4. Describe the principles and techniques of a number of application areas informed by the research directions of information systems.
- a5. Explain the broad context within which information systems including issues such as quality and reliability.
- a6. Identify information systems applications, such as accounting, health informatics, medical informatics, etc.
- a7. Identify selected specialist fields at the forefront of information systems.
- a8. Discuss the principles of Information communication and information security.
- a9. Describe the challenges inherent in the maintenance and evolution of software systems, and the techniques and best practices currently available for dealing with them.
- a10. Discuss some aspects of object-oriented analysis and design.
- a11. Explain decision support tools and systems.
- a12. Identify various approaches to Management Sciences (MS) such as Operation Management, Inventory Management, Project Management, and Supply Chain Management.
- a13. Interpret and analyze data qualitatively and/or quantitatively.
- a14. Demonstrate strong knowledge of fundamentals of programming and the construction of computer-based systems, data structures and algorithms, software engineering techniques and information retrieval.
- a15. Demonstrate a deep knowledge of business area analysis and the enterprise architecture.
- a16. Define the tools, practices and methodologies used in the specification, design, implementation and critical evaluation of computer and information systems.
- a17. Define the methods used in defining and assessing criteria for measuring the extent to which an information system is appropriate for its current deployment and future evolution.
- a18. Describe the current and underlying technologies that support computer processing and inter-computer communication.
- a19. Discuss developments in research fields across a range of knowledge areas.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

- b1. Define traditional and nontraditional information systems problems, set goals towards solving them, and observe results.
- b2. Perform comparisons between (methods, techniques...etc).
- b3. Identify attributes, components, relationships, patterns, main ideas, and errors.
- b4. Summarize the proposed solutions and their results.
- b5. Restrict solution methodologies upon their results.
- b6. Establish criteria, and verify solutions.
- b7. Identify a range of solutions and critically evaluate and justify proposed design solutions.
- b8. Solve information systems problems with pressing commercial or industrial constraints.
- b9. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.
- b10. Perform problem analysis from written descriptions;
- b11. Derive requirements specifications from an understanding of problems (analysis, synthesis).
- b12. Create and/or justify designs to satisfy given requirements (synthesis, evaluation, application).
- b13. Solve a decision model with appropriate techniques.
- b14. Solve complex problems within and between enterprises.
- b15. Perform improvement of a system that benefits stakeholders.
- b16. Recognize the professional, moral and ethical issues involved in the exploitation of Information Technology and be guided by their adoption, reflect on issues of professional practice within the discipline.
- b17. Apply the concepts, principles, theories and practices underpinning computing as an academic discipline.
- b18. Synthesize ideas, proposals and designs effectively using rational and reasoned arguments for presentation to a range of audiences.
- b19. Generate and evaluate the results of tests to investigate the functionality of information systems.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

- c1. Use appropriate programming languages.
- c2. Use appropriate web-based systems and tools, and design methodologies.
- c3. Use appropriate database management systems.
- c4. Apply the principles of effective information management, information organization, and information-retrieval skills to information of various kinds, including text, images, sound, and video.
- c5. Apply the principles of human-computer interaction to the evaluation and construction of a wide range of materials including user interfaces, web pages, and multimedia systems.
- c6. Identify any risks or safety aspects that may be involved within a given context.
- c7. 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.
- c8. Implement data and model centered systems.
- c9. Operate computing equipment effectively, recognizing its logical and physical properties, capabilities and limitations.
- c10. Commercialize knowledge and skills to computing community and industry.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d1. Collaborate effectively within multidisciplinary team.

- d2. Work in stressful environment and within constraints.
- d3. Communicate effectively using a variety of communication methods.
- d4. Communicate effectively with team members, managers and customers.
- d5. Demonstrate efficient IT capabilities.
- d6. Lead and motivate individuals.
- d7. Manage tasks and resources.
- d8. Search for information and adopt life-long self-learning.
- d9. Acquire entrepreneurial skills.
- d10. Acquire analytical thinking and problem solving skills
- d11. Effectively employ information-retrieval skills, (including the use of browsers, search engines, and on-line library catalogues).
- d12. Ability to work independently and as part of a team with minimum guidance.
- d13. Manage one's own learning and development, including time management and organizational skills.
- d14. Prepare their work in the form of reports, oral presentations or an internet web site.
- d15. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.
- d16. Develop a range of fundamental research skills, through the use of online resources, technical repositories and library-based material.

4. Academic standards

4a. External references for standards

The academic standards invoked in this specification are driven based on the National Academic Reference Standards (NARS) for "Computing" approved by the National Authority of Quality Assurance and Accreditation of Education on October 2010.

4b. Comparison of provision to external references

The computer science program 100% matches NARS reference

See the attached document "Program Matrices".

5. Curriculum Structure and Contents

5a. Program duration: 144 credit hours.

5b. Program structure

- No. of credit hours : Compulsory (100), Elective (44)
- Program Levels (in credit-hours system): 4 levels.

The following table summarizes the program structure.

Subject Area		Credit	IS Program %	Tolerance
		Hours		
Humanities, ethical and Social Sciences (Univ.	. Req.)	18	12.5 %	8-10 %
Mathematics and Basic Sciences		28	19.44 %	16-18 %
Basic Computing Sciences (institution req.)		42	29.17 %	26-28 %
Applied Computing Sciences (specialization)		42	29.17 %	28-30 %
Projects and Training		14	9.72%	6-10 %
Subtotal		144	100 %	84-96 %
Optional (Institution character-identifying sub	ojects)	15	N/A	4-16 %
Total		N/A	N/A	100 %

6. Program Courses

6a. Compulsory Courses

			General	requi	remen	ts					
Code/	Course Title	Caralita	D	No. o	f hours	/week	Constant		Achiev	ed ILOs	
course No.	Course Title	Credits	Prerequisites	Lect.	Lab	Exe.	Semester	a's	b's	c's	d's
HUM111	English Language I	2		2			1 st	a1	b 1, b 2	c 1, c 2,c 3	d1, d 2, d 3, d4, d5, d6, d7
HUM121	Social Context of Computing	1	-	1				a 1, a 2, a 3	b 1, b 2, b 3	c 1, c 2, c 3	d1, d 2, d 3, d4, d5, d6, d7, d8, d9
HUM132	Interpersonal Communication	2	-	2				a 1, a 2, a 3	b 1, b 2, b 3	c 1, c 2, c 3	d1, d 2, d 3, d4, d5, d6, d7, d8, d9
HUM231	Business Administration	2	-	2				a1- a2	b1- b3	c1- c3	d1- d7
HUM232	Technical Writing	2	HUM111	2				a 1, a 2, a 3	b 1, b 2, b 3	c 1, c 2, c 3	d1- d9
HUM241	Computers and Ethics	1	-	1				a1- a2	b1- b3	c1- c3	d1- d7
Total		10		I	I	1			1	I	

			Instituti	on re	quireme	nts					
Code/		G 11			o. of hours /				Achiev	ed ILOs	
course No.	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's
MATH101	Mathematics I	3	-	3		1	1 st	a1, a2	b2- b6	c1- c3	d1- d3
MATH102	Mathematics I I	3	MATH101	3		2		a1- a5	b1- b6	c1- c4	d1- d3
MATH202	Probability and Statistics	2	MATH102	2	2 H ^T			a1- a5	b1- b6	c1- c4	d1- d3
CS201	Discrete Structures	3	MATH102	3		2		a1- a2	b1- b6	c1- c4	d1- d4
PHYS101	Physics I	3	-	2	2 Hs		1st	a1- a6	b1- b5	c1- c6	d1- d6
PHYS102	Physics II	3	-	2	2 H ^s		2 nd	a1, a13	b3, b7, b10	c4, c6, c9	d4, d6, d7, d12, d13
EE101	Electronics	3	-	2	2 H ^s			a1	b2- b4, b6, b7	c6, c9	d2, d4, d6, d7, d12, d13
EE102	Digital Circuits	3	EE101	2	2 Hs			a1	b2- b4, b6, b7,	c6, c9	d2, d4, d6, d7, d12, d13

		Ba	sic Computi	ng Sir	nce requi	rement	S				
Code/					o. of hours /				Achieve	d IL Os	
course No.	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's
CS141	Programming Fundamentals	3	IT101	3	3 H ^T			a1- a2, a4- a7	b1-b5	c1- c3	d1- d5
CS211	Data Structures and Algorithms	3	CS241	3	2 H ^T			a1- a5	b1-b11	c1- c7	d1- d5
CS241	Object-Oriented Programming	3	CS141	3	2 H ^T			a1- a5	b1-b5	c1- c7	d1- d5
CS322	Computer Architecture and Operating Systems	3	IT101, CS201	3	2 H ^T			a14, a19	b2,b17, b18,	c1, c7,	d2, d8, d13, d14, d16
CS391	Software Engineering	3	CS211	3		2		a2- a9	b1- b15	c1- c6	d1- d6
IS201	Foundations of Information Systems	3	IT101	3	2 H ^T			a1- a7	b1- b10	c1- c8	d1- d7
IS212	Databases	3	IS201	3	2 H ^T			a1- a8	b1- b4	c1- c6	d1- d7
IS231	Systems Analysis and Design	3	IT101	3		2		a1- a5	b1- b15	c1- c5	d1- d8
IT101	IT Fundamentals	3	-		3 H ^T		1 st	a1- a9	b1- b4	c1- c4	d1- d4
IT251	Data Communications	3	IT101					a1- a7	b1- b4	c1- c5	d1- d6
IT351	Computer Networks	3	IT251, CE221					a1- a7	b1- b5	c1- c7	d1- d9
IT371	Web Programming	3	CS141, IT251					a1- a8	b1- b3	c1- c6	d1- d7

	Specialization requirements												
Code/				No	o. of hours /	'week			Achiev	ed ILOs			
course	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester		•	-			
No.								a's	b's	c's	d's		
IS311	Geographical	3	IS201, IS212	3	2 H ^T			a1 - a5	b1-	c 1-c5	d1-		
	Information								b5		d6		
	Systems												
IS341	Decision Support	3	IS201	3	2 H ^T			a1-	b1-	c1-	d1-		
	Systems							a8	b8	c7	d6		
IS342	IS Strategy,	3	IS201	3	2 H ^T			a1-	b1-	c1- c7	d1-		
	Management and							a8	b8				
	Acquisition										d6		
IS412	Distributed and	3	IS212	3	2 H ^T			a1-	b 1-	c 1-c2	d1-		
	Object							a4	b6		d6		
	Databases												
IT411	Information	3	IT351	3	2 Ho			a 1-a8	b 1-	c 1-c4	d 1-		
	Assurance and				2 110				b6		d 5		
	Security												
IT441	Enterprise	3	IT351	3	2 Ho			a 1-a6	b1-	c1-	d1-		
	Architecture								b5	c6	d5		

6b. Compulsory Courses (by levels)

			Specializa	ation	requirem	ents					
Code/		Cred	_		o. of hours /				Achior	red ILOs	,
course No.	Course Title	its	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's
Level 1											
CS141	Programming Fundamentals	3	IT101	3	3 H ^T			a1- a9	b1- b4	c1- c3	d1- d5
IT101	IT Fundamentals	3	-	3	3 H ^T			a18	b3	c10	d5, d7, d13
MATH102	Mathematics I I	3	MATH101	3		2		a1- a5	b1- b6	c1- c4	d1- d3
MATH202	Probability and Statistics	2	MATH102	2	2 H ^T			a1- a5	b1- b6	c1- c4	d1- d3
CS201	Discrete Structures	3	MATH102	3		2		a1- a2	b1- b6	c1- c4	d1- d4
PHYS101	Physics I	3	-	2	2 Hs		1 st	a1- a5	b1- b5	c1- c5	d1- d5
PHYS102	Physics II	3	-	2	2 Hs		2nd	a1, a13	b3, b7, b10	c4, c6, c9	d4, d6, d7, d12, d13
EE101	Electronics	3	-	2	2 H ^s			a1	b2- b4, b6, b7	c6, c9	d2, d4, d6, d7, d12, d13
EE102	Digital Circuits	3	EE101	2	2 H ^s			al	b2- b4, b6, b7,	c6, c9	d2, d4, d6, d7, d12, d13
HUM111	English Language I	2		2			1 st	al	b 1, b 2	c 1, c 2,c 3	d1, d 2, d 3, d4, d5, d6, d7
HUM121	Social Context of Computing	1	-	1				a 1, a 2, a 3	b 1, b 2, b 3	c1, c2, c3	d1, d 2, d 3, d4, d5, d6, d7, d8, d9
HUM132 Subtotal	Interpersonal Communication	2	-	2				a 1, a 2, a 3	b 1, b 2, b 3	c1, c2, c3	d1, d 2, d 3, d4, d5, d6, d7, d8, d9

			Speciali	zatio	n require	ments					
Code/		Credit		No	o. of hours /	'week			Achiev	ved ILO	9
course No.	Course Title	s	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's
Level 2					1						
CS201	Discrete Structures	3	MATH102	3		2		a1- a2	b1-b6	c1- c4	d1- d4
CS211	Data Structures and Algorithms	3	CS241	3	2 H ^T			a1-a5	b1- b11	c1-c7	d1-d5
CS241	Object- Oriented Programming	3	CS141	3	2 H ^T			a1-a5	b1-b5	c1-c7	d1-d5
IS201	Foundations of Information Systems	3	IT101	3	2 H ^T			a1-a7	b1- b10	c1-c8	d1-d7
IS212	Databases	3	IS201	3	2 H ^T			a1- a8	b1- b4	c1- c6	d1- d7
IS221	Project Management	2	IT101	2	2 H ^o			a1- a2	b1- b2	c1	d1- d6
IS231	Systems Analysis and Design	3	IT101	3			2	a1- a5	b1- b15	c1- c5	d1- d8
IT251	Data Communicati ons	3	IT101					a1- a7	b1- b4	c1- c5	d1- d6
HUM23 1	Business Administratio n	2	-	2				a1- a2	b1- b3	c1- c3	d1- d7
HUM23 2	Technical Writing	2	HUM111	2				a 1, a 2, a 3	b1, b2, b3	c 1, c 2, c 3	d1- d9
HUM24 1	Computers and Ethics	1	-	1				a1- a2	b1- b3	c1- c3	d1- d7
Subtotal				•						•	

			Specializ	ation	requiren	nents					
Code/			_	No	o. of hours /	/week			Achiev	ed ILOs	
course No.	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's
Level3											
CS322	Computer Architecture and Operating Systems	3	IT101, CS201	3	2 H ^T			a14, a19	b2, b17, b18	c1,c7	d2, d8, d13, d14, d16
CS381	Software Development and Professional Practice	3	CS211, CS391	3	3 H ^o			a1- a10	b1- b15	c1- c6	d1- d6
CS382	Field Training	3	IS221	3				a1- a8	b1- b10	c1- c8	d1- d6
CS391	Software Engineering	3	CS211	3		2		a2- a9	b1- b15	c1- c6	d1- d6
IS311	Geographical Information Systems	3	IS201, IS212					a1-a5	b1- b5	c 1-c5	d1- d6
IS341	Decision Support Systems	3	IS201					a1- a8	b1- b8	c1- c7	d1- d6
IS342	IS Strategy, Management and Acquisition	3	IS201					a1- a8	b1- b8	c1- c7	d1- d6
IT351	Computer Networks	3	IT251, CE221					a1- a7	b1- b5	c1- c7	d1- d9
IT371	Web Programming	3	CS141, IT251					a1- a8	b1- b3	c1- c6	d1- d7
Subtota	1	27									

			Specializati	on ree	quiremer	nts					
Code/				No	o. of hours /	'week			Achiev	ed ILOs	
course No.	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's
Level4				<u> </u>				as	05	105	us
IS412	Distributed and Object Databases	3	IS212					a 1 - a4	b 1- b6	c 1-c2	d1- d6
IS452	Capstone Project I	3	CS381, IS221	3	4 Hs			a 1 - a11	b 1- b11	c 1-c6	d1- d9
IS453	Capstone Project II	3	CS381, IS221	3	4 H ^s			a 1 - a11	b 1- b11	c 1-c6	d1- d9
IT411	Information Assurance and Security	3	IT351					a 1-a8	b 1- b6	c 1-c4	d 1- d 5
IT441	Enterprise Architecture	3	IT351					a 1-a6	b1- b5	c1- c6	d1- d5
Subtotal		15									

6c.Elective Courses

			General	requi	remen	ts					
Code/					f hours				Achion	red ILOs	
course No.	Course Title	Credits	Prerequisites	Lect.	Lab	Exe.	Semester				
HUM112	English Language II	2	HUM111	2	-	-	-	a's a 1	b's b 1- b2	c's c1-c3	d's d 1- d7
HUM122	Intellectual Property	1	-	1	-			a 1-a2	b 1- b3	c 1-c4	d 1- d7
HUM131	Organizational Behavior	2	-	2	-			a 1-a2	b 1- b3	c 1-c3	d 1- d7
HUM133	Computing Economics	2	-	2	-			a 1-a6	b 1- b2	c 1-c4	d 1- d7
HUM141	Computer Law	2	-	2	-			a 1-a5	b 1- b5	c 1-c3	d 1- d7
HUM142	Privacy and Civil Liberties	1	-	1	-			a 1-a5	b 1- b5	c 1-c3	d 1- d3
HUM151	Hand Drawing	2	-	1	3 Hs			a 1-a4	b 1- b4	c 1-c3	d 1- d3
HUM152	History of Computing	2	-	2	-			a 1-a9	b 1- b3	c 1-c4	d 1- d3
HUM153	Islamic Culture	1	-	1	-			a 1-a2	b 1- b3	c 1-c3	d 1- d3
HUM154	Scientific Thinking	1	-	1	-			a 1-a2	b 1- b2	c1	d 1- d3
Total		8		·	·	•	·	•	•	•	

			Institution	requ	irement	S					
Code/				No	o. of hours	/week	-		Achiev	ed ILOs	
course No.	Course Title	Credits	Prerequisites	Lec.	Practica.	tutorial	Semester		a's b's c's d's		
MATH201	Mathematics III	3	MATH102	3	2 H ^T	2		a1-a3	b1- b5	c 1-c4	d 1- d4
MATH301	Numerical Analysis	3	MATH102	3		2		a1-a3	b1- b6	c 1-c7	d 1- d7
CS301	Operation Research	3	CS201	3	2 H ^T			a1-a3	b1- b2	c 1-c3	
CS302	Simulation and Modeling	3	MATH202	3	2 H ^T			a1-a4	b1- b2	c1-c2	d1- d3
EE201	Digital Signal Processing	3	MATH201	3	2 H ^T			a1-a3	b1- b5	c1-c4	d1- d4
Total		6									

	Basic Computing Since requirements											
Code/				Nc	. of hours /	week	_	Achieved ILOs				
course No.	Course Title	Credits	Prerequisites	Lec. Practical. tutorial		Semester	a's	b's	c's	d's		
CS341	Visual Programming	3	CS211	3	2 H ^T			a1- a6	b1-b5	c1- c5	d1- d6	
CS351	Computer Graphics	3	IT101, CS201	3	2 H ^T			a1- a7	b1-b6	c1- c4	d1- d8	
CS361	Artificial Intelligence	3	IT101, CS201		2 H ^T			a1- a7	b1-b8	c1- c6	d1- d8	
IS211	File Organization	3	CS241	2	2 H ^T			a1- a9	b1- b4	c1- c6	d1- d6	
MM301	Introduction to Multimedia Technology	3	CS241	3	2 HT			a1- a3	b1- b6	c1- c7	d1- d7	
Total		6										

			Specializa	ition r	requirem	ents					
Code/					of hours /				Achiev	ed ILOs	5
course No.	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's
IS321	Advanced Project Management	3	IS221	3				a1- a2	b1	c1	d1
IS411	Advanced Database	3	IS212	3	2 H ^o			a1- a3	b1- b4	c1- c2	d1- d6
IS413	Web Information Systems	3	IS201, IT371	3	2 H ^T			a1- a4	b1- b5	c1- c6	d1- d8
IS414	Data Mining and Business Intelligence	3	IS201	3	2 H ^T			a1- a4	b1- b5	c1- c2	d1- d8
IS415	Database Administration	3	IS212	3	2 Ho			a1- a2	b1- b3	c1- c4	d1- d7
IS416	Transaction Processing	3	IS212	3	2 Ho			a1- a9	b1- b4	c1- c6	d1- d6
IS417	Multimedia Databases	3	IS212, CS241	3	2 Ho			a1- a2	b1- b4	c1- c6	d1- d6
IS441	Quality Assurance of Information Systems	3	IS201	3	2 Ho			a1- a9	b1- b13	c1- c6	d1- d12
IS442	IS Application Development	3	IS212, IS413	3	2 Ho			a1- a9	b1- b10	c1- c6	d1- d12
IS451	Social Information Systems	3	IS413	3	2 Ho			a1- a2	b1- b3	c1- c3	d1- d7
IT471	E-commerce	3	IT371	3	2 Ho			a1- a6	b1- b2	c1- c3	d1- d7
MM412	Human Computer Interaction	3	CS341	3	2 H ^T			a1- a8	b1- b8	c1- d8	d1- d12
Total		24									

6d. Elective Courses (by levels)

			Specializati	on re	quiremer	nts					
Code/				No	o. of hours /	'week	-		Achiev	ed ILOs	
course No.	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's
Level 1							<u> </u>	uo	~ ~ ~		us
HUM112	English Language II	2	HUM111	2	-	-	-	a1- a2	b1- b3	c1- c3	d1- d7
HUM122	Intellectual Property	1	-	1	-			a1- a2	b1- b3	c1- c3	d1- d7
HUM131	Organizational Behavior	2	-	2	-			a1- a2	b1- b3	c1- c3	d1- d7
HUM133	Computing Economics	2	-	2	-			a1- a6	b1	c1- c3	d1- d7
HUM141	Computer Law	2	-	2	-			a1- a5	b1- b5	c1, c3	d1- d4
HUM142	Privacy and Civil Liberties	1	-	1	-			a1- a3	b1- b4	c1, c3	d1- d3
HUM151	Hand Drawing	2	-	1	3 Hs			a 1- a4	b 1-b4	c 1-c3	d 1- d3
HUM152	History of Computing	2	-	2	-			a 1- a9	b 1-b3	c 1-c4	d 1- d3
HUM153	Islamic Culture	1	-	1	-			a 1- a2	b 1-b3	c 1-c3	d 1- d3
HUM154	Scientific Thinking	1	-	1	-			a 1- a2	b 1-b2	c 1	d 1- d3
Total	•	8									

Specialization requirements												
Code/				No. of hours / week					Achieved ILOs			
course No.	Course Title	Credits	Prerequisite	Lec.	Practical.	tutorial	Semester				-	
			S					a's	b's	c's	d's	
Level 2												
IS211	File	3	CS241	3	2 H ^T			a1- a9	b1-	c1-	d1-	
	Organization								b4	c6	d6	
MATH20	Mathematics III	3	MATH102	3	2 H ^T	2		a1 - a3	b1-b5	c 1-	d 1-	
1										c4	d4	
EE201	Digital Signal	3	MATH201	3	2 H ^T			a1-a3	b1-b5	c1-	d1-	
	Processing									c4	d4	
Subtotal	~	0-9	•	-			<u> </u>					

	Specialization requirements											
Code/				Nc	o. of hours /	'week	-		Achiev	ed ILOs		
course No.	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester	a's	b's	c's	d's	
Level 3								<i>a</i> 5	03	0.5	us	
CS301	Operation Research	3	CS201	3	2 H ^T			a1-a3	b1- b2	c 1-c3		
CS302	Simulation and Modeling	3	MATH202	3	2 H ^T			a1-a4	b1- b2	c1-c2	d1- d3	
CS341	Visual Programming	3	CS211	3	s2 H ^T			a1-a6	b1- b5	c1-c5	d1- d6	
CS351	Computer Graphics	3	IT101, CS201	3	2 H ^T			a1-a7	b1- b6	c1-c4	d1- d8	
IS321	Advanced Project Management	3	IS221	3				a1- a2	b1	c1	d1	
MM30 1	Introduction to Multimedia Technology	3	CS241	3	2 HT			a1- a3	b1- b6	c1- c7	d1- d7	
MAT H301	Numerical Analysis	3	MATH102	3		2		a1-a3	b1- b6	c 1-c7	d 1- d7	
Subtotal	[21-24										

			Specializa	tion r	equirem	ents					
Code/			-	No	o. of hours /	/week			Achiov	ed ILOs	
course	Course Title	Credits	Prerequisites	Lec.	Practical.	tutorial	Semester			-	
No.	-							a's	b's	c's	d's
Level 4				-	1	1	1	1 -	1.4		14
IS411	Advanced Database	3	IS212	3	2 Ho			a1- a3	b1- b4	c1- c2	d1- d6
IS413	Web Information Systems	3	IS201, IT371	3	2 H ^T			a1- a4	b1- b5	c1- c6	d1- d8
IS414	Data Mining and Business Intelligence	3	IS201	3	2 H ^T			a1- a4	b1- b5	c1- c2	d1- d8
IS415	Database Administration	3	IS212	3	2 Ho			a1- a2	b1- b3	c1- c4	d1- d7
IS416	Transaction Processing	3	IS212	3	2 H ^o			a1- a9	b1- b4	c1- c6	d1- d6
IS417	Multimedia Databases	3	IS212, CS241	3	2 H ^o			a1- a2	b1- b4	c1- c6	d1- d6
IS441	Quality Assurance of Information Systems	3	IS201	3	2 Ho			a1- a9	b1- b13	c1- c6	d1- d12
IS442	IS Application Development	3	IS212, IS413	3	2 Ho			a1- a9	b1- b10	c1- c6	d1- d12
IS451	Social Information Systems	3	IS413	3	2 Ho			a1- a2	b1- b3	c1- c3	d1- d7
IT471	E-commerce	3	IT371	3	2 Ho			a1- a6	b1- b2	c1- c3	d1- d7
MM41 2	Human Computer Interaction	3	CS341	3	2 H ^T			a1- a8	b1- b8	c1- d8	d1- d12
Subtota	1	21-24		I	I	I	I	<u> </u>	I	I	I

7. Contents of Courses

Syllabus: See below

8. Program Admission Requirements

High score in secondary school education certificate in (mathematic section)

9. Regulations for progression and program completion

Please, refer to faculty bylaw (curriculum of undergraduate programs with credit hours), 2011.

10. Student Assessment (Methods and rules for student assessment)

Method (tool)	Intended leaning outcomes assessed
1- Written examinations	Knowledge and Understanding - Intellectual Skills -
	Professional Skills - General Skills
2- Oral examination	Knowledge and Understanding - Intellectual Skills
3- Laboratory examination	Professional Skills - General Skills
4- Graduation project	Professional Skills - General Skills
5- Reports and homework	Knowledge and Understanding

11. Program Evaluation

Evaluator	Tool	Sample
1- Senior students	Questionnaires	
2- Alumni	Questionnaires	
3- Stakeholders	Questionnaires,	
4-External Evaluator(s) (External Examiner(s))	Review Reports	

IS Program Matrices



Assiut University Faculty of Computers & Information Department of Information Systems Quality Assurance Unit

IS Program Matrices



The main description of Information Systems Program can be summarized in different types of matrices. These matrices are:

1. Academic Standards Matrix This matrix shows the ILOs invoked in IS Program Specifications and those existing in NARS

and the corresponding between them.

2. Program Matrix I (Courses – NARS General)

This matrix shows how IS Program Courses can cover the NARS general ILOs.

- 3. Program Matrix II (Courses NARS Special) This matrix shows how IS Program Courses can cover the NARS special ILOs.
- 4. Program Matrix II (Courses IS Program)

This matrix shows how IS Program Courses can cover IS Program ILOs.

5. Program Matrix III (Courses - Knowledge and Understanding Skills)

This matrix shows how IS Program Courses can cover Knowledge and Understanding Skills invoked in IS Program Specifications.

6. Program Matrix IV (Courses - Intellectual Skills)

This matrix shows how IS Program Courses can cover Intellectual Skills invoked in IS Program Specifications.

7. Program Matrix V (Courses – Professional and Practical Skills)

This matrix shows how IS Program Courses can cover Professional and Practical Skills invoked in IS Program Specifications.

8. Program Matrix VI (Courses - Transferable Skills)

This matrix shows how IS Program Courses can cover Transferable Skills invoked in IS Program Specifications.

9. Program Matrix VII (Aims – ILOs)

This matrix shows how IS Program ILOs can cover the program aims.

10. Teaching and Learning Methods Matrix VIII (ILOs-Teaching and Learning Methods)

This matrix shows what teaching methods are covered by IS Program ILOs.

11. Assessment Methods Matrix VIIII (ILOs-Assessment Methods) This matrix shows what assessment methods are covered by IS Program ILOs

IS Program ILOs		ponding NARS	NARS ILOs - General	NARS ILOs - Special
a1. Demonstrate basic knowledge and understanding of a core of	K1	A1	K1.Essential facts, concepts, principles	A1. A core of analysis, algebra, applied
analysis, algebra, applied mathematics and statistics.			and theories relating to computing and	mathematics and statistics.
a2. Demonstrate strong knowledge of information systems, data and	K1	A2	information and computer applications	A2. Information systems, data and
Information management, enterprise architecture, IS project			as appropriate to the program of study.	Information Management,
management, IT infrastructure, systems analysis and design, and IS			K2. Modeling and design of computer-	enterprise architecture, IS project
Strategies.			based systems bearing in mind the	management, IT infrastructure,
a3. Demonstrate strong skills of database management systems.	K2	A3	trade-offs.	systems analysis and design, and IS
a4. Know and understand the principles and techniques of a number	K2	A3	K3.Tools, practices and methodologies	strategies.
of application areas informed by the research directions of			used in the specification, design,	A3. Principles and techniques of
information systems.			K4.Implementation and evaluation of	database management systems,
a5. Show a critical understanding of the broad context within which	K5	A4	computer software systems.	management, data mining,
information systems including issues such as quality and reliability.			K5.Criteria and specifications	geographical information systems,
a6. Show a critical understanding within information systems	K3	A3	appropriate to specific problems, and	multimedia, application
applications, such as accounting, health informatics, medical			plan strategies for their solution.	development, business process
informatics, etc.			K6. Criteria and specifications	management, enterprise systems,
a7. Have a comprehensive knowledge and critical awareness of	K8	A3	appropriate to specific problems, and	human- computer interaction,
selected specialist fields at the forefront of information systems.			plan strategies for their solution.	object-oriented analysis and design,
a8. Show a critical understanding of the principles of Information	K4	A6	K7. Principals of generating tests	e-technologies, multimedia, image
communication and information security.			which investigate the functionality of	processing, information and
a9. Show a critical understanding of the challenges inherent in the	K7	A3	computer programs and computer	infrastructures security and
maintenance and evolution of software systems, and the techniques			systems and evaluating their results.	computer graphics techniques.
and best practices currently available for dealing with them.			K8.Management and economics	A4. Issues such as quality, reliability,
a10. Provide a deeper understanding of some aspects of object-	K9	A3	principles relevant to computing and	enterprise, employment law,
oriented analysis and design.			information disciplines. Professional,	accounting and health.
a11. Provide a deeper understanding of decision support tools and	K5	A9	moral and ethical issues involved in the	A5. Awareness of organizational,
systems.			exploitation of	human and economic sides of
a12. Show an understanding of various approaches to Management	K6	A2,	K9.computer technology and be	modern organizations.
Sciences (MS) such as Operation Management, Inventory		A5	guided by the appropriate professional,	A6. Principles of Information communication and information
Management, Project Management, and Supply Chain Management.			K10.Ethical and legal practices relevant	
a13. Interpreting and analyzing data qualitatively and/or quantitatively.	K11	A8	to the computing and information	security.
a14. Demonstrate strong knowledge of fundamentals of programming	K5	A3	industry. K11.Requirements, practical	A7. Specification, analysis, design, implementation and operation and
and the construction of computer-based systems, data structures and			constraints and computer-based	maintenance of IS solutions.
algorithms, software engineering techniques and information retrieval.			*	A8. Modeling organizational processes
a15. Demonstrate a deep knowledge of business area analysis and the	K10	A8	systems	and data, defining and
enterprise architecture.				implementing technical and process
a16. Knowledge of the tools, practices and methodologies used in the	K2	A7		solutions, managing projects, and
specification, design, implementation and critical evaluation of				solutions, managing projects, and

Academic Standards (Knowledge and Understanding Skills)(October 2010)

IS Program

IS Program ILOs	Corresponding in NARS		NARS ILOs - General	NARS ILOs - Special
information systems.				integrating systems
 a17. Knowledge of the methods used in defining and assessing criteria for measuring the extent to which an information system is appropriate for its current deployment and future evolution. a18. Knowledge and understanding of the current and underlying technologies that support computer processing and inter-computer communication. 	K3 A8 K4 A6			A9. Types and alternatives of global information systems architectures, and their differences in terms of service and cost consequences, and their implications for the organizational support needed.
a19. Knowledge of developments in research fields across a range of	K8	A3		
knowledge areas				

Academic Standards (Intellectual Skills)

IS Program ILOs		ponding JARS	NARS ILOs - General	NARS ILOs - Special
b1. Define traditional and nontraditional information systems problems, set goals towards solving them, and observe results.b2. Perform comparisons between (methods, techniquesetc).	I2 I3	B1 B2	I1.Analyze computing problems and provide solutions related to the design and construction of computing systems.I2.Realize the concepts, principles, theories	B1. Define traditional and nontraditional information systems problems, set goals towards solving them, and. observe results.
b3. Identify attributes, components, relationships, patterns, main ideas, and errors.	I2	B3	and practices behind computing and information as an academic discipline.	B2. Perform comparisons between (methods, techniquesetc).
b4. Summarize the proposed solutions ad their results.	I4	B4	I3.Identify criteria to measure and interpret	B3. Identify attributes, components,
b5. Restrict solution methodologies upon their results.	I5	B4	the appropriateness of a computer system for	relationships, patterns, main ideas,
b6. Establish criteria, and verify solutions.	I4	B5	its current deployment and future evolution.	and errors.
b7. Identify a range of solutions and critically evaluate and justify proposed design solutions.	I5	B7	I4.Analyze, propose and evaluate alternative computer systems and processes taking into	B4. Restrict solution methodologies upon their results.
b8. Solve information systems problems with pressing commercial or industrial constraints.	15	B8	account limitations, and quality constraints. I5.Make ideas, proposals and designs using	B5. Select the suitable tools, methods and techniques for modeling,
b9. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.	I6	B9	rational and reasoned arguments for presentation of computing systems.	analyzing IS, establishing criteria, and verify solutions.
b10. Perform problem analysis from written descriptions;	I6	B9	I6.Evaluate the results of tests to investigate	B6. Identify a range of solutions and
b11. Derive requirements specifications from an understanding of problems (analysis, synthesis).	I6	B9	the functionality of computer systems. I7.Achieve judgments considering balanced	critically evaluate and justify proposed design solutions.
b12. Create and/or justify designs to satisfy given requirements (synthesis, evaluation, application).	I6, I7	B9	costs, benefits, safety, quality, reliability, and environmental impact.	B7. Solve IS problems with pressing commercial, time, and industrial
b13. Solve a decision model with appropriate techniques.	I8	B8	I8.Familiar with the professional, legal, moral	constraints.
b14. Solve complex problems within and between enterprises.	I1	B8	and ethical issues relevant to the computing industry.	B8. Suggest an innovative design to solve
b15. Perform improvement of a system that benefits stakeholders.	19	B6	19.Evaluate research papers in a range of knowledge areas	a problem containing a range of commercial and industrial
b16. Recognize the professional, moral and ethical issues involved in the exploitation of Information Technology and be guided by their adoption, reflect on issues of professional practice within the discipline.	19	-	Knowledge areas	constraints. B9. Perform problem analysis from written descriptions; derive requirements specifications from an
b17. Apply the concepts, principles, theories and practices underpinning computing as an academic discipline.	I2			understanding of problems (analysis, synthesis).
b18. Synthesize ideas, proposals and designs effectively using rational and reasoned arguments for presentation to a range of audiences.	I4	B7		
b19. Generate and evaluate the results of tests to investigate the functionality of information systems.	Ι7	B7		

Academic Standards (Professional and Practical Skills)

IS Program ILOs		oonding ARS	NARS ILOs - General	NARS ILOs – Special
 c1. Use appropriate programming languages. c2. Use appropriate web-based systems and tools, and design methodologies. c3. Use appropriate database management systems. 	P2 P2 P2	C1 C1 C1	P1.Operate computing equipment, recognizing its logical and physical properties, capabilities and limitations.	C1. Use appropriate programming languages, web-based systems and tools, design methodologies, and database systems.C2. Use quantitative analysis techniques appropriately.
c4. Apply the principles of effective information management, information organization, and information-retrieval skills to information of various kinds, including text, images, sound, and video.	Р3	C2, C4, C6, C7	P2.Implement comprehensive computing knowledge and skills in projects and in deployment of computers to solve position practical problems.	 C3. Justify technological, methodological and management choices for an information system project for a given organization. C4. Plan and manage an information systems project from inception to final implementation cut-over. C5. Droduce eccentralia and technical and user system.
 c5. Apply the principles of human-computer interaction to the evaluation and construction of a wide range of materials including user interfaces, web pages, and multimedia systems. c6. Identify any risks or safety aspects that may be 	P3 P7	C8 C3,	P3.Deploy the equipment and tools used for the construction, maintenance and documentation of computer applications. P4.Apply computing information retrieval skills in computing	 C5. Produce acceptable reports and technical and user system documentation. C6. Perform information acquisition and management, using the scientific literature and web sources. C7. Apply the principles of effective information acquisition, information management, organization, and information-
 involved within a given context. c7. 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. 	P5	C9 C5, C10	community environment and industry. P5.Develop a range of fundamental research skills, through the use of online resources, technical repositories	retrieval to text, images, sound, and video.C8. Apply the principles of human-computer interaction to the evaluation and construction of a wide range of materials including user interfaces, web pages, and multimedia systems.C9. Using tools to automate IS development phases.
c8. Implement data and model centered systems.c9. Operate computing equipment effectively, recognizing its logical and physical properties,	Р8 Р1	C2, C10 C10, C11	and library-based material. P6.Design, implement, maintain, and manage software systems.	 C10. Analyze and documenting the feasibility of various options and comparing solution concepts. C11. Maintaining existing information systems.
capabilities and limitations. c10.Commercialize knowledge and skills to computing community and industry	P7	C6, C11	P7.Assess the implications, risks or safety aspects involved in the operation of computing equipment within a specific context. P8.Handle a mass of diverse data, assess risk and draw conclusions.	

Academic Standards (Transferable Skills)

IS Program ILOs	Corresponding in NARS	NARS ILOs - General	NARS ILOs - Special
d1. Collaborate effectively within multidisciplinary team.	T2, P4	T1.Demonstrate the ability to make use of a range of	_
d2. Work in stressful environment and within	T3	learning resources and to manage one's own learning.	
constraints.		T2.Demonstrate skills in group working, team	
d3. Communicate effectively using a variety of communication methods.	Т6	management, time management and organizational skills. T3.Show the use of information-retrieval.	
d4. Communicate effectively with team members, managers and customers.	Τ7	T4.Use an appropriate mix of tools and aids in preparing and presenting reports for a range of audiences, including	
d5. Demonstrate efficient IT capabilities.	T2	management, technical, users, industry or the academic	
d6. Lead and motivate individuals.	T4	community.	
d7. Manage tasks and resources.	Т9	T5.Exhibit appropriate numeracy skills in understanding	
d8. Search for information and adopt life-long self-		and presenting cases involving a quantitative dimension.	
learning.		T6.Reveal communication skills, public speaking and	
d9. Acquire entrepreneurial skills.		presentation skills, and delegation, writing skills, oral	
d10. Acquire analytical thinking and problem solving skills		delivery, and effectively using various media for a variety	
d11. Effectively employ information-retrieval skills,	Т3	of audiences.	
(including the use of browsers, search engines, and		T7.Show the use of general computing facilities.	
on-line library catalogues).		T8.Demonstrate an appreciation of the need to continue	
d12. Ability to work independently and as part of a team	P4	professional development in recognition of the	
with minimum guidance.		requirement for life-long learning.	
d13. Manage one's own learning and development, including time management and organizational skills.	T1		
d14. Prepare their work in the form of reports, oral presentations or an internet web site.			
d15. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.	Т5		
d16. Develop a range of fundamental research skills, through the use of online resources, technical repositories and library-based material	Т8		

Academic Standards Matrix

	Knowledge and U	Understanding S	Skills
NARS ILOs General	Covering ILOs in IS Program	NARS ILOs Special	Covering ILOs in IS Program
K1	a1, a2, a3, a10	A1	a1
K2	a4, a5, a16	A2	a2, a12
K3	a6, a7, a17	A3	a3,a4,a6,a7,a9,a10,a14,a19
K4	a8, a18	A4	a5
K5	a11, a14	A5	a12
K6	a12	A6	a8,a18
K7	a9	A7	a16
K8	a13, a15, a19	A8	a13,a15,a17
		A9	a11

	Intellectu	al Skills	
NARS ILOs General	Covering ILOs in IS Program	NARS ILOs Special	Covering ILOs in IS Program
I1	b14	B1	b1
I2	b1, b17	B2	b2
I3	b2, b3	B3	b3
I4	b4, b6	B4	b4,b5
I5	b5, b7, b8	B5	b6
I6	b9, b10, b11, b12, b18	B6	b15
I7	b12, b19	B 7	b7,b18,b19
I8	b13	B8	b8, b13,b14
I9	b16	B9	b9,b11,b12
I10	b15		

	Professional and	l Practical Skills	8
NARS ILOs General	Covering ILOs in IS Program	NARS ILOs Special	Covering ILOs in IS Program
P1	c9	C1	c1, c2, c3
P2	c1, c2, c3	C2	c4,c8
P3	c5	C3	c 6
P4	d1, d12	C4	c4
P5	c 7	C5	c 7
P6	c4	C6	c4,c1 0
P7	c 6, c 10	C 7	c4
		C8	c5
		С9	c 6
		C10	c8, c9
		C11	c 9, c 10

Transfe	erable skills
NARS ILOs	Covering ILOs in
General	IS Program
T1	d6, d13
T2	d5
T3	d11
T4	d2
T5	d15
T6	d3
T 7	d4
T8	d16
T9	d7

IS Program Courses

	Course Code	Course Title		Course Code	Course Title
	CS141	Programming Fundamentals		CS322	Computer Architecture and Operating Systems
	IT101	IT Fundamentals		CS381	Software Development and Professional Practice
	MATH101	Mathematics I		CS382	Field Training
	MATH102	Mathematics I I	el	CS391	Software Engineering
el	PHYS101	Physics I	3 rd Level	IS311	Geographical Information Systems
st Level	PHYS102	Physics II	3rd	IS341	Decision Support Systems
1^{st}	EE101	Electronics		IS342	IS Strategy, Management and Acquisition
	EE102	Digital Circuits		IT351	Computer Networks
	HUM111	English Language I		IT371	Web Programming
	HUM121	Social Context of Computing		IS452	Capstone Project I
	HUM132	Interpersonal Communication		IS453	Capstone Project II
	CS201	Discrete Structures		IT411	Information Assurance and Security
	CS211	Data Structures and Algorithms	vel	IT441	Enterprise Architecture
evel	CS241	Object-Oriented Programming	4 th Level	MM412	Human Computer Interaction
2 nd Level	IS201	Foundations of Information Systems	4		
0	MATH202	Probability and Statistics			
	HUM231	Business Administration			

Course Code	Course Title	Course Code	Course Title
HUM232	Technical Writing		
HUM241	Computers and Ethics		

		Elective Course			Elective Course
	Course Code	Course Title		Course Code	Course Title
	HUM112	English Language II		CS301	Operation Research
	HUM122	Intellectual Property		CS302	Simulation and Modeling
	HUM131	Organizational Behavior	el	CS341	Visual Programming
	HUM133	Computing Economics	3 rd Level	CS351	Computer Graphics
ivel	HUM141	Computer Law	3rd	IS321	Advanced Project Management
1st Level	HUM142	Privacy and Civil Liberties		MM301	Introduction to Multimedia Technology
7	HUM151	Hand Drawing		MATH301	Numerical Analysis
	HUM152	History of Computing		IS411	Advanced Database
	HUM153	Islamic Culture		IS412	Distributed and Object Databases
	HUM154	Scientific Thinking		IS411	Advanced Database
	IS211	File Organization	vel	IS413	Web Information Systems
el	IS212	Databases	4 th Level	IS414	Data Mining and Business Intelligence
2 nd Level	IS221	Project Management	4	IS415	Database Administration
2 nd	IS231	Systems Analysis and Design		IS416	Transaction Processing
	IT251	Data Communications		IS417	Multimedia Databases

	Elective Course		Elective Course
Course Code	Course Title	Course Code	Course Title
EE201	Digital Signal Processing	IS441	Quality Assurance of Information Systems
		IS442	IS Application Development
		IS451	Social Information Systems
		 IS452	Capstone Project I
		IS453	Capstone Project II
		IT411	Information Assurance and Security
		IT441	Enterprise Architecture
		IT471	E-commerce
		IS411	Advanced Database
		IS412	Distributed and Object Databases
		IS413	Web Information Systems
		IS414	Data Mining and Business Intelligence
		IS415	Database Administration
		IS416	Transaction Processing
		IS417	Multimedia Databases
		IS441	Quality Assurance of Information Systems
		IS442	IS Application Development
		IS451	Social Information Systems
		IT471	E-commerce

Program Matrix I (Courses – NARS General)

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Program Matrix II (Courses – NARS Special)

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Program Matrix (Courses – IS Programs)

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$2^{\rm nd}$	IS211	-	\checkmark	\checkmark					\checkmark									-			-
2	IS211 IS212	-	·	√				\checkmark	Ľ.									-		\checkmark	_
	IS212 IS221	\checkmark						-	-				-					-		-	\checkmark
	IS231	F.		\checkmark	\checkmark	\checkmark			-				\checkmark					-	\checkmark		
	IT251	-			-	-			-				-					-			_
	EE201	\vdash	\checkmark	\checkmark			\checkmark		\vdash	-							-	\vdash			_
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	CS322 CS381	• √	• √	▼ ▼	• •	• √	√		⊢	-							\vdash	-			_
	CS381 CS382	 ✓ 	 ✓ 	✓	✓		-		-	-							-	-			_
	CS382 CS391		· ·		· •	✓			\vdash								-	\vdash			_
	IS311	\checkmark	\checkmark			✓	√		-	-							-	-			\checkmark
	IS311 IS341	Ļ	▼ √		√	· √	· √		\vdash	-	\checkmark						-	\vdash			·
	IS341 IS342	-	· √		• √	• √	ļ.	Ļ.	\checkmark		, 						-	-			_
vel	IT351	⊢	· √	√	• √	• √	\checkmark		Ļ.	-							\vdash	⊢			_
3 rd Level	IT351 IT371	✓	• •	• •	• •	• •	ŀ		-									\checkmark			_
3rd	CS301		 ✓ 	 ✓ 	 ✓ 	 ✓ 	√		\vdash	-							-	Ļ			_
^e	CS301 CS302	✓	√	✓	✓				-									-			_
	CS302 CS341				✓	✓			\vdash								-	\vdash			_
	CS351	\checkmark				✓	√		-								-	-			√
	IS321	▼ √	▼ ✓	√	✓	· •	· ✓		\vdash	-							-	\vdash			•
	MM301		✓	 ✓ 	✓		-		\vdash	-							-	\vdash			_
	MATH301	\checkmark	\checkmark	\checkmark	\checkmark				\vdash	-							-	\vdash			√
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	IS452							\checkmark		\checkmark											
	IS453							\checkmark		\checkmark											
	IT411						\checkmark	\checkmark		\checkmark	\checkmark										
	IT441		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark													
	MM412																				
	IS411		\checkmark	\checkmark				\checkmark													
	IS412		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark													
	IS413	\checkmark	✓	\checkmark							\checkmark										
	IS414	\checkmark	✓	\checkmark							\checkmark										
	IS415			\checkmark		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark										
	IS416	\checkmark	✓	\checkmark								\checkmark									
	IS417	\checkmark	✓	\checkmark								\checkmark									
	IS441	\checkmark	✓	\checkmark																	
	IS442			\checkmark		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark										
ſel	IS451	\checkmark	✓	\checkmark																	
Level	IS452	\checkmark	✓	\checkmark																	
4th]	IS453	✓	~	~	~																
4	IT411		• •		~	~															
	IT441	\checkmark	\checkmark			~	~														\checkmark
	IT471		\checkmark		\checkmark	\checkmark	\checkmark	\checkmark			\checkmark										
	IS411		\checkmark		\checkmark	\checkmark			\checkmark												
	IS412		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark														
	IS413	~	~	~	~	~												\checkmark			
	IS414	~	✓	~	~																
	IS415		• •		~	~															
	IS416	\checkmark	✓			~	~														\checkmark
	IS417		\checkmark		\checkmark	\checkmark	\checkmark	\checkmark			\checkmark										
	IS441		\checkmark		\checkmark	\checkmark			\checkmark												
	IS442		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark														
	IS451	✓	~	~	~	~												\checkmark			
	IT471		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark														
		b1	b2	b3	b4	b5	b6	b7	b 8	b9	b 10	b 11	b 12	b 13	b 14	b 15	b 16	b 17	b 18	b 19	
			1								10	11	12	13	14	13	16	17	19	19	

	Course	c1	c2	c3	C4	C5	C6	C7	C8	с9	C10	
	CS141	✓	✓	✓	✓							
	IT101	✓	√	✓	✓							
	MATH101	✓	√	✓								
	MATH102	✓	√	~	✓					-		
	PHYS101	✓	✓	✓	✓	✓				-		
	PHYS102	✓	√	✓	~	✓						
	EE101	✓	√	✓	~	✓						
	EE102	✓	√	~	✓	✓						
	HUM111	✓	√	~								
el	HUM121	✓	✓	✓								
,ev	HUM132	✓	√	~								
1st Level	HUM112	✓		~								
1	HUM122	✓	✓	✓								
	HUM131	~		~								
	HUM133	~	~									
	HUM141	~		~								
	HUM142		~	~								
	HUM151	✓		✓								
	HUM152	✓	✓									
	HUM153	✓		✓			\checkmark					
	HUM154	✓										
	CS201	✓	✓	✓								
	CS211	✓		✓								
	CS241	✓	✓	✓								
	IS201	✓	✓	~	~	✓		\checkmark		\checkmark		
	MATH202	✓	✓	~	~	✓	\checkmark		\checkmark	\checkmark		
5	HUM231											
eve	HUM232											
2 nd Level	HUM241	✓	✓	~	✓	✓						
5	IS211	✓	✓	~	~	✓						
	IS212	✓	✓	~			\checkmark				\checkmark	
	IS221	~			✓		\checkmark		\checkmark		\checkmark	
	IS231	✓	✓	✓	✓			\checkmark	\checkmark		\checkmark	
	IT251	✓			~							
	EE201	✓	✓	✓	✓	✓						
	CS322	✓	✓	✓								
	CS381	✓			✓							
	CS382	✓	✓	✓	✓							
	CS391	✓	✓	✓	✓							
	IS311			\checkmark	\checkmark			\checkmark		\checkmark	\checkmark	
vel	IS341	\checkmark			\checkmark	✓			✓		\checkmark	
Le	IS342	\checkmark		√	\checkmark				\checkmark		\checkmark	
3 rd Level	IT351	 ✓ 	 ✓ 	✓	✓							
	IT371	✓	 ✓ 		✓							
	CS301	 ✓ 	✓	✓								
	CS302	✓		✓	 ✓ 							
	CS341	✓	✓	✓	✓							
	CS351	\checkmark	1 1		✓						1	

IS321	\checkmark		\checkmark	\checkmark				\checkmark		\checkmark	
MM301		\checkmark	\checkmark					\checkmark		\checkmark	
MATH301	\checkmark			\checkmark				\checkmark			
IS452	✓ ✓	\checkmark	\checkmark	\checkmark			✓ ✓		√ √	\checkmark	
IS453	\checkmark	\checkmark	\checkmark	\checkmark			\checkmark		\checkmark	\checkmark	
IT411	\checkmark	\checkmark	\checkmark	\checkmark							
IT441	\checkmark	\checkmark	\checkmark	\checkmark							
MM412		\checkmark	\checkmark					\checkmark		\checkmark	
IS411			\checkmark		√	\checkmark		\checkmark		\checkmark	
IS412		\checkmark	\checkmark		√		\checkmark				
IS411	\checkmark	\checkmark	\checkmark	\checkmark							
IS413	\checkmark	\checkmark		\checkmark	✓		\checkmark	\checkmark			
IS414				\checkmark		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
IS415			\checkmark		✓	\checkmark					
IS416	\checkmark			\checkmark		\checkmark			\checkmark		
IS417	\checkmark	\checkmark	\checkmark	\checkmark							
IS441	\checkmark		\checkmark	\checkmark	√		\checkmark	\checkmark			
IS442	\checkmark		\checkmark	\checkmark	√		\checkmark	\checkmark			
IS451				\checkmark	√						
IS452		\checkmark	\checkmark		√		\checkmark				
IS453	\checkmark	\checkmark	\checkmark	\checkmark							
IT411	\checkmark	\checkmark		\checkmark	√		\checkmark	\checkmark			
IT441				\checkmark		\checkmark	\checkmark	\checkmark			
IT471			\checkmark		√	\checkmark					
IS411	\checkmark			\checkmark		\checkmark					
IS412	\checkmark	√	\checkmark	\checkmark							
IS413	\checkmark		\checkmark	\checkmark	√		\checkmark	\checkmark			
IS414	\checkmark		\checkmark	\checkmark	√		\checkmark	\checkmark			
IS415	\checkmark			\checkmark		\checkmark					
IS416	\checkmark	\checkmark	\checkmark	\checkmark							
IS417	\checkmark		\checkmark	\checkmark	√		\checkmark	\checkmark			
IS441	\checkmark		\checkmark	\checkmark	✓		\checkmark	\checkmark			
IS442	\checkmark		\checkmark	\checkmark	\checkmark		\checkmark	\checkmark			
IS451	\checkmark			\checkmark		\checkmark					
IT471	\checkmark	\checkmark	\checkmark	\checkmark							
	c1	c2	c3	C4	C5	C6	C7	C8	с9	C10	

	Caura	41	d2	12	d4	4r.	10	177	d8	10	d10	411	d	d	d	d	d1
	Course	d1	u∠	d3	u4	d5	d6	d7	uð	d 9	u10	uII	12	13	14	15	6
	CS141	√	√	√	√				L_								
	IT101	▼ ✓	*	▼ √	, v				_								
	MATH101			✓ ✓													
	MATH102	✓															
	PHYS101	✓	✓	✓													
	PHYS102	✓	~														
	EE101	✓	✓	~			~										
	EE102	✓	~			✓											
	HUM111																
el	HUM121	✓	~		✓												
1st Level	HUM132	✓	~														
st I	HUM112	✓		~													
1	HUM122	✓		~													
	HUM131	✓	✓														
	HUM133	✓	✓	~													
	HUM141	✓	✓														
	HUM142	✓	√	✓					⊢								
	HUM151	√	√	✓					\vdash	-	-			-			-
	HUM152	✓	√	√					\vdash	-	-			-			-
	HUM152	-	√	✓					-	-	-			-			
	HUM153	√	✓	 ✓ 													
		· √	· •	· √					-								
	CS201	✓ ✓	✓ ✓	×					-								
	CS211	v √	▼ √	✓					-								
	CS241	v √	▼ √	▼ √					-								
	IS201	✓ ✓	✓ ✓	✓ ✓					L_								
	MATH202			×													
el	HUM231	√	√														
2 nd Level	HUM232	√	✓	 ✓ 													
ЧГ	HUM241	✓	✓	✓													
\mathbf{a}^{n}	IS211	\checkmark	√	\checkmark	\checkmark		\checkmark	\checkmark		\checkmark	\checkmark						
	IS212	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark		\checkmark	\checkmark						
	IS221	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark		\checkmark	\checkmark						
	IS231	\checkmark	\checkmark	\checkmark	\checkmark				\checkmark		\checkmark				\checkmark		√
	IT251	✓	✓	✓													
	EE201	✓	✓	~													
	CS322	✓	√	✓			✓										
	CS381	✓	✓			✓											
	CS382	✓	✓	✓	✓	✓											
	CS391	✓	✓	✓	~												
	IS311	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark		\checkmark	\checkmark						
l G	IS341	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark		\checkmark	\checkmark						√
3rd Level	IS341 IS342	√	• •	• •	•	-	\checkmark	\checkmark	⊢	· √	· ~	-	-	-	-		<u> </u>
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Э.	IT351	· •	√	√					-	-	-			-			-
	IT371	• √	▼ √	▼ √			✓		-								
	CS301	▼ √	▼ √	×		√	▼ √		_								
	CS302					×			L_								
	CS341	√	✓	✓	✓ ✓		✓										
	CS351	✓	✓		✓												

	IS321			\checkmark	\checkmark				_								\checkmark
	MM301																-
	MATH301																
		\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark	_	√	√						\checkmark
	IS452 IS453	v √	v √	v √	v √		v √	v √		v √	▼ √						V
	IJ433 IT411	•	• •	•	•		• •	•		•	•						<u> </u>
	IT411 IT441	✓	✓			~	✓										
	MM412	✓	✓	✓	✓		✓										
	IS411	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark		\checkmark							
	IS411 IS412	√	· √	√	· √		· √	· √		· √	· √						
	IS412 IS411	\checkmark		· √	\checkmark		\checkmark	· √		\checkmark	\checkmark						
	IS411 IS413	√	· √	· √	· √		√	· √		· √	· ~	\checkmark			\checkmark		
	IS413 IS414	√	√	√	· √		•	√				•			·		
	IS414 IS415	• √	•	•	•	\checkmark		•	-	•							
	IS415 IS416	<u> </u>	· √	· √	· √		\checkmark	· √		· ~			\checkmark				
	IS410 IS417	\checkmark	•	• √	• •		·	• •	-	•			·				
	IS417 IS441	• √	•	•	•	\checkmark	\checkmark	•	\checkmark		\checkmark		\checkmark	\checkmark		\checkmark	\checkmark
	IS441 IS442	•	• •	• √	•	•	• •		• •		√		• •	• •		•	• •
/el	IS442 IS451	<u> </u>	· √	· √	· √		· √	\checkmark	-	\checkmark			· √	· √		•	-
Le	IS451 IS452		· √	· √	√		· √	· √		· ~			· √				
4 th Level	IS452 IS453	\checkmark	· √	· √	· √			· √					•				
4.	IT411	✓			-		✓	-									
	IT411 IT441	✓	✓			✓	✓										
	IT441 IT471	✓	✓	✓	✓		✓										
	IS411	\checkmark	\checkmark	\checkmark	\checkmark			\checkmark		\checkmark							
	IS411 IS412	√	· √	· √	· √	\checkmark		· √		· √							
	IS412 IS413	<u> </u>	· √	· √	· √		\checkmark	· √		· ~			\checkmark				
	IS413 IS414	\checkmark	· √	· √	· √			· √					•				
	IS414 IS415	\checkmark	· √	· √	\checkmark	\checkmark	\checkmark		\checkmark		\checkmark		\checkmark	\checkmark		\checkmark	\checkmark
	IS415 IS416	· √	· √	· √	· √	· √	· √		$\overline{\checkmark}$		· ~		· √	· √		· ~	· V
	IS410 IS417		· √	\checkmark	\checkmark	-	\checkmark	\checkmark		\checkmark			· √	\checkmark			
	IS417 IS441		· √	· √	· √		· √	· √		· √			· √				
	IS441 IS442		√	√	√		√	• •		√			√				
	IS442 IS451	\checkmark	• •	• •	• •			• •									
	IT471	• •	• •	• •			√	·	-								
	114/1		10	10		1-	14	1	10	1.0	14.0	14.4	d	d	d	d	d1
		d1	d2	d3	d4	d5	d6	d7	d8	d 9	d10	d11	12	13	14	15	6

	Code	Course	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a1 9
	CS141	Programming Fundamentals	\checkmark	√	V	~	V	~	~	~	~										
	IT101	IT Fundamentals																		~	
	MATH101	Mathematics I	~	~																	
	MATH102	Mathematics I I	\checkmark	~	√	~	~														
	PHYS101	Physics I																			
	PHYS102	Physics II	\checkmark												 ✓ 						
	EE101	Electronics	\checkmark																		
	EE102	Digital Circuits	\checkmark																		
	HUM111	English Language I	\checkmark																		
	HUM121	Social Context of Computing	\checkmark	√	√																
	HUM132	Interpersonal Communication	~	~	~																
1st Level	HUM112	English Language II	~	~																	
$1^{\rm st}$	HUM122	Intellectual Property	~	~																	
	HUM131	Organizational Behavior	√	~																	
	HUM133	Computing Economics	\checkmark	~	~	~	~	~													
	HUM141	Computer Law	✓	~	~	~	~														
	HUM142	Privacy and Civil Liberties	~	~	~																
	HUM151	Hand Drawing	~	~	~	~															
	HUM152	History of Computing	✓	~	~	~	~	~	~	~	~										
	HUM153	Islamic Culture	✓	~																	
	HUM154	Scientific Thinking	✓	~																	
	CS201	Discrete Structures	√	~																	
rel	CS211	Data Structures and Algorithms	~	~	~	~	~														
2 nd Level	CS241	Object-Oriented Programming	~	~	V	√	1														
5	IS201	Foundations of Information Systems	✓	~	~	~	~	~	~												

Program Matrix IV (Courses - a. Knowledge and Understanding Skills)

	MATH202	Probability and Statistics	√	✓	√	~	~										
	HUM231	Business Administration	~	~		_											
	HUM232	Technical Writing	~	~	~								 				_
	HUM241	Computers and Ethics	~	~													
	IS211	File Organization	~	~	~	~	~	~	~	~	~						_
	IS212	Databases	~	~	~	~	~	~	~	~							_
	IS221	Project Management	~	~													
	IS231	Systems Analysis and Design	✓	~	~	~	~										
	IT251	Data Communications	√	~	~	~	~	~	~								
	EE201	Digital Signal Processing	~	~	~												
	C5322	Computer Architecture and Operating Systems												~			~
	CS381	Software Development and Professional Practice	~	~	~	~	~	~	~	~	~	~					
	CS382	Field Training	~	~	~	~		~									
	CS391	Software Engineering		~	~	~	~	~	~	~	~						
	IS311	Geographical Information Systems	~	~	~	~	~										
	IS341	Decision Support Systems	~	~	~	~	~	~	~	~							
3rd Level	IS342	IS Strategy, Management and Acquisition	~	~	~	~	~	~	~	~							-
3^{rd}	IT351	Computer Networks	~	~	~	~	~	~	~								
	IT371	Web Programming	~	~	~	~	~	~	~	~							
	CS301	Operation Research	~	~	~												
	CS302	Simulation and Modeling	~	~	~	~											
	CS341	Visual Programming	✓	~	~	~	~	~									1
	CS351	Computer Graphics	✓	~	~	~	~	~	~								
	IS321	Advanced Project Management	✓	~													
	MM301	Introduction to Multimedia Technology	~	~	~												_

		Numerical Analysis	✓	✓	\checkmark													٦
	MATH301	, , , , , , , , , , , , , , , , , , ,																
Ц																		
	IS411	Advanced Database	V	√	~													
	IS412	Distributed and Object	~	~	~	~												
		Databases																
	IS411	Advanced Database	✓	√	~													
	IS413	Web Information Systems	~	~	~	~												
	IS414	Data Mining and Business	~	~	~	~												_
		Intelligence																
	IS415	Database Administration	✓	~														
	IS416	Transaction Processing	~	~	~	~	~	~	~	~	~							
	IS417	Multimedia Databases	\checkmark	~												 	_	-
	10.1.11	Quality Assurance of	✓	✓	~	~	√	~	~	~	~					 	_	-
	IS441	Information Systems																
	IS442	IS Application Development	~	~	~	~	~	~	~	V	~					 	_	-
vel	IS451	Social Information Systems	~	~													_	-
4 th Level	IS452	Capstone Project I	~	~	~	~	~	~	~	V	~	~	~					
	IS453	Capstone Project II	✓	~	~	~	~	~	~	~	~	✓	~					
	IT411	Information Assurance and Security	✓	~	~	~	V	~	~	~								
	IT441	Enterprise Architecture	~	~	~	~	~	~								 		
	IT471	E-commerce	~	~	~	~	√	~							 			
	IS411	Advanced Database	~	~	~													
	IS412	Distributed and Object Databases	✓	~	~	~												
	IS413	Web Information Systems	~	~	~	~											+	-
	IS414	Data Mining and Business Intelligence	~	~	~	~												
	IS415	Database Administration	~	~														
	IS416	Transaction Processing	~	~	~	~	V	~	~	V	~							
			1															

IS417	Multimedia Databases	✓	~																	
IS441	Quality Assurance of Information Systems	~	~	~	~	√	~	~	~	~										
IS442	IS Application Development	~	~	~	~	~	~	~	~	~										
IS451	Social Information Systems	~	~																	
IT471	E-commerce	~	~	~	~	~	~													
-		a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a1

	Cada	Course														1.1.4	1.45	1.1.6	b17	1.10	1.10
н	Code					-	-	66	b7	68	69	610	611	612	b13	614	615	b16	617	618	619
	CS141 IT101	Programming Fundamentals IT Fundamentals	~	√	√	√													<u> </u>		<u> </u>
	MATH10		_		•														<u> </u>		-
	MATH10 MATH10	Mathematics I Mathematics I I		•	•	•	•	•											<u> </u>		
			•	v	v	v	v	v											<u> </u>		
	PHYS101	Physics I																	<u> </u>		<u> </u>
	PHYS102	Physics II			v				 ✓ 			✓							<u> </u>		
	EE101	Electronics		V		V		V	√										<u> </u>		
	EE102	Digital Circuits		V		V		 ✓ 	✓												
	HUM111	English Language I	√	√																	
ve]	HUM12	Social Context of Computing	✓	V	V																
Level	HUM13	Interpersonal Communication	✓	√	✓															\vdash	
1^{st}	HUM11	English Language II	✓	✓	✓																
	HUM12	Intellectual Property	✓	√	✓																
	HUM13	Organizational Behavior	✓	√	✓																
	HUM13	Computing Economics	✓																		
	HUM14	Computer Law	✓	√	✓	√	✓														
	HUM14	Privacy and Civil Liberties	✓	√	√	√															
	HUM15	Hand Drawing	✓	√	√	√															
	HUM15	History of Computing	✓	✓	√																
	HUM15	Islamic Culture	√	√	✓																
	HUM15	Scientific Thinking	\checkmark	√																	
	CS201	Discrete Structures	\checkmark	\checkmark	√	\checkmark	V	√													
	CS211	Data Structures and Algorithms	\checkmark	√	√	√	V	∫ √	\checkmark	\checkmark	~	\checkmark	\checkmark								
	CS241	Object-Oriented Programming	√	√	√	√	√	1													
	IS201	Foundations of Information	√	√	√	√	√	1	√	√	~	\checkmark									
	MATH2	Probability and Statistics	√	√	√	√	√	1													
	HUM23	Business Administration	√	√	√																
Ve	HUM23	Technical Writing	√	√	√																
2 nd Level	HUM24	Computers and Ethics	√	√	√																
2^{nd}	IS211	File Organization	√	√	√	√															
	IS212	Databases	√		√	√															
	IS212 IS221	Project Management	~	√																	-
	IS231	Systems Analysis and Design	√		√	√	√			√	~	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				-
	IT251	Data Communications	\checkmark	√	√	√															-
	EE201	Digital Signal Processing																			-
Н			_	· ./		-													\checkmark		
	CS322 CS381	Computer Architecture and Software Development and	√	_ v _√	√		~			√	~	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		¥	\vdash	-
	CS381 CS382	Field Training	· ~			√	~				√	·								\vdash	-
	C5382 CS391	Software Engineering	· ~	• •		√	• •			, 1	√	· ~	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark			\vdash	-
	IS311	Geographical Information	• •	• •		~	~	ŀ	Ļ.	Ľ.	•	-	-	-	-	-				\vdash	-
	IS311 IS341	Decision Support Systems	• •	• •		~	• •		√	\checkmark										\vdash	-
	IS341 IS342		• √	• •	•	• •	•		• •	, ,											⊢
evel	IS342 IT351	IS Strategy, Management and	v √	v √	• •	• •	• •	Ľ	•	-									<u> </u>	\vdash	-
Le		Computer Networks	v √	v √		-	-			\square										\vdash	-
3rd L	IT371	Web Programming	v √	v √	ľ														<u> </u>		-
r.	CS301	Operation Research	-	• ./	-														<u> </u>		-
	CS302	Simulation and Modeling	√ √	v √			√	\square		\square											<u> </u>
	CS341	Visual Programming				×															-
	CS351	Computer Graphics	√ .√	√		_ ✓	√														
	IS321	Advanced Project Management	√ ∕																<u> </u>		
	MM301	Introduction to Multimedia	 ✓ 	 ✓ 	√	V	V													\vdash	
	MATH3	Numerical Analysis	\checkmark	√	✓	V	✓	✓													
Le	IS411	Advanced Database	√	√	√	\checkmark															

Program Matrix IV (Courses - Intellectual Skills)

IS412	Distributed and Object	\checkmark	√	~	~	\checkmark	\checkmark													
IS411	Advanced Database	V	~	~	~															
IS413	Web Information Systems	V	~	~	~	V														
IS414	Data Mining and Business	V	~	~	~	V														
IS415	Database Administration	V	~	~																
IS416	Transaction Processing	V	~	~	~															
IS417	Multimedia Databases	V	~	~	~															
IS441	Quality Assurance of	\checkmark	~	~	\checkmark															
IS442	IS Application Development	\checkmark	~	~	\checkmark															
IS451	Social Information Systems	\checkmark	~	~																
IS452	Capstone Project I	\checkmark	~	~	\checkmark	\checkmark		√	\checkmark	\checkmark	\checkmark	\checkmark								
IS453	Capstone Project II	\checkmark	\checkmark	~	✓	\checkmark	\checkmark	✓	\checkmark	\checkmark	\checkmark	\checkmark								
IT411	Information Assurance and	\checkmark	~	~	\checkmark	\checkmark	\checkmark													
IT441	Enterprise Architecture	\checkmark	\checkmark	~	✓	\checkmark														
IT471	E-commerce	\checkmark	\checkmark																	
IS411	Advanced Database	\checkmark	~	~	\checkmark															
IS412	Distributed and Object	\checkmark	\checkmark	~	√	\checkmark	\checkmark													
IS413	Web Information Systems	\checkmark	\checkmark	~	√	\checkmark														
IS414	Data Mining and Business	V	~	~	~	✓														
IS415	Database Administration	\checkmark	~	\checkmark																
IS416	Transaction Processing	\checkmark	\checkmark	~	✓															
IS417	Multimedia Databases	\checkmark	~	\checkmark	\checkmark															
IS441	Quality Assurance of	\checkmark	\checkmark	√	\checkmark	\checkmark	~	\checkmark												
IS442	IS Application Development	\checkmark	~	~	~	✓	\checkmark	~	\checkmark	\checkmark	\checkmark									
IS451	Social Information Systems	\checkmark	~	~																
IT471	E-commerce	\checkmark	~																	
		b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	b11	b12	b13	b14	b15	b16	b17	b18	b19

Program Matrix V (Courses - Professional and Practical Skills)

	Code	Course	c1	c2	c3	c4	c5	c6	c7	c8	c9 (c10
	CS141	Programming Fundamentals	\checkmark	\checkmark	√	\checkmark	✓					
	IT101	IT Fundamentals	\checkmark	\checkmark	√	\checkmark						
	MATH10	Mathematics I	\checkmark	\checkmark	√							
	MATH10	Mathematics I I	\checkmark	\checkmark	√	\checkmark						
	PHYS101	Physics I	$\checkmark\checkmark$	\checkmark	✓	√	√	V				
	PHYS102	Physics II				\checkmark		V			~	
	EE101	Electronics						√			\checkmark	
	EE102	Digital Circuits						\checkmark	\checkmark	√	✓	
	HUM111	English Language I	\checkmark	\checkmark	✓							
rel	HUM12	Social Context of Computing	\checkmark	\checkmark	✓							
Level	HUM13	Interpersonal Communication	\checkmark	\checkmark	✓							
[st]	HUM11	English Language II	\checkmark	\checkmark	√							
	HUM12	Intellectual Property	\checkmark	\checkmark	✓	\checkmark						
	HUM13	Organizational Behavior	\checkmark	\checkmark	✓							
	HUM13	Computing Economics	\checkmark	\checkmark	✓	\checkmark						
	HUM14	Computer Law	\checkmark	\checkmark	✓							
	HUM14	Privacy and Civil Liberties	\checkmark	\checkmark	✓							
	HUM15	Hand Drawing	\checkmark	\checkmark	✓							
	HUM15	History of Computing	\checkmark	\checkmark	✓	\checkmark						
	HUM15	Islamic Culture	\checkmark	\checkmark	✓							
	HUM15	Scientific Thinking	\checkmark									
	CS201	Discrete Structures	\checkmark	\checkmark	√	\checkmark						
	CS211	Data Structures and	\checkmark	\checkmark	✓	\checkmark	✓	√	~			
	CS241	Object-Oriented Programming	\checkmark	\checkmark	✓	\checkmark	~	\checkmark	~			
	IS201	Foundations of Information	\checkmark	\checkmark	√	\checkmark	✓	~	~	√		
	MATH2	Probability and Statistics	\checkmark	\checkmark	✓	\checkmark						
5	HUM23	Business Administration	\checkmark	\checkmark	✓							
evel	HUM23	Technical Writing	\checkmark	\checkmark	√							
	HUM24	Computers and Ethics	\checkmark	\checkmark	✓							
2 nd	IS211	File Organization	\checkmark	$\checkmark\checkmark$	✓	√	✓	√				
	IS212	Databases	\checkmark	\checkmark	✓	√	✓	√				
	IS221	Project Management	\checkmark									
	IS231	Systems Analysis and Design	\checkmark	\checkmark	✓	√	✓					
	IT251	Data Communications	\checkmark	\checkmark	✓	\checkmark	✓					
	EE201	Digital Signal Processing	\checkmark	\checkmark	✓	\checkmark						
	CS322	Computer Architecture and	\checkmark	\checkmark	√	\checkmark	~	√	~			
	CS381	Software Development and	\checkmark	$\checkmark\checkmark$	✓	\checkmark	✓	√				
	CS382	Field Training	√	√	✓	√	✓	\checkmark	~	✓		
	CS391	Software Engineering	\checkmark	 ✓ 	✓	\checkmark	✓	\checkmark			\square	
	IS311	Geographical Information	√	√	✓	\checkmark	✓					
	IS341	Decision Support Systems	✓ ✓	✓ ✓	✓	\checkmark	✓	\checkmark	√			
el	IS342	IS Strategy, Management and	√	✓ ✓	✓	\checkmark	✓	\checkmark	√		\square	
evi	IT351	Computer Networks	√	\checkmark	✓	√	✓	~	✓		\square	
3rd Level	IT371	Web Programming	√	\checkmark	✓	\checkmark	✓	\checkmark	√		\square	
ų	CS301	Operation Research	√ ∕		✓						\square	
	CS302	Simulation and Modeling	√	✓ ✓							\square	
	CS341	Visual Programming	√	√	✓	√	✓				\square	
	CS351	Computer Graphics	√	\checkmark	✓	\checkmark					\downarrow	
	IS321	Advanced Project	√ √								\downarrow	
	MM301	Introduction to Multimedia	√	 ✓ 	✓	~	✓	~	~		\square	
	MATH3	Numerical Analysis	\checkmark	\checkmark	✓	\checkmark	\checkmark	\checkmark	\checkmark			

			10	i.	1	_			-	- 1	-	-
	IS412	Distributed and Object	\checkmark	\checkmark								
	IS411	Advanced Database	\checkmark	\checkmark								
	IS413	Web Information Systems	\checkmark	\checkmark	✓	√	√	V				
	IS414	Data Mining and Business	\checkmark	\checkmark								
	IS415	Database Administration	\checkmark	\checkmark	√	√						
	IS416	Transaction Processing	\checkmark	\checkmark	√	√	V	V				
el	IS417	Multimedia Databases	\checkmark	\checkmark	✓	√	√	V				
level	IS441	Quality Assurance of	\checkmark	\checkmark	√	√	V	V	V	~	\checkmark	
4th I	IS442	IS Application Development	\checkmark	\checkmark	✓	√	√	V	~	~	\checkmark	
4	IS451	Social Information Systems	\checkmark	\checkmark	√							
	IS452	Capstone Project I	\checkmark	\checkmark	√	√	V	V				
	IS453	Capstone Project II	\checkmark	\checkmark	√	√	V	V				
	IT411	Information Assurance and	\checkmark	\checkmark	√	√						
	IT441	Enterprise Architecture	\checkmark	\checkmark	✓	✓	V	V				
	IT471	E-commerce	\checkmark	$\checkmark\checkmark$								

Program Matrix VI (Courses - Transferable Skills)

	Code	Course	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	d15	d16
	CS141	Programming Fundamentals	√	√	√	V	√	√										
	IT101	IT Fundamentals	√	√	√	√												
	MATH101	Mathematics I	√	√	√													
	MATH102	Mathematics I I	√	√	√													
	PHYS101	Physics I	√	1	√	√	√	√										
	PHYS102	Physics II				~		~	~					\checkmark	\checkmark			
	EE101	Electronics		✓		√		√	√					\checkmark	\checkmark			
	EE102	Digital Circuits		✓		√		√	√					\checkmark	\checkmark			
	HUM111	English Language I	√	1	√	√	√	√	✓									
el	HUM121	Social Context of Computing	√	√	✓	√	√	√	✓	~	\checkmark							
Level	HUM132	Interpersonal Communication	√	√	√	V	√	√	√	~	\checkmark							
st I	HUM112	English Language II	√	√	✓	√	√	√	✓									
-	HUM122	Intellectual Property	√	1	~	√	√	√	~									
	HUM131	Organizational Behavior	√	1	√	√	√	√	√									
	HUM133	Computing Economics	√	1	√	√	√	√	√									
	HUM141	Computer Law	√	√	√	√	√	√	✓									
	HUM142	Privacy and Civil Liberties	√	√	✓													
	HUM151	Hand Drawing	√	√	✓													
	HUM152	History of Computing	√	√	√													
	HUM153	Islamic Culture	√	1	✓													
	HUM154	Scientific Thinking	√	1	✓													
	CS201	Discrete Structures	\checkmark	√	V	\checkmark												
	CS211	Data Structures and	√	^	✓	√	√											
	CS241	Object-Oriented Programming	√	√	✓	√	√											
	IS201	Foundations of Information	√	√	✓	√	✓	✓	✓									
	MATH20	Probability and Statistics	√	v	✓													
Ы	HUM231	Business Administration	✓	√	✓	✓	✓	✓	✓									
Level	HUM232	Technical Writing	√	√	✓	√	√	√	✓	✓	\checkmark							
	HUM241	Computers and Ethics	✓	√	✓	√	✓	√	✓									
2 nd	IS211	File Organization	✓	√	✓	√	✓	√										
	IS212	Databases	√	√	✓	√	✓	✓	✓									
	IS221	Project Management	✓	1 🗸	✓	√	✓	√										
	IS231	Systems Analysis and Design	✓	1 🗸	✓	✓	✓	√	✓	✓								
	IT251	Data Communications	✓	✓	✓	✓	✓	✓										
	EE201	Digital Signal Processing	✓	✓	✓	✓												
	CS322	Computer Architecture and		✓						✓					\checkmark	\checkmark		\checkmark
	CS381	Software Development and	✓	↓	✓	✓	✓	✓										
	CS382	Field Training	✓	√	✓	✓	✓	✓										
	CS391	Software Engineering	✓	↓	✓	✓	✓	~										
	IS311	Geographical Information	√	V	✓	✓	√	V										
	IS341	Decision Support Systems	√	↓	✓	√	V	V	✓									
el	IS342	IS Strategy, Management and	√	Ľ	√	✓	↓	V										\square
evel	IT351	Computer Networks		Ľ		√	↓	↓		✓	√							\square
3rd L	IT371	Web Programming	✓	ľ	_ ✓	√			↓									\square
Ô		Operation Research	<u> </u>															\square
	CS302	Simulation and Modeling	 ✓ 	Ľ	✓													\square
	CS341	Visual Programming		Ľ	√	✓	↓	↓										\square
	CS351	Computer Graphics		Ľ	_ ✓	_ ✓			√	✓								\square
	IS321	Advanced Project Management	 ✓ 															\square
	MM301	Introduction to Multimedia		Ľ	∨		√ √	√ √										\square
	MATH30	Numerical Analysis	 ✓ 	L V	•	 ✓ 	V	V	✓									Щ
Ľ	IS411	Advanced Database	\checkmark	✓	\checkmark	\checkmark	\checkmark	V										

IS	S412	Distributed and Object	√	V	V	v	1	1 •	1							
IS	S413	Web Information Systems	V	~	√	v	1 •	v	√	√						
IS	S414	Data Mining and Business	V	~	√	Í v	1	v	√	✓						
IS	S415	Database Administration	√	~	√	v	v	v	√							
IS	S416	Transaction Processing	V	~	√	v	1	1 •	1							
IS	S417	Multimedia Databases	V	~	√	Í v	1	v	1							
IS	S441	Quality Assurance of	\checkmark	~	√	v	v	v	√	✓	√	\checkmark	\checkmark	\checkmark		
IS	S442	IS Application Development	√	~	√	v	v	v	√	✓	√	\checkmark	\checkmark	\checkmark		
IS	S451	Social Information Systems	\checkmark	~	√	v	v	v	√							
IS	S452	Capstone Project I	√	~	√	v	v	v	√	✓	√					
IS	S453	Capstone Project II	√	~	√	v	v	v	√	✓	√					
ľ	T411	Information Assurance and	\checkmark	\checkmark	√	v	v	v								
Ľ	T441	Enterprise Architecture	\checkmark	~	V	v	1	1								
Ľ	T471	E-commerce	√	√	V	v	1	v								

Program Matrix VII (Aims - ILOs)

		Kı	now	ledg	ge ai	nd U	Jnde	ersta	ındi	ng S	Skill	s								
	Program Aims	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a19
Ι	Improving Organizational Processes	\checkmark			\checkmark	\checkmark										\checkmark				\checkmark
II	Exploiting Opportunities Created by Technology Innovations						~										~	\checkmark		
III	Understanding and Addressing Information Requirements	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark	✓											\checkmark	
IV	Designing and Managing Enterprise Architecture					~				~	\checkmark		\checkmark			~				
V	Identifying and Evaluating Solution and Sourcing Alternatives											~		✓			✓			
VI	Securing Data and Infrastructure	\checkmark			\checkmark				\checkmark											
VII	Understanding, Managing and Controlling IT Risks			\checkmark											\checkmark		\checkmark			
					Inte	ellec	tual	Ski	ills											
	Program Aims	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	b11	b12	b13	b14	b15	b16	b17	b18	b19
Ι	Improving Organizational Processes	\checkmark	\checkmark						\checkmark	\checkmark							\checkmark			\checkmark
II	Exploiting Opportunities Created by Technology Innovations									~										
III	Understanding and Addressing Information Requirements			✓	✓		✓		✓		✓	✓				✓		~		
IV	Designing and Managing Enterprise Architecture		\checkmark					\checkmark					\checkmark		√					
V	Identifying and Evaluating Solution and Sourcing Alternatives		~	✓	\checkmark	~		\checkmark					\checkmark	~	\checkmark				\checkmark	
VI	Securing Data and Infrastructure		\checkmark															\checkmark		
VII	Understanding, Managing and Controlling IT Risks						✓		✓		\checkmark			✓						
			Pro	fess	sion	al ai	nd P	ract	ical	Ski	lls									
	Program Aims	c1	c2	c3	c4	c5	c6	c7	c8	с9	c10									
Ι	Improving Organizational Processes		\checkmark	\checkmark	\checkmark		\checkmark				\checkmark									
II	Exploiting Opportunities Created by Technology Innovations		~			~														
III	Understanding and Addressing Information Requirements			~			~		~	~										
IV	Designing and Managing Enterprise Architecture		~		~			~												
V	Identifying and Evaluating Solution and Sourcing Alternatives	✓			~			\checkmark			\checkmark									
VI	Securing Data and Infrastructure				\checkmark				\checkmark											
VII	Understanding, Managing and Controlling IT Risks		~		~		~													
				-	Гrar	isfei	abl	e Sk	ills											
	Program Aims	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	d15	d16			
Ι	Improving Organizational Processes	\checkmark	\checkmark				\checkmark			\checkmark	\checkmark		\checkmark	\checkmark						
II	Exploiting Opportunities Created by Technology Innovations			\checkmark		\checkmark			~			\checkmark			\checkmark		~			
III	Understanding and Addressing Information Requirements	✓			~						\checkmark					~				
IV	Designing and Managing Enterprise Architecture	~			\checkmark															
V	Identifying and Evaluating Solution and Sourcing Alternatives	~			~						\checkmark									
VI	Securing Data and Infrastructure	\checkmark									\checkmark									
VII	Understanding, Managing and Controlling IT Risks				~			~			\checkmark		~							

Program

Matrix VII (Aims - ILOs)

TEACHING AND LEARNING METHODS

]	Feac	-	and I ethod	Learn s	ing	<u>_</u>
In	ntended Learning Outcomes (ILO's) of the program	Lecture	Tutorials exercises	Practical exercises	Workshops	Projects	Case study	Data collection
	By the end of the program, student should	l be	able	to:				
	a1. Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics	\checkmark	\checkmark					
	a2. Demonstrate strong knowledge of information systems.	\checkmark		\checkmark		\checkmark	\checkmark	I
	a3. Demonstrate strong skills of database management systems.	\checkmark		\checkmark		\checkmark	\checkmark	\checkmark
	a4. Describe the principles and techniques of a number of application areas informed by the research directions of information systems.	~		~		~	✓	
g	a5. Explain the broad context within which information systems including issues such as quality and reliability.	\checkmark						
ndin	a6. Identify information systems applications, such as accounting, health informatics, medical informatics, etc.	~		✓		\checkmark		
ersta	a7. Identify selected specialist fields at the forefront of information systems.a8. Discuss the principles of Information	✓ ✓						
Und	communication and information security. a9. Describe the challenges inherent in the maintenance	✓		~				
ge and Understanding	and evolution of software systems, and the techniques and best practices currently available for dealing with them.	~						
ledg	a10. Discuss some aspects of object-oriented analysis and design.	\checkmark		\checkmark				
M	a11. Explain decision support tools and systems.	\checkmark		\checkmark				
Knowled	a12. Identify various approaches to Management Sciences (MS) such as Operation Management, Inventory Management, Project Management, and Supply Chain Management.	~		~		~		
	a13. Interpret and analyze data qualitatively and/or quantitatively.	\checkmark		\checkmark		\checkmark		
	a14 . Demonstrate strong knowledge of fundamentals of programming and the construction of computer-based systems, data structures and algorithms, software engineering techniques and information retrieval.	~		\checkmark				
	a15. Demonstrate a deep knowledge of business area analysis and the enterprise architecture.	\checkmark		~		\checkmark	\checkmark	
	a16. Define the tools, practices and methodologies used in the specification, design, implementation and critical evaluation of computer and information systems.	\checkmark						

]	ſeacl		and I ethod		ing	
Ir	ntended Learning Outcomes (ILO's) of the program	Lecture	Tutorials exercises	Practical exercises	Workshops	Projects	Case study	Data collection
	a17. Define the methods used in defining and assessing criteria for measuring the extent to which an information system is appropriate for its current deployment and future evolution.a18. Describe the current and underlying technologies	~						
	that support computer processing and inter-computer communication. a19. Discuss developments in research fields across a	✓ ✓				~		
	range of knowledge areas. b1. Define traditional and nontraditional information systems problems, set goals towards solving them, and observe results.	• •						
	b2. Perform comparisons between (methods, techniquesetc).	\checkmark	~	\checkmark		\checkmark	\checkmark	\checkmark
	b3. Identify attributes, components, relationships, patterns, main ideas, and errors.	✓ ✓	✓ ✓	✓ ✓		✓ ✓	 ✓ 	
	b4. Summarize the proposed solutions and their results.b5. Restrict solution methodologies upon their results.b6. Establish criteria, and verify solutions.	\checkmark	✓ ✓	✓ ✓		✓ ✓	•	
	b7. Identify a range of solutions and critically evaluate and justify proposed design solutions.	✓ ✓	 ✓ 	✓		 ✓ 		
	b8. Solve information systems problems with pressing commercial or industrial constraints.	~	~	\checkmark		\checkmark		
lls	b9. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.	\checkmark	~	\checkmark		\checkmark		
ıl Ski	b10. Perform problem analysis from written descriptions	\checkmark	\checkmark	\checkmark		\checkmark		
Intellectual Skills	b11. Derive requirements specifications from an understanding of problems (analysis, synthesis).b12. Create and/or justify designs to satisfy given	✓	✓	✓		~		
ntell	requirements (synthesis, evaluation, application). b13. Solve a decision model with appropriate techniques.	\checkmark	✓ ✓	✓ ✓		\checkmark		
	b14. Solve complex problems within and between enterprises.	~	~	\checkmark		\checkmark	\checkmark	
	b15. Perform improvement of a system that benefits stakeholders.	\checkmark		\checkmark				
	b16. Recognize the professional, moral and ethical issues involved in the exploitation of Information Technology and be guided by their adoption, reflect on issues of professional practice within the discipline.	~						
	b17. Apply the concepts, principles, theories and practices underpinning computing as an academic discipline.	~						
	b18. Synthesize ideas, proposals and designs effectively using rational and reasoned arguments for presentation to a range of audiences.	\checkmark		~				
	b19. Generate and evaluate the results of tests to investigate the functionality of information systems.			\checkmark		\checkmark		

]	ſeacl	0	and I ethod	Learn s	ing	n
Ir	ntended Learning Outcomes (ILO's) of the program	Lecture	Tutorials exercises	Practical exercises	Workshops	Projects	Case study	Data collection
	c1. Use appropriate programming languages.	\checkmark		\checkmark		\checkmark		
	c2. Use appropriate web-based systems and tools, and design methodologies.	\checkmark		\checkmark		\checkmark		
	c3. Use appropriate database management systems.	\checkmark		\checkmark		\checkmark		
S	c4. Apply the principles of effective information management, information organization, and information-retrieval skills to information of various kinds, including text, images, sound, and video.	√		~		\checkmark		
Professional Skills	c5. Apply the principles of human-computer interaction to the evaluation and construction of a wide range of materials including user interfaces, web pages, and multimedia systems.	√		~		\checkmark		
essio	c6. Identify any risks or safety aspects that may be involved within a given context.	\checkmark	\checkmark	\checkmark		\checkmark		
Profe	c7. 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.	~		~		✓	\checkmark	
	c8. Implement data and model centered systems.	\checkmark		\checkmark		\checkmark		
	c9. Operate computing equipment effectively, recognizing its logical and physical properties, capabilities and limitations. c10. Commercialize knowledge and skills to computing					✓ 		
	community and industry.					\checkmark		
	d1. Collaborate effectively within multidisciplinary team.			\checkmark		\checkmark		
	d2. Work in stressful environment and within constraints.			~		\checkmark		
	d3. Communicate effectively using a variety of communication methods.d4. Communicate effectively with team members,			\checkmark		~		
	d4. Communicate enectively with team members, managers and customers.d5. Demonstrate efficient IT capabilities.	\checkmark		✓ ✓		✓ ✓		\checkmark
S	d6. Lead and motivate individuals.			v √		 ✓ 		
kil	d7. Manage tasks and resources.			• √		• •		
General Skills	d8. Search for information and adopt life-long self-	✓		✓		~		
er:	learning. d9. Acquire entrepreneurial skills.			\checkmark				
en	d10. Acquire analytical thinking and problem solving	\checkmark						
U U	skills	 ✓ 		\checkmark		\checkmark		
	d11. Effectively employ information-retrieval skills, (including the use of browsers, search engines, and on- line library catalogues).	~		\checkmark				
	d12. Ability to work independently and as part of a team with minimum guidance.			✓		\checkmark		
	d13. Manage one's own learning and development, including time management and organizational skills.			\checkmark		\checkmark		
	d14. Prepare their work in the form of reports, oral presentations or an internet web site.	\checkmark		\checkmark		\checkmark		

]	Feac	0	and I ethod		ing		
Intended Learning Outcomes (ILO's) of the program	Lecture	Tutorials exercises	Practical exercises	Workshops	Projects	Case study	Data collection	
d15. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.					~			
d16. Develop a range of fundamental research skills, through the use of online resources, technical repositories and library-based material.			\checkmark		\checkmark			

1-ASSESMENT METHODS

			Assessment methods						
	Intended Learning Outcomes (ILO's) of the program	Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam			
	By the end of the program, student should be able to	:							
Knowledge and Understanding	a1. Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics	\checkmark	~	✓	/				
	a2. Demonstrate strong knowledge of information systems.	\checkmark	\checkmark	\checkmark	\checkmark				
	a3. Demonstrate strong skills of database management systems.	\checkmark	\checkmark	\checkmark	\checkmark				
	a4. Describe the principles and techniques of a number of application areas informed by the research directions of information systems.	\checkmark	\checkmark	✓	√				
	a5. Explain the broad context within which information systems including issues such as quality and reliability.	\checkmark	✓						
	a6. Identify information systems applications, such as accounting, health informatics, medical informatics, etc.	\checkmark	\checkmark	\checkmark					
	a7. Identify selected specialist fields at the forefront of information systems.	\checkmark	~						
	a8. Discuss the principles of Information communication and information security.	\checkmark	\checkmark	\checkmark	\checkmark				
	a9. Describe the challenges inherent in the maintenance and evolution of software systems, and the techniques and best practices currently available for dealing with them.	\checkmark	<						
[M	a10. Discuss some aspects of object-oriented analysis and design.	\checkmark	\checkmark	\checkmark	\checkmark				
Kno	a11. Explain decision support tools and systems.	\checkmark	\checkmark	\checkmark	\checkmark				
	a12. Identify various approaches to Management Sciences (MS) such as Operation Management, Inventory Management, Project Management, and Supply Chain Management.	\checkmark	~	✓	\checkmark				
	a13. Interpret and analyze data qualitatively and/or quantitatively.	\checkmark	\checkmark	\checkmark					
	a14 . Demonstrate strong knowledge of fundamentals of programming and the construction of computer-based systems, data structures and algorithms, software engineering techniques and information retrieval.	\checkmark	\checkmark	\checkmark	✓				

			Assessment methods					
Intended Learning Outcomes (ILO's) of the program		Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam		
	a15. Demonstrate a deep knowledge of business area analysis and the enterprise architecture.	\checkmark	~	\checkmark	\checkmark			
	a16. Define the tools, practices and methodologies used in the specification, design, implementation and critical evaluation of computer and information systems.	\checkmark	\checkmark	\checkmark	✓			
	a17. Define the methods used in defining and assessing criteria for measuring the extent to which an information system is appropriate for its current deployment and future evolution.	~	~	~	~			
	a18. Describe the current and underlying technologies that support computer processing and inter-computer communication.a19. Discuss developments in research fields across a range of	~	~	\checkmark	✓			
	blocuss developments in research netus deross a range of knowledge areas.b1. Define traditional and nontraditional information systems	 ✓ ✓ 	✓ ✓					
	problems, set goals towards solving them, and observe results. b2. Perform comparisons between (methods, techniquesetc).	✓ ✓	✓ ✓	✓ ✓	✓ √			
	b3. Identify attributes, components, relationships, patterns, main ideas, and errors.	▼ ✓	× √	 ✓ 	v √			
	b4. Summarize the proposed solutions and their results.	\checkmark	\checkmark	\checkmark	\checkmark			
	b5. Restrict solution methodologies upon their results.	\checkmark	\checkmark	\checkmark	\checkmark			
	b6. Establish criteria, and verify solutions.	\checkmark	\checkmark	\checkmark	\checkmark			
	b7. Identify a range of solutions and critically evaluate and justify proposed design solutions.	✓	~	~	✓			
ls	 b8. Solve information systems problems with pressing commercial or industrial constraints. b9. Concrete on imposetive design to calue a problem containing a 	✓	✓	✓	✓			
Skil	b9. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.	✓ ✓	✓	✓	✓			
ıal	b10. Perform problem analysis from written descriptionsb11. Derive requirements specifications from an understanding of	✓	✓	✓	✓			
Intellectual	problems (analysis, synthesis). b12. Create and/or justify designs to satisfy given requirements	✓ ✓	✓ ✓	✓ ✓	✓ (
Intell	(synthesis, evaluation, application). b13. Solve a decision model with appropriate techniques.	✓ ✓	✓ ✓	✓ ✓	✓ ✓			
Π	b14. Solve complex problems within and between enterprises.	· √	\checkmark					
	b15. Perform improvement of a system that benefits stakeholders.	✓	✓	\checkmark	\checkmark			
	b16. Recognize the professional, moral and ethical issues involved in the exploitation of Information Technology and be guided by their adoption, reflect on issues of professional practice within the discipline.	~	~					
	b17. Apply the concepts, principles, theories and practices underpinning computing as an academic discipline.	\checkmark						
	b18. Synthesize ideas, proposals and designs effectively using rational and reasoned arguments for presentation to a range of audiences.	\checkmark	\checkmark	~	✓			
	b19. Generate and evaluate the results of tests to investigate the functionality of information systems.	\checkmark	\checkmark	\checkmark	\checkmark			
	c1. Use appropriate programming languages.	\checkmark	\checkmark	\checkmark	\checkmark			
Professional Skills	c2. Use appropriate web-based systems and tools, and design methodologies.	✓ ✓	✓	✓	✓			
	c3. Use appropriate database management systems.	✓	\checkmark	✓	√			
	c4. Apply the principles of effective information management, information organization, and information-retrieval skills to information of various kinds, including text, images, sound, and video.	~	~	✓	✓			

		Assessment methods					
Intended Learning Outcomes (ILO's) of the program		Final Exam	Mid-Term Exam	Practical Exam	Class Work	Oral Exam	
	c5. Apply the principles of human-computer interaction to the evaluation and construction of a wide range of materials including user interfaces, web pages, and multimedia systems.						
	c6. Identify any risks or safety aspects that may be involved within a given context.	\checkmark	\checkmark	\checkmark	\checkmark		
	c7. 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.	~	~	<	~		
	c8. Implement data and model centered systems.	\checkmark	\checkmark	\checkmark	\checkmark		
	c9. Operate computing equipment effectively, recognizing its logical and physical properties, capabilities and limitations.	\checkmark	✓	✓	\checkmark		
	c10. Commercialize knowledge and skills to computing community and industry.	\checkmark	\checkmark	✓	\checkmark		
	d1. Collaborate effectively within multidisciplinary team.			\checkmark	\checkmark		
	d2. Work in stressful environment and within constraints.			\checkmark	\checkmark		
	d3. Communicate effectively using a variety of communication methods.			✓	✓		
	d4. Communicate effectively with team members, managers and customers.			✓	✓	I	
	d5. Demonstrate efficient IT capabilities.			✓	√		
	d6. Lead and motivate individuals.			✓ ✓	√		
IIS	d7. Manage tasks and resources.			✓ ✓	✓ ✓		
Skills	d8. Search for information and adopt life-long self-learning.	\checkmark		✓ ✓	✓ ✓		
SI	d9. Acquire entrepreneurial skills.	/		✓	✓ 		
Genera	d10. Acquire analytical thinking and problem solving skills d11. Effectively employ information-retrieval skills, (including the use	V		✓ ✓	~		
	of browsers, search engines, and on-line library catalogues). d12. Ability to work independently and as part of a team with minimum guidance.			✓	✓		
	d13. Manage one's own learning and development, including time management and organizational skills.			~	~		
	d14. Prepare their work in the form of reports, oral presentations or an internet web site.			\checkmark	✓		
	d15. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.			\checkmark	\checkmark		
	d16. Develop a range of fundamental research skills, through the use of online resources, technical repositories and library-based material.			\checkmark	\checkmark		

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Signature:

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