



Tanta University
Faculty of Computers and
Informatics
Information Technology Department

Bachelor Program - Credit Hours System

Program Title	Information Technology
Program Type	Single
Department(s)	Information Technology

2019

Program Specification

A. Basic Information		
Program Title		Information Technology (B. Sc.)
Award		B. Sc. Information Technology
Parent Department		Information Technology Department
Program Type		Single
Teaching Institution		Faculty of Computers and Informatics
Awarding Institution		Tanta University
Coordinator		Dr. Aida Nasr
External Evaluator(s)		
QAA Benchmarking Standards		National Academic Reference Standards (NARS)2010
Date of Approval		
B. Professional Information		
1. Aims and Objectives		
	1.	Enable students to acquire and develop knowledge and competence in fundamental areas of computer science such as algorithms, design and analysis, computational theory, networks, computer architecture and software-based systems.
	2.	Equip students to address the computer technology requirements of various organizations such as business, government, healthcare, and educational institutions. Different countries may use alternative names for these degree programs.
	3.	Equip students with the necessary knowledge and practical skills to manage an organization's IT infrastructure and its users, as well as to plan and oversee the technology lifecycle that involves maintaining, upgrading, and replacing the organization's technology. Graduates of information

		technology programs are prepared to meet these requirements. IT, in its broadest definition, encompasses all facets of computing technology.
	4.	Equip students concentrate on addressing the requirements of users in organizational and societal settings by choosing, developing, using, combining, and managing computing technologies.
	5.	equip IT graduates with the necessary skills and knowledge to enter suitable professional roles in Information Technology after graduation and progress into leadership positions or pursue further research or graduate studies in the field.
	6.	Develop the students' ability to apply mathematical foundations, algorithmic principles, and computer science theory in modelling, design, implementation, and evaluation of computer-based systems.
	7.	Provide students with a sound understanding and how to apply a wide range of principles and tools of software engineering, such as design methodologies, choice of algorithm, programming language, software libraries and user interface technique.

2. Intended Learning outcomes (ILOs)

This program provides opportunities for graduates to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas.

A. Knowledge and Understanding:

Upon successful completion of an undergraduate computer science program, the graduates will be able to:

	a1.	Understand programming concepts for various branches of computer sciences
	a2.	Know the basics of Calculus, Economic and Management relevant to computer science.
	a3.	Identify and consider the basics of Electronics for Digital Design.
	a4.	Describe and model Mathematical problems, and Statistical methods.
	a5.	Understand basic knowledge and demonstrate of fundamental principles of computer architectures and operating systems and how these support IT-based applications.
	a6.	Provide a solid understanding of the basics of programming and the creation of data structures and algorithms
	a7.	Show a critical understanding of the theory and methods of systems analysis and design.
	a8.	Know methods for the construction of web-based systems, design of internet-based systems.

	a9.	Understand the certain topics by going over things like image processing, computer and communication networks, data mining, information retrieval systems, pattern recognition, digital signal processing, speech recognition, artificial intelligence, network security and cryptography, network programming, and web services.
	a10.	Demonstrate a critical grasp of the technologies used in the planning, creation, and administration of multi-user database systems as well as in the deployment of information retrieval and database systems.
	a11.	Have a comprehensive knowledge and critical awareness of the role of human factors in the design of Information Technology systems, issues of human computer interaction, graphics and sound and multi-media theory and applications, interfacing and cognition.
	a12.	Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics.
	a13.	Describe the tools, practices and methodologies used in the specification, design, implementation and critical evaluation of computer software systems.
	a14.	Describe the methods used in defining and assessing criteria for measuring the extent to which a computer system is appropriate for its current deployment and future evolution.
	a15.	Know the principles of generating tests which investigate the functionality of computer programs and computer systems and evaluating their results.
	a16.	Give a more thorough awareness of the ethical, professional, and legal ramifications of IT exploitation.
	a17.	Demonstrate a critical awareness of the difficulties that come with maintaining and evolving IT-based systems, as well as the methods and best practices that are currently in use to address those difficulties.
	a18.	Know the principles and techniques of a number of application areas informed by the research directions of IT areas.
	a19.	Show a critical understanding of the broad context within computer information technology such as quality, reliability, enterprise, employment law, accounting, business and management and health.
<i>b. intellectual skills:</i>		
Upon successful completion of an undergraduate computer science program, the graduates will be able to:		
	b1.	Identify issues with traditional and nontraditional information systems, make plans to address them, and track your progress.
	b2.	Apply the concepts, principles, theories and practices underpinning computing as an academic discipline.

	b3.	Make contrasts between (approaches, strategies, etc.)
	b4.	Determine characteristics, elements, connections, trends, primary concepts, and mistakes.
	b5.	Determine a variety of options, then assess, analyze, and provide evidence for suggested design solutions.
	b6.	Provide an overview of the suggested fixes and their outcomes.
	b7.	Limit solution approaches based on their outcomes.
	b8.	Address issues with information systems that have urgent business or industrial restrictions.
	b9.	Create a novel design to address a problem with a variety of industrial and commercial restrictions.
	b10.	Solve a decision model with appropriate techniques.
	b11.	Perform improvement of a system that benefits stakeholders.
c. Professional and Practical Skills:		
Upon successful completion of an undergraduate computer science program, the graduates will be able to:		
	c1.	Determine, look into, evaluate, design, and create computer-based systems with the right instruments and methods.
	c2.	Assess systems for quality and potential trade-offs; determine what hardware and software are suitable for the situations at hand.
	c3.	understand the dangers or security features associated with using computer-based technologies.
	c4.	Effectively deploy tools for the implementation and documentation of computer-based systems.
	c5.	Make effective use of computing equipment by considering both its logical and physical characteristics.
	c6.	Identify and resolve moral, ethical, and professional problems within the field.
	c7.	Show an in-depth knowledge of appropriate aspects of Information Technology.
	c8.	Use investigative skills to research new and novel aspects of their work.
	c9.	Utilize basic IT resources efficiently, and organize and oversee a project to finish it on time and under budget.
	c10.	Recognize the need for continuing professional development in recognition of the need for lifelong learning.
	c11.	Apply tools and techniques for the design and development of applications and projects.
	c12.	show Reports, speeches, or online websites to showcase their efforts.

d. General and Transferable Skills		
Upon successful completion of an undergraduate computer science program, the graduates will be able to:		
	d1.	Communicate effectively.
	d2.	Work in stressful environment and within constraints.
	d3.	Understanding the Importance of Multidisciplinary Teams
	d4.	Demonstrate efficient IT capabilities
	d5.	Lead and motivate individuals.
	d6.	Search for information and adopt life-long self-learning.
	d7.	Employ information-retrieval skills, (including the use of browsers, search engines, and on-line library catalogues), communicate effectively using a variety of communication methods, and communicate effectively with team members, managers and customers.
	d8.	Prepare their work in the form of reports, oral presentations or an internet web site.
	d9.	Demonstrate suitable numeracy abilities while comprehending and articulating situations with a quantitative component.
4. Academic standards		
The academic standards invoked in this specification are driven based on the National Academic Reference Standards (NARS) for “Computing and Information” approved by the National Authority of Quality Assurance and Accreditation of Education in October 2010.		
5. Curriculum Structure and contents:		
5.A	Program duration:138 credit hours.	Four Years
5.B	Program structure: studying 138 credit hours distributed as follows:	

	A- General requirements (14) credit hours: • (8) compulsory hours • (6) hours chosen by the student from among the elective general courses. • Passing the community issues course. B- College requirements (60) hours: It is divided into two parts: • Mathematics and basic sciences (21) compulsory credit hours. • Basic computer science (39) compulsory credit hours. C- Specialization requirements (66) hours: It is divided into: • Applied sciences (39) are compulsory accredited according to specialization. • Applied sciences (21) optional accreditations within the specialization. D- Project (6) compulsory credit hours. E - Training (3) compulsory.	
5.C	The following table summarizes the program structure:	
Subject Area	IS program %	Total number of hours
Humanities and social sciences (University requirements)	9.79%	14
Mathematics and basic science (Institution requirements)	14.69%	21
Basic computing science (Institution requirements)	27.27%	39
Applied computing science (specialization requirements)	27.27%	39
Applied computing science (specialization elective)	14.69%	21
Projects and practical exercises	4.19%	6
Summer training	2.10%	3
6. Program Courses		
The summary of the courses of the 4-year full-time computer science program is presented in the following tables:		

Level 1 semester 1

Level 1 Semester 1		Course Title	Credits	No. of hours /week	
Code No	Prerequisites			Lec.	Prac.
HU111	-	Technical Report Writing	2	2	-
HU112	-	Human Rights and Combating Corruption	0	2	-
ENGL113	-	English Language (1)	2	2	-
MA111	-	Math (1)	3	2	2
MA112	-	Discrete Mathematics	3	2	2
ST121	-	Probability and Statistics (1)	3	2	2
CS111	-	Fundamentals of Computer Science	3	2	2
Total			16		

Level 1 Semester 2

Level 1 Semester 2		Course Title	Credits	No. of hours /week	
Code No	Prerequisites			Lec.	Prac.
HU114	-	Communication Skills	2	2	-
HU121	-	Marketing and Sales	2	2	-
HU117	-	Comparative Politics	2	2	-
MA113	MA111	Math (2)	3	2	2
IT111	-	Electronics	3	2	2
CS112	CS111	Structured Programming	3	2	2
IT113	-	Fundamentals of Information Technology	3	2	2
Total			18		

Level 2 Semester 1

Level 2 Semester 1		Course Title	Credits	No. of hours /week	
Code No	Prerequisites			Lec.	Prac.
ENGL211	ENGL113	English Language (2)	2	2	-
MA214	MA213	Math (3)	3	2	2
CS213	CS112	Object Oriented Programming	3	2	2
CS214	CS112	Data Structures	3	2	2
SE 211	CS112	Open Source Software	3	2	2
IT212	IT111	Logic Design	3	2	2
Total			17		

Level 2 Semester 2

Level 2 Semester 2		Course Title	Credits	No. of hours /week	
Code No	Prerequisites			Lec.	Prac.
ST222	ST121	Probability and Statistics (2)	3	2	2
CS251	CS112	Introduction to Software Engineering	3	2	2
IS211	CS112	Introduction to Database Systems	3	2	2
IS231	CS213	Web Technology	3	2	2
IT221	CS111	Computer network Technology	3	2	2
CS221	CS214	Algorithm Analysis and Design	3	2	2
Total			18		

Level 3 Semester 1

Level 3 Semester 1		Course Title	Credits	No. of hours /week	
Code No	Prerequisites			Lec.	Prac.
CS341	CS214	Operating Systems	3	2	2
IT313	IT212	Computer Architecture	3	2	2
IT331	MA113	Data Communication	3	2	2
IT341	MA 214	Signals and Systems	3	2	2
IT351	MA214 CS213	Information and Data Compression	3	2	2
IT361	CS112	Computer Graphics	3	2	2
Total			18		

Level 3 Semester 2

Level 3 Semester 2		Course Title	Credits	No. of hours /week	
Code No	Prerequisites			Lec.	Prac.
IT314	IT212	Micro Controllers	3	2	2
IT322	IT221 IT331	Advanced Computer Networks	3	2	2
IT342	IT341	Digital Signal Processing	3	2	2
IT352	IT341 ST222	Pattern Recognition	3	2	2
		Elective course (2)	3	2	2
TR301		Summer training	3	2	2
Total			15		

Level 4 Semester 1

Level 4 Semester 1		Course Title	Credits	No. of hours /week	
Code No	Prerequisites			Lec.	Prac.
IT423	IT322	Information and Computer Networks Security	3	2	2
IT443	IT341	Image Processing	3	2	2
IST497	Student must pass 85 credit hours	Graduation project (1)	3	-	3
		Elective course 2	3	2	2
		Elective course 3	3	2	2
		Elective course 4	3	2	2
Total			18		

Level 4 Semester 2

Level 4 Semester 2		Course Title	Credits	No. of hours /week	
Code No	Prerequisites			Lec.	Prac.
IT432	IT221	Communication Technology	3	2	2
IT444	IT352	Multimedia Mining			
IT498	IT497	Graduation project (2)	3	-	3
		Elective course 5	3	2	2
		Elective course 6	3	2	2
		Elective course 7	3	2	2
Total			18		

Elective Courses for Information System Program						
المتطلب السابق		عدد الساعات الفعليه		عدد الساعات المعتمدة	إسم المقرر	كود المقرر
إسم المقرر	كود المقرر	تمارين / معامل	محاضرة			
Image Processing	IT443	2	2	3	Machine Vision	IT415
Computer Graphics	IT361					
Micro Controllers	IT 314	2	2	3	Robotics	IT416
Micro Controllers	IT 314	2	2	3	Embedded Systems	IT417
Micro Controllers	IT 314	2	2	3	Selected Topics in Embedded Systems and Robotic	IT418
Advanced Computer Networks	IT 322	2	2	3	Wireless and Mobile Networks	IT424
Advanced Computer Networks	IT 322	2	2	3	Cloud Computing Networks	IT325
Advanced Computer Networks	IT 322	2	2	3	Internet Programming and Protocols	IT426
Advanced Computer Networks	IT 322	2	2	3	الضوئية الشبكات Optical Networks	IT327
Wireless and Mobile Networks	IT 424	2	2	3	Wireless Sensors Networks	IT428
Advanced Computer Networks	IT 322	2	2	3	Selected Topics in Computer Networks	IT429
Information and Computer Networks Security	IT 423	2	2	3	Cyber Security	IT433
Image Processing	IT 443	2	2	3	Advanced Image Processing	IT445

Image Processing Computer Graphics	IT443 IT361	2	2	3	Virtual Reality	IT446
Digital Signal Processing	IT 342	2	2	3	Speech Processing	IT447
Pattern Recognition	IT 352	2	2	3	Selected Topics in Multimedia	IT448
Pattern Recognition	IT 352	2	2	3	Advanced Pattern Recognition	IT453
Pattern Recognition	IT 352	2	2	3	Human Language Technology	IT454
Computer Graphics	IT 361	2	2	3	Advanced Computer Graphics	IT462
Computer Graphics	IT 361	2	2	3	Computer Animation	IT463
Advanced Computer Networks Structured Programming	IT322 CS112	2	2	3	Ubiquitous Computing	IT471
Computer Architecture Structured Programming	IT313 CS112	2	2	3	Concurrency and Parallel Computing	IT472
Computer Architecture Data Structures	IT313 CS214	2	2	3	Intelligent and Quantum Computing	IT473
٦٠ الطالب إجتهاد ساعة معتمدة	-	2	2	3	Selected Topics in Information Technology-1	IT495
٦٠ الطالب إجتهاد ساعة معتمدة	-	2	2	3	Selected Topics in Information Technology-2	IT496

7. Summer training

Students are required to complete a mandatory one-month field training, equivalent to 3 credit hours, prior to graduation. This training can be undertaken during any summer break after completing 60 credit hours.

A faculty member will be assigned as the training supervisor, along with a team of teaching assistants, to monitor participants annually and evaluate their performance based on criteria established by the college council. Please note that the grades for this course will not be included in the student's GPA."

8. Program admission requirements

A. Computer Science and Information Systems College Admissions

Students who have completed their secondary education with a major in Mathematics or Science, or an equivalent, are eligible to apply, subject to the conditions specified by the Supreme Council of Universities and the Admissions Office. For international students, admission requirements are determined based on the regulations and procedures set by the Admissions Office. Additionally, the College Council may set specific admission requirements that comply with the regulations of the Supreme Council of Universities.

B. Mathematics Proficiency

A student with a Science major must pass the Mathematics (Math 0) proficiency exam in order to be eligible to take the Mathematics (Math 2) proficiency exam, which is required for students who majored in Mathematics in their secondary education. The credits earned from these proficiency exams will be counted towards the student's cumulative GPA.

9. Regulations for progression and Program completion

- Complete a minimum of 138 credit hours with a Cumulative Grade Point Average (CGPA) of 2.7 or higher.
- Successfully pass all required proficiency exams as outlined in the college's curriculum, even if these exams do not carry credit hours.
- Complete a minimum of three academic years (six semesters) under the semester system (fall and spring).
- Fulfill all other graduation requirements as specified by the university.

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

a. Maximum Grade:

- The maximum attainable grade for any course is 100 points.

b. Passing Grade:

- To successfully pass a course, a student must achieve a minimum of 60% of the total course points and a minimum of 30% on the final exam.

c. Grade Distribution:

- Course grades are distributed as follows:
 - **Classwork (40%):** This includes assignments, quizzes, and a midterm exam (which can account for up to 20% of the total). The remaining 20% is allocated for other assessments such as periodic quizzes, practical applications, and projects assigned by the instructor. Oral exams may also be included.
 - **Final Exam (60%):** The final exam constitutes 60% of the total course grade.
- The college council sets the dates for midterm and final exams and informs students in advance.

d. Practical Components in Final Exams:

- If the final exam for a course includes a practical component, as recommended by academic departments and approved by the college council, the student's final exam grade will be determined by combining the scores from the theoretical and practical portions of the exam.

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

10 Evaluation of Program intended learning outcomes

Evaluator Tool		Sample
1. Senior students	Questionnaires	
2. Alumni	Questionnaires	
3. Stakeholders (Employers)	Questionnaires	
4. External Evaluator(s)(External Examiner(s))	Questionnaires	

IT Program Matrices

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

1- Academic Standards Matrix

This matrix shows the ILOs invoked in IT Program Specifications and those existing in NARS and the corresponding between them.

2- Program Matrix I (Courses – NARS General)

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

3- Program Matrix II (Courses – NARS Special)

This matrix shows how IT Program Courses can cover the NARS special ILOs.

4- Program Matrix I (Courses – Knowledge and Understanding Skills)

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

5- Program Matrix II (Courses – Intellectual Skills)

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

6- Program Matrix III (Courses – Professional and Practical Skills)

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

7- Program Matrix IV (Courses – Transferable Skills)

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

8- Program Matrix V (Courses –IS Program)

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

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

IT Program ILOs	Corresponding in NARS		NARS ILOs - General	NARS ILOs - Special
a1. Understand programming concepts for various branches of computer sciences	K1	A2	K1. Essential facts, concepts, principles and theories relating to computing and information and computer applications as appropriate to the program of study. K2. Modeling and design of computer based systems bearing in mind the tradeoffs. K3. Tools, practices and methodologies used in the specification, design, implementation and evaluation of computer software systems. K4. Criteria and specifications appropriate to specific problems, and plan strategies for their solution. K5. The extent to which a computer based system meets the criteria defined	A1. Demonstrate basic knowledge and understanding of fundamental principles of core computing. A2. Demonstrate strong knowledge of fundamentals of programming and the construction of computer-based systems, data structures and algorithms, software engineering techniques and information retrieval. A3. Provide a deeper understanding of some aspects of the subject, such as multimedia, computer and communication network, data mining and knowledge discovery, information storage and retrieval systems, mobile Communication Systems, pattern recognition, artificial Intelligence, cryptography and network security.
a2. Know the basics of Calculus, Economic and Management relevant to computer science.	K1, K8	A1		
a3. Identify and consider the basics of Electronics for Digital Design.	K1	A1,A2		
a4. Describe and model Mathematical problems, and Statistical methods.	K1	A1		
a5. Understand basic knowledge and demonstrate of fundamental principles of computer architectures and operating systems and how these support IT-based applications.	K1	A1		
a6. Provide a solid understanding of the basics of programming and the creation of data structures and algorithms	K3	A2		
a7. Show a critical understanding of the theory and methods of systems analysis and design.	K3	A4		

a8. Know methods for the construction of web-based systems, design of internet-based systems.	K3	A7	for its current use and future development.	A4. Show the understanding of technologies for the design, development and management of database systems, systems analysis and design and of information retrieval systems.
a9. Understand the certain topics by going over things like image processing, computer and communication networks, data mining, information retrieval systems, pattern recognition, digital signal processing, speech recognition, artificial intelligence, network security and cryptography, network programming, and web services.	K6	A3	K6. The current and underlying technologies that support computer Processing and inter-computer communication. K7. Principals of generating tests which investigate the functionality of computer programs and computer systems and evaluating their results.	A5. Know the role of human factors in the design of Information Technology systems. A6. Apply tools and techniques for the design and development of applications.
a10. Demonstrate a critical grasp of the technologies used in the planning, creation, and administration of multi-user database systems as well as in the deployment of information retrieval and database systems.	K4	A4	K8. Management and economics principles relevant to computing and information disciplines.	A7. Know methods for the construction of web-based materials and systems, design of internet-based systems. A8. Provide an understanding of legal, professional and moral aspects of the exploitation of IT.
a11. Have a comprehensive knowledge and critical awareness of the role of human factors in the design of Information Technology systems, issues of human computer interaction, graphics and sound and multi-media theory and applications, interfacing and cognition.	K2	A8	K9. Professional, moral and ethical issues involved in the exploitation of computer technology and be guided by the appropriate professional, ethical and legal practices relevant to the computing and information industry.	A9. Understand the broad context within computer information technology such as quality, reliability, enterprise, employment law, accounting and health.
a12. Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics.	K1, K3	A1	K10. Current developments in computing and information research.	A10. Understand the challenges inherent in the maintenance and evolution of IT-based systems, and the techniques and best practices currently available for dealing with them.
a13. Describe the tools, practices and methodologies used in the specification,	K3, K4	A6	K11. Requirements, practical constraints and computer-based systems	

design, implementation and critical evaluation of computer software systems.				
a14. Describe the methods used in defining and assessing criteria for measuring the extent to which a computer system is appropriate for its current deployment and future evolution.	K5	A10		
a15. Know the principles of generating tests which investigate the functionality of computer programs and computer systems and evaluating their results.	K7	A10		
a16. Give a more thorough awareness of the ethical, professional, and legal ramifications of IT exploitation.	K9	A8		
a17. Demonstrate a critical awareness of the difficulties that come with maintaining and evolving IT-based systems, as well as the methods and best practices that are currently in use to address those difficulties.	K10	A10		
a18. Know the principles and techniques of a number of application areas informed by the research directions of IT areas.	K11	A9		
a19. Show a critical understanding of the broad context within computer information technology such as quality, reliability, enterprise, employment law, accounting, business and management and health.	K10	A9		

Academic Standards (Intellectual Skills)

IT Program ILOs	Corresponding in NARS		NARS ILOs - General	NARS ILOs - Special
b1. Identify issues with traditional and nontraditional information systems, make plans to address them, and track your progress.	I1	B1	I1. Analyze computing problems and provide solutions related to the design and construction of computing systems. I2. Realize the concepts, principles, theories and practices behind computing and information as an academic discipline.	B1. Information technology systems problems, set goals towards solving them, observe results, reason and apply judgment. B2. Identify attributes, components, relationships, patterns, main ideas, and errors. B3. Summarize the proposed solutions and their results.
b2. Apply the concepts, principles, theories and practices underpinning computing as an academic discipline.	I2	B2	I3. Identify criteria to measure and interpret the appropriateness of a computer system for its current deployment and future evolution. I4. Analyze, propose and evaluate alternative computer systems and processes taking into account limitations, and quality constraints.	B4. Restrict solution methodologies upon their results.
b3. Make contrasts between (approaches, strategies, etc.)	I2	B2		B5. Establish criteria, and verify solutions.
b4. Determine characteristics, elements, connections, trends, primary concepts, and mistakes.	I2	B2		B6. Identify a range of solutions and critically evaluate and justify proposed design solutions.
b5. Determine a variety of options, then assess, analyze, and provide evidence for suggested design solutions.	I3,I4	B6	I5. Make ideas, proposals and designs using rational and reasoned arguments for presentation of computing systems.	B7. Solve information technology problems with pressing commercial or industrial constraints.
b6. Provide an overview of the suggested fixes and their outcomes.	I6	B3		B8. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.
b7. Limit solution approaches based on their outcomes.	I6	B4		

b8. Address issues with information systems that have urgent business or industrial restrictions.	I5,I3	B7	I6. Evaluate the results of tests to investigate the functionality of computer systems.	B9. Perform problem analysis from written descriptions; derive requirements specifications from an understanding of problems (analysis, synthesis). B10. Create and/or justify designs to satisfy given requirements (synthesis, evaluation, application). B11. Recognize the professional, moral and ethical issues of involved in the exploitation of Information Technology and be guided by their adoption, reflect on issues of professional practice within the discipline.
b9. Create a novel design to address a problem with a variety of industrial and commercial restrictions.	I5	B8	I7. Achieve judgments considering balanced costs, benefits, safety, quality, reliability, and environmental impact.	
b10. Solve a decision model with appropriate techniques.	I5	B9	I8. Familiar with the professional, legal, moral and ethical issues relevant to the computing industry.	
b11. Perform improvement of a system that benefits stakeholders.	I7	B10	I9. Evaluate research papers in a range of knowledge areas	
b12. Consider questions of professional practice within the field and acknowledge the moral, ethical, and professional concerns associated with the exploitation of information technology. Let these considerations influence your acceptance of the technology.	I8	B11		

Academic Standards (Professional and Practical Skills)

IT Program ILOs	Corresponding in NARS		NARS ILOs - General	NARS ILOs - Special
c1. Determine, look into, evaluate, design, and create computer-based systems with the right instruments and methods.	P3, P6	C1	P1. Operate computing equipment, recognizing its logical and physical properties, capabilities and limitations.	C1. Specify, investigate, analyze, design and develop computer-based systems using appropriate tools and techniques. C2. Evaluate systems in terms of their quality and possible trade-offs , evaluate appropriate hardware and software solutions for given scenarios. C3. Recognize risks or safety aspects involved in the operation of computer-based systems. C4. Deploy tools for the implementation and documentation of computer-based systems. C5. Work as part of a development team and to recognize the different roles of its members.
c2. Assess systems for quality and potential trade-offs; determine what hardware and software are suitable for the situations at hand.	P7	C2	P2. Implement comprehensive computing knowledge and skills in projects and in deployment of computers to solve position practical problems.	
c3. understand the dangers or security features associated with using computer-based technologies.	P7	C3	P3. Deploy the equipment and tools used for the construction, maintenance and documentation of computer applications.	
c4. Effectively deploy tools for the implementation and documentation of computer-based systems.	P3	C4	P4. Apply computing information retrieval skills in computing community environment and industry.	
c5. Make effective use of computing equipment by considering both its logical and physical characteristics.	P1	C6	P5. Develop a range of fundamental research skills, through the use of online	
c6. Identify and resolve moral, ethical, and professional problems within the field.	P7	C7		
c7. Show an in-depth knowledge of appropriate aspects of Information Technology.	P2	C9		

c8. Use investigative skills to research new and novel aspects of their work.	P2	C10	resources, technical repositories and library-based material	C6. Operate computing equipment efficiently, taking into account its logical and physical properties.
c9. Utilize basic IT resources efficiently, and organize and oversee a project to finish it on time and under budget.	P6,P7	C9	P6. Design, implement, maintain, and manage software systems.	C7. Recognize and address professional, moral and ethical issues within the discipline.
c10. Recognize the need for continuing professional development in recognition of the need for lifelong learning.	P8	C10	P7. Assess the implications, risks or safety aspects involved in the operation of computing equipment within a specific context.	C8. Effectively employ information-retrieval skills, (including the use of browsers, search engines, and on-line library catalogues), communicate effectively using a variety of communication methods, communicate effectively with team members, managers and customers.
c11. Apply tools and techniques for the design and development of applications and projects.	P6	C1	P8. Handle a mass of diverse data, assess risk and draw conclusions.	C9. Make effective use of general IT facilities, plan and manage a project to complete within budget and schedule.
c12. show Reports, speeches, or online websites to showcase their efforts.	P8	C11		C10. Manage one's own learning and development, including time management and organizational skills.
				C11. Present their work in the form of reports, oral presentations or an internet web site.

Academic Standards (Transferable Skills)

IT Program ILOs	Corresponding in NARS	NARS ILOs - General
d1. Communicate effectively.	T6	T1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning. T2. Demonstrate skills in group working, team management, time management and organizational skills. T3. Show the use of information-retrieval. T4. Use an appropriate mix of tools and aids in preparing and presenting reports for a range of audiences, including management, technical, users, industry or the academic community. T5. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension. T6. Reveal communication skills, public speaking and presentation skills, and delegation, writing skills, oral delivery, and effectively using various media for a variety of audiences. T7. Show the use of general computing facilities. T8. Demonstrate an appreciation of the need to continue professional development in recognition of the requirement for life-long learning.
d2. Work in stressful environment and within constraints.	T2	
d3. Understanding the Importance of Multidisciplinary Teams	T2	
d4. Demonstrate efficient IT capabilities	T4	
d5. Lead and motivate individuals	T2	
d6. Search for information and adopt life-long self-learning.	T1,T8	
d7. Employ information-retrieval skills, (including the use of browsers, search engines, and on-line library catalogues), communicate effectively using a variety of communication methods, and communicate effectively with team members, managers and customers.	T3	
d8. Prepare their work in the form of reports, oral presentations or an internet web site.	T6	
d9. Demonstrate suitable numeracy abilities while comprehending and articulating situations with a quantitative component.	T5	

1- Academic Standards Matrix

- Academic Standards Matrix (General)

	Knowledge and Understanding											Intellectual									Professional and Practical								Transferable							
	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	I1	I2	I3	I4	I5	I6	I7	I8	I9	P1	P2	P3	P4	P5	P6	P7	P8	T1	T2	T3	T4	T5	T6	T7	T8
a1	√																																			
a2	√							√																												
a3	√																																			
a4	√																																			
a5	√																																			
a6			√																																	
a7			√																																	
a8			√																																	

[illegible]

b4												√																	
b5												√	√																
b6														√															
b7														√															
b8													√																
b9													√																
b10													√																
b11														√															
b12															√														
c1																	√			√									
c2																					√								
c3																					√								
c4																		√											
c5																	√												

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Academic Standards Matrix (Specific)

	Knowledge and Understanding										Intellectual											Professional and Practical										
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
a1		✓																														
a2	✓																															
a3	✓	✓																														
a4	✓																															
a5	✓																															
a6		✓																														
a7				✓																												
a8							✓																									
a9			✓																													
a10				✓																												
a11								✓																								
a12	✓																															

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We certify that all of the information required to deliver this Program is contained in the above specification and will be implemented. All course specifications for this Program are in place.

Name	Signature	Date
<i>Program Coordinator:</i> Dr. Aida Nasr د / عايدة نصر		
<i>Head of Quality Assurance Unit:</i> Dr. Omnia El Barbary د / أمينة البربري		
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