



Computer Science Program Specs. 2022-2023 (2018 Bylaw)

تم اعتماد توصيف البرنامج بمقرراته

بمجلس القسم (1) بتاريخ 11-9-2019 ومجلس إدارة المعهد (11) بتاريخ 24-9-2019

وتم تطوير التوصيف في ضوء زيارة المحاكاة واعتمادها

بمجلس القسم (4) بتاريخ 10-12-2023 ومجلس إدارة المعهد (2) بتاريخ 26-12-2023

محضر مجلس قسم علوم الحاسب

بجلسته رقم (1) بتاريخ 11/09/2019

إنه في يوم الاربعاء الموافق 11/09/2019 للعام الدراسي 2020/2019 وفي تمام الساعة الثانية ظهرا عقد الاجتماع لمجلس قسم علوم الحاسب بحضور كل من:

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وقد تم دعوة أ.د. خالد عبد الحميد البهنسي لحضور المجلس.
وتم مناقشة أجندة موضوعات مجلس القسم على النحو التالي

(1) الموضوع: اعتماد محضر مجلس القسم السابق
القرار: تم الاعتماد

(2) الموضوع: مناقشة تشكيل مجلس القسم للعام الدراسي الجديد.
القرار: اعتماد تشكيل مجلس القسم العلمي للعام الدراسي الجديد 2020/2019 والذي يشكل من أ.د./ خالد البهنسي. أ.م. د. احمد سعيد جاد الله، د. أشرف فاروق سيد احمد هيكل، د. احمد احمد عطية، د. رشا عبد الستار سطوحى وتم ترشيح أ.د. احمد جاد الله مشرفا على القسم، د. احمد عطية امين المجلس.

(3) الموضوع: مناقشة تحميل المقررات الفصل الدراسي الأول لأعضاء هيئة التدريس والهيئة المعاونة.
القرار: اطلع المجلس على تخصص أعضاء هيئة التدريس والأنصبه وفقا للدرجات العلمية وطلبات الاجازات و التفرغات المقدمة من خلال الفصل الدراسي. وبناءا عليه اعتمد التحميل المقترح ويرفع لوكيل التعليم والطلاب لإتخاذ اللازم.

(4) الموضوع: استعراض توصيف برنامج ومقررات علوم الحاسب.
القرار:

تم تشكيل فريق من أعضاء هيئة التدريس بالبرنامج برئاسة أ.د/ عميد المعهد وبعد الانتهاء من تصميم البرنامج تم عرض التصميم فى جلسة عامة حضرها عدد (10) من أعضاء هيئة التدريس المعينين والمنتدبين على البرنامج وعدد (9) من أعضاء الهيئة المعاونة بالبرنامج وعدد (12) من طلاب البرنامج بالفرق الدراسية المختلفة وكذلك عدد (5) من الخريجين، وبناءا عليه تم اعتماد توصيف برنامج علوم الحاسب وتوصيفات المقررات وعددهم (44) مقرر.

د. احمد سعيد جاد الله

محضر اجتماع قسم علوم الحاسب رقم (1) بتاريخ 11/09/2019

محضر مجلس قسم علوم الحاسب

بجلسته رقم (4) بتاريخ 10/12/2023

العام الدراسي 2023-2024

الموضوع الخامس: مناقشة ما تم حتى الآن في مشاريع التخرج الخاصة بالعام 2023/2024
القرار: أفاد أ.د. محمد السيد فرج عميد المعهد بأن قائمة المشاريع موجود لدى سيادته وأنه خلال الأسبوع القادم سوف يتم الانتهاء من توزيعها على أعضاء هيئة التدريس بما في ذلك طلاب كل مشروع وأعضاء الهيئة المعاونة التي ستشارك في إنجاز المشروع على أن يتم إمداد مجلس القسم بنسخة من هذه البطاقات.

الموضوع السادس: مناقشة آلية مشاركة طلاب القسم في اتحاد الطلاب بالمعهد وتفعيل دور اللجان التابعة له والمشاركة فيها
القرار: تمت المناقشة واتفق الحاضرون على إرجاء استكمال الموضوع بمجلس القسم القادم وذلك لإعطاء الفرصة لأعضاء هيئة التدريس لوضع آلية لتفعيل دور طلاب القسم ومشاركتهم في انتخابات الاتحاد واللجان المختلفة التابعة له على أن يتم ذلك تحت إشراف من أعضاء هيئة التدريس بالقسم كرؤساء لهذه اللجان.

الموضوع السابع: مناقشة تفعيل السيمينار البحثي بالقسم
القرار: تم الاتفاق على أن يتم ذلك بدءاً من بداية الفصل الدراسي الثاني 2023/2024 على أن يكون هناك سيمينار شهري يتم فيه مناقشة الأمور العلمية والخطط البحثية لأعضاء هيئة التدريس والهيئة المعاونة على أن يتم اختيار الموعد والتوقيت ليتناسب مع أكبر عدد من أعضاء هيئة التدريس والهيئة المعاونة.

الموضوع الثامن: مناقشة آلية عمل الاختبارات العملية النهائية بالقسم
القرار: تم الاتفاق على أن تبدأ الاختبارات العملية اعتباراً من الأسبوع القادم (بدءاً من يوم السبت 16/12/2023) وعلى هذا يقوم كل عضو هيئة تدريس بالتنبيه على أعضاء الهيئة المعاونة المشاركين معه في تدريس المقررات للإعداد لهذه الاختبارات وإعداد نماذج الاختبارات التي سيتم إجراؤها ومراجعتها والاتفاق عليها ثم توقيعها من أعضاء هيئة التدريس.

الموضوع التاسع: استعراض تعديلات توصيف البرنامج والمقررات
القرار: إطلع المجلس على ما قدمه منسق البرنامج من تعديلات تمت على توصيف البرنامج ومقرراته في ضوء نتائج زيارة المحاكاة واعتمد المجلس التوصيفات وأوصى بعرضها على مجلس الإدارة.

وحيث أنه لم توجد موضوعات أخرى فقد انتهت الجلسة وأقفل المحضر في تاريخه

رئيس القسم
أ.د. كامل حسين رحومة

أمين المجلس
د. إبراهيم عبداللطيف



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Introduction

Computer science specialists are more in demand today than ever before. Bearing in mind the vision of 2030 in Egypt, computing specialists are the core manpower of this vision. The computer science program (CS) is one of the three academic programs offered by Obour High Institute for Management & Informatics. It started during 1999 and the first batch of graduates was in 2003. The CS program adopts the National Academic Reference Standards (NARS, 2010) issued by the National Authority for Quality Assurance and Accreditation of Education (NAQAAE).

Computer science is a field of study that focuses on the understanding and application of computer and Information technology. It includes a wide range of concepts and topics that deal with the design, development and use of computer systems, software and hardware. Computer sciences deals as well with different branches of sub-sciences such as programming that including writing code for the development of computer programs and applications, software engineering focusing on the design and development of software systematically, data science and artificial intelligence including the analysis and use of data mining, and the development of intelligent models to make better decisions.

In addition, computer sciences field is rich with the study of how to perform calculations on computer devices how to design systems, information security: focused on protecting data and systems from cyber-attacks and ensuring their safety, theory of computing where it deals with the theoretical foundations of computing, analysis of algorithms and mathematical issues related to computing, computer networks include the design and management of computer networks and communications and specialized applications using computer science in a variety of fields such as medicine, engineering, design, social sciences.

Finally, computer science is a dynamic and evolving field that plays a crucial role in the advancement of technology and the development of many industries. Knowledge of the basics of computer science is necessary in the modern era, as the effects of computer technology extend to most aspects of daily life and industrial business. Hence, the management of the institute through all of the above tends to prepare a unique computer science graduate.

The Computer Science program at the Obour Institute for Management, Computers and Information Systems is distinguished by providing the graduate with training courses that qualify him in different career paths such as: Designing and implementation software, developing effective ways to solve computing problems, planning and managing organizational technology infrastructure and how to design and implement software applications. All the previous topics qualify the graduate to compete strongly in local and international competitions.

Program Mission

“Preparing a graduate with a highly competitive advantage in computer science, characterized by modern knowledge and professional techniques related to programming languages, expert systems and artificial intelligence, and keeping pace with developments in the labor market through an educational program based on advanced teaching and learning strategies, scientific research in the field of computer science, and innovative community activities with good societal values and morals”

A- Basic Information

Program Title	Computer Science
Program Type	Semester's mainstream
Department(s) offering the program	Computer Science
Program Coordinator	Dr. Gaber Hassan Elsayed
Internal Auditor	Prof. Mohamed Sayed Farag
External Auditor	Prof. Mohamed Roushdy
Dates of Program by law approval	Bylaw 2019 and activated through academic year 2019-2020
Last date of Program Specification Approval	10-2022

B- Professional Data

1- Program Aims

Computer Science Program aims are a brief statement setting out the intention in providing the program degree in terms of the scope of the subject, and the overall learning outcomes sought. Aims are articulated through statements of graduate attributes in compliance with NARS, the aims of our BSc Degree program in Computer Science are:

- 1) Provide a rigorous study of the theory and principles underlying modern computing applications.
- 2) Develop a high degree of expertise in application, integration and critical evaluation of a range of computing tools and facilities.
- 3) Develop an ability to use, compare, modeling , design and critically evaluate a range of formal and informal techniques, theories, and methods applied to the development of applications of computing and computer based systems.
- 4) Encourage an understanding of the individual, social, organizational and economic applications of computing.
- 5) Provide graduates with the ability to carry out a work plane with minimal supervision.
- 6) Develop abilities to communicate effectively verbally and written through hybrid systems.
- 7) Promote the knowledge and skills required by the computing industry.
- 8) Stimulate an interest in computing as an academic discipline, with a view to encouraging progression to postgraduate research.
- 9) Possess the requisite knowledge and abilities necessary for the computing, information industry and requirement of potential employers.
- 10) Provide students with appropriate study, Knowledge and professional experience of good societal values and morals.

2-Graduates Attributes

The program adopted NARS graduate attributes 2010: the graduates of the computing and information programs should be able to:

- 1) Apply the fundamental theories and principles of computing and information applications.
- 2) Integrate and evaluate the computing tools and facilities.
- 3) Apply knowledge of mathematics and science.
- 4) Design a computing system, component and process to meet the required needs within realistic constraints.
- 5) Exploit the techniques, skills and up-to-date computing tools, necessary for computing and information practice.
- 6) Display professional responsibilities and ethical, societal and cultural concerns.
- 7) Use, compare and evaluate a range of formal and informal techniques, theories and methods to develop computing and information applications.
- 8) Consider and deal with the individual, social, environmental, organizational and economic implications of the application of computing and information.
- 9) Carry out a work plan with minimal supervision.
- 10) Communicate effectively.
- 11) Hold knowledge and skills required by the computing and information industry.
- 12) Engage in self and life-long learning and research in computing and information.
- 13) Fulfill requirements of potential employers.

In addition to General Graduate Attributes, of the computing and information programs, the attributes of computer science Graduate are:

- 14) Demonstrate knowledge and competence in fundamental areas of computer science such as: algorithms, design and analysis, computational theory, computer architecture and software based systems.
- 15) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design, implementation, evaluation and evolution of computer-based systems.
- 16) Apply knowledge of mathematics and science to real world problems; as well as to analyze and interpret data.
- 17) Demonstrate the analytic skills necessary to effectively evaluate the relative merits of software and computer systems, and algorithmic approaches.
- 18) Understand and apply a wide range of principles and tools of software engineering, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.
- 19) Understand and apply a wide range of principles and tools of natural language processing and data mining
- 20) Have a solid understanding of the used concepts in computer science to be able to pursue further learning, whether as graduate students or on their own.
- 21) Demonstrate an understanding of algorithms and data structures, computer organization and architecture, programming language concepts, compilers, networks, artificial intelligence, graphics, human computer interfaces, and databases, and identify and define the computing requirements for its solution.
- 22) Design, implement, and evaluate a computer-based system, process, component or program.
- 23) Use knowledge and understanding in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoff involved in design choices.

3- Educational program Intended Learning Outcomes (ILOS)

(A) Knowledge & Understanding

- A1) Understand fundamental and essential facts, concepts, principles, and theories pertaining to computing, information, and computer applications in the context of the computer science program.
- A2) Identify and explain the design of computer-based platforms, taking into account the inherent trade-offs associated with these systems.
- A3) Understand tools, practices, and techniques employed in the specification, design, implementation, and assessment of computer software systems.
- A4) Determine and set specifications to certain problems, as well as devising strategic approaches for their resolution.
- A5) Evaluate the degree to which a computer-based system aligns with the established criteria for its present utilization and potential advancement.
- A6) Understand some technologies that support computer processing and inter-computer communication.
- A7) Describe experiments that examine the operational capabilities of computer programs and computer systems.
- A8) Evaluate the outcomes of the computer based systems experiments.
- A9) Manage and use economic principles that are applicable to the fields of computing and information disciplines.
- A10) Deal with legal, professional, ethical issues, quality, reliability, enterprise, employment law, management, economics and moral aspects of the exploitation of computing.
- A11) Follow-up the principles and techniques of a number of application areas informed by the research directions of computer science.
- A12) Annotate the practical constraints and methodologies used in the specification of computer based systems.
- A13) Understand the fundamental mathematical and physical principles that pertain to the field of computer science.
- A14) know and understand the principles and concepts of high-level programming languages.
- A15) Exhibit a fundamental grasp of essential concepts in the fields of analysis, counting systems, algebra, applied mathematics, electricity and statistics
- A16) Interpret and analyze data, employing qualitative and /or quantitative approaches.
- A17) Demonstrate the principles and techniques of a number of application areas informed by the research directions of computer science: artificial intelligence, natural language processing, data mining, databases, multimedia and computer graphics.
- A18) Determined advanced topics to provide a deeper understanding of some aspects of artificial intelligence, and Data mining.
- A19) Identify the high level concepts of image processing, and pattern recognition.
- A20) Recognize the fundamental topics in computer science, including software architectures, software engineering principles and methodologies, operating systems, compilers, parallel and distributed computing, systems and software tools.
- A21) Show advanced topics to provide a deeper understanding of some aspects of object-oriented analysis and design, hardware systems design, artificial intelligence, parallel and concurrent computing and software engineering.

(B) Intellectual skills

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

- B1) Analyze computing problems and offer answers related to the planning.
- B2) Establish computing infrastructures.
- B3) Classify the concepts, principles, theories, and practices underpinning computing as an academic discipline.
- B4) Illustrate criteria to measure the appropriateness of a computer system.
- B5) Interpret the results thereof for its current deployment and future evolution.
- B6) Analyze and suggest substituted computer systems and procedures.
- B7) Evaluate computer systems taking restrictions and quality limitations into consideration.
- B8) Create ideas, proposals, and designs effectively using rational and reasoned arguments for presentation of computing systems.
- B9) Evaluate the results of tests to investigate the functionality of computer systems.
- B10) Justify decisions that take into account balanced cost, benefits, safety, quality, reliability and environmental impact.
- B11) Show professional and ethical issues within relevant to computing industry.
- B12) Assess research articles in various fields of expertise.
- B13) Identify traditional and non-traditional problems.
- B14) Solve the problems by defining goals and observe results.
- B15) Make comparisons between different (algorithms, methodologies, techniques, etc.).
- B16) Classify information: data, outcomes, methods, techniques and algorithms.
- B17) Identify characteristics, elements, connections, patterns, main ideas and errors.
- B18) Summarize the proposed solutions and their results.
- B19) Limit solution approaches based on the outcomes.
- B20) Construct criteria, and verify solutions.
- B21) Show a range of solutions and critically evaluates and justifies proposed design solutions. (B8)
- B22) Find solutions of computer science problems with pressing commercial or industrial constraints.
- B23) Create an innovative design to solve a problem containing a range of commercial and industrial constraints.

(C) Professional / Practical skills

On successful completion of the program the graduate should be able to:

- C1) Operate Execute computer hardware while acknowledging its logical and physical characteristics.
- C2) Explore the capabilities and limitations of any computing device.
- C3) Execute general computing resources and organize and oversee a project.
- C4) Efficient utilization of computing to facilitate problem solving.
- C5) Explore hardware and tools appropriate for building computer based systems.
- C6) Apply computing information retrieval skills in computing community environment and industry.
- C7) Reviewing computing equipment efficiently with its logical and physical properties.
- C8) Learn how to conduct basic research using a variety of online resources
- C9) Rating skills to research new and novel aspects
- C10) Reviewing, Specifying, designing, implementing, and managing computer-based systems.
- C11) Examining any potential dangers, troubleshooting problems or safety issues related to using computer equipment.

- C12) Manage a large amount of heterogeneous data, evaluate risk, and reach results.
- C13) Examine suitable design approaches and programming languages.
- C14) Explore appropriate database systems
- C15) Experiment with Communicating effectively by oral, written, and visual means.
- C16) Carry out independent data collection and administration
- C17) making use of online resources and scientific literature
- C18) analyzing and giving workshops in a professional standard.
- C19) Apply IT skills to be able to editorialize technical reports, and a dissertation, to a professional standard.
- C20) Demonstrate strong computer knowledge.
- C21) Define, create, and put into use computer-based systems.
- C22) Assess systems based on the overall quality qualities and potential trade-offs that are offered in the given situation.
- C23) Learn the fundamentals of efficient information organization and management.
- C24) Abilities to retrieve information from a variety of media, such as text, photos, sounds, and videos.
- C25) Learn about the fundamentals of computer-human interaction.
- C26) Assessment and development of a broad spectrum of resources, such as web pages, multimedia systems, and user interfaces.
- C27) Determine any potential dangers or safety issues that arise from using computer technology in a particular setting.
- C28) Use the tools for building and documenting software efficiently.
- C29) Emphasis on fully comprehending the steps necessary in applying computers to problem-solving.

(D) General & Transferable skills

On successful completion of the program the graduate should be able to:

- D1) Dealing with different learning tools.
- D2) Manage one's own learning and development.
- D3) Collaborate effectively with team members.
- D4) The ability to estimate time and organization skills.
- D5) Demonstrate how to employ information retrieval.
- D6) Demonstrate the lead for creating and presenting reports for a variety of audiences, such as management, technical, users, industry, or the academic community, using a suitable combination of tools and aids.
- D7) Role-playing appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.
- D8) Demonstrate your ability to communicate orally, in writing, through delegation, public speaking, and presentation abilities.
- D9) Dealing with different media for a variety of audiences.
- D10) Demonstrate how to use standard computer resources.
- D11) Illustrate the need of ongoing professional development in acknowledgment of the necessity for continuous learning throughout one's lifetime.

4- National Academic Reference Standard (NARS)

The Academic Norms issued from The National Accreditation for Quality Assurance to the Computer Science Program have been accredited through the Board of Directors in its session dated 21/10/2009. It lists the following:

(1) Knowledge & Understanding

The graduates of the program should acquire the knowledge and understanding of:

1. Essential facts, concepts, principles and theories relating to computing and information and computer applications as appropriate to the program of study.
2. Modeling and design of computer-based systems bearing in mind the trade-offs.
3. Tools, practices and methodologies used in the specification, design, implementation and evaluation of computer software systems.
4. Criteria and specifications appropriate to specific problems, and plan strategies for their solution.
5. The extent to which a computer-based system meets the criteria defined for its current use and future development.
6. The current and underlying technologies that support computer processing and inter-computer communication.
7. Principles of generating tests which investigate the functionality of computer programs and computer systems and evaluating their results.
8. Management and economics principles relevant to computing and information disciplines.
9. 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.
10. Current developments in computing and information research.
11. Requirements, practical constraints and computer-based systems

In addition to the above general requirements for the computing and information sector, the following are added as special requirements for computer science

12. Understand the essential mathematics relevant to computer science.
13. Use high-level programming languages.
14. Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics.
15. Interpret and analyzing data qualitatively and/or quantitatively.
16. Know and understand the principles and techniques of a number of application areas informed by the research directions of the subject, such as artificial intelligence, natural language processing, data mining, databases and computer graphics.
17. Show a critical understanding of the principles of artificial intelligence, image, and pattern recognition.
18. Understand the fundamental topics in Computer Science, including hardware and software architectures, software engineering principles and methodologies, operating systems, compilers, parallel and distributed computing, systems and software tools.
19. Select advanced topics to provide a deeper understanding of some aspects of the subject, such as hardware systems design, object-oriented analysis and design, and artificial intelligence, and parallel and concurrent computing.

(2) Intellectual Skills

The graduates of the program should be able to:

1. Analyze computing problems and provide solutions related to the design and construction of computing systems.
2. Realize the concepts, principles, theories and practices behind computing and information as an academic discipline.
3. Identify criteria to measure and interpret the appropriateness of a computer system for its current deployment and future evolution.
4. Analyze, propose and evaluate alternative computer systems and processes taking into account limitations, and quality constraints.
5. Make ideas, proposals and designs using rational and reasoned arguments for presentation of computing systems.
6. Evaluate the results of tests to investigate the functionality of computer systems.
7. Achieve judgments considering balanced costs, benefits, safety, quality, reliability, and environmental impact
8. Familiar with the professional, legal, moral and ethical issues relevant to the computing industry.
9. Evaluate research papers in a range of knowledge areas

In addition to the above general requirements for the computing and information sector, the following are added as special requirements for computer science

10. Define traditional and nontraditional problems, set goals towards solving them, and, observes results.
11. Perform comparisons between (algorithms, methods, techniques...etc).
12. Perform classifications of (data, results, methods, techniques, algorithms...etc.).
13. Identify attributes, components, relationships, patterns, main ideas, and errors.
14. Summarize the proposed solutions and their results.
15. Restrict solution methodologies upon their results.
16. Establish criteria, and verify solutions.
17. Identify a range of solutions and critically evaluate and justify proposed design solutions.
18. Solve computer science problems with pressing commercial or industrial constraints.
19. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.

(3) Professional / Practical Skills

The graduates of the program should be able to:

1. Operate computing equipment, recognizing its logical and physical properties, capabilities and limitations.
2. Implement comprehensive computing knowledge and skills in projects and in deployment of computers to solve position practical problems.
3. Deploy the equipment and tools used for the construction, maintenance and documentation of computer applications.
4. Apply computing information retrieval skills in computing community environment and industry.
5. Develop a range of fundamental research skills, through the use of online resources, technical repositories and library-based material
6. Design, implement, maintain, and manage software systems.
7. Assess the implications, risks or safety aspects involved in the operation of computing equipment within a specific context.
8. Handle a mass of diverse data, assess risk and draw conclusions.

In addition to the above general requirements for the computing and information sector, the following are added as special requirements for computer science

9. Use appropriate programming languages, web-based systems and tools, design methodologies, and knowledge and database systems.
10. Communicate effectively by oral, written and visual means.
11. Perform independent information acquisition and management, using the scientific literature and Web sources.
12. Prepare and present seminars to a professional standard.
13. Prepare technical reports, and a dissertation, to a professional standard; use IT skills and display mature computer literacy.
14. Specify, design, and implement computer-based systems.
15. Evaluate systems in terms of general quality attributes and possible tradeoffs presented within the given problem.
16. Apply the principles of effective information management, information organization, and information-retrieval skills to information of various kinds, including text, images, sound, and video.
17. 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.
18. Identify any risks or safety aspects that may be involved in the operation of computing equipment within a given context.
19. 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.

(4) Transferable Skills

Graduates of the programs should be able:

1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.
2. Demonstrate skills in group working, team management, time management and organizational skills.
3. Show the use of information-retrieval.
4. 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.
5. Exhibit appropriate numeracy skills in understanding and presenting cases involving a quantitative dimension.
6. Reveal communication skills, public speaking and presentation skills, delegation, writing skills, oral delivery, and effectively using various media for a variety of audiences.
7. Show the use of general computing facilities.
8. Demonstrate an appreciation of the need to continue professional development in recognition of the requirement for life-long learning.

5- Program Referential Marks

(Not applicable)

6- Program Structure & Contents

(A) Program Duration

The duration of the program is four academic years, each academic year consisting of two semesters, with a total of eight semesters.

(B) Program Structure

	Subject Area	NARS Requirements Tolerance %	CS Program	
			No. of Courses	%
A	Humanities, ethical and social sciences (Univ. Req.) (HUM)	8-10	4	9%
B	Mathematics and basic sciences (BAS)	16-18	7	15%
C	Basic computing sciences (Institution req.)	26-28	10	22.72%
D	Applied computing Sciences (specialization) (CSC)	28-30	17	38%
E	Training*	3-5	1	2%
F	Projects	3-5	2	4%
	Subtotal	84-96	40	90.9%
G	Optional (Institution character- identifying subjects) (CUL)	4-16	4	9%
	Total	100	44	100%

*Training is a binding material for students, and it is implemented during the summer of the third year as a requirement for the project subject and is considered one of the conditions for obtaining a bachelor's degree, but it does not affect the total or appreciation of the student and therefore it was not counted within the program's decisions, based on the directives of the sector committee.

Number of Hours and units

Theoretical	88	Practical	63	Tutorial	48	Total	199
Mandatory	80	Transitional	—			Optional	8

(C) Program Levels & Contents

										الفرقة: الأولى		
										الفصل: الاول		
م	كود المقرر	اسم المقرر	ساعات التدريس		إجمالي الساعات التدريسية	إجمالي الساعات المعتمدة	درجات الامتحان				زمن الامتحان	
			محاضرات	تطبيقات			اعمال السنة	التحريري	النهاية الصغرى	النهاية الكبرى		
1	CSC61101	مقدمة الحاسبات وتطبيقاتها	2	2	4	3	30	70	50	100	2	
2	BAS61101	تراكيب محددة	2	2	4	3	30	70	50	100	2	
3	BAS61102	فيزياء	2	4	6	4	20	80	50	100	2	
4	BAS61103	رياضيات (1)	2	2	4	3	20	80	50	100	2	
5	HUM61101	لغة إنجليزية (1)	2	2	4	3	20	80	50	100	2	
		اجمالي الساعات	10	12	22	16						
		الفصل: الثاني										
م	كود المقرر	اسم المقرر	ساعات التدريس		إجمالي الساعات التدريسية	إجمالي الساعات المعتمدة	درجات الامتحان				زمن الامتحان	
			محاضرات	تطبيقات			اعمال السنة	التحريري	النهاية الصغرى	النهاية الكبرى		
1	CSC6 1202	البرمجة الهيكلية	2	4	6	4	30	70	50	100	2	
2	CSC6 1203	حزم البرامج	2	2	4	3	20	80	50	100	2	
3	BAS61204	رياضيات (2)	2	2	4	3	20	80	50	100	2	
4	BAS61205	الكرونيات	2	2	4	3	20	80	50	100	2	
5	HUM61202	لغة انجليزية (2)	2	2	4	3	20	80	50	100	2	
		اجمالي الساعات	10	12	22	16						

الفرقة: الثانية											
الفصل : الاول											
م	كود المقرر	اسم المقرر	ساعات التدريس		إجمالي الساعات التدريسية	إجمالي الساعات المعتمدة	درجات الامتحان			زمن الامتحان	
			محاضرات	تطبيقات			امال السنة	التحريرى	النهاية الصغرى		النهاية الكبرى
1	BAS 6 2106	رياضيات (3)	2	2	4	3	20	80	50	100	2
2	CSC 6 2104	هياكل البيانات	2	4	6	4	30	70	50	100	2
3	CSC 6 2105	البرمجة الشيئية	2	2	4	3	30	70	50	100	2
4	CSC 6 2106	تصميم منطقي	2	2	4	3	20	80	50	100	2
5	HUM 6 2103	اختياري علوم انسانية(1)	2	2	4	3	20	80	50	100	2
		اجمالى الساعات	10	12	22	16					
الفصل : الثانى											
م	كود المقرر	اسم المقرر	ساعات التدريس		إجمالي الساعات التدريسية	إجمالي الساعات المعتمدة	درجات الامتحان			زمن الامتحان	
			محاضرات	تطبيقات			امال السنة	التحريرى	النهاية الصغرى		النهاية الكبرى
1	CSC 6 2207	تحليل النظم	2	2	4	3	20	80	50	100	2
2	CSC 6 2208	تنظيم الملفات ومعالجتها	2	4	6	4	30	70	50	100	2
3	BAS 6 2207	إحصاء وإحتمالات	2	2	4	3	20	80	50	100	2
4	CSC 6 2209	تنظيم الحاسبات ولغة التجميع	2	2	4	3	20	80	50	100	2
5	HUM 6 2204	اختياري علوم انسانية (2)	2	2	4	3	20	80	50	100	2
		اجمالى الساعات	10	12	22	16					

الفرقة : الثالثة											
الفصل : الاول											
م	كود المقرر	اسم المقرر	ساعات التدريس		إجمالي الساعات التدريسية	إجمالي الساعات المعتمدة	درجات الامتحان				
			محاضرات	تطبيقات			اعمال السنة	التحريري	النهاية الصغرى	النهاية الكبرى	
1	CSC 6 3110	نظم قواعد البيانات	2	2	4	3	30	70	50	100	2
2	CSC 6 3111	نظم التشغيل	2	2	4	3	30	70	50	100	2
3	CSC 6 3112	تصميم النظم	2	4	6	4	20	80	50	100	2
4	CSC 6 3113	واجهات الحاسب	2	2	4	3	20	80	50	100	2
5	CUL 6 3101	مادة اختيارية(1)	2	2	4	3	20	80	50	100	2
6	CSC63114	تطوير تطبيقات الموبيل	2	5	7	4	50	50	50	100	2
		اجمالى الساعات	12	17	29	20					
الفصل : الثانى											
م	كود المقرر	اسم المقرر	ساعات التدريس		إجمالي الساعات التدريسية	إجمالي الساعات المعتمدة	درجات الامتحان				
			محاضرات	تطبيقات			اعمال السنة	التحريري	النهاية الصغرى	النهاية الكبرى	
1	CSC 6 3215	شبكات الحاسبات	2	2	4	3	30	70	50	100	2
2	CSC 6 3216	الرسم بالحاسب	2	2	4	3	20	80	50	100	2
3	CSC 6 3217	هندسة البرمجيات (1)	2	2	4	3	30	70	50	100	2
4	CSC 6 3218	البرمجة المنطقية	2	4	6	3	30	70	50	100	2
5	CUL 6 3202	مادة اختيارية(2)	2	2	4	3	20	80	50	100	2
6	CSC 6 3219	تكنولوجيا الانظمة المدمجة	2	5	7	4	50	50	50	100	2
		اجمالى الساعات	12	17	29	19					

الفرقة: الرابعة											
الفصل: الأول											
م	كود المقرر	اسم المقرر	ساعات التدريس		إجمالي الساعات التدريسية	إجمالي الساعات المعتمدة	درجات الامتحان				زمن الامتحان
			محاضرات	تطبيقات			اعمال السنة	التحريرى	النهاية الصغرى	النهاية الكبرى	
1	CSC 6 4120	الذكاء الاصطناعي	2	2	4	3	30	70	50	100	2
2	CSC 6 4121	برمجة الشبكات	2	2	4	3	30	70	50	100	2
3	CSC 6 4122	هندسة البرمجيات (2)	2	4	6	3	30	80	50	100	2
4	CUL64103	مادة اختيارية(3)	2	2	4	3	20	80	50	100	2
5	CSC64123	مشروع تخرج (1)	2	2	4	3					
6	CSC64124	تصميم وتشغيل وصيانة الشبكات	2	5	7	4	50	50	50	100	2
		اجمالى الساعات	12	17	29	19					
الفصل : الثانى											
م	كود المقرر	اسم المقرر	ساعات التدريس		إجمالي الساعات التدريسية	إجمالي الساعات المعتمدة	درجات الامتحان				زمن الامتحان
			محاضرات	تطبيقات			اعمال السنة	التحريرى	النهاية الصغرى	النهاية الكبرى	
1	CSC 6 4225	النظم الخبيرة	2	2	4	3	30	70	50	100	2
2	CSC 6 4226	الوسائط المتعددة	2	2	4	3	30	70	50	100	2
3	CSC 6 4227	معالجة الصور	2	4	6	4	20	80	50	100	2
4	CUL64204	مادة اختيارية (4)	2	2	4	3	20	80	50	100	2
5	CSC64228	مشروع تخرج(2)	2	2	4	3	50	50	50	100	2
6	CSC64229	ادارة خدمات تكنولوجيا المعلومات	2	5	7	4	50	50	50	100	2
		اجمالى الساعات	12	17	29	20					

(D) List of Elective Courses

مقررات 4		4-مقررات علوم أخرى / ثقافية CUL 6							
ساعات معتمدة	عدد الساعات التدريسية				الفصل الدراسي	الفرقة	اسم المقرر	كود المقرر	م
	اجمالي	معمل	تمارين	محاضرة					
3	4	2	0	2	1	3	مادة اختيارية (1)*	CUL 63101	1
3	4	2	0	2	2	3	مادة اختيارية (2)*	CUL 63202	2
3	4	2	0	2	1	4	مادة اختيارية (3)**	CUL 64103	3
3	4	2	0	2	2	4	مادة اختيارية (4)**	CUL64204	4
12	16	8	0	8			الاجمالي		

القائمة الأولى (*)	القائمة الثانية (**)
نظم دعم القرار Decision Support Systems	استدعاء المعلومات Information Retrieval
خوارزميات Algorithms	انترنت الاشياء (IOT) Internet of Things
التنقيب في البيانات Data Mining	سرية المعلومات والشبكات Network Security
قواعد البيانات الموزعة Distributed Database systems	تمييز النماذج Pattern Recognition

7- Courses Contents

Course Content - First Year – First Semester	
Code: CSC61101	Course Title: introduction to computer and applications
Level: 1	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2 (2) hrs.	Tutorial: 2(1) hrs.
Introduces the components of a computer system, hardware for data storage, data manipulation, data communication, System software that includes operating system, programming languages transistors, and others, first principles of writing algorithms, programming and software development are introduced, The concepts of computer science, information system, decision support system, information technology	
Code: BAS61101	Course Title: Discrete Mathematical Structures
Level: 1	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2 (2) hrs.	Tutorial: 2(1) hrs.
Sets, sequences, algorithms, pseudo code, induction and recursion. Relations and functions, Graphs, trees, posits entices, and Boolean Algebra, Semi groups and groups	
Code: BAS61102	Course Title: PHYSICS
Level: 1	Semester: 1
No. of contact (credits): 6(4) hrs Lectures 2 (2) hrs.	Practical: 4(2) hrs.
Electrostatics ,Columbus law ,gauss low ,potential capacitors ,Electric current ,Resistors ,Kerchiefs law magnetic field and forces, induction and inductors ,Basic circuit theory and circuit analysis ,Fundamentals of three phase circuits and trans formers	
Code :BAS61103	Course Title: Mathematics (1)
Level: 1	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2 (2) hrs.	Tutorial: 2(1) hrs.
Numbers systems , real and complex numbers, variables, binomial theorem, partial fraction, polynomials, algebraic equation, roots .Calculus: real variables, functions, limits, continuity, derivatives of algebraic, tri goniometric, inverse tri goniometric, exponential.	
Code HUM 61101	Course Title: English Language I
Level: 1	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2 (2) hrs.	Tutorial: 2(1) hrs.
English vocabulary ,Grammar ,Exercises ,Reading material ,Writing techniques	

Course Content -First Year – Second Semester

Code : CSC6 1202	Course Title: Structured programming
Level: 1	Semester: 2
No. of contact (credits): 6(4) hrs Lectures 2 (2) hrs.	Practical: 4(2) hrs.
Identify the steps involved in creating C++ program ,Identify integer and character data types. Use arrays and pointers in C++, Deal with the if/else selection statement. Identify loop types and switch statement. Describe how C++ functions are constructed and implemented. Know how to create and call a-user defined functions.	
Code : CSC6 1203	Course Title: Program packages
Level: 1	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2 (2) hrs.	Practical: 2(1) hrs.
Microsoft office XP ,Microsoft word and its applications , Microsoft excel and its applications Microsoft power point its applications , Microsoft Access and its applications , Other Software Applications Packages and their usage in the PCS environment.	
Code : BAS6 1204	Course Title: Math (2)
Level: 1	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2 (2) hrs.	Tutorial: 2(1) hrs.
Plank glom: line, circle conic Sections equations , Space Geometry: line, plane, sphere, cone, cylinder quadratic equations. ,Advanced Calculus: calculus of several variables, gradient, Multiple interflows. ,Vector algebra, vector fields functions and their derivatives, motion in space, vector fields, line and surface integrals, Green's theorem, divergence theorem, and stock's theorem .	
Code : CSC6 12034	Course Title: Electronics
Level: 1	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2 (2) hrs.	Practical: 2(1) hrs.
Fundamentals of semiconductor devices ,P-N junction ,bipolar junction and field effect transistors structures ,semiconductor devices as circuit elements ,fundamentals of filters ,power supply and rectifications amplifiers ,introduction to digital circuits	
Code : HUM61202	Course Title: English Language II
Level: 1	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2 (2) hrs.	Tutorial: 2(1) hrs.
Expanding English vocabulary ,revising points of grammar ,drills and exercises ,variety of reading material ,training in academic essay writing techniques ,Listening and speaking development ,Report writing and communication skills	

Course Contents - Second Year – First Semester

Code : BAS 620106	Course Title: Math(3)
Level: 2	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Tutorial: 2(1) hrs.
metrics, linear transformation, envelopes, eigenvectors	
Code : CSC 6 2104	Course Title: Data structures
Level: 2	Semester: 1
No. of contact (credits): 6(4) hrs Lectures 2(2) hrs.	Practical: 4(2) hrs.
Built in data structures ,Stacks, queues, linked lists, and binary search trees, graphs. Introduction to data abstraction and basic of string processing, recursion, Sorting and searching algorithms efficiency considerations.	
Code : CSC 6 2015	Course Title: Object Oriented Programming
Level: 2	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
<i>Abstraction & Encapsulation:</i> Defining a class, using a class, private class members, protected class members public class members, using data members, references& pointer, using member functions. Constructors & destructors, friend classes & functions, class templates. <i>Inheritance:</i> Reusability, Single Inheritance. Seed classes, scope resolution, multiple Inheritance. <i>Overloading:</i> function overloading, overloaded non-member function, overloaded member functions, operators as member functions, operator as member functions. <i>Polymorphism:</i> Early & late binding, virtual functions, function overloading abstract classes, scope resolution and polymorphism, polymorphism with single Inheritance, Polymorphism with multiple Inheritance. <i>Exception Handling:</i> Old ways to handle exceptions,	
Code : CSC 62106	Course Title: Logic design
Level: 2	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Terminology and understanding of physical components used in computer hardware. Number systems and codes: logic gates, Boolean algebra, Graphical simplification of Boolean expressions Combinational circuits: latches and flip-flops, analysis and design of synchronous sequential circuits, registers and counters,, storage elements computer logic design.	
Code: HUM 6 2103	Course Title: علم النفس المعرفي
Level: 2	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Tutorial: 2(1) hrs.
أن يستوعب الطالب مفهوم علم النفس المعرفي ومراحل تقدمه وتطوره ويتعرف على طبيعة مفهوم تداول المعلومات وإتجاهاتها ويستخدم علم النفس المعرفي في مجال تخصصه ويجتهد كلما أمكن ذلك في تطبيق نتائج علم النفس المعرفي في المجال المهني.	

Course Contents - Second Year – Second Semester

Code : CSC 62207	Course Title: Systems Analysis
Level: 2	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Managerial and organizational fundamentals, Systems planning, Job description, roles, carry, skills ethics . . . etc. of modern systems analyst ,Information systems building blocks, Information system development, Using CASE tools Cross life cycle activities ,Data modeling, Process modeling ,Network modeling ,Object modeling.	
Code : CS 62208	Course Title: File Organization and Processing
Level: 2	Semester: 2
No. of contact (credits): 6(4) hrs Lectures 2(2) hrs.	Practical: 4(2) hrs.
Overview of files ,File design ,file manipulation blocking single buffering and double buffering. Special file ,relative file , indexed sequential file ,multiple key file and ,direct access file ,Extremely Sort ,Merge algorithms. File systems disk scheduling and accessing modes.	
Code : BAS 62207	Course Title: Statistics and Probability
Level: 2	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Tutorial: 2(1) hrs.
Descriptive statistics ,Tests of hypothesis ,Correlation regression ,Analysis of variance. Probability ,Sampling and statistical distributions	
Code : CSC 62209	Course Title: Computer Organization and Assembly Language
Level: 2	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Commuter basic units organization memory control arithmetic and logic unit ,Computer Cycles: fetch indirect addressing execute and interrupt hardwired versus microprogramming control organization ,Input/Output Devices and interrupt handling In Assembly Language is used in the lab To demonstrate most of the above concepts as well as develop students skills ,an Assembly language programming.	
Code: HUM 62204	Course Title: القانون
Level: 2	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Tutorial: 2(1) hrs.
قانون الإجراءات الجنائية , الجريمة الالكترونية , خصائص الجريمة المعلوماتية , الجرائم الإلكترونية وأثرها وسبل مواجهتها , التحديات التي تواجه التحقيقات في الجريمة المعلوماتية , ملاحق بقوانين ذات العلاقة	

Course Contents - Third Year – First Semester

Code : CSC 6 3110	Course Title: Database systems
Level: 3	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Introduction, file-systems Vs database systems , database systems Components and concepts, functionality of DBMSs Database Architecture Database Models. Relational database concepts: keys, integrity constraints, views, and catalogs. Relational algebra, query languages ,Entity-Relationship models, normalization.	
Code : CSC 6 3111	Course Title: Operating Systems
Level: 3	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Basic concepts of computer systems hardware software and firmware process concepts and processor scheduling . Memory organization and management for single user and multiuser systems. Virtual storage organizing and management .Disk scheduling and its optimization. Study and discussion of major operating system such as UNIX: Laboratory work on many control programs as well as practice on a single and multiuser systems	
Code : CSC 6 3112	Course Title: System Design
Level: 3	Semester: 1
No. of contact (credits): 6(4) hrs Lectures 2(2) hrs.	Practical: 4(2) hrs.
Systems design and construction., Cross life cycle activities. Applications are lecture and price design. Database design. Input design and prototyping. Output design and prototyping. Surer interfaces design and prototyping. Software design. Object oriented design Systems implementation Systems support.	
Code : CSC 6 3113	Course Title: Computer interfaces
Level: 3	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
The relationship between people and machines, the role of human factors and psychology. Principles of interaction, design issues. Command Engages, menus, windows, icons, error messages, response time. Physical interaction, interaction, devices, interaction styles and techniques. The design process and user models. Interface evaluation: Natural and view interfaces.	
Code : CUL 63101	Course Title: Algorithms
Level: 3	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Upon completing this course, the student should understand the solid theoretical background in analyzing and designing computer algorithms. The student should be able to use critical thinking in applying suitable algorithms design techniques to solve problems encountered either in some real problems in different domains or in advanced level courses. Also, the student will be able to analyze the time and space complexities of those various problems.	

Code: CSC63114	Course title: Mobile Application Development.
Level: 3	Semester: 1
No. of contact (credits): 7(4) hrs Lectures 2(2) hrs.	Practical: 5(2) hrs.
<p>Introduction to java mobile application development. extensible Markup Language (XML). What Is Android?</p> <p>Obtaining the Required Tools Getting started with android programming Anatomy of an Android Application Understanding Activities Linking Activities Using Intents, Fragments, Understanding the Components of a Screen ,Views and View Groups, Linear Layout, Absolute Layout, Table Layout, Relative Layout, Frame Layout</p> <p>Designing your user interface with views, Using Basic Views, Text View, Button, Image Button, Edit Text, Check Box, Toggle Button, Radio Button, and Radio Group Views ,Progress Bar View ,Data persistence ,Persisting Data to Files ,Saving to Internal Storage ,Saving to External Storage (SD Card) ,Choosing the Best Storage Option ,Using Static Resources , Creating and Using Databases , Creating the DB Adapter Helper Class Using the Database Programmatically , Pre-Creating the Database ,Location-based services , Displaying Maps Creating the Project , Obtaining the Maps API Key , Displaying the Map , Displaying the Zoom Control Changing Views , Navigating to a Specific Location , Adding Markers , Getting the Location That Was Touched Geocoding and Reverse Geocoding ,Getting Location Data , Monitoring a Location</p>	

Course Contents - Third Year – Second Semester

Code : SCS 6 3215	Course Title: Computer Networks
Level: 3	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
<p>Topology, treasure, and architecture of computer networks , Layered protocols in point-to-pony broadcasting and local area networks, the structure of some notable and public networks. Training on using LAN and WAN networks.</p>	
Code : CSC 6 3216	Course Title: computer Graphics
Level: 3	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
<p>Graphics Algorithms, 2D and Introduction, Graphics Hardware, Basic Raster 3D Transformations, Synthesized Camera Models: Curve and surfer representation: Lightening Models: Shading Techniques: Shadows: Texture Mapping: Transparency .</p>	
Code : CSC 6 3217	Course Title: Software Engineering 1
Level: 3	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
<p>The software life cynic. Requirements analysis, specification, and validation. Software design methodologies: data-structure oriented design, object oriented design and software reusability. Design quality and design description languages. Rapid prototyping and iterative refinements</p>	

Code :CSC 6 3218	Course Title: Logic Programming
Level: 3	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Introduction: Facts, objects, and predicates. Polo: Using variables, bound and free variables, anonymous variables compound goals, backtracking, variable rules. Using rules: Rules, variables in rules prolog execution rules using the trace unification execution control the built-in predict. Simple input and exclusion using the fail predicate recursion and the cut. Arithmetic operations. Compound objects. Dynamic database; lists. String operations.	
Code : CUL63202	Course Title: Data Mining
Level: 3	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
The overall aim of this course is to introduce students to modern data mining techniques and their use in business and other areas of applications. In particular, the course explores basic concepts, principles and techniques of data mining, online analytic processing, and data warehousing with emphasis on both the technical and the practical issues. The course provides students with an understanding in evaluating and comparing data mining solutions for effective use of the solutions in practice. The course also equips students with some hands-on experience and skills in conducting a data mining project using a data mining software tool, and/or constructing a data warehouse.	
Code: CSC63219	Course title: Embedded Systems Technology.
Level: 3	Semester: 2
No. of contact (credits): 7(4) hrs Lectures 2(2) hrs.	Practical: 5(2) hrs.
Introduction to Embedded System. Microcontroller and Microprocessors Architecture. Software engineering for embedded systems. Microcontroller peripherals. Embedded C programming. Microcontroller communications. Interfacing different communication modules. Controller Area Network CAN. Introduction to Real-Time Operating Systems (RTOS). Interfacing Serial port using C#. Interfacing USB using C#. Signal conditioning, basic small signal transistor circuits, and op-amp circuits. Introduction to power electronics components and elements, MOSFETS, BJTs, IGBTs and transistor drivers. Introduction to DIACs, TRIACs, Thyristors. DC/DC converters, Inverter, Three phase systems. Introduction to Proteus. Basic system simulation using proteus ISIS.PCB design using Proteus ARES.	

Course Contents - Fourth Year – First Semester

Code : CSC 6 4120	Course Title: Artificial intelligence
Level: 4	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Heuristic approaches to problem solving , different searching methods and heuristic search , logic and theorem proving , knowledge representation , some application of ai such as theorem proving , game playing , and natural language processing	
Code : CSC 6 4121	Course Title: Network Programming
Level: 4	Semester: 1
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Overview of internet protocols (HTTP , FTP , SMTP , POP3). using HTML to construct web pages (fonts, colors, lists, hyperlinks, tables, images, creating animated GIFS, clickable image maps, sound, video, forms). Using JAVASCRIPT language to add dynamic environment and interactivity to web pages .active server pages (ASP)	
Code : CSC 6 4122	Course Title: Software Engineering 2
Level: 4	Semester: 1
No. of contact (credits): 6(3) hrs Lectures 2(2) hrs.	Practical: 4(2) hrs.
Software Quality assurance ,software metrics , software measurements ,software reliability models, software Quality assurance standards software testing techniques ,white – box testing . basic path testing ,black – box testing until testing integration testing, validation testing, system testing, software maintenance; main tenability; maintenance tasks ,software configuration management .	
Course Code: CUL 64103	Course Title: Data and Network Security
Level: 4	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
The objective of the course is to provide an introduction to the basic concepts of computer security for graduate level students. The course contents include: security concepts, such as confidentiality, integrity, authenticity, availability etc. Symmetric and asymmetric cryptography and their uses; key distribution and digital signatures; discretionary and mandatory access control policies for confidentiality and integrity. Communication protocols for authentication, confidentiality and message integrity. Network security; system security, intrusion detection and malicious code. Security models and security evaluation. Administration of security. Legal aspects of computer security.	
Code: CSC64228	Course title: Project (1)
Level: 4	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
The general aim of the project is to allow each student integrate all the disciplines he has studied in a unified piece of knowledge. On the behavioral side, Students are allowed to work in a team so as to practice working in a collaborative environment. An important aspect of the project is to let the students be trained in following a scientifically-based engineering methodology for the project	

Course Contents - Fourth Year – First Semester

implementation. This emphasizes also a proper documentation and presentation procedure. On the technical side, Students are allowed to choose among a number of projects suggested by the different staff members. The topics of these projects usually reflect the unified educational policy of the department and are usually related to different subjects in the curriculum.

Code: CSC64124

Course title: Computer Networks Operating, Design and Maintenance

Level: 4

Semester: 1

No. of contact (credits): 7(4) hrs Lectures 2(2) hrs.

Practical: 5(2) hrs.

How to plan and install a network using real equipment. Practice verifying and troubleshooting network and Internet connectivity. Develop critical thinking and problem-solving skills using real equipment and Cisco Packet Tracer. Configure common Internet applications, basic IP services, and set up sharing between computers. Build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. Configure and troubleshoot routers and switches and resolve common VLAN routing issues in both IPv4 and IPv6 networks. Develop critical thinking and problem-solving skills using real equipment and Cisco Packet Tracer. Configure WAN technologies and network services required by converged applications in a complex network. Work with routers and switches using OSPF, EIGRP, and STP protocols in both IPv4 and IPv6 networks. Resolve common VLAN routing issues in both IPv4 and IPv6 networks. Develop critical thinking and problem-solving skills using real equipment and Cisco Packet Tracer. Prepare for Cisco CCENT Certification. Work with routers and switches using OSPF, EIGRP, and STP protocols in both IPv4 and IPv6 networks. Resolve common VLAN routing issues in both IPv4 and IPv6 networks. Develop critical thinking and problem-solving skills using real equipment and Cisco Packet Tracer. Configure WAN technologies and network services required by converged applications in a complex network. Build simple LANs; perform basic configs for routers & switches; and implement IP addressing schemes. Troubleshoot routers & switches; resolve common VLAN routing issues in both IPv4 & IPv6 networks. Develop critical thinking and problem-solving skills using real equipment and Cisco Packet Tracer. Prepare for Cisco CCNA R&S Certification. Understand wireless networking technology basics. Configure and troubleshoot wireless LANs, Design a mobile network and set up a home Internet access و Understand wireless LAN security and mobile applications like BOYD

Course Contents - Fourth Year – Second Semester

Code : CS 64225	Course Title: Expert System
Level: 4	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Expert system components: knowledge base , inference engine , user interface . knowledge acquisition methods . knowledge representation: rules, frames, cct. inference engine, hands on experience by developing a prototype system using expert system shell .	
Code : CS 64226	Course Title: Multimedia
Level: 4	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
Multimedia components, predictive and transform coding technique, vector quantization, dictionary based text coding entropy encoding, arithmetic coding. JPEG standards, motion estimation techniques, multimedia databases, image retrieval by contents, networking aspects of multimedia transmission	
Code : CSC64227	Course Title: Image Processing
Level: 4	Semester: 2
No. of contact (credits): 6(4) hrs Lectures 2(2) hrs.	Practical: 4(2) hrs.
Students learn the basic concept of image processing, image sampling and quantization, color, point operations, segmentation, morphological image processing, linear image filtering and correlation, image transforms, noise reduction and restoration, and feature extraction and recognition. Also, students learn the implementation of Matlab as a leading computing programming language. Upon completion of this course, students should be able to their knowledge and skills in handling real image processing problems.	
Code : CUL64204	Course Title: Internet of Things
Level: 4	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
The course aims to provide a solid foundation in IoT concepts, principles, and architectures. Students will learn about the basic components of an IoT system, including sensors, actuators, communication protocols, and cloud platforms. The course seeks to develop technical skills required for designing, building, and deploying IoT solutions. This may include hands-on experience with programming languages, microcontrollers, hardware integration, wireless communication, and data analytics.	
Code: CSC64228	Course title: Project (2)
Level: 4	Semester: 2
No. of contact (credits): 4(3) hrs Lectures 2(2) hrs.	Practical: 2(1) hrs.
The general aim of the project is to allow each student integrate all the disciplines he has studied in a unified piece of knowledge. On the behavioral side, Students are allowed to work in a team so as to practice working in a collaborative environment. An important aspect of the project is to let the students be trained in following a	

Course Contents - Fourth Year – Second Semester

scientifically-based engineering methodology for the project implementation. This emphasizes also a proper documentation and presentation procedure. On the technical side, Students are allowed to choose among a number of projects suggested by the different staff members. The topics of these projects usually reflect the unified educational policy of the department and are usually related to different subjects in the curriculum.

Code: CSC64229	Course title: Information Technology service management (ITSM)
Level: 4	Semester: 2
No. of contact (credits): 7(4) hrs Lectures 2(2) hrs.	Practical: 5(2) hrs.

IT Service Management Overview - scanning the research fields of service science, management, and engineering, IT Infrastructure, and Cloud Computing - reviewing the concepts and histories of computer platforms and operating systems, network, data storage, and applications; envisioning the trend of software development, Internet of Things, Big Data, Smart Computing/Cities, Cognitive Computing— talking about some hot IT service topics, IT service strategy, methods, and case study – demonstrating the practical and successful approaches for IT services, IT Project / Service Management overview – illustrating the IT project linkage between the physical world and the service fields, in comparing with ITIL ,IT Service team building – introducing the mechanisms for building up an effective IT service team ,Soft Skills in IT Service Management – discussing the methods for communicating inside and outside of the IT project/service teams, and the skills for effective negotiation and presentation for the IT services.

8- Program Admission Requirements

Students are nominated to the Institute according to the conditions and admission rules determined by the admission Coordination Office of Egyptian universities and institutes, and the program accepts students with high school degree (mathematics department), and equivalent Arabic and foreign certificates.

9- Regulations for Progression & Program Completion

- Study in the program is based on a system of two semesters and a summer semester. The student is considered successful and transferred as long as the number of failed subjects is less than three subjects. If the student fails in only three subjects, the student has the right to take the summer semester exam. If the student succeeds in any of the three failing courses, he becomes transferred. Otherwise, it is considered failed.
- The number of student absences in any course should not exceed 25% of the number of theoretical or practical hours during the semester. In case of exceeding, the student is considered to have failed this course, unless this absence is with an excuse acceptable to the course professor or/and the dean of the institute.
- If a student fails to take the final exam for a course without a compelling excuse acceptable to the Board of Directors, he is considered to have failed, and in the event of repeating the course, the student receives his grade in this course, provided that it does not exceed the highest grade for an acceptable grade.
- Students may be transferred to the Institute from university colleges or similar institutes within the Republic in accordance with the controls decided by the Board of Directors of the Institute and in a manner that does not conflict with the controls and decisions regulating this.
- A student who is regular in one of the institute's departments can transfer his enrollment to another department, provided that he fulfills the admission conditions for the department to which he is transferred. A student who has been expelled from the institute due to exhausting failure times in one of the departments, and after the approval of the Institute's Board of Directors, can re-enroll him in another department, provided that the admission conditions for the department he is transferred to are met.
- The student may submit a request to suspend his enrollment for an academic year, provided that he presents reasons accepted by the Institute's Board of Directors, provided that the matter is submitted to the central administration of private higher institutes to approve the Board of Directors' decision. In this case, the student is exempted from paying tuition fees and retains his right to obtain the highest grade he obtains in the academic year. Courses in which his enrollment was suspended.
- The student is considered expelled if he receives a failing grade twice in a row or twice with a suspension of registration between them.
- If the student fails twice in a row in the first year, he will be permanently expelled.
- If the student fails the second year in the second year twice in a row, he has the right to take the exam once from abroad. If he fails it, he becomes expelled.
- If the student fails the third year in a row twice in a row, he has the right to take the exam twice from abroad. If he fails both, he becomes expelled.
- If the student fails twice in a row in the fourth year, he has the right to take the exam twice from abroad, followed by a final semester, unless the student is successful in the largest number of subjects prescribed in the fourth year.

Grade	Percentage
Excellent	Greater or Equal 85%
Very Good	Greater or Equal 75% and less than 85 %
Good	Greater or Equal 65% and less than 75 %
Pass	Greater or Equal 50% and less than 65 %
fail	Less than 50 %

10- Teaching and Learning Methods & Rules for Evaluating Program Participants

(A) Teaching and Learning Methods

Teaching and Learning Methods
Lectures
Interactive learning
Online Lectures
Laboratory Sessions
Discussion
Case Study
Field Visits
Problem Solving
Role Play
Workshops
Cooperation With the institutes surrounding communities
Projects
Summer Training

(B) Rules for Evaluating Program Participants

Evaluation Methods	Intended Learning Outcomes			
	Knowledge & understanding	Intellectual skills	Professional / practical skills	Transferable skills
Assignments	✓	✓	✓	
Practical Exam	✓	✓	✓	✓
Quizzes, periodical exams	✓	✓		
Written Exam	✓	✓	✓	
Oral Evaluation Through Projects	✓	✓	✓	✓

11- Evaluation of the program

	The Evaluator	Tool	Sample	% contribution in total marks of evaluation
1	Senior Students	Questionnaires, Periodic meetings	Questionnaire	20%
2	Alumni	Questionnaire	Questionnaire	15%
3	Stakeholders	Questionnaire	Meeting/ Year	15%
4	External evaluators for program and courses	Site visit, document examination	External evaluator comments	20%
5	Internal evaluators for courses	document examination	Internal evaluator comments	20%
6	Other Methods	Questionnaire in event	Comments and feedback of the meetings	10%

Affiliation	Name
Program Coordinator	Dr. Gaber Hassan
Dean	Prof. M. Sayed Farag

12- CS Program Matrices

CS Program Mission Vs. Institute Mission (2015-2023)

ملانمة رسالة برنامج علوم الحاسب مع رسالة المعهد (2023-2015)

		Program Mission					
		<i>Providing the labor market with human cadres specialized in computer science distinguished by modern knowledge and professional techniques related to programming languages, expert systems, and artificial intelligence, and keeping pace with developments in the labor market through an educational program based on advanced teaching and learning strategies, scientific research in the field of computer science, and innovative community activities to build graduates with a competitive advantage with good societal values and morals.</i>					
			Providing the labor market with human cadres specialized in computer science	modern knowledge and professional techniques related to programming languages, expert systems, and artificial intelligence	educational program based on advanced teaching and learning strategies, scientific research in the field of computer science,	innovative community activities	build graduates with a competitive advantage with good societal values and morals.
Institute Mission (2015-2023)	<i>The Institute contributes to providing the needs of the local labor market of specialists in Accounting, Management, Information Systems and computer science, through a high-quality educational and research process consistent with national standards with adherence to ethical and professional rules, as well as continuous interaction with various community parties to contribute to achieving the goals of economic and social development.</i>	High-quality educational and research process	√				
		Conform to national standards		√	√	√	
		Compliance with ethical and professional rules					√
		Continuous interaction with various community parties to contribute to achieving the goals of economic and social development				√	√

CS Program Mission Vs. Institute Mission (2023-2028)

ملانمة رسالة برنامج علوم الحاسب مع رسالة المعهد (2028-2023)

		CS Program Mission					
		<p><i>“Preparing a graduate with a high competitive advantage in computer science, characterized by modern knowledge and professional techniques related to programming languages, expert systems and artificial intelligence, and keeping pace with developments in the labor market through an educational program based on advanced teaching and learning strategies, scientific research in the field of computer science, and innovative community activities with good societal values and morals”</i></p>					
			Preparing a graduate with a high competitive advantage in computer science	characterized by modern knowledge and professional techniques related to programming languages, expert systems and artificial intelligence	keeping pace with developments in the labor market through an educational program based on advanced teaching and learning strategies	scientific research in the field of computer science	innovative community activities with good societal values and morals
Institute Mission (2023-2028)	Obour High Institute for Management & Informatics seeks through its management, accounting, information systems and computer science programs, to prepare a skillful graduate capable of innovation and entrepreneurship,	seeks through its management, accounting, information systems and computer science programs, to prepare a skillful graduate capable of innovation and entrepreneurship,	√	√	√		
	keeping pace with developments in the local, regional and international labor market needs through a distinguished educational, learning and research environment consistent with digital transformation development	keeping pace with developments in the local, regional and international labor market needs		√	√		
	through a distinguished educational, learning and research environment consistent with digital transformation development	through a distinguished educational, learning and research environment consistent with digital transformation development		√		√	
	to meet societal needs and achieve Sustainable Development Goals	to meet societal needs and achieve Sustainable Development Goals				√	√

Program Aims Vs. Program Mission (2019 - 2023)

مصفوفة تحقيق أهداف البرنامج لرسالة البرنامج (2023-2019)

		Program Mission				
		<i>Providing the labor market with human cadres specialized in computer science distinguished by modern knowledge and professional techniques related to programming languages, expert systems, and artificial intelligence, and keeping pace with developments in the labor market through an educational program based on advanced teaching and learning strategies, scientific research in the field of computer science, and innovative community activities to build graduates with a competitive advantage, with good societal values and morals</i>				
		Providing the labor market with human cadres specialized in computer science	modern knowledge and professional techniques related to programming languages, expert systems, and artificial intelligence	educational program based on advanced teaching and learning strategies, scientific research in the field of computer science,	innovative community activities	build graduates with a competitive advantage with good societal values and morals.
Program Aims	1. Provide a rigorous study of the theory and principles underlying modern computing applications.		√	√		
	2. Develop a high degree of expertise in application, integration and critical evaluation of a range of computing tools and facilities.	√	√	√	√	√
	3. Develop an ability to use, compare, modeling , design and critically evaluate a range of formal and informal techniques, theories, and methods applied to the development of applications of computing and computer based systems.		√	√		
	4. Encourage an understanding of the individual, social, organizational and economic applications of computing.	√			√	√
	5. Provide graduates with the ability to carry out a work plane with minimal supervision.	√			√	√
	6. Develop abilities to communicate effectively verbally and written through hybrid systems.	√			√	√
	7. Promote the knowledge and skills required by computing industry.	√	√	√		√
	8. Stimulate an interest in computing as an academic discipline, with a view to encouraging progression to postgraduate research.		√	√	√	
	9. Possess the requisite knowledge and abilities necessary for the computing, information industry and requirement of potential employers.		√	√	√	
	10. Provide students with appropriate study, Knowledge and professional experience of good societal values and morals.		√	√		√

Program Aims Vs. Program Mission (2023 - till present)

مصفوفة تحقيق أهداف البرنامج لرسالة البرنامج (2023 - حتى تاريخه)

		Program Mission				
		<i>“Preparing a graduate with a high competitive advantage in computer science, characterized by modern knowledge and professional techniques related to programming languages, expert systems and artificial intelligence, and keeping pace with developments in the labor market through an educational program based on advanced teaching and learning strategies, scientific research in the field of computer science, and innovative community activities with good societal values and morals”</i>				
		Preparing a graduate with a high competitive advantage in computer science	characterized by modern knowledge and professional techniques related to programming languages, expert systems, and artificial intelligence	keeping pace with developments in the labor market through an educational program based on advanced teaching and learning strategies	scientific research in the field of computer science	innovative community activities with good societal values and morals
Program Aims	1. Provide a rigorous study of the theory and principles underlying modern computing applications.	√	√			
	2. Develop a high degree of expertise in application, integration and critical evaluation of a range of computing tools and facilities.	√	√	√		
	3. Develop an ability to use, compare, modeling , design and critically evaluate a range of formal and informal techniques, theories, and methods applied to the development of applications of computing and computer based systems.	√	√	√		
	4. Encourage an understanding of the individual, social, organizational and economic applications of computing.	√	√			
	5. Provide graduates with the ability to carry out a work plane with minimal supervision.	√				
	6. Develop abilities to communicate effectively verbally and written through hybrid systems.					√
	7. Promote the knowledge and skills required by computing industry.	√	√			
	8. Stimulate an interest in computing as an academic discipline, with a view to encouraging progression to postgraduate research.			√	√	
	9. Possess the requisite knowledge and abilities necessary for the computing, information industry and requirement of potential employers.	√				
	10. Provide students with appropriate study, Knowledge and professional experience of good societal values and morals.				√	√

مصفوفة ملائمة أهداف البرنامج مع مواصفات الخريج - Program Aims Vs. Graduate Attributes

		Program Aims									
		1. Provide a rigorous study of the theory and principles underlying modern computing applications.	2. Develop a high degree of expertise in application, integration and critical evaluation of a range of computing tools and facilities.	3. Develop an ability to use, compare, model, design & critically evaluate a range of formal & informal techniques, theories, & methods applied to the development of applications of computing & computer based systems.	4. Encourage an understanding of the individual, social, organizational and economic applications of computing.	5. Provide graduates with the ability to carry out a work plane with minimal supervision.	6. Develop abilities to communicate effectively verbally and written through hybrid systems.	7. Promote the knowledge and skills required by computing industry.	8. Stimulate an interest in computing as an academic discipline, with a view to encouraging progression to postgraduate research.	9. Possess the requisite knowledge and abilities necessary for the computing, information industry and requirement of potential employers.	10. Provide students with appropriate study, Knowledge and professional experience of good societal values and morals.
Graduate Attributes	1) Apply the fundamental theories and principles of computing and information applications.	√									
	2) Integrate and evaluate the computing tools and facilities.		√								
	3) Apply knowledge of mathematics and science.	√									
	4) Design a computing system, component and process to meet the required needs within realistic constraints.		√		√						
	5) Exploit the techniques, skills and up-to-date computing tools, necessary for computing and information practice.		√	√				√			
	6) Display professional responsibilities and ethical, societal and cultural concerns.										√
	7) Use, compare and evaluate a range of formal and informal techniques, theories and methods to develop computing and information applications.			√							
	8) Consider and deal with the individual, social, environmental, organizational and economic implications of the application of computing and information.				√						
	9) Carry out a work plan with minimal supervision.					√					
	10) Communicate effectively.						√				
	11) Hold knowledge and skills required by the computing and information industry.							√			
	12) Engage in self and life-long learning and research in computing and information.								√		
	13) Fulfill requirements of potential employers.									√	
	14) Demonstrate knowledge and competence in fundamental areas of computer science such as: algorithms, design and analysis, computational theory, computer architecture and software based systems.	√									
	15) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design, implementation, evaluation and evolution of computer-based systems.		√								
	16) Apply knowledge of mathematics and science to real world problems; as well as to analyze and interpret data.				√			√		√	
	17) Demonstrate the analytic skills necessary to effectively evaluate the relative merits of software and computer systems, and algorithmic approaches.		√	√							
	18) Understand and apply a wide range of principles and tools of software engineering, such as design methodologies, choice of algorithm, language, software libraries and user interface technique.	√	√	√							
	19) Understand and apply a wide range of principles and tools of natural language processing and data mining	√	√	√							
	20) Have a solid understanding of the used concepts in computer science to be able to pursue further learning, whether as graduate students or on their own.								√		
	21) Demonstrate an understanding of algorithms and data structures, computer organization and architecture, programming language concepts, compilers, networks, artificial intelligence, graphics, human computer interfaces, and databases, and identify and define the computing requirements for its solution.	√	√	√							
	22) Design, implement, and evaluate a computer-based system, process, component or program.		√	√							
	23) Use knowledge and understanding in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoff involved in design choices.			√							

مصفوفة توافق ILOs البرنامج مع NARS

[illegible]

مصفوفة توافق ILOs البرنامج مع المقررات والتدريب الميداني

[illegible]

مصنوفة تو افق ILOs البرنامج مع طرق التعليم والتعلم والتقييم

Program ILOs	Learning & Teaching Methods											Assessment Methods					
	Direct teaching strategy	Active Learning	Brainstorming Strategy	E-Simulation	Mobile Learning	Learning Environment	Problem solving	Learning based on critical thinking	Cooperative learning strategy	Self-learning strategy	Project-based learning	Assignments	Regular exams	Mid-term exams	Practical exams (if applicable)	Theoretical Exams	Graduation projects
(a) Knowledge & Understanding	√					√						√	√	√		√	
(b) Intellectual skills			√				√					√	√	√		√	
(c) Professional / Practical skills		√						√		√	√				√	√	√
(d) General & Transferable Skills				√	√				√		√				√		√

