



Kuwait University
College of Computing Sciences and Engineering
Department of Information Science

STUDENT HANDBOOK

MASTER OF SCIENCE
IN
COMPUTING INFORMATION SYSTEMS
(MSCIS)

2019-2020

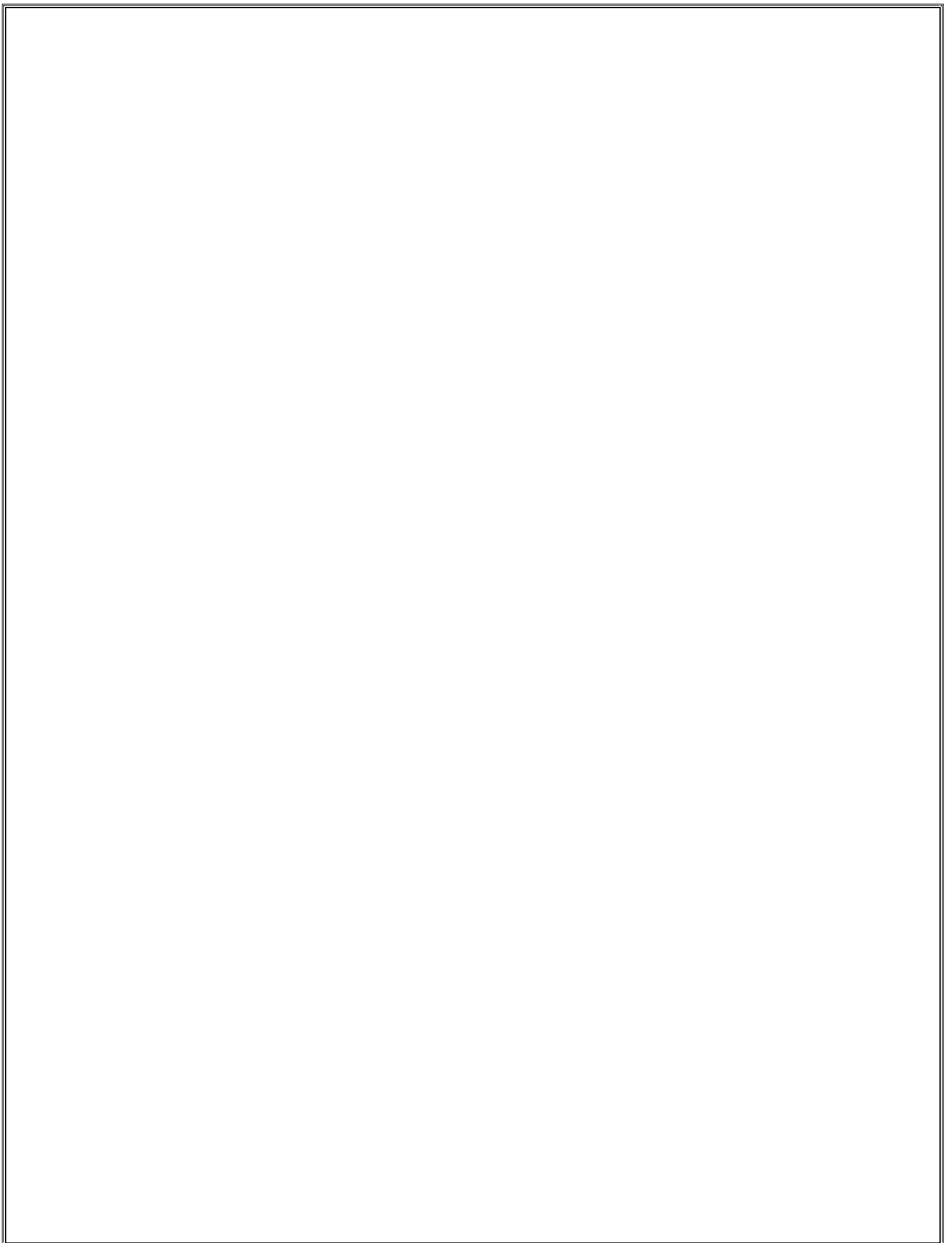


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1. INTRODUCTION

In 2018, the Department of Information Science has embarked on introducing a graduate program that leads to a Master of Science in Computing Information Systems (MSCIS) degree. Full-time and part-time students will be admitted to this program. The MSCIS program features a thesis and non-thesis options. The program allows students to select a group of courses that constitute a career-track. The program offers four career tracks: Information Systems Security, Information Systems Development, Data and Knowledge Management, and Health Informatics. Each career track includes a core course and a set of track elective courses. The program is designed to allow its candidates acquire the knowledge, advanced skills, systems development methodologies, and technologies needed to design, manage, evaluate and implement Information Systems (ISs), applications and services within enterprises and organizations. Subjects are introduced with a balanced multidisciplinary approach and cover advanced IS theory, practices, and management. A strong emphasis of the program is on graduating MS holders equipped with the advanced knowledge and skills needed for their enterprise/organizations to complete strongly in the global marketplace.

2. PROGRAM MISSION

The mission of the Master of Science in Computing Information Systems (MSCIS) is to offer high-quality and career-oriented graduate education in order to bridge the gap between information systems and industries by keeping pace with rapidly growing knowledge and changing technologies. The program provides inter-disciplinary approach for preparing graduates with expertise in information systems. The program structure allows students to build career elective choices based on their individual career goals.

3. PROGRAM EDUCATIONAL OBJECTIVES

The primary objective of MSCIS program is to respond to the changing needs of the global economy for individuals who can develop innovative, information system-based solutions. The program addresses the growing need for information system leaders in areas including Information Systems Development, Information Systems Security, Data and Knowledge Management and Health Informatics.

Graduates of the MSCIS are expected to attain the followings within the first few years of graduation:

1. Engage in a productive career with solid knowledge enabling them to design, develop, analyze, and manage Information Systems for public and private enterprises use.
2. Acquire state-of-the-art technologies and design methodologies in Information Systems.
3. Develop their professional career through broadening their knowledge and/or pursue further graduate Ph.D. studies in the computing information systems and related areas.

4. PROGRAM LEARNING OUTCOMES

The procedural objectives of the program are to produce graduates who:

1. Apply skillfully the knowledge of designing, implementing, deploying, and managing Information Systems (ISs) that provide business solutions for modern enterprises.
2. Possess the know-how of applying and managing cutting-edge Information Technology (IT) skills in today's competitive marketplace.
3. Apply world class Information System security standards in modern enterprises and organizations.
4. Apply most up-to-date methodologies in data management and knowledge discovery.
5. Apply the modern knowledge and skills needed in managing healthcare related Enterprises.
6. Keep pace with the rapidly changing technologies.

5. ADMISSION REQUIREMENTS

This program is designed to cater to candidates with undergraduate degrees in related disciplines who wish to pursue a career in Computing Information Systems. Candidates with any of the following qualifications are eligible to apply:

- BS in Information Science.
- BS in Computer Science or Computer Engineering.
- BS in Information Systems or Information Technology.
- A related BS degree in addition to work experience in IS related jobs as determined by the department.

The following requirements need also to be met:

- A minimum Overall GPA of 2.67 (4.00 basis), Major GPA of 3.00 (4.00 basis) or equivalent.
- A minimum of TOEFL score of 500 or equivalent.

Admission requirements are subject to change. New requirements are normally included in the call for applications published by the College of Graduate Studies.

Full-time and part-time students will be admitted to this program.

6. PROGRAM SUMMARY

MSCIS program component	Non-Thesis Option (CRs)	Thesis Option (CRs)
Compulsory Credit	14	14
Elective Credits	6	3
Track Credits	12	9
Project (1731-593)	3	NA
Thesis (1731-597,1731-598, 2000-599)	NA	9
Total Credit	35	35

7. PROGRAM REQUIREMENTS

7.1. COMPULSORY GENERAL CORE COURSES (for all students)

Course Number	Course Title	(Credit Hours)	Prerequisite
1731-511	Information Systems Infrastructure	(3)	None
1731-512	Information Systems Analysis, Modeling & Design	(3)	None
1731-513	Enterprise Models	(3)	None
1731-501	Scientific Writing & Communication Skills	(3)	None
1731-503	Ethics and Professionalism	(2)	None

COMPULSORY FOR THESIS OPTION		COMPULSORY FOR NON-THESIS OPTION	
Course	(CR)	Course	(CR)
1731-597 I	(0)	1731-593 (project)	(3)
1731-598 II	(0)		
2000-599 III	(9)		

7.2. ELECTIVE COURSE REQUIREMENT

MSCIS (Non-thesis Option): 6 CRs

MSCIS (Thesis Option): 3 CRs

Course No	Course name	Prerequisite
1731-514	Information Systems Strategy and Policy	1731-513
1731-516	Project and Change Management	1731-512
1731-517	Emerging Trends in Information System	1731-511
1731-533	Special Topics in Information System I	1731-511, 1731-512, 1731-513
1731-534	Special Topics in Information System II	1731-511, 1731-512, 1731-513
1731-540	Concepts in Information System Security	1731-511
1731-560	Advances in Information Systems Architecture and Design	1731-512
1731-570	Database Management Systems	1731-512
1731-580	Health Informatics	1731-513

*Students are allowed to take up to 6 credit hours (as part of the Elective Courses) from any 500 level courses offered by other departments at Kuwait University subject to the approval of the MSCIS Graduate Program Committee.

7.3. TRACK COURSES

MSCIS Non-thesis Option: 12 CRs

MSCIS Thesis Option: 9 CRs

Students select courses exclusively from one of the following four tracks.

Track 1: Information Systems Security

Compulsory course		
1731-540	Concepts in Information System Security	1731-511
Elective track courses (Thesis Option: 2 courses – Non-Thesis Option: 3 courses)		
1731-541	Computer and Network Forensics	1731-540
1731-542	Web Application Security	1731-540
1731-543	Disaster Recovery Planning	1731-540
1731-544	Information Security Strategies and Risk Management	1731-540
1731-545	Special Topics in Information Systems Security I	1731-540
1731-546	Special Topics in Information Systems Security II	1731-540

Track 2: Information Systems Development

Compulsory course		
1731-560	Advances in Information Systems Architecture and Design	1731-512
Elective track courses (Thesis Option: 2 courses – Non-Thesis Option: 3 courses)		
1731-561	Human Computer Interaction	1731-560
1731-562	Design and Implementation of e-Governance	1731-560
1731-563	Information System Testing, Quality Assurance, and Maintenance	1731-560
1731-564	Design and Implementation of e-Commerce	1731-560
1731-565	Special Topics in Information Systems Development I	1731-560
1731-566	Special Topics in Information Systems Development II	1731-560

Track 3: Data and Knowledge Management

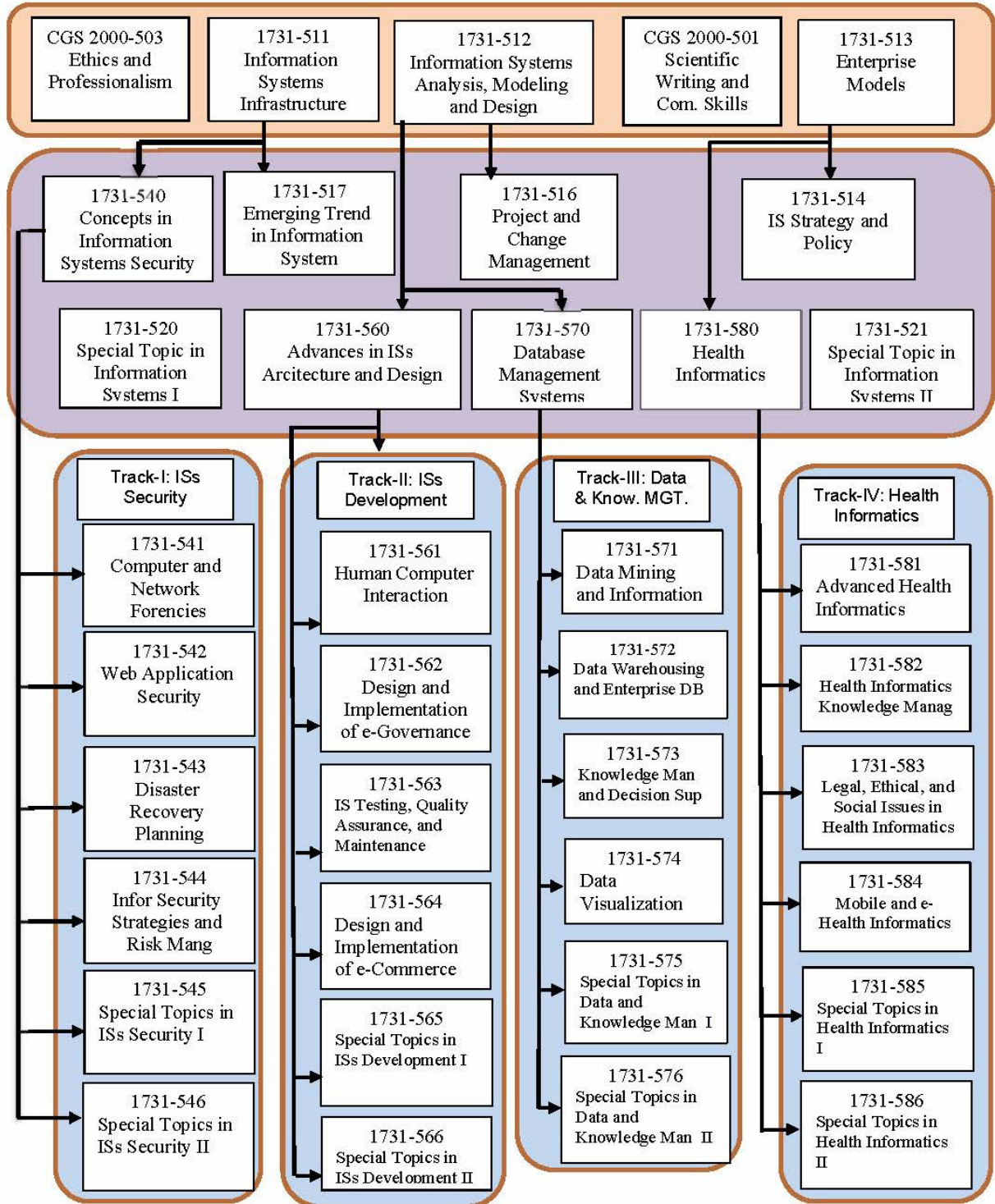
Compulsory course		
1731-570	Database Management Systems	1731-512
Elective track courses (Thesis Option: 2 courses – Non-Thesis Option: 3 courses)		
1731-571	Data Mining and Information Retrieval	1731-570
1731-572	Data Warehousing and Enterprise Databases	1731-570
1731-573	Knowledge Management and Decision Support	1731-570
1731-574	Data Visualization	1731-570
1731-575	Special Topics in Data and Knowledge Management I	1731-570
1731-576	Special Topics in Data and Knowledge Management II	1731-570

Track 4: Health Informatics

Compulsory course		
1731-580	Health Informatics	1731-513
Elective track courses (Thesis Option: 2 courses – Non-Thesis Option: 3 courses)		
1731-581	Advanced Health Informatics	1731-580
1731-582	Health Informatics Knowledge Management	1731-580
1731-583	Legal, Ethical, and Social Issues in Health Informatics	1731-580
1731-584	Mobile and e-Health Informatics	1731-580
1731-585	Special Topics in Health Informatics I	1731-580
1731-586	Special Topics in Health Informatics II	1731-580

7.4. COURSE DEPENDENCY GRAPH

MSCIS Course Dependency Graph



8. GRADUATION REQUIREMENTS

8.1. REQUIREMENTS FOR MSCIS WITH THESIS

1. Passing all the required courses (33CRs).
2. Obtaining minimum GPA of 3.00.
3. Passing the thesis examination.

MSCIS Thesis Path

Course Requirements for the Thesis option

Completing course requirements for a total of 26 CRs (including 14 CRs of core courses: 1731-511, 1731-512, 1731-513, 2000-501, 2000-503, 3 CRs of elective courses, and 9 CRs of track courses)

Registration of course 1731-597: Thesis Proposal needs to be submitted.

The following duly filled forms should be submitted to supervisor and subsequently to CGS through MSIT program director

1. **AC/1 T: Request to register for the Master's Thesis**
This form should be submitted to the CGS 4 weeks before the beginning of the semester in which the student is currently registered for thesis.
2. **AC/2 T: Thesis research proposal and budget**
This form should be submitted to CGS within 5 weeks from the beginning of the semester in which the student is currently registered for thesis.
3. **AC/3 (If needed): Change of supervisory committee and request to change study option.**

Registration of course 1731-598: Student must have satisfactory progress (S) in course 1731-597.

Registration of course 2000-599: Thesis Defense (9 CRs).

1. Candidate must have satisfactory progress in course 1731-598, reported by the supervisor to CGS.
2. Candidate can register the 2000-599 course as a co-requisite to 1731-598.

On completing the requirements of course 2000-599 satisfactorily, the following forms have to be duly filled and submitted to CGS through MSIT program director:

1. **AC/4:** Thesis examination committee: Two copies of the thesis (one spiral bound and one soft copy) must be submitted with the form.
2. **AC/6T:** Thesis examination date to be filled by MSIT program director.
3. **AC/7:** Thesis examination result to be filled by convener of thesis examination committee.
4. **AC/8:** Form for distributing final bound thesis to be duly filled and submitted.
5. **AC/9:** Submitting custody Items to be filled by student and submitted to the CGS through MSIT program director.
6. **AC/10:** Thesis binding allowance to be filled by student and duly submitted.

8.2. REQUIREMENTS FOR MSCIS NON-THESIS

1. Passing all the required courses (35CR).
2. Obtaining minimum GPA of 3.00.
3. Passing the comprehensive examination.

MSCIS Non-Thesis Path

Course Requirements for the Non-Thesis option

Completing course requirements for a total of 32 CRs (including 14 CRs of core courses: 1731-511, 1731-512, 1731-513, 2000-501, 2000-503 and 6 CRs of elective courses, and 12 CRs of track courses)



Student registers in the following course

1731-593: Project (3 CR)



The following duly filled forms should be submitted to supervisor and subsequently to the CGS through MSIT program director

- 1. AC/1 P: Request to register for the Master's Project**
This form should be submitted to the CGS within 4 weeks before the beginning of the semester in which the student is currently registered for project (1731-593).
- 2. AC/2 P: Project Research Proposal & Budget**
This form should be submitted to CGS within 5 weeks from the beginning of the semester in which the student is currently registered for project.
- 3. AC/3 (If needed):** Change of supervisory committee & request to change study option.



Comprehensive examination

1. Non-thesis MSIT students are eligible to take the comprehensive exam after satisfactorily passing the core courses (1731-511, 1731-512, 1731-513, 2000-501, 2000-503).
2. A student has to pass the comprehensive examination arranged by MSCIS departmental committee under the article (22) of CGS by-laws.



1. A student must submit a project report and give a project presentation to the project supervisor.
2. **AC/9:** Submitting custody Items to be filled by student and submitted to the CGS through MSCIS program director.

9. THESIS REGISTRATION

Upon completing one semester, a graduate student may (with the approval of the academic supervisor, the program director and the CGS) register for a thesis in accordance with the following rules:

1. Completion of a minimum of 12 credits of courses approved for the degree, with a minimum GPA of 2.67.
2. Registration for a thesis as a full-time study load.
It should be noted that registration for thesis may last for more than one semester and the student must register every semester until graduation. The thesis under preparation is given a grade of "Satisfactory (S)" or "Unsatisfactory (U)". The final grade given after thesis examination is either Pass (P) or Fail (F).
3. Fulfillment of the thesis registration forms.
It should be noted that the required forms can be obtained on-line (www.kuniv.edu.kw) or from the program director.

10. MASTER'S THESIS

10.1. SUPERVISION OF THESIS

An academic supervisor shall be nominated for each Master's student who is required to prepare a thesis. The nomination should take place as soon as possible but not later than the end of the semester following the one in which the student was admitted. The supervisor's major field of specialization should be the same as that of the student. A co-supervisor whose major field of specialization or program is different from that of the student but related to the student's research, may be nominated.

The Program Committee submits its recommendation for the nomination of the main supervisor and co-supervisor (if any) to the College of Graduate Studies (CGS) for approval. The approval is based on satisfying the requirements stipulated by CGS. The student is supposed to have only one main supervisor. The addition of a co-supervisor should be justified and approved by the College of Graduate Studies after studying the matter.

10.2. RESPONSIBILITIES OF THE MAIN SUPERVISOR AND CO-SUPERVISOR

The main supervisor is primarily responsible for guiding the student through various stages leading to the preparation and submission of the thesis. These stages include selecting a research topic, formulating the research plan, registering for the thesis, conducting the actual research, and writing the thesis. Other responsibilities of the main supervisor are as follows:

1. Accounting for any payments made for the student's thesis research, in accordance with the relevant guidelines and prescribed procedures.
2. Conducting periodical evaluation of the student's research performance and thesis under preparation.

3. Participating in the final evaluation of the student's thesis.

The role and responsibilities of the co-supervisor are determined by the concerned Program Committee.

10.3. EVALUATION OF THESIS

All thesis prepared by Master's degree students at Kuwait University are evaluated by external referees. Details on the rules governing the evaluation process and the procedures that have to be followed, can be found in the booklet entitled "A Guide to Master's Thesis".

10.4. THESIS EXAMINATION COMMITTEE

The Thesis Examination Committee is formed according to article (24) of the CGS by-laws. In the case of resorting to voting in order to determine the result of the examination, the vote should be counted as follows:

1. Supervisor or co-supervisor or both (one vote)
2. The two faculty members in the major specialization of the student (one vote each)
3. Report of the external referee (one vote)
4. Report of the second external referee if resorted to (one vote).

In the case of equal number of votes on both sides, the opinion of the side which include the Committee Chairman shall prevail.

11. COMPREHENSIVE EXAMINATION

Each non-thesis graduate student has to pass a written and oral examination. The examination must be so comprehensive as to reveal the extent of the student's preparation to pursue graduate studies in his/her field of specialization. In particular, it must show the student's capabilities with respect to synthesis, analysis, interpretation, application and discussion.

The Program Committee shall lay down clear written rules as well as a well-defined policy on comprehensive examination and inform the concerned students, about the following:

1. Date, time, and place of holding the comprehensive examination.
2. Clearly defined and written academic subject in which the students are to be examined.

The Comprehensive Examination may be conducted through the committees of oral examinations which are held for each course, provided that the area committee specifies the rules and regulations under which these examinations shall be held and attended, and the comprehensiveness in the field of specialization is taken into consideration.

11.1. COMPREHENSIVE EXAMINATION COMMITTEE

The Comprehensive Examination Committee consists of at least three members of the academic program, appointed by the Dean of the College of Graduate Studies upon the recommendation of the program committee. The committee carries out the task of examining the students and delivering the results, using the form prepared for that purpose, to the program committee for submission to the College of Graduate Studies.

11.2. GRADE OF THE COMPREHENSIVE EXAMINATION

The student's grade in the Comprehensive Examination shall be "Pass" or "Fail".

A student who fails the examination for the first time must repeat it during the next semester. If the student fails for the second time he/she is academically dismissed from the Master's Degree Program.

12. COURSE DESCRIPTION

I. Computing Information Systems Core Courses

1731-511–Information Systems Infrastructure

This course addresses the advanced concepts and practice of acquiring and setting the main building blocks of information systems (ISs) infrastructure for enterprise applications. Topics covered include ISs architecture and classifications, enterprise information infrastructure, enterprise network design & architecture, server architecture, web services, enterprise LAN/WAN services, storage identification and management, wireless technologies, network security, systems platform, and resource management.

Prerequisite: None

1731-512 –Information Systems Analysis, Modeling and Design

This course emphasizes modern object-oriented methods for information system analysis and design. Topics covered include: Systems development life cycle, analysis and design techniques, information systems planning and project identification & selection, requirements collection and structuring, process modeling, conceptual and logical data modeling, system design, design of human-computer interface, and system maintenance. The course also exposes students to the use of current generation tools such as rapid application development, prototyping, and visual development. Students are required to complete a term project.

Prerequisite: None

1731-513 – Enterprise Models

This course provides a process-oriented view of the organization and its relationship with suppliers, customers, and competitors. Topics covered include: processes as vehicles for achieving strategic objectives and transforming the organization, process analysis, design, implementation, control and monitoring, processes as means of achieving compliance, impact on work, the role of enterprise resource planning (ERP), supply chain management (SCM), and customer relationship management (CRM) systems. The course also covers process continuum from structured to unstructured processes, impact on work practices, roles of systems in transforming organizations and markets, and the global perspectives.

Prerequisite: None

CGS 2000-501 – Scientific Writing and Communication Skills

The course includes a review of the language of scientific writing and its appropriate use; the art of writing a grant proposal, thesis and manuscript for publication, and the use of applied statistics, soft wares for references, how to respond to reviewers' comments and a brief description of the fate of a submitted manuscript; communicating and/or disseminating scientific information to an audience of small or large group.

Prerequisite: None

CGS 2000-503 -- Ethics and Professionalism

Definition of ethics and professionalism. Ethics in conducting research and reporting results. Plagiarism. Code of ethics. Components of ethics and professionalism for example being trustworthy, reliable, responsive, approachable, etc. Ethics in Islam. Ethics and Professionalism for individuals and institutions. Professionalism and leadership. Environmental ethics. Conflict of interest. Case studies.

Prerequisite: None

II. Elective Courses

1731-514 –Information Systems Strategy and Policy

This course covers the top management, strategic perspective for aligning competitive strategy, core competencies, and information systems. The course also covers the development and implementation of policies and plans to achieve organizational goals including defining the systems that support the operational, administrative, and strategic needs of the organization, its business units, and individual employees. Covered also are approaches used to manage information system functions in organizations, including examination of the dual challenges of effectively controlling the use of well-established information technologies, while experimenting with selected emerging technologies. Role of the CIO is also covered.

Prerequisite: 1731-513

1731-516 – Project and Change Management

This course emphasizes managing projects within an organizational context. Topics include the processes related to initiating, planning, executing, controlling, reporting, and closing a project, project integration, scope, time, cost, quality control, and risk management, software size and cost estimation, assigning work to programmer and other team members, monitoring progress, version control, managing the organizational change process, identifying project champions, working with user teams, training, and documentation. Covered also are the change management role of the IS specialist, the use of sourcing and external procurement, contracts and managing partner relationships.

Prerequisite: 1731-512

1731-517 – Emerging Trends in Information Systems

This course addresses emerging trends in information systems (ISs) design, implementation, and security. It emphasizes the growth of ISs and the effect of international political, social, economic and cultural factors on their evolvement. Topics covered include IS agility issues, enterprise resource planning (ERP) & forecasting, technology related privacy concerns, international perspectives on emerging technologies, future organizational and customer trends. The course also covers topics related to ISs technology forecasting methodologies including monitoring, expert opinion, and trend analysis.

Prerequisite: 1731-511

1731- 520 – Special Topics in Information System I

A set of most-up-to-date topics related to the field of Information Systems will be studied in this course.

Prerequisite: 1731-511, 1731-512, 1731-513

1731- 521 – Special Topics in Information Systems II

A set of most-up-to-date topics related to the field of Information System will be studied in this course.

Prerequisite: 1731-511, 1731-512, 1731-513

1731-540 – Concepts in Information Systems Security

This course allows students to gain fundamental understanding of cryptography and security protocols, and their applications in various areas, including operating system security, database security, software security, and networking security. Emphases are on cryptanalysis and cipher security. Covered also are the DES algorithm, block and cipher feedback modes, the AES algorithm, public-key cryptography, the RSA algorithm, message authentication, hash functions, network encryption, and network attacks. Covered also are ethics and legal issues, and management of security systems.

Prerequisite: 1731-511

1731-560 – Advances in Information Systems Architecture and Design

This course provides a working knowledge of the terms, principles and methods of information system architecture and module design. It explains the constraints on the design and the properties of capacity, response time, consistency, and concurrency. Topics include: architectural styles and patterns, interface isolation, decoupling, reuse, data structures, design simplification and refactoring, generalized design solutions for information system design problems, and the reuse of design patterns.

Prerequisite: 1731-512

1731-570– Database Management Systems

The objective of this course is to help students develop their data organization and management skills by introducing them to the fundamentals of data collections, retrieval, storage, and processing. Topics covered include: data organization and management techniques, conceptual data modeling, organizational data implementation issues, data warehousing current and emerging techniques, business intelligence, organization data/information security, data stream management, data management tools, customer relationship management, business performance management, and decision making.

Prerequisite: 1731-512

1731-580—Health Informatics

This course covers the concepts of health informatics and explores the impact of Information Technology (IT) on healthcare enterprise. Topics covered include: introduction to healthcare information, healthcare data Quality; identification of healthcare organization business functions and their modeling, current and emerging use of clinical information systems, healthcare information system standards and security issues. The course also covers the topics related to strategic planning for healthcare information systems and health IT leadership. The course helps students to plan and build healthcare information systems through a set of course projects.

Prerequisite: 1731-513

III. Track Courses

1731-541 – Computer and Network Forensics

This course covers cyber-attack prevention, planning, detection, response, and investigation with the goals of counteracting cybercrimes, and making the responsible persons/groups accountable. Topics covered include: fundamentals of digital forensics, forensic duplication and analysis, network surveillance, intrusion detection and response, incident response, anti-forensics techniques, anonymity and pseudonymity, cyber law, computer security policies and guidelines, and case studies.

Prerequisite: 1731-540.

1731-542 – Web Application Security

The course provides students with better understanding of web application vulnerabilities, specifically covering OWASP Top 10 and mitigation strategies to ensure applications are tested and secured against the latest threats. Focus will be on practical experience using vulnerability scanners and web proxy tools to detect and prevent input validation flaws. Cross-Site Scripting (XSS), Cross-Site Request Forgery (CSRF), SQL Injection, as well as in-depth understanding of authentication, access control, and session management, their weaknesses, how they can be hijacked, and how they are best defended.

Prerequisite: 1731-540.

1731-543 – Disaster Recovery Planning

This course explores an in-depth coverage of disaster recovery planning including techniques to prevent, detect, and recover from loss of information availability. Particular emphasis is placed on assessing threats which may lead to disastrous events, evaluating control alternatives and implementing strategies. The course helps students to formulate a disaster and recovery plan, and test and implement the plan in the form of a project.

Prerequisite: 1731-540.

1731-544 – Information Security Strategies and Risk Management

This course covers the strategies, procedures and policies to manage and mitigate risk in information systems. It also covers risk analysis techniques that can be used to identify and quantify both accidental and malicious threats to computer systems within an organization. In addition to technical solutions, the course considers strategies and policies that will provide cost effective and highly secure systems.

Prerequisite: 1731-540.

1731-545 – Special Topics in Information Systems Security I

A set of most-up-to-date topics related to the field of Information Systems Security will be studied in this course.

Prerequisite: 1731-540.

1731-546 – Special Topics in Information Systems Security II

A set of most-up-to-date topics related to the field of Information Systems Security will be studied in this course.

Prerequisite: 1731-540.

1731-561– Human Computer Interaction (HCI)

This course covers the topics of human characteristics and their impacts on developing human-centered information systems, fit between human, technology, and tasks to achieve high performance and satisfaction within organizational and business context, HCI development processes that concerns the entire lifecycle of the information system, HCI evaluation concerns, techniques, issues, and standards.

Covered also in the course are the organizational and business context of HCI, interactive technologies, ergonomic engineering, cognitive engineering, affective engineering, Evaluation issues, concerns, techniques and standards, HCI design principles and guidelines, tasks in organizational context, componential design, HCI development methodology and its relation to systems analysis and design, impacts of HCI on users, organizations, and society, and business value of HCI.

Prerequisite: 1731-560.

1731-562: Design and Implementation of e-Governance

This course addresses the design and implementation aspects of e-Governance. Students will be exposed to concepts and models of e-Government including stockholders and their rights. Topics include e-Government infrastructure, m-Government, v-Government, public administration & public policy, analysis of standards of e-Governance, transparency and Information Act. Management of e-Governmental database including security issues, integration of distributed systems including heterogeneous databases of different departments and regions are also discussed in the course.

Prerequisite: 1731-560.

1731-563 – Information System Testing, Quality Assurance, and Maintenance

This course covers the concepts and techniques for testing an information system and assuring its quality. Topics include software testing at all levels, integration testing, techniques of test data selection, test oracle design, test data analysis, static vs. dynamic analysis, functional testing, inspections, software quality assessment, software maintenance, configuration management, and capacity management.

Prerequisite: 1731-560.

1731-564 – Design and Implementation of e-Commerce

This course starts by introducing the concepts of e-commerce including nature and scope of e-commerce, success & failure of e-commerce operations and identifying key factors in their success or failure, promotional strategies, monitoring and adjusting e-commerce strategies. The course continues with e-commerce tools, e-commerce design, and e-commerce development. The course helps students to build fully functional web sites using database and client- and server-side technologies.

Prerequisite: 1731-560.

1731-565 – Special Topics in Information Systems Development I

A set of most-up-to-date topics related to the field of information systems development will be studied in this course.

Prerequisite: 1731-560.

1731-566 – Special Topics in Information Systems Development II

A set of most-up-to-date topics related to the field of information systems development will be studied in this course.

Prerequisite: 1731-560.

1731-571 – Data Mining and Information Retrieval

This course explores web mining as the discovery of knowledge from online resources such as web page content, a hyperlink structure, and a usage log, to mention a few. Using the already learned knowledge in the Data Management course, this course allows students to use web mining techniques to broaden their selection of data sources. In addition, students will learn various online and offline information retrieval models, algorithms, principles, and techniques on data sources such as text.

Pre-requisites: 1731-570.

1731-572 – Data Warehouse and Enterprise Databases

The purpose of this course is to provide a comprehensive in-depth coverage on managing enterprise databases. The main part of this course covers concepts and techniques in the design, implementation, and administration of a data warehouse. Topics covered include: data warehouse architectures, logical and physical design issues, technical factors, and implementation considerations. The course also introduces Online Analytical Processing (OLAP) and multi-dimensional operations. The course also addresses database access standards for enterprise database systems. Special data warehousing concepts for CRM and web-based enterprise databases are also addressed.

Prerequisite: 1731-570.

1731-573– Knowledge Management and Decision Support

This course covers knowledge management (KM) in large organizations doing business and/or providing services over the web. The course addresses issues that are involved in creating, organizing, and using knowledge in web applications. The topics include KM life cycle model, ontology modeling, role of standards, resource description framework (RDF), and business rules and automated reasoning mechanisms. The course also covers applications in decision support systems, expert systems, and recommendation systems.

Prerequisite: 1731-570.

1731-574 –Data Visualization

This course covers the foundations of visually displaying data both for presentation and data analyzing tasks. The goals of the course include data description, understanding, presentation, discovery and analysis. The course starts by graphs and charts foundation, followed by introducing algorithms used to visualize scientific data sets. The course moves on to provide applications from several environments with both real and simulated datasets.

Prerequisite: 1731-570.

1731- 575 – Special Topics in Data and Knowledge Management I

A set of most-up-to-date topics related to the field of Data and Knowledge Management will be studied in this course.

Prerequisite: 1731-570 and consent of the department.

1731- 576 – Special Topics in Data and Knowledge Management II

A set of most-up-to-date topics related to the field of Data and Knowledge Management will be studied in this course.

Prerequisite: 1731-570 and consent of the department.

1731-581—Advanced Health Informatics

This course explores the latest advances in health informatics and the electronic applications in healthcare delivery and management. The course explores the recent impact of IT on the healthcare domain in improving the health related complex decisions, efficient and accurate diagnostics procedure, effective healthcare delivery, and rehabilitation. The topics covered include IT applications in surgical decisions, genetics explorations, cancer detection, medical imaging, and ultrasound.

Prerequisite: 1731-580.

1731-582 – Health Informatics Knowledge Management

The goal of this course is to characterize healthcare knowledge and to examine the technical issues related to the development and deployment of knowledge management solutions for managing healthcare knowledge to support three main activities: Clinical decision support, practitioner and patient education,

and health administration. The course examines technical issues related to the management of healthcare knowledge from an enterprise perspective. It deals with methods to capture, organize and utilize healthcare knowledge to improve the delivery of healthcare. The course is designed along the lines of the standard knowledge management lifecycle, including topics that address knowledge acquisition, organization, processing, sharing and operationalization within a healthcare enterprise.

Prerequisite: 1731-580.

1731-583 - Legal, Ethical, and Social Issues in Health Informatics

This course addresses the legal, ethical, and social issues related to healthcare informatics. The course covers regulatory informatics requirements as they apply to healthcare data and information management systems. Topics covered include: privacy and security, fraud and abuse, confidentiality, antitrust law, intellectual property, disclosure, and compliance programs.

Prerequisite: 1731-580.

1731-584– Mobile and e-Health Informatics

This course explores the changes occurring in the structure and delivery of health services as a result of technologies such as the Internet and mobile devices including smart phones and tablets. Topics include the provision of health services and information via mobile technologies such as mobile phones and wearable sensors, e-health records, e-public information systems, and specific applications of e-health such as e-rehabilitation, e-medicine, e-homecare, e-diagnosis support systems, telemedicine and e-health intelligence. The course also covers strategies in e-healthcare technology management, e-health security issues, and the impacts of e-technologies.

Prerequisite: 1731-580.

1731-585 – Special Topics in Health Informatics I

A set of most-up-to-date topics related to the field of Health Informatics will be studied in this course.

Prerequisite: 1731-580.

1731-586 – Special Topics in Health Informatics II

A set of most-up-to-date topics related to the field of Health Informatics will be studied in this course.

Prerequisite: 1731-580.

II. MSCIS Project and Thesis

1731-593 – Project

Prerequisite: None

1731-597 – Thesis Proposal

Prerequisite: None

1731-598 – Thesis in Progress

Prerequisite: None

2000-599 – Thesis Defense

Prerequisite: None

13. SOME IMPORTANT INFORMATION

1. The following grading scale is used for evaluation of student's performance:

Percentage Range	Letter Grade	GPA
95-100	A	4.00 point
90-94	A-	3.67 point
87-89	B+	3.33 point
83-86	B	3.00 point
80-82	B-	2.67 point
75-79	C+	2.33 point
70-74	C	2.00 point
Less than 70%	F	zero point

2. The study load of a full-time student ranges between (9-15) credits during each semester.
3. The study load of a part-time student ranges between (6-9) credits during each semester. In exceptional cases a student may, with the approval of both the program director and the College of Graduate Studies (CGS), register for less than the specified workload.
4. An employed applicant should submit from the place of work a signed notification of joining the program.
5. A student's final grade can be deferred and a grade of "Incomplete" (I) can be given due to reasons acceptable by the course instructor and approved by the program director. The student has to complete these requirements during the time specified by the CGS, or his/her grade for the course changes to "Fail" (F).
6. A student who studies a course that continues for more than one semester (under semester system), is given a grade of "Continuing Course" (CC). The final grade is recorded only in the last semester of the course. At the end of this semester, it is not allowed to postpone the award of final grade. The course credits (if any) shall be used in computing the student's study load only once.
7. A student who has registered for the thesis, is given a grade of "Satisfactory" (S), or "Unsatisfactory" (U), as long as his/her research is ongoing. The final grade [P/F] is not given until after thesis examination.
8. A student is given one chance to repeat up to a maximum of 2 courses which she/he had previously studied and obtained a grade of B or less. It should be noted that the repetition of a course does not lead to the cancellation of the previously obtained grade. An average of both grades is calculated (See article 18 item 10, CGS by-laws).
9. A student, who is caught cheating or attempting to cheat or helping others to cheat in the exam, will be considered to have failed in all courses registered during the semester in which the cheating occurred.

10. If cheating is repeated, the student is academically dismissed from the CGC and the dismissal is indicated in his/her academic record.
11. If it is confirmed that a student has done anything that violates examination regulations, s/he will be considered to have failed the course for which the examination was taking place when the violation occurred.

14. LIST OF FORMS USED FOR MSCIS PROGRAM

MSCIS student has to fill following forms at different stages as listed in below table. The required form can be download from college of graduate study URL (www.kuniv.edu.kw) or from IS department URL (<http://www.isc.ku.edu.kw>) or from the MSCIS program director office.

The forms and their purpose

Non-Thesis Option		Thesis Option	
AC/1P	Request to register for the Master's project (Non-Thesis option)	AC/1T	Request for Master's Thesis registration
AC/2P	Project research proposal and budget (Non-Thesis option)	AC/2T	Thesis Research proposal and budget
AC/3	Change of Supervisory Committee and change study options in Master's	AC/4T	Thesis Examination Committee
		AC/6T	Thesis Examination date
		AC/7T	Thesis Examination result
		AC/3FF	Transfer of approved budget
		AC/8	For Distributing final bound thesis
		AC/10	Thesis Binding Allowance
Graduation			
AC/9	Submitting custody items		

15. ISC FACULTY MEMBERS' PROFILE

Dr. Abdullah Al Mutairi

Research Interest: Machine Learning, AI, Deep Learning, Data Mining, Computer Vision.

Prof. Anton Cerny

Research Interest: Discrete Mathematics, Combinatorics on Words, Network Reliability.

Dr. Aseel Al Monaeis

Research Interest: Web application migration, Web Services, Service-oriented architecture and Security.

Dr. Bader Ali

Research Interest: Large Scale distributed systems, Social networking inspired trusted network systems, Digital Rights management, Digital identity management.

Dr. Dari Alhuwail

Research Interest: Health Informatics, Information Systems Adoption, Quality Assurance and Performance Improvement, Systems Development, Information and Communication Technologies for Development, Systems Evaluation, Geographical Information Systems, GeoHealth.

Dr. Eiman T. Al Shammari

Research Interest: Data Mining, IT applications (Educational/Environmental).

Dr. Fatima Boujarwah

Research Interest: Human Computer Interaction, Crowdsourcing, Assistive Technologies, Educational Technologies, Autism and Technology.

Dr. Hanady Abdulsalam

Research Interest: Data streams, Data mining, Data gathering in WSN, and scheduling algorithms.

Dr. Helal Al-Hamadi

Research Interest: Fuzzy Logic, Power Quality, Mobile Adhoc Networks.

Prof. Jihad Al Dallal

Research Interest: Software testing, software refactoring, software analysis, and software metrics.

Dr. Kalim Qureshi

Research Interest: Distributed computing, performance measurement of systems, Medical Imaging and IS development.

Prof. Kassem Saleh, Program director

Research Interest: software engineering, distributed systems, programming languages, information security, project management, risk and quality engineering, business analysis.

Dr. Loulwah AlSumait

Research Interest: Data mining, Deep learning, Text mining, Pattern Recognition, Topic modeling.

Prof. Mostafa Abd-El-Barr

Research Interest: Information Systems Security, Cryptographic Algorithms and Structures, Parallel Processing / Algorithms, Computer Networks Optimization, Design and Analysis of Reliable and Fault-Tolerant Computer Systems, Beyond-Binary Logic System Design & Analysis.

Prof. Muhammad Sarfraz

Research Interest: Intelligent Systems, Information Systems, Computer Graphics, Computer Vision, Pattern Recognition, Soft Computing.

Dr. Naelah Al-Dabbous

Research Interest: Wireless Communications, Adaptive Signal Processing, Sensor Networks and information system security.

Dr. Omar Al-Ibrahim

Research Interest: Embedded systems security, web application security, reverse engineering, malware analysis.

Prof. Paul Manuel

Research Interest: Graph Algorithms, Enterprise Computing, Cheminformatics.

Dr. Ranya Al Awadhi

Research Interest: Information, computer, and network security, Fault-tolerant computing.

Dr. Safaa Zaman

Research Interest: Intrusion Detection Systems.

Dr. Sana BuHamra

Research Interest: Environmental statistics, Risk Assessment, Small sample area estimation, Applied statistical modeling; Nonparametric Inference; Modeling and Simulation; Sur-vey design and analysis.

Dr. Shaikha AlDuaij

Research Interest: Data Mining, Cyber Security, Health Informatics.

Dr. Zainab Al-Jazzaf

Research Interest: Web Services, Quality of Services, Service-Oriented Architecture, Trust, Cloud Computing, E-governance, E-Learning.

Dr. Zainab Al-Meraj

Research Interest: Computer Graphics, Human-Computer Interaction (HCI), Usability and accessibility of web and mobile technologies, Assistive technologies.

NOTES

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For more information contact:

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