Program Handbook

College	**Computer Sciences and Information Technology**
Department	**Information Systems**
Program Title	**Master in Computer Information Systems**

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1. Introduction

This program manual serves as a comprehensive guide for students enrolled in the **Master in Computer Information Systems** under the **Information Systems** of the **Computer Science and Information Technology**. It is designed to provide a clear understanding of the program's structure, offerings, and support services, equipping students with essential information to navigate their academic journey successfully.

2. College Name

Computer Sciences and Information Technology

The College of Computer Sciences and Information Technology (CCSIT) at King Faisal University (KFU) was established in the year 2003. The College branched out from the Department of Computer Information Systems at the School of Business. CCSIT comprises of the following four departments:

- Computer Science
- Information Systems
- Computer Networks and Communications
- Computer Engineering

CCSIT currently offers 4 undergraduate programs and 4 postgraduate programs. The undergraduate programs in Computer Science and Computer Information Systems were started in the year academic year 2004-2005. The undergraduate program in Computer Networks and Communication (CN) program started in the academic year 2012-2013 whereas the undergraduate program in Computer Engineering started in recently in 2019-20. The college building was located in building 15, inside main KFU campus.

Department Name

Information Systems

To establish an innovative global program of high quality in education and scientific research, preparing graduates to become leaders and contributors in the field of information systems; and to enhance the community's understanding of the latest technologies and educate them on how to best disseminate and use these technologies in their daily lives.

The objectives of the Information Systems Program:

The objectives of the College of Computer Science and Information Technology are derived from the university's goals. These objectives have been adapted for the Information Systems Program as follows:

- Excellence in teaching and educating in the field of Information Systems.
- Adopting specialized scientific, applied, and collaborative research in Information Systems fields.
- Continuous development of faculty and staff members, enhancing their skills in Information Systems.
- Improving the program's resources, facilities, and infrastructure.
- Providing lifelong learning opportunities in the field of Information Systems.
- Efficient and effective implementation of the Information Systems Program.
- Serving the community by offering IT-based solutions.

Scientific Programs

- Bachelor in Computer Information Systems
- Master in Computer Information Systems

3. Program Title

Master in Computer Information Systems

- **Program mission**

To establish a world-class and innovative Information System (IS) program to prepare IS graduates for advanced careers in IT industry, help IT industry working professionals advance their careers through graduate continuing education, conduct high-quality education and innovative research to advance IS discipline and prepare graduates to serve the community in comprehending, transferring, adapting, and integrating latest technologies into their everyday life.

- **Program Goals**

1. Demonstrate excellence in analysis, critical thinking, strategic planning, and problem-solving skills to model Information Systems solutions
2. Advance academic, research or professional career in information systems and progress to higher-level professional

3. Conduct research in information systems related fields and share knowledge with the scientific community
4. Provide advanced educational and research resources to equip students with the ability to implement newer technologies in the enterprise
5. Integrate technical skills in information systems with the business need to meet organizational goals
6. Engage in life-long learning to adapt to rapidly changing computing problems and information technology environments
7. Build effective leadership, management and communication skills necessary to implement change and innovation in a rapidly changing IT environment

- **Degree**
    - Master in Computer Information Systems

- **Admission Requirements**

  The eligibility criteria for candidates applying for admission to the Master program in Computer Information Systems:

  1. Fulfill all requirements of the Unified Regulations for Graduate Studies in Saudi Universities.
  2. Hold a bachelor's degree in IS/IT or a related field, or in an unrelated field with the condition of completing prerequisite master's courses as determined by the department.
  3. Have a GPA of "Very Good" or its equivalent in their bachelor's degree. Both Saudi and non-Saudi applicants may be accepted with tuition fees.
  4. Demonstrate English proficiency by obtaining a TOEFL-iBT score of 61 or higher, or an IELTS score of 5, or equivalent. Alternatively, a bachelor's degree from an English-medium program is acceptable.
  5. Provide two letters of recommendation.
  6. Submit a certificate of good conduct.
  7. Provide an employer's approval for study (if employed).
  8. Pass a departmental entrance exam or personal interview.
  9. Agree to pay tuition fees.
  10. Meet any other requirements determined by the department or college.

- **Program Learning Outcomes**

  The graduates of the program will be able to:

  - Describe and interpret information systems theories and practices.
  - Analyze scholarly work and apply appropriate research methodologies to conduct effective research.
  - Apply correct techniques and tools for IS development and management by engaging themselves in continuous professional development.
  - Use effective techniques in accomplishing goals and objectives of independent and collaborative efforts.
  - Analyze, design, develop, and evaluate innovative IS solutions that meet organizational needs.
  - Communicate scientific knowledge to a wide range of audiences through effective presentations and writing.
  - Develop or integrate methods and analytical approaches to research that contributes to extending knowledge in the discipline of information systems
  - Demonstrate a clear understanding of professional, ethical, legal, security, and social issues and practices related to Information Systems.

- **Professions/jobs**

The graduate of the program will be able to occupy one of the following positions:

- (251)System development (System analysis & Design; support; System Integration, Web Developer, Application Developer, Programming & Software Design)
- (251) Internet (Programming & Software Design; Web Site Design; Web Site Administration)
- (2511) Business (Business Analyst, Enterprise Architect, Business Solution Development)
- (2521)Databases (Database Administration; Data Warehouse Specialist, Data Analytics Auditor, Real-Time Analytics Data Architect, Data Management Specialist, Data Scientist)
- (2511)Information Management (Information System Manager, Information System Analyst, Information System Architect, Chief Information Officer, Information Security Analyst, Computer and Information Research Scientist)

- **Number of credit hours**
  - The number of credit hours required to graduate from the program is 36 credit hours for Thesis track and 42 credit hours for Project and Course Work track.

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Course	Required	5	15	42
	Elective	4	12	33
Thesis		1	9	25
Total		10	36	100

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Course	Required	5	15	42
	Elective	6	18	43
Project Proposal		1	3	7
Project Implementation		1	6	14
Total		13	42	100

- **Program Courses**

The study plan of the program includes courses that cover the main areas of specialization, which include

  - IT Management
  - Knowledge Management
  - Information Retrieval and Extraction
  - Data Management and Data Warehousing
  - Enterprise Systems
  - Human Computer Interaction

The course of program study plan courses are distributed into required requirements, and electives, as follows:

Curriculum Study Plan Table (Thesis Track)

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level	0912610	Advanced Information Systems	Required	None	3	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
1	0912611	Advanced Database Management Systems	Required	None	3	Program
	0912612	IT Infrastructure	Required	None	3	Program
Level 2	0912613	Advanced Object-Oriented Design and Development	Required	None	3	Program
	0912615	Research Methodology	Required	None	3	Program
	091xxx	Elective 1	Elective	None	3	Program
	091xxx	Elective 2	Elective	None	3	Program
Level 3	091xxx	Elective 3	Elective	None	3	Program
	091xxx	Elective 4	Elective	None	3	Program
	0912700	Thesis	Required	None	9	Program
Level 4						

***Curriculum Study Plan Table (Project and Coursework Track)**

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	0912610	Advanced Information Systems	Required	None	3	Program
	0912611	Advanced Database Management Systems	Required	None	3	Program
	0912612	IT Infrastructure	Required	None	3	Program
Level 2	0912613	Advanced Object-Oriented Design and Development	Required	None	3	Program
	0912615	Research Methodology	Required	None	3	Program
	091xxx	Elective 1	Elective	None	3	Program
	091xxx	Elective 2	Elective	None	3	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 3	0912690	Project Proposal	Required	None	3	Program
	091xxx	Elective 3	Elective	None	3	Program
	091xxx	Elective 4	Elective	None	3	Program
Level 4	0912695	Project Implementation	Required	None	6	Program
	091xxx	Elective 5	Elective	None	3	Program
	091xxx	Elective 6	Elective	None	3	Program

Elective Course

Course Code	Course Title	Required or Elective	Credit Hours
0912620	Information Systems Security	Elective	3
0912622	Designing and Implementing Data Warehouses	Elective	3
0912623	Advanced Web-Based Systems	Elective	3
0912625	Information Systems Audit and Control	Elective	3
0912627	Information Retrieval & Extraction	Elective	3
0912629	Knowledge Management	Elective	3
0912630	Usability Analysis and Testing	Elective	3
0912631	Pervasive and Ubiquitous Information Systems	Elective	3
0912632	Decision Support Systems	Elective	3
0912634	Special topics in information system	Elective	3

4. Laboratories and equipment

The study plan includes many courses that include practical component, so the program has many laboratories that support these courses, and these laboratories include:

Resources	Minimum Quantity	Purpose	Availability in the College
Desktop Computers	30	Students will use them to perform hands-on training and exercises	Yes
Server	2	This system will host the vulnerable system	No
Small Experimental Wired and Wireless Network (includes LAN Switch, cables and Wi-Fi router)	-	An experimental network is made available either as cloud or a single instance for students to practice network security and penetration testing	Yes
Kali Linux	Installed on the Desktop Computers	The Operating System of choice	(Free)
Windows, Linux and Mobile Operating Systems	Different Operating system images installed on student machines	Students will work with different operating system vulnerabilities through the virtual machines	Yes

5. Services provided by the university

The university provides the student and teaching staff with many educational and non-educational services that the student needs during his educational journey, and these services include the following:

- **The Central Library**

The central library is located in building No. ..... The library includes several sources of information in both hardcopy and digital forms to cover all areas of knowledge and various specializations. The library provides loan services and many electronic services. The services provided by the Central Library can be viewed through the following electronic link.

https://www.kfu.edu.sa/ar/Deans/Library/Pages/Home-new.aspx

- **Medical polyclinic**

The medical polyclinic is located in building No.... , Where the Medical Clinics Center provides primary health care including:

  - Medical examination of patients, diagnosis of diseases, and determination of the best treatment methods.
  - Providing the necessary treatment for simple and common diseases.
  - Referring complex medical cases to Ministry of Health hospitals in coordination with them.
  - Treating emergency cases and providing first aid to serious cases until they arrive at the hospital.
  - Conducting all the medical tests that doctors need to help them diagnose various diseases.
  - Initial medical examination for male and female students.
  - Organizing health awareness and education cases.
  - Sick leaves: Sick leaves are granted to students after conducting a medical examination by the doctors in medical polyclinic. Sick leaves issued by another party, whether governmental or private, are investigated by the student's college. Students who wish to obtain evidence that they have an urgent sick excuse that prevent them from taking the exams must be medically tested, at least one hour before the exam, by the medical committee in the medical polyclinic.
  - The services provided by the Medical polyclinic can be viewed through the following electronic link

https://www.kfu.edu.sa/ar/Departments/Medical_Srvices/Pages/Home-new.aspx

- **The Deanship of Student Affairs**

The Deanship of Student Affairs is one of the supporting deanships at the university, as it is considered the first and most important service center for the students. The deanship provides the students with all services related to student activities and services that contribute in creating an attractive university environment. The deanship provides housing for university students. The deanship of student affairs building include: a restaurant, clubs, and a hall to practice some sports. It also provides students with nutrition services with reasonable prices. The deanship also pays great attention to student activities that improves students skills and personality. It organizes seminars, workshops, and cultural competitions. It is interested in developing and refining students' hobbies. It organizes social activities and outdoor trips to strengthen students relationships and to help them acquire good social habits. The services provided by the Deanship of Student Affairs can be viewed through the following link

https://www.kfu.edu.sa/ar/Deans/AhsaaStudent/Pages/Home-new.aspx

6. Services provided by the program/College

The Student Activities Committee at the College of Computer Science and Information Technology seeks to have a positive impact on students and develop their personal and social skills and values. The Student Activities Committee also aims to organize and direct student activities and provide a diverse educational and recreational environment that enhances student interaction and promotes comprehensive learning.

Committee objectives:

- Organize and implement diverse student activities that include scientific, sports, cultural and recreational aspects.
- Encourage and support student initiatives and provide the necessary support for their implementation.
- Prepare students to transition from the educational environment to the work environment.
- Develop programs and activities that enhance learning and develop skills for students.
- Enhance communication and cooperation with the Deanship of Student Affairs and other committees related to the college.
- Provide periodic evaluation of student activities and suggestions for raising their level.
- Update and manage the content of student activities and clubs on the college website.

Student Clubs:

- Programming and Artificial Intelligence Club
- Cybersecurity Club
- Peer Learning Club
- Google Developers Club

Student Activities:

- Programming Competition
- External Student Activities
- Recreational Activities
- Research Activities
- Sand Team

The college is committed to fostering academic excellence and personal growth by offering a variety of services and activities for students and faculty members.

Development and Quality Assurance:

Overview

The Development and Quality Assurance Committee aims to ensure the quality of the educational process in academic programs and follow up on the implementation of accreditation requirements for college programs in a way that ensures maintaining local and international accreditations for academic programs, and proposes development plans and holds workshops for faculty members.

The most important tasks of the committee:

- Follow up on everything issued by the National Authority for Academic Evaluation and Accreditation, and the Deanship of Development and Quality Assurance regarding quality and development, and circulate it to the various departments of the college
- Evaluate the quality of the educational, research and service process in the college (self-evaluation), by conducting surveys or inquiries for individuals or beneficiaries
- Disseminate the culture of quality and introduce it within the college, by holding internal courses for students, faculty members, technicians and administrators
- Study the "course evaluation" reports conducted by college students, and come up with appropriate recommendations for each course, and discuss them with the head The relevant academic department
- Follow up on the implementation of the course report and the program report with the academic departments in the college at the end of each semester or quarter, and receive the final reports of the workshops held by the departments to discuss the course and program reports. Implement the requirements of the quality management system at King Faisal University
- Preparing an annual plan to determine the training needs of the college's staff and following up on its implementation. Supervising and following up on orientation programs for new college members.
- Proposing a mechanism to stimulate excellence and creativity in the performance of faculty members, and nominating distinguished ones for excellence awards at the college/university/community level.
- Studying the transactions referred by the Dean of the College to the committee and expressing an opinion on them, and submitting the necessary recommendations regarding them.

7. Registration of the courses.

Article 22

The student may postpone the study at the recommendation of the competent Department Council and the approval of the College Council in accordance with regulations approved by the University Council based on the proposal of the Standing Committee.

Article 23

The student may withdraw from one or more courses or all courses of the semester after the end of the registration period upon the recommendation of the competent Department Council and the approval of the College Dean according to regulations approved by the Universi ty Council based on the proposal of the Standing Committee.

Article 24

If a graduate student withdraws from the university and then decides to re-join, the university may apply the admission requirements at the time of the new application.

Article 25

A student shall be deemed to have dropped out if he does not register within the specified period for registration in each semester in which he is allowed to register.

8. Study regulations and tests

The Computer Science Specialization Program aims to graduate qualified individuals who are able to:

- Practice their profession with confidence and global competitiveness
- Practice a profession with the ability to develop personally and professionally and continue postgraduate studies successfully.
- Work individually with minimal guidance and work as a professional team leader or team member while ensuring professional, legal and ethical responsibility.

Outcomes of the Computer Science Specialization Program

- A graduate of the Computer Science Program is expected to be able to

- Apply mathematical, scientific and engineering knowledge related to the Computer Science specialization.
- Analyze problems related to computer science and identify and formulate the computing requirements necessary to solve these problems.
- Design, implement and measure the effectiveness of computer systems and programs that meet the needs.

Article 34:

Exam in graduate courses shall be conducted and grades shall be recorded in accordance with the Regulations on Studying and Examinations at the University Undergraduate Level, except for the following:

1. The student shall not be considered to have passed the course unless he obtains at least an (above average) grade.
2. The student must pass the supplementary course on the first attempt with a grade of no less than (above average), and his cumulative GPA in all supplementary courses must not be less than (very good).
3. Regarding alternative exams and courses that require more than one semester to be studied, the College Council decides what is considered appropriate based on the Department Council's recommendation.

9. Academic advising and counselling services

The college introduces a range of guidance and counseling services designed to support students' personal, academic, and professional growth. These services address various needs, ensuring students are well-prepared for academic success and life beyond their studies.

Cooperative Training:

The Cooperative education program is a joint venture between King Faisal University and employers to better prepare students for employment upon graduation.

The training must constitute a link between theoretical and scientific academic background and the work environment to provide a better understanding and a clear view of the real world work environment. It also provides students complementary knowledge and training such as facing and dealing with real world problems and being trained to work in team works.

Definition

The Cooperative Training Program is a joint project between the College of Computer Science and Information Technology and employers with the aim of preparing college students for work fields after graduation. Through this program, the student trains in a public or private institution appropriate to his specialization in order to gain practical experience. Cooperative training is an important part of the college's bachelor's program, as the student acquires new concepts and skills other than those studied in the college. The program also links the scientific and theoretical theories and principles taught to students, and professional life in the fields of work with the aim of improving understanding and opening new horizons for students through practicing professional work in an appropriate work environment.

Objectives

Students apply the knowledge and information acquired during the study period and reflect it on the field reality. Develop a sense of responsibility in the student.

Tasks

Review students' academic records to ensure that all cooperative training requirements are met. Contact training institutions to request training opportunities for students.

Enrollment requirements:

The number of credit hours must be at least 95 hours or (95 = credit + registered) during the second semester preceding the summer semester in which the cooperative training course is scheduled to be registered.

Cooperative Training Entities

- Saudi Aramco
- Saudi Electricity Company
- SABIC
- Saudi Telecom Company
- Saudi Data and Artificial Intelligence Authority (SDAIA)
- Ministry of Communications and Information Technology
- Saudi Federation for Cybersecurity, Programming and Drones

Prerequisites

The number of credit hours must be at least 95 hours or (95 = credit + registered) during the second semester preceding the summer semester in which the cooperative training course is scheduled to be registered.

The condition of success and passing the courses registered during the second semester preceding the summer semester in which the cooperative training course is scheduled to be registered, on the basis of which the expected (95) hours are calculated.

Not registering any other course during the cooperative training period (summer semester period).

Program Guide: Microsoft Word - Co-op Training Manual 2019.docx

Community Service

- This committee aims to enhance the social responsibility of university members towards society
- Build and spread the culture of community partnership
- Participate university members in training programs provided to serve the community
- Encourage all university members to participate in society
- Provide opportunities for university members to practice social responsibility and build community partnerships

10. Complaints and grievances.

Student Disciplinary Regulations at King Faisal University

- Article One:

All students studying at the university are subject to the disciplinary system in accordance with Articles (second to ninth) of these regulations.

- Article Two:

Any violation of university rules, regulations and traditions is considered a disciplinary violation, in particular:

A- Acts that violate the system of the university or university facilities, as well as the deliberate abstention or incitement not to attend lectures, exercises, practical lessons and other matters that the regulations require regularity.
B- Any word, action or action that affects honor and dignity or violates good conduct, behavior and values inside or outside the university.
C- Cheating in the exam or attempting it.
D- Violation of the examination system.

Organizing associations within the university, issuing or distributing bulletins, or collecting funds or signatures before obtaining a license from the competent university authorities.

Any damage or attempted damage to university facilities or equipment.

Deliberate abuse of university facilities, annexes, houses prepared for residence and their contents.

- Article Three:

The student who commits the violation stipulated in paragraph (c) of Article (II) and is caught in flagrante delicto is taken out of the hall by the exam invigilator, and he writes a record detailing what happened and submits it with the documents to the Dean of the College, who submits the minutes and documents to the Rector or whoever he authorizes to refer the student to the Disciplinary Committee to decide the appropriate punishment, but whoever commits the violation mentioned in paragraph (d) of Article (II), the Dean of the College or whoever is authorized by him may assess the situation in terms of removing the student. From the examination hall or allowing him to continue taking the exam as the case may be, and the Dean shall submit a report thereon to the competent Vice President or his authorized representative - to take the necessary action.

If the student leaves the examination hall, his exam will be canceled in the subject in which he was examined (a failed grade is given) and the student's exam in other subjects is not canceled except based on the decision of the disciplinary committee based on the dean's report, and the student's result in those subjects is not announced until the decision of the disciplinary committee is issued.

- Article Four:

Disciplinary sanctions are:

A- Warning in writing.
B- Warning.
C- Deprivation of enjoying some or all of the university benefits of students.
D- Canceling the student's exam in one or more courses and giving a grade (fail).
E- Depriving the student from entering the exam in one or more courses and giving a grade (fail).
F- Dismissal from the university for a semester or more.
G- Final dismissal from the university.

The decisions issued with disciplinary sanctions shall be kept in the student's file, and the final dismissal shall result in the student not being allowed to re-enroll, and the decision issued with the disciplinary sanction may be announced within the university. The student's guardian may also be notified.

- Article Five:

The competent authorities to impose disciplinary sanctions are:

A- The competent dean: He may impose the two penalties A and B set forth in Article (Fourth) upon the proposal of the concerned parties for what happens from students during lectures, lessons or otherwise.

B- University President: He may impose the penalties A, B, and C, set forth in Article (Fourth) after taking the opinion of the concerned dean, and when referring the student to the Disciplinary Committee, he may prevent him from entering the university and its facilities until the day appointed for his appearance before the Committee.

C- The Disciplinary Committee: It may impose the penalties mentioned in Article (Fourth), taking into account that the infliction of any of the penalties specified in this Article shall not take place until after conducting the necessary investigation.

- Article Six:

The Disciplinary Committee shall be formed by the competent Vice President as Chairman, the Dean of the College concerned, the Dean of Admission and Registration and the Dean of Student Affairs as members, and the secretariat of the committee shall be one of the legal advisors at the university, and in the event that the committee cannot meet as advanced, it shall be formed by a decision of the Rector.

- Article Seven:

The student referred to the Disciplinary Committee to appear before the Committee on the date specified by the Chairman of the Disciplinary Committee shall be notified by a registered letter at his address indicated in his file or by a letter delivered to him personally.

- Article Eight:

Without prejudice to the provisions of Article (III), the student may appeal to the University Council against the decision issued by one of the penalties set forth in paragraphs (d, e, f, g) of Article (IV) and the grievance shall be by request submitted by the student to the Rector within fifteen days from the date of notification of the decision to the student.

The student may not protest that he is not aware of the university's regulations and instructions issued.

- Article Nine:

The University Council has the right to interpret these regulations.

Source:
https://www.kfu.edu.sa/ar/Deans/AdmissionRecordsDeanship/RulesAndRegulations/Pages/Discipline.aspx

11. Appendix A "Program Study Plan"

Curriculum Study Plan Table (Thesis Track) (36 Credit Hours)

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	0912610	Advanced Information Systems	Required	None	3	Program
	0912611	Advanced Database Management Systems	Required	None	3	Program
	0912612	IT Infrastructure	Required	None	3	Program
Level 2	0912613	Advanced Object-Oriented Design and Development	Required	None	3	Program
	0912615	Research Methodology	Required	None	3	Program
	091xxx	Elective 1	Elective	None	3	Program
	091xxx	Elective 2	Elective	None	3	Program
Level 3	091xxx	Elective 3	Elective	None	3	Program
	091xxx	Elective 4	Elective	None	3	Program
	0912700	Thesis	Required	None	9	Program
Level 4						

***Curriculum Study Plan Table (Project and Coursework Track) (42 Credit Hours)**

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	0912610	Advanced Information Systems	Required	None	3	Program
	0912611	Advanced Database Management Systems	Required	None	3	Program
	0912612	IT Infrastructure	Required	None	3	Program
Level 2	0912613	Advanced Object-Oriented Design and Development	Required	None	3	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
	0912615	Research Methodology	Required	None	3	Program
	091xxx	Elective 1	Elective	None	3	Program
	091xxx	Elective 2	Elective	None	3	Program
Level 3	0912690	Project Proposal	Required	None	3	Program
	091xxx	Elective 3	Elective	None	3	Program
	091xxx	Elective 4	Elective	None	3	Program
Level 4	0912695	Project Implementation	Required	None	6	Program
	091xxx	Elective 5	Elective	None	3	Program
	091xxx	Elective 6	Elective	None	3	Program

12. Appendix B "Course Descriptions"

Course Name	*Advanced Information Systems*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912610	IS 610	3 (3-0-6)	
Course Track	☒Program Core ☐Electives			

Course Description

The course introduces managerial and engineering design concepts related to advanced information systems including information retrieval, knowledge-based systems, and intelligent systems such as case-based reasoning, machine learning, genetic algorithms, fuzzy logic, and autonomous decision-making. The learners are introduced to the internal architecture, design trade-offs, and basic techniques of design and working of such systems. In addition, learners develop appreciation of legal, ethical, and social implications regarding privacy, security, and safety of information systems for informed decision-making. Due to the inherently dynamic nature of the knowledge domain, learners are also put on the path of self-learning about contemporary, emerging, and futuristic information and computing technologies.

Course Outcomes

After the completion of this course, the student will be able to:

1. Understand business and managerial implications of information systems.
2. Develop an understanding of internal working of advanced information systems including information retrieval, knowledge-based systems, and intelligent systems.
3. Compare and evaluate various design tradeoffs by understanding internal working of information systems.
4. Use legal, ethical, and social implications regarding privacy, security, and safety of information systems in their decision-making.
5. Discover emerging and future information systems concepts and technologies via self-learning and life-long learning skills.

Assessment Policy	**Assignments**	5%	**Quiz**	10%	**Project**	15%
	Midterm	30%	**Final**	40%	**Others**	-
Textbook	R. Sharda, D. Delen, & F. Turban, "Analytics, Data Science, & Artificial Intelligence – Systems for Decision Support", Pearson (2020).					
References	1. D. Kroenke & R. Boyle, "Experiencing MIS", Global Ed., Pearson (2020).					

Course Name	*Advanced Database Management Systems*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912611	IS 611	3 (3-0-6)	
Course Track	☒Program Core ☐Electives			

Course Description

This course covers advanced topics in the design and management of database systems including storage and primary file organizations, index structures and access methods for files, directory management, query processing, query optimization, transaction processing, nested transactions, concurrency control techniques, deadlock management, fragmentation and its control, integrity constraints, database recovery, distributed databases, object and object-relational databases, deductive databases and data integration in multi-databases. The primary focus of this course is to provide students with insights on the internal working of a database management system as well as draw attention to advanced topics in database.

Course Outcomes

After the completion of this course, the student will be able to:

1. Develop insights to the issues and challenges involved in database design and management.
2. Develop insights into the internal working of modern Database Management Systems.
3. Identify and apply efficient storage and retrieval techniques to manage massive databases.
4. Identify and apply advanced concepts and techniques in performance tuning, recovery and database security.
5. Recognize and review alternative or innovative solutions to the emerging issues and challenges in data management.

Assessment Policy	**Assignments**	-	**Quiz**	10%	**Project**	25%
	Midterm	25%	**Final**	40%	**Others**	-
Textbook	Avi Silberschatz, Henry Korth, and S. Sudarshan, Database System Concepts", 7th Edition, McGraw-Hill					
References	1. Elmasri, Ramez. Navathe, Shamkant B., Fundamentals of Database Systems, Addison-Wesley, 6th Edition, 2010. 2. Carlos Coronel, Steven Morris and Peter Rob, *"Database Systems: Design,Implementation, and Management"*, 9th Edition, Course Technology, 2009. ISBN: 0538469684. 3. David M. Kroenke and David Auer, *"Database Processing"*, 11th Edition or newer, Prentice Hall, 2009. ISBN: 0132302675					

Course Name	*IT Infrastructure*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912612	IS 612	3 (3-0-6)	
Course Track	☒Program Core ☐Electives			

Course Description

This course focuses on the concepts, models, architectures, protocols, standards, and security for the design, implementation, and management of digital networks, server architectures, server farms, cluster computing, and grid computing, storage area networks and network attached storage, data center design and implementation, development of an integrated technical architecture (hardware, software, networks, and data) to serve organizational needs in a rapidly changing competitive and technological environment, network, data and application architectures, and enterprise application integration.

Course Outcomes

After the completion of this course, the student will be able to:

1. Explain how to manage successfully stakeholders' needs for IT services from IT Infrastructure
2. Identify managerial issues and technologies related to interoperability
3. Design and implement robust and integrated processes for managing IT Infrastructure services to align with business objectives
4. Design, implement and manage security and disaster recovery plans and business continuity from an overall organizational perspective.

Assessment Policy	**Assignments**	10%	**Quiz**	-	**Project**	25%
	Midterm	25%	**Final**	40%	**Others**	-
Textbook	Rich Schiesser, "IT Systems Management", Second edition, Prentice Hall, 2010, ISBN: 0137025068					
References	1. Bill Holtsnider and Brian D. Jaffe, "IT Manager's Handbook, Getting your new job done", Second Edition, Morgan Kaufmann, 2006, ISBN: 012370488X					

Course Name	*Advanced Object-oriented Design and Development*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912613	IS 613	3 (3-0-6)	
Course Track	☒Program Core ☐Electives			

Course Description

This course introduces software as complex products and adopts proper engineering approach with appropriate modelling and methodology to develop them. The focus is on object-oriented modelling and methodology. Hence Unified Modelling Language (UML) is introduced as a robust modelling tool. Advanced topics such as Component Reuse, Model-Driven Architecture (MDA) and Design Patterns etc. are also covered in this course. Case studies and recent research papers along with textbooks are used in delivering the course. For the course project, students will use Unified Modeling Language (UML) based development tools (such as, IBM Rational Rose or UMLet) to design a software with average complexity. Although students are not required to develop the complete software, they will be required to demonstrate both Forward Engineering and Reverse Engineering with the help of structural codes generated automatically by such tools. In general, students will experience the complete Software Development Life-Cycle using OO methodology as defined by the Unified Software Development Process (UP).

Course Outcomes

After the completion of this course, the student will be able to:

1. Familiarize with the state-of-the-art software engineering techniques using object-oriented modelling methodology
2. Develop an insight to the capabilities and pitfalls of object-oriented approach and other Software Engineering approach
3. Integrate advanced OO features (reusable component, design patterns, etc.) in the design and development of object-oriented software
4. Develop Model-Driven Architecture and Model Driven Software Engineering for safety-critical systems
5. Analyze, design and develop practical systems of average complexity from a software architect's point of view using the Unified Process
6. Demonstrate Model-Driven Architecture and Model Driven Software Engineering for safety-critical systems

Assessment Policy						
	Assignments	-	**Quiz**	15%	**Project**	25%
	Midterm	20%	**Final**	40%	**Others**	-

Textbook	Bernd Bruegge and Allen H. Dutoit, "Object-Oriented Software Engineering Using UML, Patterns, and Java", 3rd Edition, Prentice Hall, 2009, ISBN-13: 978-0136061250 Erich Gamma, Richard Helm, Ralph Johnson and John M. Vlissides, "Design Patterns: Elements of Reusable Object-Oriented Software", Addison-Wesley Professional, 2007, ISBN: 0201633612
References	Matt Weisfeld, "The Object-Oriented Thought Process", 3rd Edition, Addison-Wesley, 2009, ISBN-13: 978-0672330162

Course Name	*Research Methodology*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912615	IS 615	3 (3-0-6)	
Course Track	☒Program Core ☐Electives			

Course Description

The philosophy of Science, basics of doing research including problem solving and research, defining the research problem, writing a literature review, hypothesis development and validation, conceptual modeling and research design, case study research, survey and observations, primary data collection, experiments, histories and simulations, interventions including benchmarking, action research and pilot studies, sampling and measurement, instrument and questionnaire design, analysis methods including qualitative, quantitative and mixed data analysis, grounded theory, usability evaluations, research ethics, peer review process, reporting and publishing including displaying data and writing up results.

Course Outcomes

After the completion of this course, the student will be able to:

1. Improve understanding of the research process and creation of knowledge
2. Study research approaches, tools, techniques and methodologies used in computing research
3. Identify a research topic and justify its worth
4. Develop and apply fundamental research skills, including literature reviews, collection and analysis of data and designing a research project
5. Develop research writing and presentation skills
6. To work autonomously to develop innovative approaches for solving computer based systems issues

Assessment Policy	**Assignments**	-	**Quiz**	15%	**Project**	30%
	Midterm	20%	**Final**	35%	**Others**	-
Textbook	1. The Craft of Research: Chicago Guides to Writing, Editing and Publishing by Booth, Colomb & Williams, 3rd Edition, University of Chicago Press, 2008. ISBN: 0226065669. 2. Recker, J. (2013). Scientific Research in Information Systems: A Beginner's Guide. Springer					
References	1. Avison, D. and Pries-Heje, J. "Research in Information Systems: A Handbook for Research Students and Their Supervisor", Elsevier Butterworth Heinemann, Oxford, 2005, ISBN: 0750666552. 2. Berndtsson, Mikael, et al. Thesis projects: a guide for students in computer science and information systems. Springer Science & Business Media, 2007.					

	3. Zobel, J. (2014). Introduction. In Writing for Computer Science (pp. 1-7). Springer London. 4. Bernard, H. R., & Bernard, H. R. (2012). Social research methods: Qualitative and quantitative approaches. Sage.

Course Name	*Information Systems Security*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912620	IS 620	3(3-0-6)	0912610
Course Track	☐Program Core ☒Electives			

Course Description

The security design principles are discussed and applied to eliminate typical vulnerabilities in implementing an information system. The course includes discussion on several emerging threats including next-generation phishing, drive-by-pharming, online extortion, multi-application botnets, crimeware, mobile worms. Emerging defense techniques are also discussed with all threats. The latest web vulnerabilities covered in this course include client-state manipulation, cookie-based attacks, SQL injection, cross domain attacks (XSS/XSRF/XSSI), and HTTP header injection. Security issues that arise specifically in Web 2.0 applications taking advantage of AJAX, XmlHttpRequest, and mash-ups are discussed. The course also covers Same-Origin-Policy (SOP) violations that can occur due to DNS rebinding, timing, and user tracking attacks.

Course Outcomes

After the completion of this course, the student will be able to:

1. Recognize the importance of Penetration Testing, in providing security for web information systems for organizations.
2. Explain the phases of Penetration Testing along with in depth study of many exploiting techniques for selected latest web vulnerabilities.
3. Analyze the information systems to identify attack surface for security vulnerabilities and threats by following a standard methodology.
4. Design and Implement the penetration testing plan to launch attacks for selected vulnerabilities to evaluate security of the web-based systems.
5. Show experience in solving security problems and writing report as a team leader or a team member.

Assessment Policy	**Assignments**	-	**Quiz**	10%	**Project**	20%
	Midterm	25%	**Final**	45%	**Others**	-
Textbook	Dafydd Stuttard, Marcus Pinto, “Web Application Hacker’s Handbook: Finding and Exploiting Security Flaws”, 2nd Edition, Wiley, 2011.					
References	Offensive Security material on Kali Linux and Penetration Testing					

Course Name	*Designing and Implementing Data Warehouses*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912622	IS 622	3(3-0-6)	
Course Track	☐Program Core ☒Electives			

Course Description

This course provides students with the technical skills required to plan, design, implement and maintain a data warehouse using a DBMS such as Oracle Warehouse Builder. Key topics includes: Online Analytical Process OLAP, Dimension modelling, Data Extraction & Transformation (ETL detail), DWH Lifecycle, DWH Implementation and deployment. Students will experience all phases of a Data Warehouse implementation from Extract, Transform and Load (ETL) of the data to running queries on the final database.

Course Outcomes

After the completion of this course, the student will be able to:

1. Get a familiarity with the typical data warehouse components and architecture
2. Get knowledge of the theories and principles of data warehousing
3. Understand the theory and principles of data warehousing with regard to the practice of decision support
4. Get an understanding of the practical uses of data warehousing
5. Develop an understanding of the techniques and tools used to design a data warehouse.

Assessment Policy	**Assignments**	15%	**Quiz**	10%	**Project**	20%
	Midterm	20%	**Final**	30%	**Others**	5%
Textbook	W. H. Inmon, "Building the Data Warehouse", Second Edition, Wiley, 2005, ISBN: 0764599445					
References	1. Ralph Kimball and Joe Caserta, "The Data Warehouse ETL Toolkit: Practical Techniques for Extracting, Cleaning, Conforming, and Delivering Data", Wiley Publishing, Inc. 2004, ISBN: 0764567578 2. Paulraj Ponniah, "Data Warehousing Fundamentals", John Wiley & Sons Inc., NY, 2001 3. Fon Silvers, "Building and Maintaining a Data Warehouse", Auerbach Publications, 2008, ISBN: 1420064622					

Course Name	*Advanced Web-based Systems*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912623	IS 623	3(3-0-6)	0912613
Course Track	☐Program Core ☒Electives			

Course Description

Although the World-Wide Web was initially considered as a means for transferring documents, it is now being used as a platform for sophisticated interactive applications, taking the place of traditional desktop applications. This course provides an overview of the theory and practice of the state-of the-art technologies for application development for the Web including service-oriented systems and mobile web systems. The course covers how information (or data) is communicated over the web both synchronously and asynchronously along with the different data standards and data management technologies including schema-less database management. Advanced topics such as web security, web optimization, and critical rendering path are also introduced in the course.

Course Outcomes

After the completion of this course, the student will be able to:

1. Describe what is the web and how it is architected
2. Identify and describe the technologies surrounding the modern web
3. Discuss the web services architectures
4. Explain and implement the various data standards on the web
5. Use web scripting language to consume data from web services and APIs
6. Explain and implement web semantics
7. Analyze web performance and use techniques to optimize performance
8. Describe and implement techniques for web security.

Assessment Policy	**Assignments**	10%	**Quiz**	-	**Project**	25%
	Midterm	25%	**Final**	40%	**Others**	-
Textbook	Leon Shklar and Rich Rosen , "Web Application Architecture: Principles, Protocols and Practices" John Wiley, 2009					
References	1. Sven Casteleyn, Florian Daniel, Peter Dolog, Maristella Matera "Engineering Web Applications", Springer, 2009. 2. Marijn Haverbeke, "Eloquent JavaScript - A Modern Introduction to Programming", 2014. 3. Tom Marrs, "JSON at Work", 1st Edition, O'Reilly Media, Inc., 2017. ISBN-13: 978-1449358327. 4. Joshua Eichorn, "Understanding AJAX: Consuming the Sent Data with XML and JSON", Prentice Hall, July 2006. ISBN-13: 9780132337939					

	5. Jon Duckett, “HTML and CSS: Design and Build Websites”, John Wiley and Sons, ISBN: 1118008189 6. Jon Duckett, “JavaScript & JQuery: Interactive Front-End Web Development”, John Wiley and Sons, ISBN: 1118531647 7. Robin Nixon “Learning PHP, MySQL, JavaScript, and CSS”, 2nd Edition, O'Reilly Media 2012, ISBN: 1449319262

Course Name	*Information Systems Audit and Control*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912625	IS 625	3(3-0-6)	
Course Track	☐Program Core ☒Electives			

Course Description

This course equips students with essential knowledge and skills for IT audit and control, ensuring effective and secure IT systems and processes. It emphasizes safeguarding IT assets, rigorous auditing, and risk mitigation. Students gain a robust understanding of audit and control tasks, along with legal requirements. The course demystifies risk assessment and management, providing clarity in this complex area, ultimately preparing students to be vital contributors to any organization's IT framework.

Course Outcomes

After the completion of this course, the student will be able to:

1. Recognize the importance of the IT audit and control functions within the modern IT domain.
2. Explain the foundational principles of the IT audit, emphasizing its role in safeguarding a company's IT assets.
3. Recognize globally recognized IT audit standards and control frameworks, including COBIT, ITIL, and ISO 27001.
4. Evaluate the tools and methodologies tailored for rigorous IT auditing.
5. Analyze the meticulous processes involved in auditing various IT domains.
6. Decide on the appropriate control measures essential for mitigating risks within the IT domain.
7. Show an understanding of the underlying reasons for each audit and control task, demonstrating the ability to think critically about the purpose and implications of each task.
8. Show clarity in demystifying the intricacies of risk assessment and management, emphasizing ethical considerations and the importance of transparency.
9. Show responsibility in implementing, optimizing, and elevating the IT audit and control functions, ensuring they align with organizational values and objectives..

Assessment Policy						
	Assignments	10%	**Quiz**	5%	**Project**	-
	Midterm	30%	**Final**	50%	**Others**	5%
Textbook	IT Auditing Using Controls to Protect Information Assets by Mike Kegerreis, Mike Schiller, Chris Davis, 2020, McGraw-Hill Education, ISBN 978-1260453232					

References	CISA – Certified Information Systems Auditor Study Guide by Hemang Doshi, 2020, Packt Publishing, ISBN 1838989587, 9781838989583

Course Name	*Information Retrieval & Extraction*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912627	IS 627	3(3-0-6)	
Course Track	☐Program Core ☒Electives			

Course Description

This course covers concepts in Information Retrieval and Extraction (IR). The focus of this course is to discuss IR techniques for text-based information systems. The course will discuss a variety of both classical and modern IR models, Text classification, Indexing and Search, Web retrieval, structured text retrieval. This course will also address more advanced topics in "intelligent" IR, including Natural Language Processing techniques, and "smart" Web agents.

Course Outcomes

After the completion of this course, the student will be able to:

1. Explain different classic and advanced IR models
2. Provide term weighting and document ranking
3. Elaborate indexing, processing, and querying textual data
4. Apply document processing operations and compression methods
5. Apply machine learning algorithms for text classification
6. Use basic retrieval models, algorithms, and IR system implementations
7. Explore the application of IR in smart web agents.

Assessment Policy	**Assignments**	10%	**Quiz**	10%	**Project**	15%
	Midterm	25%	**Final**	40%	**Others**	-
Textbook	Ricardo Baeza-Yates, Berthier Ribeiro-Neto “Modern Information Retrieval: The Concepts and Technology behind Search”, 2nd Edition (2010) Addison-Wesley					
References	1. Christopher D. Manning, Prabhakar Raghavan and Hinrich Schütze, Introduction to Information Retrieval, (2008) Cambridge University Press. 2. Soumen Chakrabarti, Mining the Web: Discovering Knowledge from Hypertext Data, (2002), Morgan-Kauffman					

Course Name	*Multimedia Systems Design*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912628	IS 628	3(3-0-6)	
Course Track	☐Program Core ☒Electives			

Course Description

Multimedia systems explores the fundamental aspects of multimedia computing, including multimedia operating systems, networking, communication, and middleware. This course provides a comprehensive understanding of multimedia applications by integrating user interface development with underlying system components such as operating systems, networks, security, and multimedia devices. The course is structured into two main parts. The first part covers the design and construction of multimedia delivery systems, including human perception, data coding, and storage techniques to ensure realistic multimedia experiences. The second part focuses on advanced concepts for achieving true multimedia computing, emphasizing the generation and interaction with multimedia content.

Course Outcomes

After the completion of this course, the student will be able to:

1. Explain the fundamental concepts of multimedia computing and security.
2. Design and develop multimedia applications by integrating user interfaces with underlying system components such as operating systems, networks, and multimedia devices.
3. Apply appropriate data coding, storage, and processing techniques to enhance the realism and efficiency of multimedia content delivery.
4. Recognize the ethical, legal, and security considerations in multimedia system development and their impact on users and society..

Assessment Policy	**Assignments**	10%	**Quiz**	-	**Project**	25%
	Midterm	25%	**Final**	40%	**Others**	-
Textbook	Tim Morris, “Multimedia Systems Delivering, Generating and Interacting with Multimedia”, 2000, Springer London.					
References	Multimedia Systems, Ralf Steinmetz, Klara Nahrstedt, Springer Verlag, 2004					

Course Name	*Knowledge Management*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912629	IS 629	3(3-0-6)	
Course Track	☐Program Core ☒Electives			

Course Description

This course will develop your knowledge and understanding of contemporary theories and practices of knowledge management (KM) by examining the relationship between a theoretical understanding of knowledge management and real-life situations and by integrating different dimensions of knowledge management arising from human resource management, information systems and strategic management. The course will explain the concept of `intellectual capital' and how it is managed and exploited in organizations. The course will demonstrate a critical understanding of knowledge management policies and strategies in organizations that enhance effectiveness. You will be able to apply a range of transferable skills including literature search, analytical skills, application of theory to real-life situations, teamwork, motivation and interpersonal skills.

Course Outcomes

After the completion of this course, the student will be able to:

1. Define KM, learning organizations, intellectual capital and related terminologies in clear terms and understand the role of knowledge management in organizations.
2. Explain the characteristics of dominant knowledge cycle and knowledge models
3. Identify and select tools and techniques of KM for the stages of creation, acquisition, transfer and management of knowledge.
4. Analyze and present cases involving information and knowledge management that can assist in solving practical organizational problems in finance and economic sectors; legal information systems; health information systems and others.
5. Develop a working knowledge Management system in the area through focused project.

Assessment Policy	**Assignments**	15%	**Quiz**	10%	**Project**	10%
	Midterm	30%	**Final**	35%	**Others**	-
Textbook	Kimiz Dalkir (2011), Knowledge Management in Theory and Practice, 2ed, MIT Press					
References	Collison, Chris, & Parcell, Geoff (2004). Learning to Fly: Practical Knowledge Management from Leading and Learning Organizations. Chichester, West Sussex: Capstone Publishing					

	Pasher, Edna & Ronen, Tuvya (2011). The complete guide to knowledge management: A strategic plan to leverage your company's intellectual capital. Hoboken, New Jersey: John Wiley & Sons

Course Name	*Usability analysis and testing*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912630	IS 630	3(3-0-6)	
Course Track	☐Program Core ☒Electives			

Course Description

As professionals, it is important that we are able to critically evaluate user interfaces and work environment issues in relation to humans' interaction with computers. This analysis and evaluation of usability issues is the main focus of the course. Topics to be covered include recent approach and methods of HCI and usability evaluations. It also includes usability engineering issues, human factors issues, usability testing, human computer interaction, user centered design techniques, and web interface development.

Course Outcomes

After the completion of this course, the student will be able to:

1. Recognize the recent approaches and methods in the field of HCI in general and usability evaluation in particular.
2. Recognize the theory behind human factors, human computer interfaces and usability engineering
3. Identify interface designs issues, strengths and weakness
4. Apply methods and techniques used in analysis, evaluation, prototyping and assessment of user interface needs.
5. Develop skills for evaluating the requirements of a user interface considering various aspects of an environment including international issues
6. Develop skills to conduct independent research in usability analysis and testing.
7. Write a review article on current usability analysis and testing topics.

Assessment Policy	**Assignments**	15%	**Quiz**	-	**Project**	30%
	Midterm	15%	**Final**	40%	**Others**	-
Textbook	1. Elizabeth Goodman, Mike Kuniavsky and Andrea Moed, Observing the user experience: A Practitioner's Guide to User Research, 2nd Edition, Morgan Kaufmann, 2012. ISBN: 978-0123848697 2. William Albert and Thomas Tullis, Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics (Interactive Technologies), 2nd Edition, Morgan Kaufmann, 2013. ISBN: 978-0124157811					

References	1. Alan Dix, Janet Finlay, Gregory Abowd, and Russell Beale, Human-Computer Interaction, 3rd Edition, Prentice Hall, 2004. 2. Rubin, J. & Chisnell, D., Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests, 2nd Edition, Wiley Publishing, Inc., 2008. ISBN: 0521865719

Course Name	*Usability analysis and testing*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912631	IS 631	3(3-0-6)	
Course Track	☐Program Core ☒Electives			

Course Description

The key element of this course is the omnipresence of information devices. These devices can be embedded into cars, airplanes, ships, bikes, posters, signboards, walls and even clothes. This course focuses on independent information devices including wearable computers, mobile phones, smart phones, smart-cards, wireless sensor-compute nodes and the services made available by them. It includes human computer interaction using several types of elements including sensing, text, speech, handwriting and Vision.

Course Outcomes

After the completion of this course, the student will be able to:

1. Gain a sound conceptual foundation in the area of ubiquitous and pervasive computing
2. Define and describe the various concepts and techniques related to ubiquitous computing.
3. Recognize various technologies available for ubiquitous and pervasive information systems.
4. Evaluate various ubiquitous technologies and identify the challenges and opportunities related with these technologies.
5. Propose ubiquitous computing paradigm in the development of various information systems.
6. Apply trendy techniques of ubiquitous computing to analyze and evaluate the information systems both individually and as part of a team.

Assessment Policy	**Assignments**	10%	**Quiz**	10%	**Project**	15%
	Midterm	20%	**Final**	40%	**Others**	5%
Textbook	Stefen Poslad, "Ubiquitous Computing: Smart Devices, Environments and Interactions", Wiley, London, 2009, ISBN: 9780470035603					
References	1. John Krumm, "Ubiquitous Computing Fundamentals", Chapman and Hall/CRC, 2009, ISBN:1420093606 2. Adam Greenfield, "Everyware: The Dawning Age of Ubiquitous Computing", New Riders Publishing,2006, ISBN: 0321384016					

Course Name	*Decision Support Systems*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912632	IS 632	3(3-0-6)	0912610
Course Track	☐Program Core ☒Electives			

Course Description

The purpose of this course is to provide students with an understanding of the key technical and managerial issues in the effective development and use of decision support systems in organizations. This course provides an overview of the theoretical and practical aspects of decision support systems (DSS). The course consists of three modules. The first module concentrates on the managerial aspects of decision-making, the role of automation in decision making, and decision models. The second module discusses the design and development of decision support systems, with an emphasis on data management. The last module addresses the integration and implementation challenges in Enterprise DSS, intelligent DSS, web-based DSS, as well as their future trends. Tools such as MS Excel, R, Python may be used.

Course Outcomes

After the completion of this course, the student will be able to:

1. Describe basic DSS concepts, tools and techniques.
2. Describe the fundamentals of DSS design and development.
3. Describe and elaborate current and future DSS implementation challenges.
4. Distinguish among individual, group and organizational DSS.
5. Apply methods and techniques to gain hands-on experience by developing a small-scale DSS.

Assessment Policy	**Assignments**	15%	**Quiz**	-	**Project**	20%
	Midterm	25%	**Final**	40%	**Others**	-
Textbook	Ramesh Sharda, Dursun Delen, Efraim Turban, "Business Intelligence and Analytics: Systems for Decision Support", 10th Edition (Global), Pearson, 2014. ISBN: 978-0133050905					
References	1. Julie Pallant, "SPSS Survival Manual", 6th Edition, Open University Press, 2016. 2. Murtaza Haider, "Getting Started with Data Science: Making Sense of Data with Analytics", 1st Edition, IBM Press, 2015. ISBN: 978-0133991246. 3. S. Christian Albright, "VBA For Modelers: Developing Decision Support Systems with Microsoft Office Excel", 5th Edition, Cengage Learning, 2016. 4. Steve Wexler, Jeffrey Shaffer and Andy Cotgreave "The Big Book of Dashboards: Visualizing Your Data Using Real-World Business Scenarios", 1st Edition, 2017, Wiley. ISBN-13: 978-1119282716.					

Course Name	*Project Proposal*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912690	IS 690	3 (3-0-6)	
Course Track	☒Program Core ☐Electives			

Course Description

The Project Proposal emphasizes on application of the theoretical concepts of software analysis and design learned during the course work. The analysis component comprises of preparing formal Software Requirements Specifications (SRS) document including problem statement, scope, justification, requirements, cost estimation, assumptions, limitations, methodology and tools to be used in project development. The assumption should be taken in such a way that scope of the problem becomes clear and well defined in the problem statement. All the functional and non-functional requirements of the system must be identified and analyzed in the proposal. The students are encouraged to develop and describe logical models of the proposed system based on the requirements. The design component of the course includes prototypes including input and output of the proposed system.

Course Outcomes

After the completion of this course, the student will be able to:

1. Identify and define problem statement
2. Define and justify scope of the problem
3. Gather and analyze system requirements
4. Propose an optimized solution among the existing solutions
5. Practice software analysis and design techniques learned during the course work
6. Develop technical report writing and oral presentation skills

Assessment Policy	**Assignments**	-	**Quiz**	-	**Project**	100%
	Midterm	-	**Final**	-	**Others**	-
Textbook	Lynn E. Miner & Jeremy T. Miner, "Proposal Planning and Writing", Third Edition, Greenwood Publishing Group, 2003, ISBN: 1573564982					
References	Statistics for Engineers and Scientists by William Navidi, 2nd Edition, McGraw-Hill, 2007. ISBN: 0073309494.					

Course Name	*Project Implementation*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912695	IS 695	6	0912690
Course Track	☒Program Core ☐Electives			

Course Description

In this course the students will be required to implement proposed design of the project. The students will review the design specification and make any necessary enhancements to synchronize the implementation details. The students will identify and learn the use of tools required for the project implementation. The students will be expected to: prepare application architecture, code, debug, document, and test the application software within suggested timeframe. A key focus of the course is to emphasize the quality of software project through various evaluation aspects such as professional coding style, documentation of code, intuitive user interface design, input validation, verification and user guide. The students will be further required to evaluate the developed system by generating test cases of the critical components of the designed model.

Course Outcomes

After the completion of this course, the student will be able to:

1. Develop a functional application based on the software design.
2. Apply the coding, debugging and testing tools to enhance the quality of the software.
3. Construct new software systems based on the theory and practice gained through this exercise.
4. Prepare the proper documentation of software projects following the standard guidelines.
5. Learn technical report and oral presentation skills.

Assessment Policy	**Assignments**	-	**Quiz**	-	**Project**	100%
	Midterm	-	**Final**	-	**Others**	-
Textbook	Lynn E. Miner & Jeremy T. Miner, “Proposal Planning and Writing”, Third Edition, Greenwood Publishing Group, 2003, ISBN: 1573564982					
References	Statistics for Engineers and Scientists by William Navidi, 2nd Edition, McGraw-Hill, 2007. ISBN: 0073309494.					

Course Name	*Dissertation*			
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0912700	IS 700	9	
Course Track	☒Program Core ☐Electives			

Course Description

Student will choose a research topic under supervision of a faculty member. After approval of the thesis subject, the student needs to define objectives of the research and prepare the research proposal. In the proposal, he/she will be required to (i) conduct an exhaustive survey (ii) identify and define the problem clearly (iii) decide scope of the problem and provide its assumptions and limitations (iv) ensure the originality of the research proposal (v) suggest the approach and methodology used in the research and (vi) present the expected results. At the successful presentation of the proposal, student will be asked to submit the proposal. The student will apply the proposed methodology to solve the problem. After completion, student will submit the thesis. Then student will defend the thesis.

Course Outcomes

After the completion of this course, the student will be able to:

1. Conduct survey of research issues.
2. Practice research techniques, tools and methodologies.
3. Work independently and take initiatives in academic or professional environment.
4. Develop writing and oral presentation skills.

Assessment Policy	**Assignments**	-	**Quiz**	-	**Project**	100%
	Midterm	-	**Final**	-	**Others**	-
Textbook	The Craft of Research: Chicago Guides to Writing, Editing and Publishing by Booth, Colomb & Williams, 3rd Edition, University of Chicago Press, 2008. ISBN: 0226065669					
References	Statistics for Engineers and Scientists by William Navidi, 2nd Edition, McGraw-Hill, 2007. ISBN: 0073309494.					