جامعة الملك سعود
King Saud University

IS Undergraduate Students Handbook

To GUIDE YOU FROM THE PRIMARY STAGES TO GRADUATION

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Introduction

The information systems Bachelor's program is considered a bridge between computer science specializations and organizational and administrative fields. It enables a student to gain knowledge and acquire skills necessary for analyzing, designing, developing, and operating information systems and then utilizing them in any type of public or private organizations.

Vision

To be recognized nationally and internationally as a leader in the area of information systems education and research.

Mission

Serving students and society through distinctive education, creative research, and the ability to participate in the building of the knowledge economy.

Department Objectives

After completing their studies in the IS department, graduates should be able to demonstrate in a period of five years the ability to:

1. Engage in lifelong learning for continued professional excellence.
2. Achieve higher positions in the job market

and/or complete graduate studies.
3. Further develop sense of professionalism, ethical values, and respect for society.

Student Outcomes

In concordance with ABET requirements for IS programs, graduates from the IS department will possess computing skills as well as the ability to:

1. Apply knowledge of computing and mathematics appropriate to the discipline.
2. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
4. Function effectively on teams to accomplish a common goal.
5. Demonstrate an understanding of professional, ethical, legal, security and social issues and responsibilities.
6. An ability to communicate effectively with a range of audiences.
7. Analyze the local and global impact of computing on individuals, organizations, and society.
8. Recognize the need for and to engage in continuing professional development.
9. Use current techniques, skills, and tools necessary for computing practice.
10. Understand the processes that support the delivery and management of information

systems within a specific application environment.

Career Opportunities

The need for highly skilled IS engineers is growing day after day. Graduates from the IS program will have various career opportunities in the information systems field and IT industry including, but not limited to the followings:

- Information Systems Analyst
- Information Systems Developer
- Information Systems Project Manager
- Information Systems Consultant
- SERP Implementation Specialist
- Database Administrator
- Database Developer

Faculty and Staff

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Study Plan

LEVEL ONE

Code	Course Name	Hours	Pre-/Co-requisites
MATH140	Introduction to Mathematics	2	
Engl140	English I	8	
CI140	Learning, Thinking and Research Skills	3	
CHS101	Health and Fitness	1	
ENT 101	Introduction to Entrepreneurship	1	
Total		**15**	

LEVEL TWO

Code	Course Name	Hours	Pre-/Co-requisites
CT140	Computer and IT skills	3	
MATH150	Differential Calculus	3	
Engl150	English II	8	
MC140	Communication Skills	2	
Total		**16**	

LEVEL THREE

Code	Course Name	Hours	Pre-/Co-requisites
CSC111	Computer Programming I	4	CT140
MATH106	Integral Calculus	3	MATH150
IS201	Fundamentals & Ethics of Information Systems	3	
MGT101	Principles of Management and Business	3	
CHEM103	General Chemistry I or	4	
CHEM104	General Chemistry Lab or		
BCH101	General Biochemistry or		
PHYS104	General Physics		
Total		**17**	

LEVEL FOUR

Code	Course Name	Hours	Pre-/Co-requisites
CSC113	Computer Programming II	4	CSC111
IS240	Information Systems Analysis & Design	3	
ACCT201	Accounting Principles	3	
STAT324	Engineering probability and statistics	3	
MATH151	Discrete Math	3	MATH150
IC101	Introduction to Islamic Culture	2	
Total		**18**	

LEVEL FIVE

Code	Course Name	Hours	Pre-/Co-requisites
CSC212	Data Structures	3	CSC113
IS224	Visual Programming	3	
IS230	Introduction to Database Systems	3	
IS351	Information Systems Project Management	3	
IS362	Mathematical Modeling for IS	3	
MGT121	Organizational Behavior	3	
Total		**18**	

LEVEL SIX

Code	Course Name	Hours	Pre-/Co-requisites
CSC227	Operating Systems	3	
IS324	Modern Application Development	3	
IS335	Database Management Systems	3	
FIN200	Principles of Finance	3	
IC102	Islam and Society	2	
Total		**17**	

SUMMER INTERNSHIP

Code	Course Name	Hours	Pre-/Co-requisites
IS999	Practical Training	1	
Total		**1**	

LEVEL SEVEN

Code	Course Name	Hours	Pre-/Co-requisites
IS385	Enterprise Resource Planning	3	
IS482	Electronic Business	3	
IS498	Capstone Project I	3	
MGT 330	Managerial Skills	3	
IC103	Economic System in Islam	2	
Total		**17**	

LEVEL EIGHT

Code	Course Name	Hours	Pre-/Co-requisites
IS499	Capstone Project II	3	
IC104	Fundamentals of Political System in Islam	2	
ISxxx	Elective I	3	
ISxxx	Elective II	3	
ISxxx	Elective III	3	
ISxxx	Elective IV	3	
Total		**17**	

Courses Description

IS201 ***3(3+0+1)***

Fundamentals & Ethics of Information Systems

Pre-requisite: CT140

This course introduces students to the fundamentals of information systems, starting from computer architecture and the binary number system all the way to ethics of working with information systems. Other

topics include: Definition of Information Systems, Enterprise-wide computing and networking, and E-Business. Conceptual foundations; The decision-making process, Concepts of information, Information Strategic Planning, Information system requirements, and the strategic role of information systems.

IS224
Visual Programming ***3(2+2+0)***
Pre-requisite: CSC 113
The objective of the course is to give to the student the basis for developing visual applications. Using a carefully selected visual programming language, the following topics are studied: Data structures review (vectors, linked lists, files). OO design, OO programming techniques, exception handling, modular programming. GUI design rules. Model View Control (MVC) architecture, event handing. Swing model and components, Multithreading, Networking (Client Server Model), and access to databases.

IS230
Introduction to Database Systems ***3(3+0+1)***
Pre-requisite: CSC 212
In this course, students should study the following topics: characteristics and advantages of the database management systems (DBMS), database concepts and architecture; data models, database schemes and instances, DBMS and the concept of program-data independence, database languages and interfaces, database models, relational data model and relational algebra, relational model constraints; domains, keys, and integrity constraints, the structured query

language (SQL); data definition, queries, update, statements, and views in SQL, database design; functional dependencies, normal forms.

IS240
Information Systems Analysis & Design 3(3+0+1)
Pre-requisite: IS 201
This course is concerned with the fundamental knowledge, methods and skills needed to analyze, design and implement computer-based systems. It addresses the role of the systems analyst, the techniques and technologies used, and the ethical considerations in requirements specification. The structured software development life cycle approach, modeling techniques and development phases are comprehensively discussed and reviewed. In modeling techniques, process models, information models and object oriented models are thoroughly described. A project is given to all students that should cover analysis and design phases of a relatively data-oriented business case; with emphasis on data modeling (ER diagrams) and process modeling (DFDs).

IS324
Modern Application Development 3(2+2+0)
Pre-requisite: IS 224, IS 240
In this course, modern programming trends and techniques are given, and their usage in developing real applications for society organizations. Students go through a learning curve that starts by understanding a problem, analyzing it, sketching and implementing a solution as three-tier by using an object oriented approach. Hence, all these skills must be emphasized in this course. This course is intended

to widen the vision of students and gives them a flavor of the real world problems that can be tackled using programming languages, as opposed to higher level tools such as CASE tool or DB packages. Projects must be selected carefully to provide the student with skills in modern applications. Students learn a new programming language that will be used as an implementation tool. Students must be able to finish one project during the period of this course. Modern trends of software development, e.g. component-based programming can be covered

IS335
Database Management Systems 3(3+0+1)
Pre-requisite: IS 230
This course covers the following topics: DBMS architecture and administration; centralized and client-server approaches, system catalog, and data dictionary, transaction management; concepts, characteristics, and processing, recovery techniques, concurrency control techniques: serializability, deadlock, locking schemes, time-stamp ordering, multi-version, and optimistic techniques, DB security, distributed databases, distributed DBMS, data fragmentation and replication, distributed transactions management, object-oriented databases, introducing to new emerging DB technologies and applications; Web DBs, multimedia DBs, data warehousing , data Mining, … etc.

IS351
Information Systems Project Management 3(3+0+1)
Pre-requisite: IS 240
This course provides an introduction to management concepts, principles, techniques and terminology with

particular reference to IS projects. It addresses issues such as project definition, scope management, planning, organization, resources, scheduling, control, quality, cost estimation, time estimation, risk management, and tools and software of project management. Covered project management tools include Work Breakdown Structure, Gantt charts, PERT, and the critical path method. Topics covered also include project management ethics, and effective project manager skills such as people and leadership skills.

IS362
Mathematical Modeling for IS 3(3+0+1)
Pre-requisite: Math151
This course offers an introduction to mathematical modeling methods and techniques. The goal is for the students to have a solid mathematical foundation in modeling that allows them to apply mathematical modeling techniques to real-world information system problems. This course covers the following topics: introduction to mathematical modeling for information system, linear programming and integer linear programming, applications of linear and integer programming models in information systems, network models, inventory models, and queuing models.

IS370
Data Communications and Computer Networks 3(3+0+1)
Pre-requisite: IS201
Co-requisite: CSC227
This course covers the following topics: definition of computer networks and their, objectives and applications, computer network types; LANs, PANs,

MANs and WANs, computer network architecture: layering, protocols and standard models, the ISO OSI and TCP/IP reference models, physical layer of computer network: the transmission media; signal types, signal characteristics and impairments, modulation techniques and modems, digital signal encoding schemes; NRZ, Manchester and AMI encoding, physical interface; USART, RS-232C/V.24, and USB, data transmission basics: synchronous and asynchronous transmission, synchronization levels; bit, character and frame, transmission modes; full , half duplex, simplex , parallel and serial, data link layer: data link layer functions and standards, ARQ protocols; stop and wait, Go-back-N, and selective reject, DLC protocol standards; HDLC , Internet PPP and SLIP, local area networks: topology and media access methods, LAN protocols and the IEEE 802 standard, Ethernet and IBM token ring LANs, wireless LANs, WANs and data transport networks; GSM cellular, satellite, ATM & ISDN.

IS385

Enterprise Resource Planning Systems 3(2+2+0)

Pre-requisite: IS230, FIN200

The objective of this course is to enable the students to have theoretic and practical knowledge on the Enterprise Resource Planning (ERP). The students will learn the business processes of a company and how they are integrated (sales and distribution, finance, human resources, supply chain management, e-business, and customer relationship management). Each business process is deeply explained in order to learn its modules, techniques and appropriate strategies. The students will have the chance to work on real ERP systems and get the chance to work

through the main business scenarios. During this course students will work in groups in order to fulfill a project which will be related to the configuration of a business scenario based on typical company needs.

IS424
Web Application Development 3(2+2+1)
Pre-requisite: IS240, IS324
This course explores advanced and modern concepts and technologies used in the development of electronic business applications. Topics include component development and reuse, distributed object technologies, multi-tier applications, client-side versus server-side technologies, service-oriented architectures, enterprise application integration, data transformation, role of open-source technologies, and finally e-business application installation and deployment issues.

IS432
Semi-structured Data 3(3+0+1)
Pre-requisite: IS230
This course offers a general overview on semi-structured data and XML. It covers the following topics: HTML and XML fundamentals, Graph models for semi-structured data, Typing XML (DTD or schema), XPath and XQuery languages, Data transformation by XSLT, XML-Relational Mapping.

IS436
DBMS Lab 3(2+2+1)
Pre-requisite: IS335
This course covers the following topics: Selection of DBMS, Architecture of the chosen DBMS, Installation issues, DB creation, Indexing, Integrity

Constraints triggers and assertions, DB Backups, Security management, Recovery issues, Performance management and tuning. Other features of the DBMS: Integration with web technologies, DB connectivity tools, Data distribution, fragmentation, and replication issues, Management issues of the DBA activity.

IS438
Introduction to Data Warehouses 3(3+0+1)
Pre-requisite: IS335
This course introduces the concepts and practices of data warehousing. It covers the fundamentals of developing and using a data warehouse, developing requirements, designing models, creating a dimensional model, generating population and maintenance plans for a warehouse. Also the course includes, manipulating the data in the warehouse for update, maintenance and data extraction. If possible, various industry partners will demonstrate some of the other major warehouse products used.

IS442
Information Systems Engineering 3(3+0+1)
Pre-requisite: IS240
This course covers the following topics: the advanced steps in software developing such as types of software testing and user acceptance testing, different strategies used in software installation, processes of maintaining information systems; types of maintenance, measuring and controlling of maintenance effectiveness, software quality assurance, quality concepts, the ISO 9000 & ISO 9126 quality factors, technical metrics for software, testing metrics, technical metrics for software sizing, object-oriented systems metrics, software

development methodologies, requirement engineering and configuration management.

IS462
Information Systems Modeling and Simulation 3(3+0+1)
Pre-requisite: IS362
This course covers foundations of model-based information systems management. It introduces basic concepts and techniques of simulation modeling as a decision-support tool and a problem-solving approach. Emphasis will be on discrete-event simulation model development methodologies and implementation techniques.

IS463
Introduction to Data Mining 3(3+0+1)
Pre-requisite IS230, IS362
This course offers an introduction to data mining concepts and techniques. The goal is for the students to have a solid foundation in data mining that allows them to apply data mining techniques to real-world problems and to conduct research and development in new data mining methods. Topics include data mining algorithms and methods including association analysis, classification, cluster analysis, as well as emerging applications and trends in data mining.

IS466
Decisions Support Systems 3(3+0+1)
Pre-requisite: IS230
This course covers the following topics: the decision making process, decision making and support systems (DSS), modeling and support, categorization of problem-solving techniques, data management and

concepts of the data warehousing, modeling; forecasting models, simulation models and association analysis models, decision support system construction methods, decision tree induction, knowledge-based systems and expert systems, expert system architecture, representation of knowledge, forward and backward chaining, inferences making process, applications of expert systems in decision making.

IS472
E-health ***3(3+0+1)***
Pre-requisite: IS240, IS335
This is interdisciplinary course where it brings the information technology along with the health care systems. It serves as an introductory course about how IT, communications and technologies can contribute effectively to manage and link health care information systems. The course will provide students with knowledge and skills towards the use and application of IT to all aspects of health care discipline. This course will cover E-health record, e-public health information systems, E-networking, E-medicine, E-home care, E-diagnosis support systems and E-health Intelligence. The course also introduces E-Health care technology management, E-health security and Mobile health.

IS473
Distributed Information Systems ***3(3+0+1)***
Pre-requisite: IS370
In this course the following topics are covered: principles of distributed computing, the Internet as a huge computer system, distributed computing models: client-server model, multiple-server model, mobile

agents model, and computer networks, TCP applications, IP layer applications, socket management, inter-process communication, UNIX case study, distributed object oriented architectures; design issues, applications in client-server computing, introduction to distributed file systems, name servers, mobile computing, modern trends in distributed computing.

IS481
Business Process Management 3(3+0+1)
Pre-requisite: IS351, MGT121
This course discusses management issues and problems related to the development of database, decision support, and large-scale software systems in business. This course is intended to provide students with a foundation of critical issues in the design and implementation of business process-driven change. The course focuses on managing information technology and information systems in the business environment by examining managing business process redesign and software development, managing projects and changes, managing enterprises, information Systems, and IT Leadership. The course covers also the documentation, analysis, modeling and improvement methodologies, techniques and tools of business process. The course makes a special focus on workflow management systems, building networked-organization, and the development of process-driven, knowledge-based organization.

IS482
Electronic Business 3(3+0+1)
Pre-requesiteIS230, IS370
Overview of e-commerce types: B2B, B2C, and, C2C ; E-marketplaces: structure, mechanisms, economics, and impacts; Retailing in electronic commerce: products and services, consumer behavior, online market research, and customer relationship management; Online advertising, e-procurement, exchanges and portals; E-supply chains, collaborative commerce; Mobile commerce and pervasive computing; Auctions; E-commerce security; Electronic payment systems, order fulfillment, content management, and other support services; E-business strategy, launching a successful online business; Legal, ethical, and social impacts of e-business, building e-commerce applications and infrastructure; E-government, e-learning, and other e-business applications.

IS485
Enterprise Resource Planning Systems Lab 3(2+2+0)
Pre-requisite: IS385
The objective of this course is to enable the students to have deep practical knowledge on a select business scenario in the Enterprise Resource Planning (ERP). We propose in this course to teach Supply Chain Management (SCM), since it is the business scenario which is most demanded by companies. The students will learn this business scenario: the techniques used in SCM, the customizing of SCM, the different modules used in SCM. The students will have the chance to work on real ERP system and practice its theory knowledge. During this course the students

will have to work in a group in order to fulfill a project which will be related to the implementation of one module of SCM based on company needs.

IS491
Selected Topics in Information Systems 3(3+0+1)
Pre-requisite: IS324, IS 351
This course intends to introduce special topics of current trends in information systems and information technology. The department council should approve the selected topics of this course. Such possible topics include: requirement engineering tools and methods, simulation, virtual reality, internet security, data warehousing and mining, geographic information systems, telemedicine and medical informatics, workflow management, quantitative and qualitative methods in information systems, global information technology management, intelligent agent technology and applications, human computer interaction, computer-based learning and training, philosophical foundations of information systems, absorbing continuous it developments in organizations, it professional and organizational needs, organizational learning and collaborative technologies, understanding and managing information users behavior, policy, legal and security issues in is, and virtual organizations.

IS492
Introduction to Geographic Information Systems 3(2+2+0)
Pre-requisite: IS335
This course introduces students to a mix of geographic information system theory and applications. Topics include geographic projection

and coordinate systems, spatial data management, spatial analysis, concept of topology, models of spatial data (focusing on raster and vector models), spatial analysis techniques, and GIS implementation issues. By the end of the course, students are expected to have a thorough understanding of GIS development, functionality, methodology for implementing the technology, and its potential usefulness in geographic and environmental studies.

IS493
Information Security ***3(3+0+1)***
Pre-requisite: IS370
Security fundamentals, policies, procedures, and mechanisms. Identification, authentication models, access control models. Data models, concepts and mechanisms for software, hardware, operating system and database security. Basic cryptography (symmetric and asymmetric) and its applications. Security in computer networks and distributed systems. Attacks types and how to prevent them. Prevention and control of viruses and other rogue programs. In addition, the basics of physical security, incidence response, disaster recovery, business continuity, and forensics.

IS498
Capstone Project-I ***3(3+0+0)***
Pre-requisite: IS 230, IS 324, IS 351
The previous courses have provided the IS students with strong and sufficient knowledge to develop information systems. The next logical stage is that the IS student must acquire hands-on experiences on developing real world information systems. In addition, the students should be familiarized with real

world problems encounter during the development of real world information systems. Furthermore, the students should be trained to work in teams. In this course, the students will be organized into groups. The number of students in each group should not exceed three students. In developing an information system, a particular information system development methodology should be used. Each group will develop a real world information system in two stages: The first stage will be carried out in IS 498. In IS 498, the students of each group must identify a problem domain, define a problem, identify the requirements in details, specify requirements in details, analyze and document the current system, proposed alternative systems, and design a particular system in details which includes the definitions of all the required system models such as the data model and the functional model. At the end of the course, each group must submit a formal report documenting the problem domain, the problem, the requirements, the specifications, and the system models.

IS499
Capstone Project-II ***3(3+0+0)***
Pre-requisite: IS 498

In this course, each group will continue developing the information systems that started in IS 498. Groups must use particular tools to implement their information systems in a good programming practice. These implementation tools must be new, up to date, and fully approved in IS design and implementation environment. Furthermore, students must generate user manuals for their information systems in an appropriate format. At the end of the term, each group must submit a final report, which documents

completely the information system, from the problem definition phase to the implementation phase, and contains a user manual for the information system.

Useful Contacts

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