



# IS Undergraduate Students Handbook



To GUIDE YOU FROM THE PRIMARY STAGES  
TO GRADUATION



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## Introduction

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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

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

## Mission

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

## Department Objectives

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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

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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

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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

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### LEVEL ONE

Code	Course Name	Hours	Pre-/Co-requisites
<b>MATH101</b>	Differential Calculus	3	
<b>Engl100</b>	English Language	6	
<b>ARAB100</b>	Writing Skills	3	
<b>CHS101</b>	General Chemistry I	4	
<b>Total</b>		<b>15</b>	

### LEVEL TWO

Code	Course Name	Hours	Pre-/Co-requisites
<b>STAT101</b>	Introduction to Statistics	3	
<b>CT101</b>	Computer Skills	3	
<b>ENT101</b>	Entrepreneurship	1	
<b>EPH 101</b>	Fitness and Health Education	1	
<b>Engl110</b>	Specialized English Language	6	Engl100
<b>CUR101</b>	University Skills	3	
<b>Total</b>		<b>17</b>	

### LEVEL THREE

Code	Course Name	Hours	Pre-/Co-requisites
<b>CSC111</b>	Computer Programming I	4	CT101
<b>MATH151</b>	Discrete Math	3	MATH101
<b>IS201</b>	Fundamentals & Ethics of Information Systems	3	CT101
<b>MGT101</b>	Principles of Management and Business	3	
<b>Total</b>		<b>13</b>	



#### LEVEL FOUR

Code	Course Name	Hours	Pre-/Co-requisites
<b>CSC113</b>	Computer Programming II	4	CSC111
<b>IS240</b>	Information Systems Analysis & Design I	3	IS201
<b>ACCT201</b>	Accounting Principles	3	
<b>IS230</b>	Introduction to Database Systems	3	MATH151 CSC111
<b>MATH244</b>	Linear Algebra	3	
<b>Total</b>		<b>16</b>	

#### LEVEL FIVE

Code	Course Name	Hours	Pre-/Co-requisites
<b>CSC212</b>	Data Structures	3	CSC113
<b>IS324</b>	Modern Application Development	3	IS230 IS240
<b>IS 340</b>	Information Systems Analysis & Design II		IS 240
<b>IS351</b>	Information Systems Project Management	3	IS240
<b>IS362</b>	Mathematical Modeling for IS	3	MATH106 STAT324
<b>MGT121</b>	Organizational Behavior	3	MGT101
<b>Total</b>		<b>18</b>	

#### LEVEL SIX

Code	Course Name	Hours	Pre-/Co-requisites
<b>CSC227</b>	Operating Systems	3	CSC212
<b>FIN200</b>	Principles of Finance	3	ACCT201
<b>IS370</b>	Data Communication and Computer Network	3	CSC113



<b>IS385</b>	Enterprise Resource Planning	3	IS230
<b>IS335</b>	Database Management Systems	3	IS230
<b>IS494</b>	Practical Training	1	IS230 IS351
<b>Total</b>		<b>16</b>	

### LEVEL SEVEN

Code	Course Name	Hours	Pre-/Co-requisites
<b>IS493</b>	Information Security	3	IS370 CSC277
<b>IS482</b>	Electronic Business	3	IS230 IS370
<b>IS 424</b>	Web Application Development	3	IS324
<b>IS498</b>	Capstone Project I	3	IS340 IS324
<b>MGT 330</b>	Managerial Skills	3	MGT101
<b>IC107</b>	Professional Ethics	2	
<b>Total</b>		<b>17</b>	

### LEVEL EIGHT

Code	Course Name	Hours	Pre-/Co-requisites
<b>IS499</b>	Capstone Project II	3	IS498
<b>IC108</b>	Current Issues	2	
<b>IS495</b>	Seminar	1	IS340 IS385
<b>ISxxx</b>	Elective I	3	
<b>ISxxx</b>	Elective II	3	
<b>ISxxx</b>	Elective III	3	
<b>ISxxx</b>	Elective IV	3	
<b>Total</b>		<b>18</b>	



## Courses Description

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

***Fundamentals & Ethics of Information Systems***

***Pre-requisite: CT101***

This course introduces students to the fundamentals of information systems and to ethical issues related to information systems as a discipline and profession. Topics covered include: definition of information systems, hardware and software, the binary system, telecommunications and networks, concepts of information, database approach to data management, systems development, specialized information systems, moral, legal and social issues in the cyberspace, professional conduct, personal, local and global impacts of computers, and IS professionals' need for continuous professional development.

**IS230** **3(3+0+1)**

***Introduction to Database Systems***

***Pre-requisite: CSC111, MATH151***

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 I 3(3+0+1)**

*Pre-requisite: IS201*

This course provides the basic concepts and techniques of information systems analysis and design. It provides coverage of the basic Unified Modelling Language (UML) notation used for structural and behavioral modeling and it provides the practical application of UML through using CASE tools. It develops an understanding of the role and importance of the systems analyst in a rapidly changing world. New approaches to systems analysis and design will be described, including object-oriented analysis and design. Topics in this course include: overview of the system development lifecycle, information systems development methodologies with an emphasis on agile approach, identifying and describing problems, requirements discovery process, stakeholder identification, importance of user involvement, basic analysis models and basic design models. The course involves a project component in order to allow students to apply concepts presented in the course.

### **IS324**

#### **Modern Application Development 3(2+2+0)**

*Pre-requisite: IS230, CSC113*

In this course, modern programming trends and techniques are given, and their usage in developing real applications for society organizations. Students start 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 tools 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., mobile applications development, component-based programming can be covered.

### *IS335*

#### *Database Management Systems 3(3+0+1)*

*Pre-requisite: IS230*

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.

### *IS340*

#### *Information Systems Analysis & Design II*

*3(3+0+1)*

*Pre-requisite: IS240*



This course extends existing knowledge and skills of the information systems analysis and design obtained from IS240 course. It provides additional concepts and techniques of information systems analysis and design. The course continues the coverage of the Unified Modelling Language (UML) notation used for structural and behavioral modeling and it provides the practical application of UML through using CASE tools. Topics in this course include: systems development team structure and dynamics, user interface design, architectural design and detail design, basic design patterns, system architecture including reference architecture and domain-specific architecture, concepts of reusability, portability and robustness in design. The course also explains design principles for input/output (I/O) with regard to human interaction and user acceptability, GUI builders and UI programming environments. The course involves a project component in order to allow students to apply concepts presented in this course.

### ***IS351***

#### ***Information Systems Project Management 3(3+0+1)***

***Pre-requisite: IS240***

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: Math244*

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, CSC113*

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*

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: 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, CSC212*

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: IS340*

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.

### **IS451**

#### **Introduction to Enterprise Architecture 3(3+0+0)**

*Pre-requisite: IS351, IS385*

This course explores the design, selection, implementation and management of enterprise IT solutions. The focus is on applications and infrastructure and their fit with the business. Students



learn frameworks and strategies for infrastructure management, system administration, data/information architecture, content management, distributed computing, middleware, legacy system integration, system consolidation, software selection, total cost of ownership calculation, IT investment analysis, and emerging technologies. Attention is paid to managing risk and security within audit and compliance standards.

### **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, IS362*

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.

### **IS466**

#### **Data Science Fundamentals**

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

*Pre-requisite: IS230, CSC212*

This course is an introduction to data science as a field dealing with big data in modern business and research environments that requires making decisions and deriving meaningful insight from large-scale, heterogeneous data. The course covers general principles of analysis, investigation and reporting, and provides an overview of several key concepts, skills, and technologies used by practicing data scientists. Students will be introduced to basic algorithms and software tools dealing with data.

### **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.

### **IS479**

#### **Practical Training 1(0+0+1)**

*Pre-requisite: IS230, IS351*

Training is an important aspect of the educational process in the College of Computer and Information Sciences. Student is required join an IT center in a government or private sector as a full time for at least 8 weeks in the last summer prior to his graduation. The aim of the student training is to acquire the experience in applying what he learned in real life and in team working. The student training is evaluated through both his training advisor at the IT center and the training committee through the report he provides about his training.

### **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-requisite: IS230, 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, FIN200*

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.

### **IS486**

#### **Cloud Computing**

**3(3+0+0)**

*Pre-requisite: IS385, IS370*

The main purpose of this course is to educate students on building cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers (physical, virtual, control, orchestration, and service) and three cross-layer functions (business continuity, security, and service management) for building a cloud infrastructure. For each layer and cross-layer function, this course covers the comprising technologies, components, processes, and mechanisms. This course takes an open-approach to describe the concepts and



technologies with real examples related to cloud computing, Students will learn about the key considerations and steps involved in transitioning from the current state of a data center to a cloud computing environment.

### *IS491*

#### *Selected Topics in Information Systems 3(3+0+1)*

*Pre-requisite: IS230, IS240*

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: IS230*

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, CSC227*

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.

### *IS495*

#### *Seminar*

*1(1+0+0)*

*Pre-requisite: IS340, IS385*

This seminar course offers students practical in-depth discussions of state-of-the-art topics relating to information systems, organizations, and information systems in industry. The aim of the course is to



prepare students for IT professions by giving them glimpses from what to expect upon employment. Speakers from different IT private and public organizations may be invited to share their experiences with the students.

### **IS498**

#### **Capstone Project-I**

**3(3+0+0)**

*Pre-requisite: IS340, IS324*

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: IS498*

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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