

# CS100x Introduction to Information Technology

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<b>Module Code:</b>	<b>CS100x</b>
<b>Module Title:</b>	<b>Introduction to Information Technology</b>
<b>Level:</b>	<b>1</b>
<b>Credit points:</b>	<b>3</b>
<b>Module Leader:</b>	<b>Maged El-Hakeem</b>
<b>Pre-requisite:</b>	<b>None</b>

## Aims

This module familiarizes the student with the efficient use of computers, to improve general skills and training on popular computer application packages. The module serves also as an introduction to computer-related terminology and introduces software and hardware basics for a computer science student.

## Learning outcomes

### *Knowledge*

On completion of this module, the successful student will be able to:

- Describe the essential hardware components of the computer and its peripheral devices and how they work. (1)
- Understand the different numbering systems. (2)
- Define the basics of computer communications and networks and describe their applications. (3)
- Demonstrate the use of browsers, search engines and Internet learning resources. (4)
- Understand programming concepts ( Flow chart and pseudo code) (5)

### **Skills**

- Use the basic computer productivity tools and applications (word processing, databases, spread sheets, presentations, and graphics. (6)
- Use binary arithmetic and conversions between numbering systems. (7)
- Effectively use the Internet resources, organise, retrieve, select, set up, and troubleshoot information on a computer. (8)
- Examine careers that involve computers and outline a professional development plan. (9)

## Syllabus

- Introduction and historical background.
- Inside the computer - Details about data storage, encoding systems, binary arithmetic, conversions between numbering systems, analysing a computer system, describing the processor.
- Software – common software concepts, purpose and objectives of an operating system, understanding relationship between computers and programming languages, programming concepts and distinguishing between different platforms.
- Storing and retrieving Information, secondary storage files, sequential and direct access, magnetic disks, magnetic tapes, optical laser disks.
- Input /Output devices, traditional input devices, Source-Data automation, output devices, and terminals.
- Computer Networks, a brief overview of data communications hardware, data highways, network topologies, local area networks.

- An overview of online services & Productivity software. Understanding graphics software concepts, functions of different types of graphics software, multimedia concepts and applications. A detailed practical coverage is provided in lab.
- Conversion between number systems and arithmetic operations.
- Programming concepts. (Flow charts and pseudocode)

## **Learning, Teaching and Assessment Strategy**

**Weekly lectures** to introduce the basic ideas of the course subjects

**Weekly computer laboratory:** to investigate the concepts of computer hardware, software and applications practically: To demonstrate the use of computer networks and to learn the use of the standard Desktop applications.

**Group presentations** Instead of a project, students are assigned a specific subject to investigate in depth and present it in class.

### **Assessment**

Assessment will be based on:

- Two unseen exams several questions to assess the student knowledge and understanding (L.O. 1, 2, 3, 5, 7, 9)
- Lab weekly assignments and lab presentation to assess (L.O. 4, 6, 8)

### **Assessment Weighting**

- Unseen examinations 60%
- Coursework 40%

### **Learning materials**

#### **Essential**

- Computing Essentials 2013, Complete Edition, by Timothy J. O'Leary, Linda I. O'Leary, McGraw-Hill. ISBN: 978-0-07-131472-5.

#### **Recommended**

- Computers: Tools for an Information Age, 8th ed., by H. L. Capron, J. A. Johnson, Prentice Hall, 2003.
- Using Information Technology (A practical introduction to computers and communications), 7th ed., by Brian Williams, Stacey Sawyer, McGraw-Hill, 2007.
- Digital Design, 5<sup>th</sup> edition, Morris Mano, Prentice Hall, 2007.
- Explorations in Computer Science: A Guide to Discovery by Mark Meyer, Jones & Bartlett Pub, 2003.
- Essential Introduction to Computers, 5th ed. by Thomas J. Cashman and Gary B. Shelly, Course Technology, 2003.

# CS101x Fundamentals of Computing I

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**Module Code:** CS101x  
**Module Title:** Fundamentals of Computing I  
**Level:** 1  
**Credit points:** 3  
**Module Leader:** Dr.Ahmed Farouk  
**Pre-requisite:** None

## Aims

This module introduces computer programming techniques, with an emphasis on important programming concepts. It gives the student the fundamentals of logic thinking to analyse and solve simple programming problems.

## Learning outcomes

### Knowledge

On completion of this module, the successful student will be able to:

Demonstrate understanding of the main three phases of programme writing (Input, processing, and output).(1)

Provide a correct solution for a given problem in different complicated levels.(2)

Evaluate two different solutions to a given problem and determine a suitable solution.(3)

### Skills

This module will call for the successful student to demonstrate:

Ability to differentiate between syntax and semantics and to understand and explain a given source code.(4)

Ability to develop a good programming technique for readability and traceability.(5)

Effectively use automated and manual debugging tools to correct a given programme.(6)

Ability to validate and trace a given source code.(7)

Ability to critically analyse the logic of a programme either to complete it or correct it.(8)

## Syllabus

- Basic programme construction (identifiers, statements, functions, comments, and pre-processors).
- Data types in a given programming language.
- Constants and variables declaration.
- Input and output statements.
- Output manipulators.
- Mathematical and logical expressions.
- Decision statements.
- Repetition statements.
- One dimensional array.
- String manipulations.
- Procedural programming using user-defined functions.

## Learning, Teaching and Assessment Strategy

Weekly lectures to introduce the basic ideas of the course subjects

Weekly computer laboratory: The students are expected to use C++programming language to solve different types of problems from a variety of fields.  
Team Projects

### **Assessment**

Assessment will be based on:

Unseen examinations: all exam questions assess the ability of the student to choose the appropriate programming technique for a problem, demonstrate and apply his programming knowledge in problem solving.(to assess L.O.. 2.,3,6,7,8)

Coursework: distributed between the following topics

Lab work and team projects:

The lab focuses on assessing the practical skills described earlier. All lab work and projects are assessed according to the students' programming ability and efficiency; speed of development, proper use of language constructs, proper structure of the programme, clarity and annotation of the programmes and the quality of the overall solution developed; ease of use and speed of execution. All lab assignments and projects should run correctly, be documented and presented.(to assess L.O.. 1 to 8)

Homework assignments.(to assess L.O. 1 to 8)

In class assessment.(to assess L.O. 2.,3,6,7,8)

### **Assessment Weighting**

Unseen examinations: 60%

Coursework: 40%

Lab work 15%

Homework assignments 15%

In class assessment 10%

### **Learning materials**

Software Requirements

Microsoft Visual Studio 6 (VC++), or any other programming language.

Reference text

Timothy B. D'Orazio, "Programming in C++ Lessons and Applications", 1st ed. McGraw-Hill Science/Engineering/Math; 2004

Object-Oriented programming in C++, 4th ed. Robert Lafore, Waite Group Press, 2001.

Supplementary readings

C++ Programming: From Problem Analysis to Programme Design, Fourth Edition by D.S. Malik, Course Technology; Feb 11, 2008

C++ Programming: Programme Design Including Data Structures, Third Edition by D.S. Malik W. Norton & Company, May 2, 2006

C Programming: A Modern Approach, 2nd Ed. by K. N. King (Paperback - April 19, 2008)

C++ Programming: An Object-Oriented Approach, by Course Technology, 2003.

Object Oriented Programming Using C++, 2nd Ed. by B. Chandra, Alpha Science International, Ltd - Feb 2005

The C++ Programming Language 3rd ed. by Bjarne, Stroustrup, Addison- Wesley, 2000.

C++ and Object-oriented Numeric Computing for Scientists and Engineers, by Daoqi Yang, Springer Verlag, 2000

Microsoft Visual C++ .Net: Step by Step: by Julian Templeman, Andy Olsen, John Sharp, Microsoft Press, 2003.

# CS102x Fundamentals of Computing II

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**Module Code:** CS102x  
**Module Title:** Fundamentals of Computing II  
**Level:** 1  
**Credit points:** 3  
**Module Leader:** Dr. Ahmed Farouk  
**Pre-requisite:** CS101x

## Aims

This module provides students with the fundamentals to analyse and solving advanced programming problems. It also aims to provide the students with the ability to design algorithms and translate them into a programming source code.

## Learning outcomes

### Knowledge

On completion of this module, the successful student will be able to:

Critically design and analyze a large problem using object-oriented methodologies (OOP).(1)

Provide the main three phases of advanced object-oriented programme writing(input, processing and output).(2)

Provide a correct solution for an advanced problem in different complicated levels.(3)

Evaluate two different solutions to a large problem, using object-oriented methodologies.(4)

### Skills

This module will call for the successful student to demonstrate:

Ability to understand and explain an object-oriented source code.(5)

Ability to develop a good programming technique using object-oriented methodologies.(6)

Effective use of automated and manual debugging tools to correct long and high complexity programmes.(7)

A positive contribution to group working.(8)

## Syllabus

- Two-dimensional arrays.
- Structures and arrays of structures.
- Pointers.
- Classes' usage and declaring.
- Objects as function arguments.
- Operator and function overloading.
- Inheritance.

## Learning, Teaching and Assessment Strategy

Weekly lectures: to introduce the basic concepts of the course subjects listed in the syllabus part.

Weekly computer laboratory: to apply the concepts learned to develop workable programming solutions for different types of problems from a variety of fields, e.g. mathematical, text manipulation and business problems.

Weekly assignments: The student will be assigned a weekly programming homework to develop on his own. All programmes have to be submitted to the instructor running without errors.

Project: The students are expected to use the C++ programming language to solve different types of problems from a variety of fields, the lab focuses on assessing the practical skills described earlier. They are expected to do a group project of sizable programming task (300 to 500 line requiring 50 to 100 programming hours). All lab work and projects will be assessed on the student's programming ability and efficiency; speed of development, proper use of language constructs proper structure of the programme, clarity and annotation of the programmes and the quality of the overall solution developed; ease of use and speed or execution. All lab assignment and projects should correctly run, be documented and presented.

**Assessment:**

Unseen examinations: all exam questions assess the ability of the student to choose the appropriate programming technique for a problem, demonstrate and apply his programming knowledge in problem solving.(L.O. 3, 4, 5, 6, 7, 8)

Coursework: distributed between the following topics:

Lab project.(L.O. from 1 to 8)

Homework assignments (L.O. from 1 to 7)

In class assessment (L.O.1 from 7)

Assessment Weighting	
Unseen examinations.	60%
Coursework:	
Lab project	20%
Homework assignments	10%
In class assessment	10%

**Learning materials**

Software Requirements

VC++

Useful Websites

[www.cplusplus.com/doc/tutorial/](http://www.cplusplus.com/doc/tutorial/)

Reference text

Timothy B. D'Orazio, "Programming in C++ Lessons and Applications", 1st ed. McGraw-Hill Science/Engineering/Math; 2004

Object-Oriented programming in C++, 4th ed. Robert Lafore, Waite Group Press, 2001.

Supplementary readings

C++ Programming: From Problem Analysis to Programme Design, Fourth Edition by D.S. Malik, Course Technology; Feb 11, 2008

C++ Programming: Programme Design Including Data Structures, Third Edition by D.S. Malik W. Norton & Company, May 2, 2006

C Programming: A Modern Approach, 2nd Ed. by K. N. King (Paperback - April 19, 2008)

C++ Programming: An Object-Oriented Approach, by Course Technology, 2003.

Object Oriented Programming Using C++, 2nd Ed. by B. Chandra, Alpha Science International, Ltd - Feb 2005

The C++ Programming Language 3rd ed. by Bjarne, Stroustrup, Addison- Wesley, 2000.

C++ and Object-oriented Numeric Computing for Scientists and Engineers, by Daoqi Yang, Springer Verlag, 2000

Microsoft Visual C++ .Net: Step by Step: by Julian Templeman, Andy Olsen, John Sharp, Microsoft Press, 2003.

## **CS203 Computer Organization**

**Module Code:** CS203  
**Module Title:** Computer Organization  
**Level:** 2  
**Credit points:** 3  
**Module Leader:** Tarek Makladi  
**Pre-requisite:** CS102x

### **Aims**

This module is concerned with Fundamentals of computer operation, instructions set architecture, assembly language programming, computer organization, pipelining, memory hierarchy, storage and I/O, and trends in computer design.

### **Learning outcomes**

#### ***Knowledge***

On completion of this module, the successful student will be able to:

- Illustrate the importance of the Instruction Set Architecture abstraction. (1)
- Demonstrate an understanding of the instruction set architecture of a MIPS processor. (2)
- Demonstrate an understanding of the Procedures and the Runtime Stack. (3)
- Demonstrate an understanding of the organization/operation of integer & floating-point units. (4)
- Demonstrate a knowledge of mathematics in CPU performance analysis and in speedup computation.(5)
- Demonstrate an understanding of the organization/operation of memory and caches. (6)

#### ***Skills***

This module will call for the successful student to:

- Evaluate the performance of processors and caches. (7)
- Design the data path and control of a single-cycle CPU.(8)
- Design the data path/control of a pipelined CPU & handle hazards.(9)

### **Syllabus**

- Instruction Set Architecture.
- MIPS Assembly Language Programming.
- Procedures and the Runtime Stack.
- Interrupts.
- Integer Arithmetic and ALU design.
- Floating-point arithmetic.
- CPU Performance.
- Single-Cycle data path and Control Design.
- Pipelined data path and Control.
- Memory System Design.

## **Learning, Teaching and Assessment Strategy**

**Weekly lectures (3 hours per week):** to introduce the basic ideas of the course subjects.

**Weekly computer laboratory (1.5 hours per week):** to use simulation tools to apply the concepts learned in the course.

**Team Projects** The student will work as a member of project team to apply the concepts learned in the course to analyze, design and programming an application for Intel 8051 microcontroller family.

**Class presentations** as part of the implementation of the team project the student will prepare project documentation, prepare and present a slide presentation on the project and give a live demonstration of its application.

### **Assessment:**

**Unseen examinations:** The exams will be divided between testing the student knowledge outcomes.(L.O.3, 4, 5, 6, 7, 8, 9)

**Lab work:** Lab work will be assessed on the student's ability to use software, design, build and debug the built systems and meet the deadlines.(L.O 2, 6, 7)

**Weekly assignments** are exercises on the topics introduced in the lectures and the students will be asked to hand in their solutions. (L.O.1, 4, 7, 9)

### **Assessment Weighting**

- |                            |     |     |
|----------------------------|-----|-----|
| • Unseen examinations      |     | %60 |
| • Coursework               |     | %40 |
| • Two in class exams       | %10 |     |
| • Assignments and lab work |     | %10 |
| • Team Project Defense     | %20 |     |

### **Learning material**

#### **Essential**

Computer Organization and Design, The Hardware/Software Interface, 4th Edition, by David A. Patterson and John L. Hennessy, ISBN: 9780123744937, Morgan Kaufmann Publishers.

#### **Software**

SPIM MIPS

Assembly language simulator; There are also other MIPS editors in the CD that comes with the Textbook.

# CS205 Principles of Information Systems

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**Module Code:** CS205  
**Module Title:** Principles of Information Systems  
**Level:** 2  
**Credit Points:** 3  
**Module Leader:** Prof. Ali El-Bastawissy  
**Prerequisites:** CS100x

## **Aims**

This course provides an introduction to basic Information System concepts. It explains the importance of information systems in business environment which supports firms' business operation, managerial decision and strategic advantage. It focus on defining main components of information system, basic hardware and software concepts, telecommunications, business process, information systems development, and the application tools.

## **Learning Outcomes**

### **Knowledge**

On completion of this module, the successful student will be able to:

Describe the development of computer utilization in the workplace (1).

Identify the key components of an Information System (2).

Discuss how effective use of the Internet and Information Systems furthers the goals and objectives of a business organization operating in a global economy (3).

Understand existing system and Identify potential problems (4).

Figure out the outlines of possible system enhancement (5).

### **Skills**

This module will call for the successful student to:

Prepare Information System case (analyze case studies; identify the potentials and impact of IT evolving the existing system). (6)

Map between system needs and system Software requirements. (7)

Plan, Schedule, and allocate the resources required for information Systems Projects. (8)

## **Syllabus**

The world of Information Systems

The mangers, the organization, types of users, and the team

Types of IS

Components of IS

Organizing data and information

Systems development lifecycle

IS Methodologies

Comparisons between different IS Methodologies

Information Systems Management

## **Learning, Teaching and Assessment Strategy**

Weekly lectures: to introduce the basic concepts of the course subjects

Weekly tutorials: to discuss the solution of the weekly homework assignments

Project: The students will work in teams to plan small IS-projects of different types. Some of the better projects will be presented in class.

### **Assessment**

Assessment will be based on:

Two unseen exams composed of several questions to assess the student knowledge and understanding (L.O.. 1 to 7)

Case studies and assignments are used to assess (L.O. 4,5,6,7,8) 20%

Assignments and term paper to assess (L.O. 1,2,5,6,7,8) 20%

#### Assessment Weighting

Unseen examination	60 %
Coursework (no examination)	40 %
• Project	20%
• Assignments and presentation	20%

### **Learning materials**

Essential:

Information Systems Development - Methodologies, tools, and techniques, David Avison & Guy Fitzgerald, 4th Edition, McGraw Hill, 2006

Recommended Readings:

PROJECT MANAGEMENT IN PRACTICE, Samuel J. Mantel, Scott M. Shafer and Jack R. Meredith, Fourth Edition, Wiley, 2010

# CS213 Algorithms and Data Structures

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**Module Code:** CS213  
**Module Title:** Algorithms and Data Structures  
**Level:** 2  
**Credit points:** 3  
**Module Leader:** Dr. Ahmed Farouk  
**Pre-requisite:** CS102x

## Aims

This module aims to allow the student to analyse and select the optimized algorithm for different problems. Optimization techniques are classified in two ways, either in terms of speed (complexity), or in terms of memory usage (volatile or secondary memory).

## Learning outcomes

### Knowledge

On completion of this module, the successful student will be able to:

- Explain in depth the different algorithms for data structure manipulation.(1)
- Demonstrate different sort and search algorithms and the optimum search algorithm.(2)
- Illustrate the use of recursion and recursion functions.(3)
- Categorize the classes of problems according to complexity theory.(4)
- Illustrate the use of different data compression techniques for files.(5)

### Skills

This module will call for the successful student to demonstrate:

- The ability to analyse and select the best algorithm that suits a problem.(6)
- The ability to build a robust computer programme that will not crash for unexpected input.(7)
- The ability to expertly debug complicated algorithms and programmes.(8)
- The ability to understand and examine predefined algorithms.(9)
- A positive contribution to group (team) working.(10)

## Syllabus

- Analyse the efficiency of algorithms.
- Recursion functions (implementation and usage).
- Implement a list class.
- Implement a Stack and queues.
- Design of generic classes.
- Recursion functions.
- Searching and sorting algorithms.
- Trees representation.
- Binary search trees

## Learning Teaching and Assessment Strategy

Weekly lectures to introduce the basic concepts of the course subjects

Weekly computer laboratory: to provide Hands-on training on the use of C++ programming language to manipulate different file structures and implement sort and search algorithms. Extended time will be given to the student to work on large programming assignment on his own.

Team Projects: The student will work as a project team member to apply the learned concepts on real world problems. The subject of the project will be chosen to reflect current issues of software development

### **Assessment**

Unseen examinations.(L.O. 1, 2, 3, 4, 6)

Coursework: distributed between the following topics.

Lab work(L.O. from 1 to 8)

In class assessment.(L.O. 2, 3, 4, 6)

Homework assignments.(L.O.. 1, 3, 4, 6, 7, 8)

Project(L.O.1,7, 8, 9,10 )

#### Assessment Weighting

Unseen examinations	60%
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Coursework:

Lab work	8%
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In class assessment	5%
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Homework assignments	12%
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Project	15%
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### **Learning materials**

Software Requirements

VC++, or any other programming language.

#### Useful Websites

[www.cplusplus.com/doc/tutorial/](http://www.cplusplus.com/doc/tutorial/)

[warrior-101.tripod.com/dstut/dstut.htm](http://warrior-101.tripod.com/dstut/dstut.htm)

#### Reference Text

Data Structures and Algorithm Analysis in C++, 4th Ed. by Mark Allen Weiss, Addison Wesley  
June, 2013

#### Supplementary Readings

Data Structures and Algorithms in C++, 3rd ed. Adam Drozdek, Course Technology, 2004.

Introduction to Algorithms, 2nd ed. by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, MIT Press, 2001

## CS214 Systems Analysis and Design

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**Module Code:** CS214  
**Module Title:** Systems Analysis and Design  
**Level:** 2  
**Credit points:** 3  
**Module Leader:** Prof. Ali El-Bastawissy  
**Pre-requisite:** CS205

### Aims

This course emphasizes the system analysis and design techniques for software project development. It includes: setting IS project goals, developing work plans and methods to achieve those goals, and measuring progress against a project plan. Analyse a business need for information and develop an appropriate strategy to solve the problem and provide the required information service. Prepare and use various information gathering techniques for eliciting user information requirements and system expectations. Construct and interpret a variety of system description documents, including data flow diagrams, entity–relationship diagrams, Structured English, structure charts, use-case diagrams, ... etc. The student will design and prototype a system.

### Learning outcomes

#### Knowledge

On completion of this module, the successful student will be able to:

Define and differentiate between the concepts of system life cycle development methodology and system modelling. (1)

Illustrate the basic system modelling perspectives and the related modelling primitives.(2)

Demonstrate the main features of structured system modelling perspectives, and their advantages.(3)

Identify the advantages and limitations of different development methodologies.(4)

#### Skills

This module will call for the successful student to:

Apply the structured system analysis and design techniques to project development and prepare a set of document for the analysis, design and test phases of a project.(5)

Carry out the tasks of information gathering, cataloguing and documenting.(6)

Apply the concepts of data modelling, Process modelling, and Logic Modelling to a software development project. (7)

Manage a system analysis and design project, with reference to project lifecycle Issues.(8)

### Syllabus

- System Development Environment.
- Initiating and Planning Systems Development Projects.
- Information gathering techniques.
- Determining Systems Requirements.
- Structuring System Requirements: Process Modelling and Data flow diagram
- Structuring System Requirements: Logic Modelling and Entity diagram.

## Learning Teaching and Assessment

Weekly lectures: will introduce the concepts and topics of the module syllabus.

Weekly Tutorials: the student will be given short case studies to prepare a model based on what has been discussed in the lectures of the same week.

Team Project: the students form groups of 2-3, choose a real application that they are familiar with, and over the length of the semester (~8 weeks) perform the complete system lifecycle studied to prepare system analysis and system design document.

Short paper: starting on the first week of study, each student will prepare a short paper on one the current methodologies such as Agile, RAD, Prototyping etc. The best papers are presented to the class.

### Assessment:

Assessment will be based on:

Weekly tutorial assignment (10%) [Outcomes: 3,4,5,6,7]

Team projects (20 %) [Outcomes: 2,3,4,5,7,8]

Short paper (10%) [ Outcome:1]

Two unseen exams (midterm exam of one hour and a half hours – 20% , and a final exam of three hours – 40%) which include several questions to assess the student knowledge and understanding [Outcomes: 2,6,7]

Assessment Weighting

Unseen examinations	60%
Coursework	40%
• Weekly tutorial assignment	10%
• Team projects	20 %
• Short paper	10%

### Learning materials

Software Requirements

Oracle Designer

Useful Websites

<http://otn.oracle.com/>

[www.smartdraw.com](http://www.smartdraw.com)

[www.uml.org](http://www.uml.org)

[www.comp.glam.ac.uk](http://www.comp.glam.ac.uk)

TextBook

Modern Systems Analysis and Design 7th ed. by Jeffrey A. Hoffer, Joey F. George, Joseph S. Valacich, Prentice Hall College, 2013.

Supplementary Readings

- Systems Analysis and Design for the Global Enterprise Bentley and Whitten 2007 McGraw Hill.
- Systems Analysis and Design Methods 6th ed. by Jeffrey L. Whitten, Lonnie D. Bentley, Kevin C. Dittman, McGraw-Hill, 2008.
- Modern Structured Analysis, by E. Yourdon, 2nd ed. Prentice Hall, 2008.
- Systems Analysis techniques, by B. Robinson & M. Prior, International Thomson Computer Press, 2007.

# CS215 Fundamentals of Database Systems

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**Module Code:** CS215  
**Module Title:** Fundamentals Of Database Systems  
**Module Level:** 2  
**Credit Points:** 3  
**Module Leader:** Prof. Ali El-Bastawissy  
**Prerequisites:** CS205

## Aims

This module introduces the basic concepts in database system and its architecture. It discusses the different models and different levels of abstractions. Then it introduces the entity-relationship model as a conceptual modelling technique. The main subject of the module is the relational database model, languages and systems.

## Learning Outcomes

### Knowledge

On completion of this module, the successful student will be able to:

- Demonstrate the concepts of database management systems.(1)
- Explain and appreciate the underlying theory, such as mathematics and logic, relevant to database design, development and evaluation.(2)
- Illustrate the relational model using entity relationship diagram (ERD).(3)
- Illustrate the elements and syntax of the SQL language and explain their use.(4)

### Skills

This module will call for the successful student to:

- Model business data using entity relationship diagram (ERD), transform it to the relational model and apply normalization and integrity rules to it. (5)
- Use any implementation of the SQL language for data manipulation.(6)
- Use an RDBMS (e.g. ORACLE) to implement a relational database schema, a database application, and execute queries.(7)

## Syllabus

- Databases and Database users
- Database system concepts and architecture
- The relational data model, relational constraints, and the relational algebra
- Fundamentals of SQL: DDL and DML
- Data modelling using the entity-relationship model
- The relational database standard ER and EER to relational mapping and other relational languages
- Converting ER/EER models into Relational model
- Fundamentals of Normalization

## Learning Teaching and Assessment Strategy

Weekly lectures to introduce the theoretical concepts of the course subjects

Weekly tutorials to discuss the solution of the weekly homework assignments

Weekly computer laboratory to use some RDBMS and its event driven development environment to build database applications, and to practice SQL and ERDs

Team Projects: the project team will apply the concepts learned in the course to build a real database application. The projects will be implemented using ERDs, ORACLE Developer (FORMS & REPORTS), and SQL

### **Assessment**

Assessment will be based on:

Two unseen exams several questions to assess the student knowledge and understanding (L.O.. 1 to 5)

Assignments and Case studies is used to assess (L.O. 1 to 5) 20%

Team Project to assess (L.O. 5 to 7) 20%

Assessment Weighting

Unseen examinations 60 %

Coursework 40 %

Assignments and Case studies 20%

Team Project

20%

### **Learning Materials**

Essential

Fundamentals of Database Systems, 6th ed. by Ramez Elmasri and Shamkant B. Navathe, Addison-Wesley, 2011.

Recommended Readings

- An Introduction to Database Systems, 8th ed. by C. J. Date, Addison-Wesley, 2008.
- Database System Concepts by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan McGraw-Hill- Aug 1, 2009.
- Database Systems: Design, Implementation, and Management 8th ed. by Peter Rob and Carlos Coronel, Course Technology, Dec 20, 2007.
- Oracle 10g Developer: PL/SQL Programming by Joan Casteel, Course Technology, Aug 15, 2007.
- Oracle Database 11g: The Complete Reference by Kevin Loney Osborne ORACLE Press Series, Dec 17, 2008.
- Oracle Developer Advanced Forms and Reports, by Peter Koletzke, Paul Dorsey, McGraw-Hill Osborne, 2007.

## **CS216 Computer Networks**

**Module Code: CS216**

**Module Title: Computer Networks**

**Level: 2**

**Credit points: 3**

**Module Leader: Dr. Samir Hassan**

**Pre-requisite: CS100x**

### **Aims**

This module covers the high-level (protocol)oriented aspects of computer networks, specifically: application, transport and network layers. It includes the internet, socket programming and quality of service issues. It also introduces the student to problem analysis and network administration.

### **Learning outcomes**

#### **Knowledge**

On completion of this module, the successful student will be able to:

- Describe communication protocol sand layered network architectures.(1)
- Develop networked applications based on client-server and web based techniques.(2)
- Administer, and maintain a computer network.(3)
- Demonstrate the principals of wired and wireless LAN and WAN.(4)
- Evaluate the techniques Used to transmit data in mobile communication system.(5)

#### **Skills**

This module will call for the successful student to:

- Examine and comprehend the networking concepts including protocol layer stack ,client-server paradigm, application layer applications including Telnet, FTP,DNS,HTTP, SMTP, other state of arts topics including wireless and mobile networks, and computer network administration.(6)
- Examine and analyze the transport-layer concepts including transport layer services, reliable. Un-reliable data transfer, TCP protocol and UDP protocol.(7)
- Examine and synthesize the network layer concepts including network-layer services, routing, IP protocol and Pad dressing. (8)
- Examine and evaluate the data link layer and local area network concepts including data link layer services, Ethernet, error detection and correction and ARP protocol. (9)

#### **Syllabus**

- Computer Networks and the Internet.
  - What is the internet?
  - Protocol layers and their service models.
  - History of computer networking and the internet.

- Application Layer.
  - Principles of Application Layer Protocols.
  - The Web and HTTP.
  - File Transfer :FTP.
  - Electronic Mail in the Internet.
  - DNS-The Internet's Directory Service.
  - Socket Programming with TCP.
  - Socket Programming with UDP.
  - Building a Simple Web Server.
- Transport Layer.
  - Introduction and Transport-Layer Services.
  - Multiplexing and De-multiplexing.
  - Connection less Transport: UDP.
  - Principles of Reliable Data Transfer.
  - Connection- Oriented Transport :TCP.
- Network Layer and Routing.
  - Introduction and Network Service Models.
  - Routing Principles.
  - The Internet Protocol(IP).
  - Routing in the Internet.
  - IPv6.
- Data Link Layer and Local Area Networks.
  - Introduction and Network Service Models.
  - Introduction and services.
  - Error detection and correction techniques.
  - Multiple access protocols.
  - LAN addresses and ARP.
  - Ethernet.
  - Wireless links.
  - PPP :The Point-to-Point Protocol.
- Network Management.
  - What is network management?
  - The infrastructure for network management.
  - The internet network-management framework.

### **Learning, Teaching and Assessment Strategy**

Teaching/learning approaches are integrated with assessment arrangements to facilitate student achievement of the learning outcomes identified for this module.

Lectures (3 hours per week) introduce the key features of Computer networks, relate to relevant current scientific thinking, to open up associated issues, and invite student questions and debate. [L.O 1, 2, 3, 5, 7, 8 and 9]

Weekly Tutorials:(1.5 hour per week) to advise and assist student groups in developing group presentation and perform lab exercises. Tutorials will provide

The framework to promote student reflection, including production of an individual reflective critique/evaluation of personal learning and of the module. [L.O 1, 3, 4 and 7]

Network Lab: In the lab the student will be able to:

- 1) Investigate the Ethernet protocol and the ARP protocol including capturing and analyzing Ethernet frames and observing the ARP protocol in action.
- 2) Explore several aspects of the ICMP protocol including ICMP messages generated by the Ping program, ICMP messages generated by the Trace route program and the format and contents of an ICMP message.
- 3) Investigate the IP protocol, focusing on the IP datagram.
- 4) Explore the DHCP and examine the DHCP packets captured by a host.
- 5) Investigate the behavior of TCP in detail.
- 6) Take a closer look at the client side of DNS.
- 7) Explore several aspects of the HTTP protocol including the basic GET/response interaction, HTTP message formats, retrieving large HTML files, retrieving HTML files with embedded objects, and HTTP authentication and security.
- 8) Implement client-server applications using socket programming.

[L.O 3, 6 and 9]

### **Assessment**

- 1) Assignments that discuss the students' understanding of the classes [L.O 3, 5, 6 and 7]: 10%
- 2) Lab Exercises [L.O 6 and 7]: 10%
- 3) Group Presentation/Team Project to demonstrate the module outcomes through a practical network application [L.O 2, 3, 4, 5 and 7]: 20%
- 4) Unseen examinations: 60%

### **Learning Materials**

Software Requirements:

- 1) Ethereal Application

Textbook:

- J. Kurose and K. Ross, Computer Networking :A Top- Down Approach Featuring the Internet", Addison-Wesley, 5th edition, Mar 2009.
- Data Communications and Networking, 4th Ed. By Behrouz A. Forouzan, Mc Graw Hill Higher Education, May 1, 2006.

Supplementary Readings:

- Data and Computer Communications, 8th ed. By William Stallings, Prentice Hall, 2007.

## **CS217 Professional Computing Ethics**

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**Module Code:** CS217  
**Module Title:** Professional Computing Ethics  
**Level:** 2  
**Credit Points:** 3  
**Module Leader:** Prof. Ali El-Bastawissy  
**Prerequisites:** CS102x

### **Aims**

Information Systems is an area of practical activity, which in different ways employs and affects a large number of people in society. It is now vital that graduating CS students are aware of the most pressing social, legal and professional issues affecting Information Systems. The aim of this module is to provide the students with the tools enabling them to appreciate and incorporate the ethical, legal and professional standards of the computer science profession into their careers.

### **Learning Outcomes**

#### **Knowledge**

On completion of this module, the successful student will be able to:

- Present basic ethical theories governing the field of professional ethics.(1)
- Discuss the applicability, benefits and rules of the different intellectual property protection methods available for CS professionals.(2)
- Identify the possible improper or criminal behaviours within the computer profession and their consequences.(3)

#### **Skills**

This module will call for the successful student to:

- Analyse the ethical, legal and professional standing of an activity within the computing field.(4)
- Determine the possibility or appropriateness of using an intellectual property protection method such as copyright or patent to protect a given product.(5)

#### **Syllabus**

- Computer ethics and cyber ethics
- Application of normative ethical frameworks to computer issues
- Intellectual property rights including copyright, patent, trade secrets and trade marks
- Regulating and governing the internet
- Free speech and content controls in cyber space
- Computer and Cybercrimes.
- Securing the electronic frontier
- Professional Ethics and Codes of Conduct

#### **Learning Teaching and Assessment Strategy**

Weekly lectures to introduce the basic ideas of the course subjects

Ethical presentation: The students are assigned a computer or Internet related issue to investigate and prepare a short paper and presentation of the issue.

Weekly tutorial: The first few weeks will be used to discuss few case studies. The tutorial is mainly used for the above student presentations. The presenting student is evaluated on the quality and

completeness of his presentation while attending students are evaluated on their ability to comprehend and criticize the presentation.

### **Assessment**

Assessment will be based on:

- two unseen exams several questions to assess the student knowledge and understanding (L.O.. 1 to 5)
- Case studies is used to assess (L.O. 1,4) 10%
- Presentation and term paper to assess (L.O. 3,4,5) 30%
- In addition the presentation and term paper is used to assess the student's general graduate skills such as independent research, technical writing and communication skills.

### Assessment Weighting

- Unseen examinations 60 %
- Coursework 40 %
  - Case studies 10%
  - Presentation and term paper 30%

### **Learning materials**

#### Essential

- Cyberethics: Morality And Law in Cyberspace, 5th ed. by Richard Spinello, Jones & Bartlett; Feb 2013

#### Recommended

- Quinn, Michael J. Ethics for the Information Age, 5th ed. Upper Saddle River, NJ: Pearson, 2013.
- Computer Ethics: A Global Perspective by Giannis Stamatellos, Jones & Bartlett; 1st ed. January 9, 2007
- The Essence of Professional Issues in Computing, by R. Ayres, Prentice Hall, 2007
- A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet 3rd ed. by Sara Baase, Prentice Hall, Jan 6, 2008
- Computer Ethics and Social Value, by D. Johnson and H.F. Nissenbaum, Prentice Hall, 1998.

## CS232 Multimedia Programming

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**Module Code:** CS232  
**Module Title:** Multimedia Programming  
**Level:** 2  
**Credit points:** 3  
**Module Leader:** Dr. Ahmed Farouk  
**Pre-requisite:** CS213

### Aims

This module investigates and provides an overview of multimedia programming concepts. It aims to two parallel techniques visualization and multimedia techniques. Visualization techniques introduce different methods of programming under GUI (Graphical User Interface) environment. Multimedia techniques introduce skills of animation methods of photometric, and colour images.

### Learning outcomes

#### **Knowledge**

On completion of this module, the successful student will be able to:

- Compare/Contrast the main differences between the event handling in software development in relation to console application.(1)
- Critically ensure the quality of image appearance and image enhancement.(2)
- Critically handle the display snapshots of large sense. (3)
- Critically understand different multimedia file format details (for example: waves, bmp, avi) (4)

#### **Skills**

This module will call for the successful student to:

- Read and write multimedia files with different formats. (5)
- Design and implement a large project in small modules using DLL, as well as interactive user interfaces and navigational functions. (6)
- Utilize team approaches to problem solving and decision-making. (7)
- Plan, design and develop a comprehensive multimedia project. (8)

### Syllabus

- Introduction to GUI programming.
- Event handling.
- Drawing in GUI programming (pens, lines ,fonts and text drawing)
- Double Buffering techniques.
- Using Timers in animation.
- Image photometric.
- Image Transformations.
- Building custom controls.
- Image and Sound file format.
- Playing AVI files.

## **Learning, Teaching and Assessment Strategy**

Weekly lectures: to introduce the basic concepts of the course subjects. Weekly computer laboratory to apply the concepts learned to develop workable programming solutions for different types of problems from a variety of fields, e.g. mathematical, text manipulation and business problems.

Weekly assignments: The student will be assigned a weekly programming homework to develop on his own. All programmes have to be submitted to the instructor running without errors.

Project: The student will work as a member of a project team to apply the concepts learned in the course to a real world problem. The subject of the project will be chosen to reflect current issues of software development.

### **Assessment**

- Unseen examinations (L.O..2, 3, 4, 5)
- Coursework: distributed between the following topics.
  - Lab work (L.O.. 1, 4, 5)
  - Homework assignments. (L.O.. 1, 2, 3, 4, 5)
  - In class assessment (formative) to assess (L.O. 1, 2, 3, 4)
  - Project (L.O.. 2, 3, 4, 5, 6, 7, 8)

#### Assessment Weighting

- |                         |     |
|-------------------------|-----|
| • Unseen examinations.  | 40% |
| • Coursework:           |     |
| • Lab work.             | 20% |
| • Homework assignments. | 10% |
| • Project.              | 30% |

### **Learning materials**

#### Software Requirements

- Microsoft visual studio .NET, or any programming language according to instructor's requirements

#### Useful Websites

- <http://csharpcomputing.com/>
- <http://www.c-sharpcorner.com/>
- <http://www.programmingtutorials.com/csharp.aspx>

#### Reference Text

- Programming Microsoft® Windows® Forms, by Charles Petzold, 2005

## CS283 Web Programming

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**Module Code:** CS283  
**Module Title:** Web Programming  
**Level:** 2  
**Credit Points:** 3  
**Module Leader:** Dr. Emad Nabil  
**Prerequisites:** CS101x

### Aims

This is a core module for web programming. The student will learn the client-side aspect of web programming. The topics will cover different client-based techniques and their applications in real world. Emphasis will be made on Mark up and Scripting languages and their use in web applications.

### Learning Outcomes

#### Knowledge

On completion of this module the successful student will be able to:

- Evaluate web technologies programming languages used (1)
- Implement client-side scripting tools and techniques (2)
- Create web applications using the new frameworks such as Asynchronous JavaScript and XML-Ajax (3)
- Develop Rich Internet Applications-RIA (4)

#### Skills

This module will call for the successful student to:

- Assess the use of Mark-up languages in building web pages (5)
- Create interactive web pages using scripting language such as JavaScript (6)
- Develop using Document Object Model methods (7)
- Evaluate web techniques such as Ajax in development of web applications (8)

### Syllabus

- Extensible Mark-up Languages such as HTML5 and XML
- Cascading Style Sheets (CSS3)
- Client-side scripting languages such as JavaScript
- Server-side scripting language such as ASP.NET
- Document Object Model (DOM)
- Using XML and the DOM
- The use of scripting languages libraries such as J Query
- Creating a full Rich Internet Application (RIA)

### Learning, Teaching and Assessment Strategies

Weekly lectures: to introduce the basic concepts of the course subjects.

Weekly computer laboratory: to develop Rich Internet Applications using client-side web programming techniques.

Team Projects: The student will work as a member of project team to apply the concepts learned in the course to a real world problem. The subject of the project will be chosen to reflect client-side web programming.

## **Assessment**

Unseen Exams: Two unseen exams several questions to assess the student knowledge and understanding (L.O. 1, 2, 3, 5, 6, 8)

Course work: composed of Assignments, Lab work and team project:

Lab weekly progress to assess (L.O. 5, 6, 7, 8)

Project defence to assess (L.O. 3, 4, 6, 7, 8)

### Assessment Weighting

- Unseen Examinations 60%
- Coursework 40%

## **Learning Material**

### Reference Text

- Deitel, Paul (2012) Internet and World Wide Web: How to Programme, 5th edition, Prentice Hall.

### Useful websites

- <http://www.w3schools.com/>
- <http://tutorialspoint.com/>

### Reference Text

- 3D Programming for Windows, by Charles Petzold, Microsoft Press (July 25, 2007)
- Game Graphics Programming, 1st Ed. by Allen Sherrod (Jun 26, 2008).
- Supplementary readings
- Foundations of 3D Graphics Programming: Using JOGL and Java3D, 2nd Ed .By Jim X. Chen, Chunyang Chen. Springer (August 25, 2008)
- Introduction to 3D Graphics & Animation Using Maya (Graphics Series), 1st Ed . by Adam Watkins. Charles River Media(April 6, 2006)
- Fundamentals of Computer Graphics, 2nd Ed. by Peter Shirley, Michael Ashikhmin, Michael Gleicher, and Stephen Marschner (Hardcover - Jul 2005).
- Mathematics for Computer Graphics by John Vince (Paperback - Sep 30, 2005).
- Computer Graphics: Theory Into Practice by Jeffrey J. McConnell (Hardcover - Aug 18, 2005).
- Procedural Elements in Computer Graphics, 2nd ed. by David F. Rogers, McGraw Hill, 1997.

## **ENG101x English for Academic Writing Purposes**

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**Module Code: ENG101x**

**Module Title: English for Academic Writing Purposes**

**Level: 1**

**Credit Points: 3**

**Module Leader: Dr. Aziza Hafez**

**Prerequisite: ENG 90 or passing the ELAT exam**

### **Aims:**

This course is geared towards helping students in effectively writing academic essays and avoiding common errors in writing. In addition, reading passages are used as a means of teaching students reading comprehension, style and organization of writing, summary writing and understanding vocabulary from context.

### **Syllabus**

Introduce the course objectives and the grading system.

- Unit 1: Reading for Writing: "Narrative of the Life of Frederick Douglass" , Prewriting Activities, Structured Writing.
- Unit 2:"What's Your Verdict?: "Fluency Practice: Freewriting, Reading for Writing: "The Case of Leroy Strachan", Prewriting Activities, Structured Writing.
- Unit 3:"Men and Women: Nothing but the Facts"Fluency Practice: Freewriting, Reading for Writing: "The Case of Leroy Strachan" , Prewriting Activities, Structured Writing Focus.
- Unit 4:"The Best Time To Be Alive"Fluency Practice: Freewriting, Reading for Writing: "There's No Time Like the Past", Prewriting Activities, Structured Writing Focus, Structured Writing.
- Unit 5:"The Happiest School in the World"Fluency Practice: Freewriting, Reading for Writing: "Summerhell: A Radical Approach to Child Rearing", Prewriting Activities , Structured Writing Focus, Structured Writing.
- Unit 6:"Are you Getting Enough Sleep"Fluency Practice: Freewriting, Reading for Writing: "The Causes of Sleep Deprivation in America: a Nation of Walking Zombies" , Prewriting Activities, Structured Writing Focus, Structured Writing.
- Unit 8:"For and Against Bilingual Education"Fluency Practice: Freewriting, Reading for Writing: "Bilingual Education: Parents' Views", Prewriting Activities, Structured Writing Focus.
- Unit 9:"Case Studies in Business Ethics: Malden Mills and Ben & Jerry's Ice Cream"Fluency Practice: Freewriting, Reading for Writing: "Malden Mills" , Prewriting Activities, Structured Writing Focus.
- Unit 10:"The Tell-Tale Heart"Fluency Practice: Freewriting, Reading for Writing(Cont.): "The Tell-Tale Heart", Prewriting Activities, Structured Writing Focus,

### **Assessment Scheme:**

Students sit a midterm unseen exam of 90 minutes – with an essay, a summary, a reading comprehension and editing exercises. Students sit a final unseen exam of 3 hours - with an essay, a summary, a reading comprehension and editing exercises. Students present a portfolio compiling all the essays they had written throughout the semester with their different drafts.

**Assessment Pattern:**

Coursework 40%  
Unseen Examinations 60%

**Learning Materials:****Textbooks:**

Mary R. Colonna & Judith E. Gilbert. *Reason to Write*. (Intermediate)UK.:Oxford Univ.Press, 2006

**Useful Tools :**

[www.eslcafe.com](http://www.eslcafe.com)

[www.geocities.com/SoHo/Atrium](http://www.geocities.com/SoHo/Atrium)

[www.204.pair.com/ebaack](http://www.204.pair.com/ebaack)

[www.io.com](http://www.io.com)

<http://owl.english.purdue.edu/>

[www.better.english.com](http://www.better.english.com)

[www.eviews.net/references.html](http://www.eviews.net/references.html)

[www.ohiou.edu/esl/english/index.html](http://www.ohiou.edu/esl/english/index.html)

## **ENG102x English for Study Skills**

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**Module Code: ENG102x**

**Module Title: English for Study Skills**

**Level: 1**

**Credit Points: 3**

**Module Leader: Dr. Aziza Hafez**

**Prerequisite: ENG101x**

### **Aims:**

This course helps students acquire study skills that would facilitate any research process. Students are also taught types of business writing, such as reports, business letters, memos, and curriculum vitae. Special focus also goes to having students acquire presentation skills through presenting their own reports.

### **Syllabus:**

Unit 1: Business Communication Basics

General introduction to the course 102/126

Unit 2: Speaking, Listening and Non-verbal Communication

Unit 3: Use of English in communication

Introducing the report as a type of business writing

- Brainstorming

- Skimming and scanning

- Bibliography cards (APA methodology)

- Introduction to paraphrasing- Paraphrasing Exercises

- Library skills-Plagiarism

- Report outline

- More applications on paraphrasing

- Quiz on paraphrasing

- In-text citation

- Organizational analysis

- Unit 5: Rules of good writing

Introducing the business letter

- Reply to enquiry- Letter of confirmation

- Acknowledgement Letter

- Enquiry letter

- Collection letters

- Complaint letter

- Reply to a complaint

- Designing a questionnaire

- Application letter & CV as examples of business writing

- Offer of employment letter
- Letter of acceptance
- Letter of resignation
  
- Fax messages
- E-mail
  
- Data representation: Tables
- Data representation: Graphs
- Findings, conclusion, and rest of report pages
  
- Memos
- Oral presentation skills

**Learning Outcomes:**

**Knowledge**

At the end of this module students will recognize the importance of business communication skills and will be able to distinguish between different communication means in business, analyze the texts they need to incorporate in their reports, as well as identify graphical, visual and statistical information.(1)

**Skills**

At the end of this module students will be able to:

- paraphrase, summarize and analyze the texts they need to incorporate in their reports.(2)
- write clear and effective curriculum vitae, business letters, faxes, e-mails and memos.(3)
- design and administer questionnaires.(4)
- analyze the quantitative and qualitative data obtained from the questionnaires.(5)
- integrate graphical, visual and statistical information into their reports.(6)
- produce a report with an outline and a simplified “Works Cited” page.(7)
- present their reports using slides or computer software.(8)

**Assessment Scheme:**

Students sit a midterm unseen exam of 90 minutes – with short answer questions and several technical writing tasks. Students sit a final unseen exam of 3 hours – with short answer questions and several technical writing tasks. Students produce a report about a current problem or issue. Their report should incorporate background information about the problem and the results of a questionnaire they had designed and administered. They submit a 2000 word report. A presentation of their reports is also required.

**Assessment Pattern:**

Coursework	40%
Unseen Examinations	60%

**Learning Materials:**

Text Book:

Shirley Taylor. Communication for Business: A Practical Approach. 4<sup>th</sup> ed. Longman, 2005.

Useful Tools:

Search engines

[www.yahoo.com](http://www.yahoo.com)

[www.google.com](http://www.google.com)

[www.altavista.com](http://www.altavista.com)

[www.ipl.org](http://www.ipl.org)

Useful links for business and report writing:

[www.devry-phx.edu/lrnresrc/dowsc/](http://www.devry-phx.edu/lrnresrc/dowsc/)

[owl.english.purdue.edu/](http://owl.english.purdue.edu/)

[www.io.com](http://www.io.com)

[www.better.english.com](http://www.better.english.com)

## ENG201x English for Research Purposes

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**Module Code: ENG201x**

**Module Title: English for Research Purposes**

**Level: 2**

**Credit Points: 3**

**Module Leader: Dr. Aziza Hafez**

**Prerequisite: ENG101x & ENG102x**

### **Aims:**

This course emphasizes research skills necessary for writing research papers. It also provides a survey of different articles on specialized topics. The course trains the students on rhetorical awareness beyond traditional composition, intensive writing practice with a thorough guidance on using references and citing sources.

### **Syllabus**

Introduction to the course (Objectives – assignments – grading)

Introduction of selected research topics

Chapter One: **Writing from Research**

Chapter two: **Finding a Topic** (All except pp. 24 – 31)

Library Skills: Chapter Three: Finding and Filtering Electronic Sources:

Library Skills: Chapter Four: **Gathering Data in the Library**

Chapter Six: **Understanding and Avoiding Plagiarism**

Chapter Seven: **Finding and Evaluating Sources**

Definition + Process Writing Approaches

Practice (Analysis and Production Tasks)

Practice (Analysis and Production Tasks) cont.

Comparison and Contrast + Division and Classification

Practice (Analysis and Production Tasks)

“Expressing a Thesis Sentence, Enthymeme, and Hypothesis” (Chapter Two p. 24) + Exercises

Chapter Eight: “Writing a Rough Outline” + “Writing a Formal Outline”

For MLA Classes Chapter 9: **Writing Effective Notes**

For APA Classes Chapter 5: **Conducted Research Outside the Library**

For MLA Classes Chapter 9 (cont.)

For APA Classes Chapter 9: **Writing Effective Notes**

Argumentation and Persuasion + Cause and Effect.

Practice (Analysis and Production Tasks).

Drafting the Paper in an Academic Style.

Writing the Introduction, Body and Conclusion.

Revising, Proofreading, and Formatting the Rough Draft.

Fallacies.

## Learning Outcomes

### Knowledge:

At the end of this module students will be able to analyze different texts to identify thesis statements and developmental functions of those texts, identify fallacies in the texts they analyze, identify different library classification systems and card catalogue.(1)

### Skills:

At the end of this module students will be able to:

- write outlines and summaries.(2)
- develop logical arguments.(3)
- write a research paper using correct in-text citations according to the MLA style.(4)
- prepare in their research paper a complete 'Works Cited' or 'References' page prepared according to the MLA or APA style.(5)
- present their papers using slides or computer software.(6)

### Assessment Scheme:

Students sit a midterm unseen exam of 90 minutes – with short answer questions and several writing tasks. Students sit a final unseen exam of 3 hours – with short answer questions and several writing tasks. Students produce a research paper that incorporates information from different sources. They must demonstrate an understanding of the topic they select, and develop a logical argument. Their paper should follow correct research skills such as in-text citation and works cited. They submit a 6000 word paper. A presentation of their papers is required as well.

### Assessment Pattern:

Coursework:	40%
Unseen Examinations	60%

### Learning Materials:

Textbook:

James Lester. Writing Research Papers. 12<sup>th</sup> ed. Pearson, Longman, 2007

Useful Tools:

Internet search engines:

[www.yahoo.com](http://www.yahoo.com)

[www.google.com](http://www.google.com)

[www.altavista.com](http://www.altavista.com)

[www.ipl.org](http://www.ipl.org)

Useful links for research writing:

<http://www.devry-phx.edu/lrnresrc/dowsc/>

<http://owl.english.purdue.edu/>

## MTH100 Calculus

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<b>Module Code:</b>	<b>MTH100</b>
<b>Module Title:</b>	<b>Calculus</b>
<b>Level:</b>	<b>1</b>
<b>Credit points:</b>	<b>3</b>
<b>Module Leader:</b>	<b>Dr. Magda El-Daghestany</b>
<b>Pre-requisite:</b>	<b>None</b>

### **Aims**

This module aims to introduce basics of Calculus. The concepts and rules of differentiation of functions, including algebraic, trigonometric and exponential functions, discussed. Basics of integration are also introduced.

### **Learning Outcomes**

#### **Knowledge**

After completing this module students will be able to:

- Identify real numbers and real line coordinates.(1)
- Understand functions, continuity and derivation of the function.(2)
- Understand chain rule and implicit differentiation.(3)
- Understand integration basic rules.(4)

#### **Skills**

This module will call for the successful student to:

- Test continuity and discontinuity.(5)
- Apply implicit differentiation and the chain rule.(6)
- Differentiate and integrate different functions.(7)

#### **Syllabus**

- Real Numbers and the Real Line, Coordinates, Lines, and Increments.
- Functions, Shifting Graphs, Trigonometric Functions, Exponential and Logarithmic functions.
- Rates of Change and Limit Rules.
- Continuity, Tangent Lines, The Derivative of a Function and Differentiation Rules.
- Applications on Derivatives.
- Graphing with Limits as Asymptotes, and Dominant Terms.
- Indefinite Integrals, Integration by Substitution and Definite Integrals.

#### **Learning, Teaching and Assessment Strategy**

Weekly lectures to introduce the basic concepts of the course subjects.

Weekly tutorials to apply the concepts introduced in the lectures and discuss the solution of the homework assignments.

#### **Assessment**

Homework Assignments for feedback. (L.O. 1 - 4)

In class tests. (L.O. 5 - 7)

Unseen examinations: to test the student knowledge and understanding of the material delivered. (L.O. 1 - 7)

Assessment weighting

- Unseen Examinations 60 %.
- Coursework 40%.

**Learning materials**

Essential

- Thomas' Calculus Early Transcendentals, Twelfth Edition, by George Thomas, Maurice Weir and Joel Hass, Pearson, 2010.

Recommended

- Calculus and Analytical Geometry, by George B. Thomas & Ross L. Finney, Addison-Welsey, 1996.
- Calculus Labs using Mathematical, by Arthur G. Sparks, John Davenport and James Braselton, Harper Collins College Publisher.

## MTH103 Discrete Mathematics

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<b>Module Code:</b>	<b>MTH103</b>
<b>Module Title:</b>	<b>Discrete Mathematics</b>
<b>Level:</b>	<b>1</b>
<b>Credit points:</b>	<b>3</b>
<b>Module Leader:</b>	<b>Dr. Magda El-Daghestany</b>
<b>Pre-requisite:</b>	<b>None</b>

### **Aims**

This module is the basis of Mathematics for Computer Science. It teaches students how to think logically and mathematically. Formal Logic, Set Theory, Inductive Proofs and Counting are introduced, with applications.

### **Learning Outcomes**

#### **Knowledge**

After completing this module students will be able to:

- Know the basics of formal logic. (1)
- Understand induction, recursion and their applications. (2)
- Know the basics of Set Theory. (3)
- Understand counting arguments. (4)

#### **Skills**

This module will call for the successful student to:

- Solve formal logic problems. (5)
- Differentiate between true and false statements as well as prove or disprove them. (6)
- Use sets and set operations in formal arguments. (7)
- Build counting arguments. (8)

### **Syllabus**

- Introduction to Logic.
- Introduction to Proof Techniques.
- Recursive Definitions and Recurrence Relations.
- Sets: Set Operations, and Set Identities.
- Counting sets. Addition and Multiplication Principle.
- Permutations and Combinations.
- Functions.
- Relations.

### **Learning Teaching and Assessment Strategy**

Weekly lectures to introduce the basic concepts of the module subjects.

Weekly tutorials to apply the concepts introduced in the lectures and discuss the solution of the homework assignments.

### **Assessment**

Unseen examinations: to test the student knowledge and understanding of the material delivered. (L.O. 1 – 8).

Homework Assignments for feedback. (L.O. 1 – 4).  
In class tests (L.O. 5 – 8).

Assessment Weighting

- Unseen Examinations 60%
- Coursework 40%

**Learning materials**

Essential

- Discrete Mathematics and its Applications, Kenneth Rosen, McGraw-Hill, 2013 .

Recommended

- Discrete Mathematical Structures, Kolman, 4th ed., 2000.

## MTH106 Linear Algebra

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<b>Module Code:</b>	<b>MTH106</b>
<b>Module Title:</b>	<b>Linear Algebra</b>
<b>Level:</b>	<b>1</b>
<b>Credit points:</b>	<b>3</b>
<b>Module Leader:</b>	<b>Dr. Magda El-Daghestany</b>
<b>Pre-requisite:</b>	<b>MTH100</b>

### **Aims**

This module is an introduction to the basics of linear algebra. Matrix and vector operations are studied to solve a system of linear equations. The concepts of vector spaces, Eigen values and Eigen vectors are understood and used to solve linear problems.

### **Learning Outcomes**

#### **Knowledge**

After completing this module students will be able to:

- Know the basics of matrix theory including matrix properties and functions. (1)
- Understand the abstract concepts of vector spaces. (2)
- Know how to apply linear algebra in solving linear systems of equations. (3)

#### **Skills**

This module will call for the successful student to:

- Solve matrix problems. (4)
- Have the ability to differentiate between true and false statements about matrices and vector spaces as well as prove or disprove them. (5)
- Use linear algebraic concepts to tackle linear problems. (6)

### **Syllabus**

- Introduction to Matrices: Matrix Operations and their Properties.
- Solutions of Linear Systems of equations in matrix form.
- Matrix Inverse, Determinants and Cramer's Rule.
- Vector Spaces and Subspaces.
- The Span and Linear Independence.
- Basis and Dimension of Vector Spaces.
- The Rank of a matrix.
- Introduction to Eigenvalues, Eigenvectors and Diagonalization.

### **Learning Teaching and Assessment Strategy**

Weekly lectures: to introduce the basic concepts of the module subjects.

Weekly tutorials: to apply the concepts introduced in the lectures and discuss the solution of the weekly homework assignments

### **Assessment**

Unseen examinations: exam questions assess the students ability to solve linear problems in matrix form and understand the concept of vector space. (L.O. 1 - 6)

Homework assignments. (L.O. 1 - 3)

In class tests (L.O. 4 – 6)

#### Assessment Weighting

- Coursework 40%
- Unseen Examination 60%

#### **Learning Materials**

##### Useful Websites

- [http://www.psc.edu/~burkardt/papers/linear\\_glossary.html](http://www.psc.edu/~burkardt/papers/linear_glossary.html)

##### Reference Text

- Introductory Linear Algebra, by Bernard Kolman and David Hill, Pearson Prentice Hall, 2013.

##### Supplementary Readings

- Matrix Analysis and Applied Linear Algebra, by C.D. Meyer.

## MTH204 Probability and Statistics

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**Module Code:** MTH204  
**Module Title:** Probability and Statistics  
**Level:** 2  
**Credit points:** 3  
**Module Leader:** Dr. Magda El-Daghestany  
**Pre-requisite:** MTH100

### Aims

The module aims to introduce analytical methods to solve problems, using concepts from probability and statistics. This includes random variables and their distributions, mathematical expectation, point and confidence interval estimation, correlation and applications.

### Learning outcomes

#### Knowledge

On completion of this module, the successful student will be able to:

- Distinguish between different probability distributions. (1)
- Analyze different statistical problems. (2)
- Find problem solution and find confidence intervals. (3)

#### Skills

This module will call for the successful student to demonstrate:

- Select the appropriate probability distribution in a specific application. (4)
- Testing statistical hypothesis. (5)
- Making statistical decisions. (6)

### Syllabus

- Describing Data.
- Probability and Random variables.
- Mathematical expressions.
- Discrete distribution.
- Continuous distribution.
- Statistical inference.

### Learning, Teaching and Assessment Strategy

Weekly lectures to introduce the basic concepts of the module subjects.

Weekly tutorials to apply the concepts introduced in the lectures and discuss the solution of the homework assignments.

### Assessment

Unseen examinations (L.O. 1 - 6)

Homework assignments for feedback (L.O. 1 - 3)

In class tests (L.O. 4 – 6)

#### Assessment Scheme

- Unseen Examinations 60 %
- Coursework 40%

## **Learning materials**

### Reference Text

Applied Statistics and Probability for Engineers, Fifth edition, Douglas Montgomery and George Runger, John Wiley, 2011.

### Supplementary Readings

Statistical Techniques in Business and Economics, Fourteenth edition, M. Lind, Mc-Graw Hill International edition, 2010.

## PHY103x Fundamentals of Electronics

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**Module Code:** PHY103x  
**Module Title:** Fundamentals of Electronics  
**Level:** 1  
**Credit points:** 3  
**Module Leader:** Dr. Nabila Nowaira  
**Prerequisite:** None

### Aims:

The module gives the students an idea about semiconductors with their two main devices, namely, pn-junction diodes and transistors. The students learn the main characteristics of these devices. Thereafter, diodes and transistors are used to build electronic circuits which perform different specific functions.

### Learning outcomes:

#### Knowledge:

After completing this course students will be able to:

- Using the laws of electricity to analyse electric circuits.(1)
- Differentiate between different types of semiconductors.(2)
- Appreciate suitable conditions to operate diodes and transistors.(3)
- Construct and analyse electronic circuits of specified functions.(4)
- Performing measurements to check the faults in electronic circuits.(5)

#### Skills:

- Check the electronic components to choose the suitable ones.(6)
- Use the chosen components to construct electronic circuits of specific functions.(7)
- Reading the data sheets of the chosen components to define the operating conditions of the components used.(8)

### Syllabus

- Introduction to electric circuits
  - Electric current and Ohm's Law
  - Elements of Electric circuits
  - Kirchhoff's Laws
- Semiconductor diodes:
  - Introduce the band theory of solids to differentiate among insulators, conductors and semiconductors.
  - Semiconductor diodes; Zener diodes; Light-Emitting diodes (LEDs).
- Diode applications:
  - Load-line analysis.
  - AND / OR gates.
  - Half-wave and Full-wave rectification.
  - Clippers, Clampers and Voltage multiplier circuits.
- Bipolar junction transistor: (BJT)
  - Transistor construction.
  - Transistor operation.

- Common-base configuration.
- Transistor amplifying action.
- Common-Emitter configuration.
- Common-Collector configuration.
- Limits of operation.
- DC Biasing-(BJT):
  - Operating point.
  - Fixed –bias circuit.
  - Emitter-Stabilized bias circuit.
  - Voltage-Divider bias.
  - DC-Bias with voltage feedback

#### Lab Experiments

- Determination of unknown resistances using Ohm’s Law.
- Verifying Kirchhoff’s Laws.
- Determination of the band gap in a semiconductor.
- Diodes and Rectifier circuits.
- BJT characteristics
- BJT as a switch

#### **Learning Teaching and Assessment Strategy**

Weekly lectures to introduce the basic items of the course subjects

Bi-Weekly tutorials: to discuss and solve homework assignments.

Bi-Weekly laboratory: to apply practically some of the theoretically taught ideas.

#### **Assessment**

- Five class tests (LO 1 – 4).
- Assignments in the form of drill problems concerning the material covered each week. (LO 1-4)
- Lab experiments and projects. (LO 4 - 8)

#### Assessment weighting

- |                      |     |
|----------------------|-----|
| • Coursework         | 40% |
| • Unseen examination | 60% |

#### **Learning Materials**

##### Reference Texts

- “Electronic devices”, Thomas L. Floyd.
- “Electronic devices and circuit theory”, Robert L. Boylestad& Louis Nashelsky

## **MGT200 Introductory Management**

<b>Module Code</b>	<b>MGT200</b>
<b>Module Title</b>	<b>Introductory Management</b>
<b>Level</b>	<b>1</b>
<b>Credit</b>	<b>3</b>
<b>Module Leader</b>	<b>Dr. Emad Elwy</b>
<b>Pre-requisite</b>	<b>ENG101</b>

### **Aims**

This module aims to provide students with a solid grounding in the core concepts and functions of management. It also enables students to develop their practical skills in the study of real world management practice. It also gives students an appreciation of the field of management studies.

### **Learning Outcomes**

#### **Knowledge**

After completing this module, the successful student will be able to:

- Explain in a discursive form the basic functions of management. (1)
- Distinguish between different elements of organizational environment. (2)
- Understand the rationale for the manager's decision making process. (3)
- Appreciate the contribution of different management schools of thought to the science of management. (4)
- Identify new trends in different management functions. (5)

#### **Skills**

After completing this module, the successful student will be able to:

- Apply SWOT analysis to an organization. (6)
- Develop alternative solutions to specific managerial problems. (7)
- Present an analysis of a case study using appropriate tools. (8)
- Practice working as a team to present research work. (9)

#### **Syllabus**

- Basic managerial functions: planning, organizing, leading and controlling
- Different approaches to management: past and present.
- Managing in a global environment.
- The business environment
- Organization strategies through the use of SWOT analysis.
- The manager as a decision maker

#### **Learning, Teaching and Assessment Strategies**

Lectures will be used to introduce students to the main theoretical topics of the module. In-class discussions will be used to extend the scope of the lectures by encouraging students to explore the issues and ideas raised by the lecturer. Seminars will be used to enable students to apply management concepts to real world situations. Students are expected to carry out independent study on a regular basis, as specified by the tutor. This might include further readings; it might also require work for specified written assignments. When students undertake project work, they will be supported

by means of regular tutorials which will provide them with feedback on work in progress, and in-class presentations will involve the use of informal peer assessment.

### **Assessment Scheme**

Written tests and unseen exams will be used to assess the students' understanding of the theoretical frameworks and their practical application.

A written report and its presentation will be used to assess the student's abilities to recognize various managerial practices.

- Written tests are used to assess students' understanding of core topics (10%) (outcomes 1-5)
- Written report (2000 words) and presentation based on a SWOT analysis (12% for report, 3% for presentation). Students will be provided with written and oral feedback on first drafts of reports. (outcomes 6,9)
- Brief written assignments based on case studies (10%).(outcomes 7, 8)
- Class Participation (5%). (outcomes 6,7, & 8)
- An unseen mid-term exam (20%) of 90 minutes and an unseen final exam (40%) of 3 hours will require students to answer questions (Multiple choice, and essays answers) on core theoretical issues. (outcomes 1-5)

#### Assessment Weighting

Coursework	40%
Exams	60%

### **Learning Materials**

#### Essential

Robbins, Stephen, P. & Coulter, M. (2007). Management. New Jersey: Prentice Hall.

#### Recommended

Cole, G.A. (2005). Management Theory and Practice. Boston:Thomson.

Daft, Richard L. (2006). The New Era of Management. USA: Thomson/ South-western.

Schermerhorn, John R. (2006). Management. N.J.: John Wiley & Sons.

University Web-site, including: seminar activities, review questions, lecture notes and slides.