**Ministry of Higher Education and Scientific Research**

**Scientific Supervision and Scientific Evaluation Apparatus**
**Directorate of Quality Assurance and Academic Accreditation**
**Accreditation Department**

# Academic Program and Course Description Guide

# نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة .....

الكلية/ المعهد: كلية ...الفارابي.....

القسم العلمي: قسم .....هندسة الحاسوب....

اسم البرنامج الأكاديمي او المهني: بكالوريوس .هندسة الحاسوب..

اسم الشهادة النهائية: بكالوريوس في .هندسة الحاسوب..

النظام الدراسي: سنوي

تاريخ اعداد الوصف: 2024/3/31

تاريخ ملء الملف: 2024/4/7

**University :**
**College:** Al-Farabi University College.
**Scientific Department**: Computer Engineering.
**Academic Program name:** Bachelor of Computer Engineering.
**Final certificate name**: B.Sc. Computer Engineering.
**Academic System**: Annual System.

**Description preparation date**: 31/3/2024
**File completion date:** 7/4/2024

التوقيع :

اسم رئيس القسم:ا.د مازن سمير الحكيم

التاريخ : ٧/٤/٢٠٢٤

التوقيع :

اسم المعاون العلمي:ا.م.د عدنان عباس العزاوي

التاريخ : ١٤/٤/٢٠٢٤

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: د. خالد عبد الله جبر

التاريخ 14/04/2024

التوقيع

مصادقة السيد العميد

ا.د احمد كيلان عبدالله

## 1. **Program Vision**

In order to prepare students for a technological community that is compatible with global technological revolutions, to prepare students for community service, and to prepare students for the demands of the labor market, the Department of Computer Engineering seeks to establish a scientific environment compatible with the quality of undergraduate education in computer engineering. The department also aspires to stay in touch with contemporary scientific advancements in the field of computer engineering and follow developments at specific universities, which results in the ongoing development of curricula and the upgrading of teaching staff through the establishment of workshops and training to give them scientific and practical experience as well as the opportunityto provide services to various state institutions and the private sector. The department's basic objectives are to conduct basic and applied research in computer-related engineering sciences and to graduate computer engineers who can work with the growing number of institutions and businesses in this industry. This work has been ongoing since the department's founding and continues today.

## 2. **Program Mission**

The department's mission is to stimulate the student's scientific and practical potential through programs, educational curricula, and training workshops in computer engineering to link the theoretical basis with the

scientific and applied aspects of the programs, which qualifies them to acquire the necessary skills required for the labor market. The Department of Computer Engineering aspires to excellence in order to become a solid educational and scientific research institution capable of achieving its mission in serving the community through various specialized applied research that brings prosperity and progress to everyone and graduates a computer engineer who is able to keep pace with modern technology and push the wheel of development.

## 3. **Program Objectives**

I. Creating curricula for numerous disciplines that stay up with technological advancement.

II. Managing the scientific relationships with the departments of computer engineering at various universities by planning seminars, hosting scientific meetings and workshops, and collaborating with other government colleges and the commercial sector to addressissues with institutional research.

III. Training and preparing engineering employees with a high level of understanding, expertise, and ability to create, examine, and develop computer systems.

IV. Encouraging and motivating students to comprehend the idea of self-development, as well as to create the drive and enthusiasm to seek out and comprehend the information they will need to be successful in the jobs that will be assigned to them in the future.

V. Offering computer engineering consulting services that are both applied and scientific to both the public and commercial sectors of

society.

VI. Providing students with the knowledge, skills, and talents they need to be qualified to pursue higher education after graduation.

Followings are also goals of the department of computer engineering:

VII. Intellectual goals: The capacity to describe and resolve issues using knowledge of mathematics, physics, and engineering. Ability to build a system, component, or process to satisfy specific needs; ability to plan and carry out experiments; ability to evaluate and understand data.

VIII. Skills development goals: The capacity for using the contemporary engineering methods, abilities, and equipment required for engineering practice. Students who complete the Computer Engineering program will be able to: Acquire a foundational understanding of the various fields of computer engineering.Graduate will be able to utilize current engineering tools, techniques, and skills, identify, formulate, and resolve computer engineering challenges. Through hands-on practice, perform integrated design of computer systems, components, or processes.

IX. Emotional and moral objectives: gaining an awareness of the impact a graduate's profession has on society; gaining a grasp of some of the ethical issues that arise in the practice of the profession.

X. General objectives: (additional skills important for employability and growth personally): Ability to work in multidisciplinary teams; development of written and vocal communication abilities.

## 4. **Program Accreditation**

| |
|---|
| Does the program have program accreditation? And from which agency?The department is recognized by the Ministry of Higher Education and is seeking programmatic accreditation |

| 5. **Other external influences** |
|---|
| Is there a sponsor for the program?<br>Baghdad University/ College of Engineering/ Computer Department. |

6. **Program Structure**

| Program Structure | Number of Courses | Credit hours | Percentage | Reviews* |
|---|---|---|---|---|
| **Institution Requirements** | **13** | **52** | | |
| **College Requirements** | **9** | **50** | | |
| **Department Requirements** | **11** | **62** | | |
| **Summer Training** | **Third Level** | | | |
| **Other** | | | | |

* This can include notes whether the course is basic or optional.

**7. Program Description**

| Year/Level | Course Code | Course Name | Credit Hours | |
|---|---|---|---|---|
| **First** | | | **theoretical** | **practical** |
| | **GS 101** | Human rights | **2** | **-** |
| | **GE 102** | Mathematics | **4** | **-** |
| | **COE 103** | Electronic I | **3** | **2** |
| | **COE 104** | Electrical circuits | **3** | **2** |
| | **COE 105** | Fundamentals of Digital Systems | **3** | **2** |

| | | | | |
|---|---|---|---|---|
| | **COE 106** | Computer programing Methodology | **3** | **2** |
| | **COE107** | Fundamentals of Computer System | **3** | **2** |
| | **GS 108** | English | **2** | **-** |
| | | | | |
| **Second** | GS 201 | Arabic | 2 | - |
| | COE 202 | Engineering Mathematics | 4 | - |
| | COE 203 | Electronic II | 3 | 2 |
| | COE 204 | Microprocessor and Microcomputer I | 3 | 2 |
| | COE 205 | Digital System Design | 3 | 2 |
| | COE 206 | Data Structure and Algorithms | 2 | 2 |
| | COE 207 | Communications | 3 | 2 |
| | GS 208 | English | 2 | - |
| | | | | |
| **Third** | COE 301 | Computer Architecture I | 3 | - |
| | COE 302 | Digital Control Systems | 3 | 2 |
| | COE 303 | Microprocessor and Microcomputer II | 3 | 2 |
| | COE 304 | Operating Systems | 3 | - |
| | COE 305 | Computer Network | 3 | 2 |
| | COE 306 | Digital Signal Processing | 2 | - |
| | COE 307 | Data Base Systems | 2 | 2 |
| | GS 308 | English | 2 | - |
| | | | | |
| **Fourth** | COE 401 | Internet Technology | 3 | 2 |
| | COE 402 | Computer Architecture II | 3 | - |
| | COE 403 | Embedded Systems | 3 | 2 |
| | COE 404 | Computer Security | 3 | - |
| | COE 405 | Robotics and Artificial Intelligence | 3 | - |

| | | | | |
|---|---|---|---|---|
| | COE 406 | Computer Vision and pattern Recognition | 3 | - |
| | COE 407 | Engineering Project | 2 | 2 |
| | GS 408 | English | 2 | - |

## 8. Expected learning outcomes of the program

**Knowledge**

1. The ability to perform engineering analysis and scientific thinking through the application of principles of science and mathematics, and to infer data, information, and measurements for any project within engineering and administrative frameworks to ensure the execution of tasks in an efficient and effective manner.
2. The ability to research and inquire scientifically to acquire new knowledge and skills in the field of engineering, focusing on modern engineering sciences and advanced technologies. This includes designing innovative solutions for specific technical and professional requirements, with consideration for quality and management in work environments. Additionally, the ability to develop engineering design skills and acquire the skills to employ information technologies.

**Skills**

1. The ability to create and perform required measurements, collect and analyze results, and compare findings to implement them effectively in the work environment.
2. The ability to design integrated systems of equipment, materials, and tools, and to analyze and implement practical work processes based on scientific approaches and methodologies.

**Ethics**

1. The acquisition of ethical principles that govern professional practice.
2. The ability to understand the impact of the graduate's profession on society.

## 9. Teaching and Learning Strategies

1. Preparing scientific reports, both experimental and theoretical.
2. Solving applied questions and assignments related to construction engineering and radiation techniques.
3. Summer training.
4. Field Trips.
5. Seminars
6. Discussion Panels and Oral Presentations

## 10. Evaluation methods

1. Quizzes.
2. Daily, monthly, and final tests and examinations. Oral discussions and exams inside and outside the classroom, Reports, presentations, and posters.
3. Scientific projects.

| Academic Rank | Specialization | | Number of the teaching staff | |
|---|---|---|---|---|
| | **General** | **Special** | **Staff** | **Lecturer** |
| Mazin Sameer AL-Hakeem | Computer Science | Computer | Yes | |
| Yasameen Fawzi Azeez | Electronic and Communication Engineering | Electronic and Communication Engineering | Yes | |
| AL-Hasan Ali Mohammed | Computer Engineering | Computer Engineering | | Yes |
| Mohammed Mosadaq | Network Engineering and International Networking Technologies | Network Engineering and International Networking Technologies | | Yes |
| Norah Jabir Faisel | Computer Science | Artificial Intelligence | Yes | |
| Mohammed AL-Mukhtar Yousif | Computer Engineering | Computer Engineering | | Yes |
| Duaa Khalid Ridha | Computer Science | Information Technology | Yes | |
| Zahraa Aqueel Salih | Computer Engineering | Computer Engineering | Yes | |
| Huda Ali Mahdi | Technical Computer Engineering | Technical Computer Engineering | Yes | |
| Mahdi Salah Mahdi | Computer Engineering | Computer Engineering | Yes | |
| Mariam Amer | Technical Computer Engineering | Technical Computer Engineering | | |

## Professional Development

**Mentoring new faculty members**

- Conducting specialized orientation programs for new faculty members to introduce them to the institution's system and its mission.
- Training new faculty members.

Encouraging existing faculty members

Actively participate in professional development programs organized by the institution and providing training opportunities in coordination with related academic departments and external academic development centers.

## 12.Acceptance Criterion

Setting appropriate criteria for admission into the institute (for example, mentioning the following or others):

1. Academic qualifications, including equivalency of foreign certificates if applicable.
2. Admissions should align with state academic policies and regulations.
3. Reviewing all required documents during the admission process.

## 13.The most important sources of information about the program

1. Program webpage on the electronic portal.
2. Study plan.
3. Course descriptions.
4. Bulletins issued by the institution related to the program.

| 14.Program Development Plan |
| --- |
| 1. Working on integrating modern teaching and training techniques by utilizing the latest digital transformation technologies to create an interactive learning environment. This includes using electronic learning tools such as educational platforms and digital content while enhancing students' technical skills to keep pace with technological advancements in teaching and training.<br>2. Focusing on practical and applied aspects by increasing practical sessions, enhancing students' skills in necessary areas, and providing opportunities for hands-on activities that link theoretical knowledge with practical application in institutions and workplaces.<br>3. Developing curricula and study plans in alignment with the latest updates in knowledge and labor market demands. This includes enhancing academic content to meet the needs of students and improving their job readiness in line with modern trends.<br>4. Continuous assessment and improvement through clear performance indicators to measure the program's development. This involves periodic reviews of the program's plans to identify improvement opportunities and define areas for focus |

## Program Skills Outline

| | | | | Required program Learning outcomes | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Year/Level** | **Course Code** | **Course Name** | **Basic or optional** | **Knowledge** | | | | **Skills** | | | | **Ethics** | |
| | | | | **A1** | **A2** | **A3** | **B1** | **B2** | **B3** | **B4** | **B5** | **C1** | **C2** |
| **First-** | **GE 102** | Mathematics | C | √ | √ | √ | | | | | | | |
| | **COE 103** | Electronic I | C | √ | √ | | √ | √ | √ | √ | | √ | √ |
| | **COE 106** | Computer programing Methodology | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 104** | Electrical Circuits | C | √ | √ | √ | √ | √ | √ | | √ | | |
| | **COE107** | Fundamentals of Computer System | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 105** | Fundamentals of Digital | C | √ | √ | √ | √ | √ | | √ | | | √ |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Systems | | | | | | | | | | | |
| | **GS 101** | Human Rights | | | | | | | | √ | | √ | |
| | **GS 108** | English | C | | | | | | | √ | √ | | |
| **Second** | **GS 201** | Arabic | C | | | | | | | √ | √ | | |
| | **COE 202** | Engineering Mathematics | C | √ | √ | | | | | | | | |
| | **COE 203** | Electronic II | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 204** | Microprocessor and Microcomputer I | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 205** | Digital System Design | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 206** | Data Structure and Algorithms | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 207** | Communications | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **GS 208** | English | C | | | | | | | √ | √ | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Third** | **COE 301** | Computer Architecture I | C | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | **COE 302** | Digital Control Systems | C | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | **COE 303** | Microprocessor and Microcomputer II | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 304** | Operating Systems | C | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | **COE 305** | Computer Network | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 306** | Digital Signal Processing | O | √ | √ | √ | √ | | √ | | √ | √ | √ |
| | **COE 307** | Data Base Systems | O | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | **GS 308** | English | C | | | | | | | √ | √ | | |
| **Fourth** | **COE 401** | Internet Technology | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 402** | Computer Architecture II | C | √ | √ | √ | √ | √ | √ | | | √ | √ |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **COE 403** | Embedded Systems | C | √ | √ | √ | √ | √ | √ | | √ | √ | √ |
| | **COE 404** | Computer Security | C | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | **COE 405** | Robotics and Artificial Intelligence | O | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | **COE 406** | Computer Vision and pattern Recognition | O | √ | √ | √ | √ | √ | √ | | | √ | √ |
| | **COE 407** | Engineering Project | C | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | **GS 408** | English | C | | | | | | | √ | √ | | |

- **Please tick the boxes corresponding to the individual program learning outcomes**

# First Year

# Course Syllabus

**Course Code & Title: Fundamentals of Computer System**

**Department/ College: Computer Engineering**

**Credit Hours: 6**

**Course Calendar:** (5 hrs. per week, 24 weeks, theory 3 hrs., lab2 hrs.)

**Lecturer Name: Assist. L. Layth Mohammed Abbas**
**Tel:07716022879**
**Email: layth.muhammad@alfarabiuc.edu.iq**

**Course Prerequisites:** no

**Course Description:**
Student study the basic concept of computer and the main components of computer system (hardware & software).

**Course objectives:**
1. understand the concept of computer system.
2. understand the main components of computer system.
3. understand how computer components work and configuration of computer system.
4. understand how troubleshooting computer system issue.

**Class / Laboratory Schedule**:
**Class and discussion:** one session per week, 3 hrs**.**
**Lab**.: one session per week, 2 hrs.

**Course Content & Outlines:**

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1-2 | 1 | Introduction to Computer System |
| 3-4 | 2 | CPU |
| 5-6 | 3 | Motherboard |
| 7-9 | 4 | Power supply |
| 10-12 | 5 | Memory |
| 13-14 | 6 | Adapter cards |
| 15-16 | 7 | Storage Drives |
| 17-18 | 8 | Input and Output Devices |
| 19-20 | 9 | Operating Systems |
| 21-22 | 10 | Networking Fundamental |

| | | |
|---|---|---|
| **23-24** | **11** | **Laptops and Portable Devices** |

**Text Books**

1. COMPUTER ORGANIZATION & ARCHITECTURE BY WILLIAM STALLINGS
2. FUNDAMENTALS OF COMPUTERS BY RAJARAMAN V , ADABALA N

**Useful References**

1. FUNDAMENTALS OF COMPUTERS BY REEMA THAREJA
2. COMPUTER FUNDAMENTALS BY PRADEEP K. SINHA, PRITI SINHA. 6TH

**Grading Policy**

| | |
|---|---|
| **Assignments** | (2 assignments, grade 10) **20%** |
| **Quizzes** | (6 quizzes, grade 10) **10%** |
| **Midterm Exam** | **20** % |
| **Final Exam** | **50**% |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: Fundamentals of Digital Systems**

**Department/ College: Computer Engineering/Al-Farabi University College**

**Credit Hours: 10 Hours**

**Course Calendar:** (10 hours per week, 15 weeks in the semester, theory 3 Hours, lab 2 Hours)

**Lecturer Name: Hiba Hussein Mirza**
**Tel: 07706365977**
**Email: hiba.hussein@alfarabiuc.edu.iq**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)
It is a fundamental course.

**Course Description: (**Describe the importance of the course in two or three sentences)
This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided

**Course objectives:** (max. 3-4 objectives)
1. Students will be introduced to introductory logic design, their principle of operation, analysis and their design and provides the student to numbering systems.
2. To discuss the steps in the design process for combinational systems and the development of truth tables, switching algebra.
3. Implementation of switching functions using common gates, simplification using the Karnaugh map, design of larger combinational systems and introduces analysis of sequential systems.

**Class / Laboratory Schedule** (2 sessions each week and duration of each session is 3 hours theory and 2 hours Lab)

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | Lec-1- | Chapter one/Number System: Binary, Octal, Decimal, Hexadecimal |
| 2 | Lec-2- | Chapter one/Number System: Binary, Octal, Decimal, Hexadecimal |
| 3 | Lec-3- | Chapter one/Number System: Converting between the four numbering systems (decimal, binary, Hex and octal), fraction of number system |
| 4 | Lec-4- | Chapter one/Number System: Signed and un signed binary numbers, two's complement, binary addition and subtraction |

| | | |
|---|---|---|
| **5** | **Lec-5-** | Chapter one/Number System: Binary coded decimal (BCD) codes, ASCII code, Gray code. |
| **6** | **Lec-6-** | Chapter two/Logic gates: OR, AND, NOT, NOR, NAND, XOR, XNOR gates |
| **7** | **Lec-7-** | Chapter two/Logic gates: OR, AND, NOT, NOR, NAND, XOR, XNOR gates |
| **8** | **Lec-8-** | Chapter three/Boolean Expressions: Combinational Logic Circuits and Boolean algebra |
| **9** | **Lec-9-** | Chapter three/Boolean Expressions: Sum of Product and Product of Sum |
| **10** | **Lec-10-** | Chapter three/Boolean Expressions: Universality of NAND gate and NOR gate Theorems |
| **11** | **Lec-11-** | Chapter three/Boolean Expressions: Karnough Map for two, three, four and five variables |
| **12** | **Lec-12-** | Chapter three/Boolean Expressions: minimum SOP expressions using the Karnaugh map, finding a minimum product of sums (POS) expression |
| **13** | **Lec-13-** | Chapter four/Arithmetic Circuits: Design 1-bit and 2-bits full adder design 1-bit subtractor, subtractor/ adder |
| **14** | **Lec-14-** | Chapter four/Arithmetic Circuits: 1's complement substractor and 2's complement substractor and BCD adder |
| **15** | **Lec-15-** | Chapter four/Arithmetic Circuits: Encoders, decoders, multiplexers and demultiplexers |
| **16** | **Lec-16-** | Chapter five/Sequential Logic Circuits: General SR Flip-Flop, other type of Flip-Flops (D, JK, and T) |
| **17** | **Lec-17-** | Chapter five/Sequential Logic Circuits: General SR Flip-Flop, other type of Flip-Flops (D, JK, and T) |
| **18** | **Lec-18-** | Chapter five/Sequential Logic Circuits: Edge-Triggered Flip-Flop |
| **19** | **Lec-19-** | Chapter five/Sequential Logic Circuits: The concept of propagation delay, set-up time and hold time |
| **20** | **Lec-20-** | Chapter five/Sequential Logic Circuits: Counter Techniques |
| **21** | **Lec-21-** | Chapter five/Sequential Logic Circuits: Shift Register Applications |

**Text Books**

**1.** Introduction to logic design", 3rd edition 2010, published by McGraw-Hill.

2. Digital Design, 5th edition 2013, M. Morris Mano and Michael D. Ciletti.

**Useful References**

1. Introduction to logic design", 3rd edition 2010, published by McGraw-Hill.

2. Digital Design, 5th edition 2013, M. Morris Mano and Michael D. Ciletti.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (list number of assignments and the grade per each) %5 |
| **Quizzes** | (list number of quizzes and the grade of each) **%5** |
| **Midterm Exam** | %40 |
| **Final Exam** | %50 |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

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Mobile: 078023333461- 07712365333

# Course Syllabus

**Course Code & Title:**

**COE 108, Computer Programming Methodology**

**Department/ College: Computer Engineering /Al-Farabi University College**

**Credit Hours: 5 Hours**

**Course Calendar: (5 Hours per week, 30 weeks in the semester, 2 theory hours, 2 lab hours, 1 tutorial hour)**

**Lecturer Name : Dr. Hussein Muzahim Aziz Basi**
**Tel 07827174515**
**E-mail : hussein.muzahim@alfarabiuc.edu.iq**

**Course Prerequisites:** The course requires no previous background in programming, as the students will have their first experience in C programming language.

**Course Description:**

This subject will covers the principle of C programming methods and demonstrates fundamental programming techniques in how to compile and link C programs, how to use the standard C library, and how to access system libraries. The students will learn how to write an algorithms and translated to a programming codes by implementing different techniques that are more suitable to the solution for the proposed problems, which been discussed briefly in the classroom.

**Course Objectives:**

1. The students will learn the principle of computer and its terminology.
2. The students will learn how to define a problem and provide alternative solutions.
3. The students will learn algorithms and translated to C programming codes.
4. Compile and execute a C program in a programming environment.
5. The students will learn how to construct their programs, which include loops and conditions.

**Class / Laboratory Schedule:**
The duration of the class is 2 hours and 1 hour tutorial per week and the lab is 2 hours per week.

**Course Content & Outlines:**

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | 1 | Computers and their uses/ Hardware/Software. |
| 2 | 2 | Programming languages/How to use/ run programs. |
| 3 | 3 | Using computers in problem solving/ requirement specifications/ analysis. |
| 4 | 4 | Input and output/ data types. |
| 5 | 5 | Arithmetic and logical operators, precedence of operators. |
| 6 | 6 | C program control and structured programming Selections. |
| 7 | 7 | If statement, nested if statement, if-else if ladder else. |
| 8 | 8 | Switch-case statements, nested switch-case statement. |
| 9 | 9 | Counter controlled and sentinel controlled repetition. |
| 10 | 10 | Counter controlled and sentinel controlled repetition. |
| 11 | 11 | The do-while. |
| 12 | 12 | The while loops. |
| 13 | 13 | Labels and goto statement, nested loops. |
| 14 | 14 | Input and output/ data types. |
| 15 | 15 | **Exam of 1st Semester** |
| 16 | 16 | Create a call by pointer reference/ formal reference. |
| 17 | 17 | Prototype, Local, global, and static variables in functions. |
| 18 | 18 | The importance of prototype, the difference between local and global, and the mean of static variables. |
| 19 | 19 | Using the array data structure to represent lists and tables of values. |
| 20 | 20 | One-dimensional array creation, initialization and processing. |
| 21 | 21 | Two-dimensional array creation, initialization and processing. |
| 22 | 22 | Pass arrays to functions/ multiple-subscripted arrays. |
| 23 | 23 | Formal parameters call by value and call by reference/ Math and other standard library functions, Create a call by pointer reference/ formal reference. |
| 24 | 24 | Local, global, and static variables in functions, and the different between local and global and the mean of static variables. |
| 25 | 25 | Pointers and pointers operators/ using pointers to pass arguments to functions by reference. |
| 26 | 26 | Relationships among pointers, arrays and strings. |
| 27 | 27 | Using the array data structure to represent lists and tables of values. User defined data types, C structures. |
| 28 | 28 | C characters and strings/ character handling library (ctype)/ string conversion utility library (stdlib)/ string/ character I/O standard library (stdio) and string handling library (string). Data Types and Type Declaration C Expressions and Operators. Typedef/copy structure and using structures with functions. |
| 29 | 29 | Union, bit manipulations and numerations. |
| 30 | 30 | **2nd Exam of 2nd Semester** |

**Text Books:**

1. Tim Bailey**.** An Introduction to the C Programming Language and Software Design, 2005.
2. Stephen G. Kochan. Programming in C, 4th Edition, 2014.

**References:**

1. Bharat Kinariwala, Tep Dobry. Programming in C, 1993.
2. Jens Gustedt. Modern C, 2015.

**Grading Policy:**

| | |
|---|---|
| **Lab** | **20% (2 lab examination and each worth 10%) 20%** |
| **Quizzes** | **10% (2 quizzes and each worth 5%)** |
| **Midterm Exam** | **20**% |
| **Final Exam** | **50 %** |

**Academic Policy:**

Regarding to the rules and regulation, kindly refer to Al-Farabi university college policy.

# Course Syllabus

**Course Code & Title: Electronics Theory 1**

**Department/ College: Computer Engineering / Al-Farabi University College**

**Credit Hours: 5**

**Course Calendar:** (10, 30, 6, 4)

**Lecturer Name: A.L. Mohanad Ghazi Khamees**
**Tel: 07707920075**
**Email: Muhannad.ghazi.khamis@alfarabiuc.edu.iq**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)
No previous knowledge is required

**Course Description: (**Describe the importance of the course in two or three sentences)
To explain the principles of molecular structure and semi-conductors. Also, to learn about some circuits that include various combinations of diodes and transistors.

**Course objectives:** (max. 3-4 objectives)
1. To teach the students about theories of atomic structure
2. To gain information about the origin of electronics
3. To understand semi-conductors and diodes
4. To analyze some transistor circuits

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)
One laboratory session per week, its duration is 2 hours

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | 1 | Introduction |
| 2 | 2 | Atomic structure |
| 3 | 3 | Theories about the atomic structure (Part 1) |
| 4 | 4 | Theories about the atomic structure (Part 2) |
| 5 | 5 | Atoms, molecules, and ions |
| 6 | 6 | Conduction band and valence band |
| 7 | 7 | Types of materials |
| 8 | 8 | Movement of charge carries |

| | | |
|---|---|---|
| 9 | 9 | P - region and N – region |
| 10 | 10 | Understanding PN Junction majority and minority carries |
| 11 | 11 | Formation of diodes (Part 1) |
| 12 | 12 | Formation of diodes (Part 2) |
| 13 | 13 | Ideal diode |
| 14 | 14 | Light Emitting Diodes (LED's) as an example of a diode |
| 15 | 15 | Review |
| 16 | 16 | Introduction |
| 17 | 17 | Silicon diode |
| 18 | 18 | Logic gates from silicon diode |
| 19 | 19 | Zener Diode |
| 20 | 20 | Applications of Zener diode |
| 21 | 21 | Circuits with multiple diodes (Part 1) |
| 22 | 22 | Circuits with multiple diodes (Part 2) |
| 23 | 23 | Introduction to BJT |
| 24 | 24 | BJT Biasing (Part 1) |
| 25 | 25 | BJT Biasing (Part 2) |
| 26 | 26 | Examples on BJT Configurations (Part 1) |
| 27 | 27 | Examples on BJT Configurations (Part 2) |
| 28 | 28 | Introduction to FET |
| 29 | 29 | Open discussion |
| 30 | 30 | Review |

**Text Books**

**1.** "Microelectronic circuits", Sedra and Smith, 1987

**2.** "Microelectronics", Milliman and Grabel, 1988

**Useful References**

1. "Microelectronics", Milliman and Halkais, 1982

**Grading Policy**

| | |
|---|---|
| **Assignments** | (5 assignments) 3% each |
| **Quizzes** | (5 quizzes) 2% each |
| **Midterm Exam** | 15% |
| **Final Exam** | 60% (50% Theory & 10% Laboratory) |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: English**

**Department/ College: Computer Engineering**

**Credit Hours: 2**

**Course Calendar:** (2 hours per week)

**Lecturer Name: Dr. Yasameen Fawzi Azeez**
**Tel:07731536763**
**Email: Yasmin.fawzi@alfarabiuc.edu.iq**

**Course Prerequisites:**

**Course Description:**

**Course objectives:** (max. 3-4 objectives)
1. Reading the academic researches
2. Writing an academic assignments
3. rephrase the paragraphs for their graduation project
4.

**Class / Laboratory Schedule**

**Course Content & Outlines:**

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1-3 | | Unit 1-3 |
| 4-8 | | Unit 4-6 |
| 9-10 | | 7-8 |
| 11-12 | | Unit 9 |
| 13-15 | | Unit 10 |
| 16-18 | | Unit 11 |
| 19-21 | | Unit 12 |
| 22-24 | | Rephrase the paragraphs for their graduation project |
| 25-26 | | Reading practice |
| 27-30 | | Listening practice |

**Text Books**

**1. Headway English (Beginner level)**

**Useful References**

1.

2.

3.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (5) % |
| **Quizzes** | (5 Quiz) **%** |
| **Midterm Exam** | **20** % |
| **Final Exam** | **70**% |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: Mathematics**

**Department/ College: Computer Engineering Dept.**

**Credit Hours: 4 hrs.**

**Course Calendar: 4 hrs. per week (3 hrs. theory and 1 hr. tutorial) , 30 week in two semester)**

**Lecturer Name: A.L. Safa R. Ridha**
**Tel: 07726238504**
**Email: safariyadh@alfarabiuc.edu.iq**

**Course Prerequisites: Mathematics**
**Course Description: Determinants, Complex Numbers, Limit , Derivatives, Applications of Derivatives ,Techniques of Integration,**

**Course objectives:** (max. 3-4 objectives)

1. Find determinant of the two and third orders
2. Explain Limit of functions
3. Review of functions and explain derivatives of it's.
4. Solve Indefinite and Definite integration, Evaluate area between two curves and area of surface Revolution, Evaluate volume of solid revolution, Solve integration by parts and partial fractions.

**Class Schedule (**2 sessions each week and 2 hrs. of each session**)**

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | 1 | Determinants |
| 2 | 2 | Determinants |
| 3 | 3 | Determinants |
| 4 | 4 | Determinants |
| 5 | 5 | Complex Numbers |
| 6 | 6 | Complex Numbers |
| 7 | 7 | Complex Numbers |
| 8 | 8 | Limit |

| | | |
|---|---|---|
| 9 | 9 | Limit |
| 10 | 10 | Limit |
| 11 | 11 | Limit |
| 12 | 12 | Derivatives |
| 13 | 13 | Derivatives |
| 14 | 14 | Derivatives |
| 15 | 15 | Derivatives |
| 16 | 16 | Derivatives |
| 17 | 17 | Integrals |
| 18 | 18 | Integrals |
| 19 | 19 | Integrals |
| 20 | 20 | Integrals |
| 21 | 21 | Integrals |
| 22 | 22 | Exercises of all above |

**Text Books**

**Thomas &Finney "Calculus &Analytic Geometry"(1988),7th edition, Addison Wesley**

**Useful References**

**Thomas &Finney "Calculus &Analytic Geometry"(1988),7th edition, Addison Wesley, CALCULAS William L. Brigges Lyle Cochran International Edition 2011**

**Grading Policy**

| | |
|---|---|
| **Assignments** | **6 assignments and the grade per each 5%** |
| **Quizzes** | **6 number of quizzes and the grade of each 10%** |
| **Midterm Exam** | **15%** |
| **Final Exam** | **70%** |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Second Year

# Course Syllabus

**Course Code & Title:** COE 208: Data Structures and Computer Algorithms

**Department/ College:** Computer Engineering

**Credit Hours:** Four hours per week

**Course Calendar:** (eight hours per week, fifteen weeks in the semester, two hrs, two hrs)

**Lecturer Name:** Asst. Lect. Qasim Hadi Kareem

**Tel:+9647723796829**
**Email: dr.qasim.hadi@alfarabiuc.edu.iq**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)

**Course Description:**
Data Structures uses "objects" and their interactions to design applications and computer programs. From this module, our study will be in the art of the object-oriented programming using JAVA Programming Language.

**Course objectives:** (max. 3-4 objectives)
1. How to define a class and use it to create an object.
2. How to use various concepts related to data structure and important algorithms that can be applied to solve nowadays computer applications.
3. How to use and define some important topics such as arrays, linked lists, stacks & queues, and trees.
4. How to implement the above subjects in Java

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)

Four sessions per week and two hours for each session

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | 1 | Introduction to C++ and JAVA Programming & Program Structure, Input, Output |

| | | |
|---|---|---|
| 2 | 1 | Introduction to C++ and JAVA Program & Program Structure, Input, Output |
| 3 | 2 | Introduction to java programming |
| 4 | 2 | Introduction to java programming |
| 5 | 3 | Fundamentals of classes in java: Object Oriented Programming: Class Definition; Accessing Data Members and Member Functions. |
| 6 | 3 | Fundamentals of classes in java: Object Oriented Programming: Class Definition; Accessing Data Members and Member Functions. |
| 7 | 3 | Constructors and Destructors |
| 8 | 3 | Constructors and Destructors |
| 9 | 1-3 | 1st Exam |
| 10 | 4 | Nested classes |
| 11 | 4 | Nested classes |
| 12 | 5 | This keyword and exceptions |
| 13 | 5 | This keyword and exceptions |
| 14 | 4-5 | 2nd Exam |
| 15 | 1-5 | Mid-term Exam |
| 16 | 6 | Static keyword |
| 17 | 7 | Inheritance and polymorphism |
| 18 | 7 | Inheritance and polymorphism |
| 19 | 6-7 | 1st Exam |
| 20 | 8 | Computer algorithms: arrays |
| 21 | 8 | Computer algorithms: stack |
| 22 | 8 | Computer algorithms: stack |
| 23 | 8 | Computer algorithms: queue |
| 24 | 8 | Computer algorithms: queue |
| 25 | 9 | Computer algorithms: linked list |
| 26 | 9 | Computer algorithms: linked list |
| 27 | 10 | Applications by using android studio |
| 28 | 10 | Applications by using android studio |
| 29 | 8-10 | 2nd Exam |
| 30 | 1-10 | Revision |

**Text Books**

**1.** Introduction to JAVA programming, Y. Daniel Liang, 10th edition. prentice-Hall, 2015.

**Useful References**

1. Data Structures and Algorithms in JAVA, 6th edit., Michael T. Goodrich and Roberto Tamassia; John Wiley & Sons, Inc., 2014.

2. Foundations of C++ and Object-Oriented Programming, Namir C. Shamas, IDG Books worldwide 2005.

3. Fundamentals of Data Structures in C++, Ellis Horowitz, Sartaj Sahni and Dinesh Mehta, Second Edition; Galgotia Publishing pvt. Ltd., 2009.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (number of assignments is six and the grade per each is 5/5) |
| **Quizzes** | (number of quizzes is six and the grade of each is 10/10) |
| **Midterm Exam** | **15** % |
| **Final Exam** | **50** % |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: Digital System Design**

**Department/ College: Computer Engineering Dept.**

**Credit Hours: 5 hours**

**Course Calendar:** (5 hours per week, 30 weeks in the semester, 2 hours theory,2 hours lab, 1 hour tutorial)

**Lecturer Name: A.L. Eman H. Jadoua**
**Tel: +9647734937337**
**Email: iman.hassouni@alfarabiuc.edu.iq**

**Course Prerequisites:** The course requires knowledge of the basics of digital logic design (logic gates and simple logic circuits).

**Course Description:** Digital system design course focuses on design digital systems from scratch. The course focuses on designing combinational and sequential building blocks, using these building blocks to design bigger digital systems. During this course, we also learn how to use VHDL to design/model a digital system.

**Course objectives:**

1. Introduce the concept of a digital system design
2. Be able to design and analyze combinational logic circuits.
3. Be able to design and analyze sequential logic circuits.
4. Understand the basic software tools for the design and implementation of digital circuits and systems.

**Class / Laboratory Schedule** The duration of the class is 2 hours and 1 hour tutorial per week and the lab is 2 hours per week.

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1. | 1 | Register, Register types (SISO,SIPO,PIPO,PISO) |
| 2. | 2 | Register applications (Ex. Serial adder, sequence generator & detector) |
| 3. | 3 | VHDL description of combinational circuits |
| 4. | 4 | Signal and constant, arrays and VHDL operators |

| | | |
|---|---|---|
| 5. | 5 | Combinational and simulation of VHDL code |
| 6. | 6 | Design of synchronous state machine step1 & step2 |
| 7. | 7 | Design of synchronous state machine step3 |
| 8. | 8 | Design of synchronous state machine step4 |
| 9. | 9 | Design of synchronous state machine step5 |
| 10. | 10 | Design of synchronous state machine complete examples |
| 11. | 11 | Analysis of synchronous state machine |
| 12. | 12 | Design of asynchronous state machine step1 & step2 |
| 13. | 13 | Design of asynchronous state machine step3 & step4 |
| 14. | 14 | Design of asynchronous state machine step5 |
| 15. | 15 | Exam of First Semester |
| 16. | 16 | Design of asynchronous state machine step6 |
| 17. | 17 | Design of asynchronous state machine complete examples |
| 18. | 18 | Analysis of asynchronous state machine |
| 19. | 19 | Modeling combinational logic using VHDL processes |
| 20. | 20 | Modeling a sequential machine |
| 21. | 21 | Synthesis of VHDL code |
| 22. | 22 | Programmable logic devices part1 |
| 23. | 23 | Programmable logic devices part2 |
| 24. | 24 | Programmable logic devices part3 |
| 25. | 25 | Algorithmic state machines(ASM), finite state method |
| 26. | 26 | Finite string recognized |
| 27. | 27 | ASM chart |
| 28. | 28 | Realization ASM chart using PLA & ROM devices |
| 29. | 29 | VHDL for digital system design |
| 30. | 30 | Exam of Second Semester |

**Text Books**

**1. Roth Jr, Charles H., Larry L. Kinney, and Eugene B. John. Fundamentals of logic design. Cengage Learning, 2020.**

**2. D.Levin, "Design of logic Systems"**

**3. D.J.Comer, "Digital logic and state machine"**

**Useful References**

1. Digital systems principles and applications by Ronald J. Tocci and Neal S. Widmer, Eigthh Edition, Prentice Hall Publication, ISBN (0-13-085634-7).
2. Fundamentals of digital circuits by A. Anand Kumar, Second Edition, PHI Learning Private Limited, ISBN (978-81-203-3679-7).

**Grading Policy**

| | |
|---|---|
| **Assignments** | 20% (2 lab examination and the grade per each 10 %) |
| **Quizzes** | **10%**(2 quizzes and the grade of each **5%)** |
| **Midterm Exam** | %20 |
| **Final Exam** | %50 |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: Engineering Mathematics**

**Department/ College: Computer Engineering Dept.**

**Credit Hours: 4 hrs.**

**Course Calendar: 4 hrs. per week (3 hrs. theory and 1 hr. tutorial) , 30 week in two semester)**

**Lecturer Name: A.L. Safa R. Ridha**
**Tel: 07726238504**
**Email: safariyadh@alfarabiuc.edu.iq**

**Course Prerequisites: Knowledge in Mathematics II**
**Course Description:** Vectors ,partial derivatives, Differential Equations , Laplace Transform, Fourier Transform, Fourier Series.

**Course objectives:**

1. Explain a vector space and the angle between the gradient vector of the function at point and the unit vector u
2. Solve the first and second order partial derivatives and Find the directional derivative of the function at point.
3. Solve homogenous and linear first order DE and non-homogenous second order DE by variation of parameters.
4. Explain Laplace Transform and solve ODE using Laplace Transform and Explain Fourier- Series and Fourier Transform

**Class / Laboratory Schedule Class Schedule (**2 sessions each week and 2 hrs. of each session**)**

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | 1 | Vector Space |
| 2 | 2 | Vector Space |
| 3 | 3 | Vector Space |
| 4 | 4 | Multivariable functions and partial derivatives |
| 5 | 5 | Multivariable functions and partial derivatives |
| 6 | 6 | Multivariable functions and partial derivatives |

| | | |
|---|---|---|
| 7 | 7 | Multivariable functions and partial derivatives |
| 8 | 8 | Differential Equations |
| 9 | 9 | Differential Equations |
| 10 | 10 | Differential Equations |
| 11 | 11 | Laplace Transform |
| 12 | 12 | Laplace Transform |
| 13 | 13 | Laplace Transform |
| 14 | 14 | Laplace Transform |
| 15 | 15 | Fourier Series |
| 16 | 16 | Fourier Series |
| 17 | 17 | Fourier Series |
| 18 | 18 | Fourier Transform |
| 19 | 19 | Fourier Transform |
| 20 | 20 | Fourier Transform |
| 21 | 21 | Exercises of all above |

**Text Books**

**"Calculus" by George B. Thomas, Jr. publishing company, 2010**

**Useful References**

**Thomas &Finney "Calculus &Analytic Geometry"(1988),7th edition, Addison Wesley,**

**"Calculus" by George B. Thomas, Jr. publishing company, 2010**

**Grading Policy**

| | |
|---|---|
| **Assignments** | **6 assignments and the grade per each 5%** |
| **Quizzes** | **6 number of quizzes and the grade of each 10%** |
| **Midterm Exam** | **15%** |
| **Final Exam** | **70%** |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

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# Course Syllabus

**Course Code & Title: Electronics Theory 2**

**Department/ College: Computer Engineering / Al-Farabi University College**

**Credit Hours: 5**

**Course Calendar:** (10, 30, 6, 4)

**Lecturer Name: A.L. Mohanad Ghazi Khamees**
**Tel: 07707920075**
**Email: Muhannad.ghazi.khamis@alfarabiuc.edu.iq**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)
No previous knowledge is required

**Course Description: (**Describe the importance of the course in two or three sentences)
To teach the topics that include various combinations of integrated circuits and transistors in different topologies so that the students acquire knowledge about the behavior and analyses of these circuits.

**Course objectives:** (max. 3-4 objectives)
1. To teach students about integrated circuits
2. To get the students acquainted of regulators
3. To gain the experience to analyze different circuits

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)
One laboratory session per week, its duration is 2 hours

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | 1 | Review |
| 2 | 2 | Linear circuits of OP-AMP's (part 1) |
| 3 | 3 | Linear circuits of OP-AMP's (part 2) |
| 4 | 4 | Non-linear circuits of OP-AMP's |
| 5 | 5 | OP-AMP specifications |
| 6 | 6 | Feedback circuits |
| 7 | 7 | Oscillators |
| 8 | 8 | Tutorial |
| 9 | 9 | Exam |

| | | |
|---|---|---|
| 10 | 10 | Regulated power supplies |
| 11 | 11 | Astable circuits |
| 12 | 12 | Monostable circuits |
| 13 | 13 | Bistable circuits |
| 14 | 14 | Tutorial |
| 15 | 15 | Exam |
| 16 | 16 | Review |
| 17 | 17 | Resistor Transistor Logic and DTL |
| 18 | 18 | Transistor-Transistor Logic |
| 19 | 19 | Emitter Coupled Logic |
| 20 | 20 | Complementary Metal Oxide Semiconductor |
| 21 | 21 | Tutorial |
| 22 | 22 | Exam |
| 23 | 23 | Digital to Analog Converter |
| 24 | 24 | Analog to Digital Converter |
| 25 | 25 | Types of memories |
| 26 | 26 | Introduction to nanotechnology |
| 27 | 27 | Tutorial |
| 28 | 28 | Exam |
| 29 | 29 | Open discussion |
| 30 | 30 | Open discussion |

**Text Books**

**1.** "Electronic Devices and Circuit Theory", Robert Boylestad, Louis Nashelsky, 9th Edition, 2006.
**2.** "Integrated Electronics; Analog and Digital Circuits and Systems", Millman, McGraw-Hill, 1989.

**Useful References**

1. "Microelectronic Circuits", Sedra, Smith, Fourth edition or 5th Edition, Oxford University Press, 1998-2003.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (5 assignments) 3% each |
| **Quizzes** | (5 quizzes) 2% each |
| **Midterm Exam** | 15% |
| **Final Exam** | 60% (50% Theory & 10% Laboratory) |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: Engineering Mathematics**

**Department/ College: Computer Engineering Dept.**

**Credit Hours: 4 hrs.**

**Course Calendar: 4 hrs. per week (3 hrs. theory and 1 hr. tutorial) , 30 week in two semester)**

**Lecturer Name: A.L. Safa R. Ridha**
**Tel:**
**Email: safariyadh@alfarabiuc.edu.iq**

**Course Prerequisites: Knowledge in Mathematics II**
**Course Description:** Vectors ,partial derivatives, Differential Equations , Laplace Transform, Fourier Transform, Fourier Series.

**Course objectives:**

1. Explain a vector space and the angle between the gradient vector of the function at point and the unit vector u
2. Solve the first and second order partial derivatives and Find the directional derivative of the function at point.
3. Solve homogenous and linear first order DE and non-homogenous second order DE by variation of parameters.
4. Explain Laplace Transform and solve ODE using Laplace Transform and Explain Fourier- Series and Fourier Transform

**Class / Laboratory Schedule Class Schedule (**2 sessions each week and 2 hrs. of each session**)**

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | 1 | Vector Space |
| 2 | 2 | Vector Space |
| 3 | 3 | Vector Space |
| 4 | 4 | Multivariable functions and partial derivatives |
| 5 | 5 | Multivariable functions and partial derivatives |
| 6 | 6 | Multivariable functions and partial derivatives |

| | | |
|---|---|---|
| 7 | 7 | Multivariable functions and partial derivatives |
| 8 | 8 | Differential Equations |
| 9 | 9 | Differential Equations |
| 10 | 10 | Differential Equations |
| 11 | 11 | Laplace Transform |
| 12 | 12 | Laplace Transform |
| 13 | 13 | Laplace Transform |
| 14 | 14 | Laplace Transform |
| 15 | 15 | Fourier Series |
| 16 | 16 | Fourier Series |
| 17 | 17 | Fourier Series |
| 18 | 18 | Fourier Transform |
| 19 | 19 | Fourier Transform |
| 20 | 20 | Fourier Transform |
| 21 | 21 | Exercises of all above |

**Text Books**

**"Calculus" by George B. Thomas, Jr. publishing company, 2010**

**Useful References**

**Thomas &Finney "Calculus &Analytic Geometry"(1988),7th edition, Addison Wesley,**

**"Calculus" by George B. Thomas, Jr. publishing company, 2010**

**Grading Policy**

| | |
|---|---|
| **Assignments** | **6 assignments and the grade per each 5%** |
| **Quizzes** | **6 number of quizzes and the grade of each 10%** |
| **Midterm Exam** | **15%** |
| **Final Exam** | **70%** |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

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# Course Syllabus

**Course Code & Title: English**

**Department / College: Computer Engineering / Alfarabi University Collage**

**Credit Hours: 2**

**Course Calendar:** (2 hours per week)

**Lecturer Name: Dr. Isam Abdulmunem Abdullah**
**Tel:**
**Email: dr.essam.abdelmoneim@alfarabiuc.edu.iq**

**Course Prerequisites:**

**Course Description:**

The overall aims of the course are :

- Enable the learner to communicate effectively and appropriately in real life situation:
- Use English effectively for study purpose across the curriculum;
- Develop interest in and appreciation of Literature;
- Develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and Writing;
- Revise and reinforce structure already learnt.

**Course objectives:** (max. 3-4 objectives)
1. Reading the academic researches
2. Writing an academic assignments
3.
4.

**Class / Laboratory Schedule**

**Course Content & Outlines:**

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1-3 | | Unit 1-3 |
| 4-8 | | Unit 4-8 |
| 9-10 | | Unit 9 |
| 11-12 | | Unit 10 |
| 13-15 | | Unit 11 |

| | | |
|---|---|---|
| **16-18** | | **Unit 12** |
| **19-21** | | **Unit 13** |
| **22-24** | | **Unit 14** |
| **25-26** | | **Reading practice** |
| **27-30** | | **Listening practice** |

**Text Books**

**1. Headway English (pre-intermediate level)**

**Useful References**

1.

2.

3.

**Grading Policy**

| | |
|---|---|
| **Assignments** | **5%** |
| **Quizzes** | **5%** |
| **Midterm Exam** | **20%** |
| **Final Exam** | **70%** |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: Microprocessor and Microcomputer 1**

**Department/ College: Computer Engineering/ Al- Farabi University College**

**Credit Hours: 5 Hours**

**Course Calendar: (5 hours per week, 30 weeks in the semester, 3 theory hrs, 2 lab hours)**

**Lecturer Name: Maryam Amer Saffo**
**Tel: (+964) 7705836038**
**Email: maryam.saffo@gmail.com , maryam.saffo@alfarabiuc.edu.iq**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)

- Fundamentals of digital systems.

**Course Description: (**Describe the importance of the course in two or three sentences)

In this course students will study microprocessor architecture, assembly language and interfacing techniques. The 8086 microprocessor trainer will be used in the laboratory to run programs and to perform experiments.

**Course objectives:** (max. 3-4 objectives)

1. Describe the architecture of the 8088/8086 microprocessor and understand the relationship between a microprocessor and a microcomputer system.
2. Learn the instruction set for the 8088/8086 microprocessor and be able to write assembly language using the instruction set.
3. Become familiar with various interfacing techniques which are interfaced to and controlled by the 8088/8086 microprocessor.
4. Use M86-01 Microprocessor trainer for experimentation and write clear laboratory reports describing experiments performed, results obtained, and the interpretation of those results.

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)

2 theory hours and 1 Tutorial hour / 2 lab. hours.

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1st Week | Lecture 1-1 | Introduction to the Microprocessors, Microcomputers, Microcontroller, and Embedded Systems. |
| 2nd Week | Lecture 1-2 | History of 80X86 Microprocessor and its Architecture (Internal Architecture, Programming Model). |
| 3rd Week | Lecture 2 | Registers & Segment registers |
| 4th Week | | 8088/8086 Architecture (Internal Architecture, Programming Model, Registers & Segment registers). |
| 5th Week | Lecture 3 | Real Mode Memory Addressing, Segments & Offsets. |
| 6th Week | | Addressing Modes. |
| 7th Week | Lecture 4 | Machine Codes |
| 8th Week | | |
| 9th Week | Lecture 5 | Stack Memory & Addressing Modes. |
| 10th Week | Lecture 6-1 | 8088/8086 Instruction set (Data transfer instructions). |
| 11th Week | | Arithmetic instructions |
| 12th Week | | Logic instructions. |
| 13th Week | Lecture 6-2 | Shift, Rotate & Flag Control Instructions. |
| 14th Week | | Compare Instructions. |
| 15th Week | Lecture 7 | Jump , Loop & Strings Instructions. |
| 16th Week | | |
| 17th Week | Lecture 8 | Bus Timing(Basic Bus Operation, Read Timing & Write Timing). |
| 18th Week | | |
| 19th Week | | Memory Devices, Address Decoding & 8088/8086 Memory Interface. |
| 20th Week | Lecture 9 | Basic description of 8255 & Programming of 8255. |
| 21st Week | | Serial Input/Output Interface. |
| 22nd Week | | Introduction to Interrupts & Interrupt instructions. |
| 23rd Week | | |
| 24th Week | Lecture 10 | Timming and memory interfacing |
| 25th Week | | |
| 26th Week | | |
| 27th Week | | |
| 28th Week | | Hardware Interrupts, 8259A Programmable Interrupts Controller. |
| 29th Week | | |
| 30th Week | | Direct Memory Access (DMA) Operation. |

**Text Books**

1. “The 8088 and 8086 Microprocessors, Programming, Interfacing, Software, Hardware, and Applications”, W. A. Triebel & A. Singh, ISBN-13: 978-0130930811, 4th Edition, Prentice Hall, 2002.

**Useful References**

1. "The Intel Microprocessors: 8086/8088, 80186, 80286, 80386 and 80486. Architecture, Programming, and Interfacing", B. B. Brey, 8th Edition, Prentice Hall, ISBN-13:977-0-13-502645-8, 2009.
2. "Introduction to 80X86 Assembly Language and Computer Architecture", R. Detmer, ISBN:0763717738, 2001.
3. "80X86 IBM PC and Compatible Computers: Assembly Language, Design, and Interfacing" Muhammad Mazidi , Janice Mazidi, Volumes I & II (4th Edition) Aug 31, 2002. (Recommended reading)
4. "Digital Fundamentals", Thomas L. Floyd, 9th edition, 2006. (Recommended reading)
5. "Fundamentals of Logic Design", Charles Roth and Larry Kinney, 6th edition, 2010. (Recommended reading)

**Grading Policy**

**Assignments** (list number of assignments and the grade per each) %

1. Homework Problem sets / 5%
2. Oral tests and Discussions / 6%
3. Reports / 5%

**Quizzes** (list number of quizzes and the grade of each) **%**

8 Quizzes / 10 %

**Midterm Exam**

2 Exams (1st term % and 2nd term %) 12% for each term >> 24% for 2 terms

**Final Exam** **50** %

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Third Year

# Course Syllabus

**Course Code & Title: Computer Architecture 1**

**Department/ College: Computer Engineering/ Al- Farabi University College**

**Credit Hours: 3 Hours**

**Course Calendar: (3 hours per week, 30 weeks in the semester, 3 theory hrs)**

**Lecturer Name: Maryam Amer Saffo**
**Tel: (+964) 7705836038**
**Email: maryam.saffo@gmail.com , maryam.saffo@alfarabiuc.edu.iq**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)

- Fundamentals of digital systems
- Microprocessors and microcomputers 1

**Course Description: (**Describe the importance of the course in two or three sentences)

1. This course describes the computer architecture as well as computer organization and design.
2. Computer Organization is concerned with the way the hardware components are connected together to form a computer system.

Computer design is concerned with the development of the hardware for the computer taking into consideration a given set of specifications.

**Course objectives:** (max. 3-4 objectives)

1. To provide the basic knowledge necessary to understand the hardware operation of digital computers.
2. To cover some of the subjects associated with computer hardware.
3. To show the steps that a designer must go through in order to design an elementary basic computer.
4. To present the organization and the architecture of central processing unit, input-output and memory.

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)

2 theory hours and 1 Tutorial hour / no lab. In this course.

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1st Week | Lecture ch4-1 | **Register Transfer and Microoperations:** Register Transfer Language, Register Transfer |
| 2nd Week | Lecture ch4-2 | Bus and Memory Transfers, Arithmetic Microoperations |
| 3rd Week | Lecture ch4-3 | Logic Microoperations, Shift Microoperations |
| 4th Week | Lecture ch4-4 | Arithmetic Logic Shift Unit |
| 5th Week | Lecture ch5-1 | **Basic Computer Organization and Design:** Instruction Codes, Computer Registers |
| 6th Week | Lecture ch5-2 | Computer Instructions, Timing and Control |
| 7th Week | Lecture ch5-3 | Instruction Cycle, Memory-Reference Instructions, |
| 8th Week | Lecture ch5-4 | Input-Output and Interrupt, Complete Computer Description |
| 9th Week | Lecture ch5-5 | Design of Basic Computer, Design of Accumulator Logic |
| 10th Week | Lecture ch5-6 | Complete Computer Description |
| 11th Week | Lecture ch6-1 | Programming The Basic Computer |
| 12th Week | Lecture ch6-2 | Assembly Language Program |
| 13th Week | Lecture ch6-3 | **Programs: loops, Interrupts, arithmetic and logic operations** |
| 14th Week | Lecture ch7 | **Microprogrammed Control Introduction:** Control Memory, Address Sequencing |
| 15th Week | | Microprogram Example, Design of Control Unit |
| 16th Week | Lecture ch8 | **Central Processing Unit:** Introduction, General Register Organization |
| 17th Week | | Stack Organization, Instruction Formats |
| 18th Week | | Addressing Modes, Data Transfer and Manipulation |
| 19th Week | | Program Control, Reduced Instruction Set Computer |
| 20th Week | Lecture ch9 | **Pipeline and Vector Processing:** Parallel Processing, Pipelining, Arithmetic Pipeline |
| 21st Week | | Instruction Pipeline, RISC Pipeline, Vector Processing, |
| 22nd Week | | **Computer Arithmetic:** Introduction, Addition and Subtraction |
| 23rd Week | | Multiplication Algorithms, Division Algorithms |
| 24th Week | Lecture ch10 | **Input-Output Organization:** Peripheral Devices, Input-Output Interface |
| 25th Week | | Asynchronous Data Transfer, Modes of Transfer |
| 26th Week | | Priority Interrupt, Direct Memory Access, Input-Output Processor |
| 27th Week | Lecture ch11 | **Memory Organization:** Memory Hierarchy, Main Memory, Auxiliary Memory |
| 28th Week | | Cache Memory, Virtual Memory, Memory Management Hardware |
| 29th Week | Lecture ch12 | **Multiprocessors:** Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration |
| 30th Week | Lecture ch13 | Interprocessor Communication and Synchronization, Cache Coherence |

**Text Books**

1. "Computer system architecture", Morris Mano, 3rd edition, 2007.

**Useful References**

1. "Computer system architecture", Morris Mano, 3rd edition, 2007. (The course reference)
2. https://www.studytonight.com/
3. "Digital Fundamentals", Thomas L. Floyd, 9th edition, 2003. (Recommended reading)
4. "Fundamentals of Logic Design", Charles Roth and Larry Kinney, 6th edition, 2010. (Recommended reading)

**Grading Policy**

**Assignments** (list number of assignments and the grade per each) %

1. Homework Problem sets / 3%
2. Oral tests and Discussions / 5%
3. Reports / 3%

**Quizzes** (list number of quizzes and the grade of each) **%**

8 Quizzes / 5 %

**Midterm Exam**

2 Exams (1st term % and 2nd term %) 7% for each term >> 14% for 2 terms

**Final Exam** **70** %

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title:**

**Computer Networks**

**Department/ College: Computer Engineering /Al-Farabi University College**

**Credit Hours: 5 Hours**

**Course Calendar: (5 Hours per week, 30 weeks in the semester, 2 theory hours, 2 lab hours, 1 tutorial hour)**

**Lecturer Name : Dr. Hussein Muzahim Aziz Basi**
**Tel 07827174515**
**E-mail : hussein.muzahim@alfarabiuc.edu.iq**

**Course Prerequisites:** The course requires no previous background in computer networking, as the students will have their first experience in learning the principle of computer networks communication.

**Course Description:**

Computer networks course will cover the theory, design, engineering, and installation of networks to connect digital computers. The course will prepare students to plan and implement a network. Also includes peer-to-peer networks, the client-server model, network protocols, ISO and TCP/IP and an introduction to different networks, like local area networks, metropolitan area network, wide area networks. The network and implementation tools may vary to meet current development.

**Course Objectives:**

1. To educate basic knowledge of networking technologies and networks management concepts
2. To interpret the layering concepts in computer networks.
3. To analyze the functions of each layer and gain knowledge in different applications that use computer networks.
4. To emphasize the hand-on experience of network topology in a laboratory environment
5. To be familiar with contemporary issues in networking technologies

**Class / Laboratory Schedule:**
The duration of the class is 2 hours and 1 hour tutorial per week and the lab is 2 hours per week.

**Course Content & Outlines:**

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | 1 | Computers and their uses/ Hardware/Software. |
| 2 | 2 | Programming languages/How to use/ run programs. |
| 3 | 3 | Using computers in problem solving/ requirement specifications/ analysis. |
| 4 | 4 | Input and output/ data types. |
| 5 | 5 | Arithmetic and logical operators, precedence of operators. |
| 6 | 6 | C program control and structured programming Selections. |
| 7 | 7 | If statement, nested if statement, if-else if ladder else. |
| 8 | 8 | Switch-case statements, nested switch-case statement. |
| 9 | 9 | Counter controlled and sentinel controlled repetition. |
| 10 | 10 | Counter controlled and sentinel controlled repetition. |
| 11 | 11 | The do-while. |
| 12 | 12 | The while loops. |
| 13 | 13 | Labels and goto statement, nested loops. |
| 14 | 14 | Input and output/ data types. |
| 15 | 15 | **Exam of 1st Semester** |
| 16 | 16 | Create a call by pointer reference/ formal reference. |
| 17 | 17 | Prototype, Local, global, and static variables in functions. |
| 18 | 18 | The importance of prototype, the difference between local and global, and the mean of static variables. |
| 19 | 19 | Using the array data structure to represent lists and tables of values. |
| 20 | 20 | One-dimensional array creation, initialization and processing. |
| 21 | 21 | Two-dimensional array creation, initialization and processing. |
| 22 | 22 | Pass arrays to functions/ multiple-subscripted arrays. |
| 23 | 23 | Formal parameters call by value and call by reference/ Math and other standard library functions, Create a call by pointer reference/ formal reference. |
| 24 | 24 | Local, global, and static variables in functions, and the different between local and global and the mean of static variables. |
| 25 | 25 | Pointers and pointers operators/ using pointers to pass arguments to functions by reference. |
| 26 | 26 | Relationships among pointers, arrays and strings. |
| 27 | 27 | Using the array data structure to represent lists and tables of values. User defined data types, C structures. |
| 28 | 28 | C characters and strings/ character handling library (ctype)/ string conversion utility library (stdlib)/ string/ character I/O standard library (stdio) and string handling library (string). Data Types and Type Declaration C Expressions and Operators. Typedef/copy structure and using structures with functions. |
| 29 | 29 | Union, bit manipulations and numerations. |
| 30 | 30 | **2nd Exam of 2nd Semester** |

**Text Books:**

1. Data and Computer Communications, by *William Stallings*, 9th Edi on 2011.
2. Data Communications and Networking, by *Behrouz A. Forouzan* , 4th Edi on 2007.

**References:**

1. Network Fundamentals ,*Cisco network Academy*, 4th Edition Cisco Press, 2010
2. TCP/IP Protocol Suite, by *Behrouz A. Forouzan* , 4th Edi on 2010.
3. Computer Network A Top Down Approach, by *James F. Kourse*, 5 th edi on 2010.

**Grading Policy:**

| | |
|---|---|
| **Lab** | **20% (2 lab examination and each worth 10%) 20%** |
| **Quizzes** | **10% (2 quizzes and each worth 5%)** |
| **Midterm Exam** | **20**% |
| **Final Exam** | **50 %** |

**Academic Policy:**

Regarding to the rules and regulation, kindly refer to Al-Farabi university college policy.

Republic of Iraq
Ministry of Higher Education and Scientific Research
University of Baghdad
College of Engineering

# MATLAB

## Computer Engineering Department
## Fourth year

| | Name of Experiment | No. of Weeks |
|---|---|---|
| 1 | Feedback Control System Characteristics | 1 |
| 2 | Transient response analysis | 2 |
| 3 | Stability in feedback control systems | 1 |
| 4 | Root locus method | 2 |
| 5 | Frequency response analysis | 2 |
| 6 | Conversions between Continuous and Discrete time Control Systems | 1 |
| 7 | Design of Continuous and Digital PID Controller | 2 |
| 8 | State space model | 2 |

# Course Syllabus

| | |
|---|---|
| **Course Code & Title** | Digital Control Systems |
| **Department / College** | Computer Engineering/ Al-Farabi university college |
| **Credit Hours** | 6 Hours |
| **Course Calendar** | (5 hours per week, 15 weeks in the semester, theory: 2 hours, lab 2 hours, tutorial1 hours) |

**Lecturer Name: Dr. Subhi Aswad Mohammed**
**Tel:**
**Email:** **subhi.aswd@alfarabiuc.edu.iq**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)

**Course Description:** **(**Describe the importance of the course in two or three sentences)

**Course objectives:**

1. Classify Control systems. And Writing the differential equation describing both mechanical and electrical systems.
2. Using the Laplace/LaPlace inverse transformation to convert the model from the time domain to the frequency domain,
3. Using the z/ inverse -transformation to convert the model from the time domain to the frequency domain, back in time domain
4. Using the Transfer Function definition to build the blocks representing any system. Representing the system by state space models
5. Evaluating the dynamic time response for any system to impulse, step and cosine input signals. Checking the system stability , Using the PID control algorithm to improve the system stability and other performance characteristics

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)
one lecture and one lab session in each week . (5 hours per week, 15 weeks in the semester, theory: 2 hours, lab 2 hours, tutorial 1 hours)

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| **1, 2** | **Lect. 1, 2** | Introduction to control systems, Open and closed loop systems, Classification of feedback control systems |
| **3, 4** | **Lect. 3, 4** | Laplace Transform<br>- Inverse Laplace Transformation |
| **5, 6, 7** | **Lect. 5, 6, 7** | Modeling of Dynamic Systems<br>- Electrical Systems<br>- Mechanical Systems |

| | | |
|---|---|---|
| **8, 9** | **Lect. 8, 9** | Transient and Steady State response analysis |
| **10, 11** | **Lect. 10, 11** | State Space and State, variable Models |
| **12, 13** | **Lect. 12, 13** | Block Diagram reduction |
| **14, 15** | **Lect. 14, 15** | The Stability of Linear Control Systems |
| **16, 17** | **Lect. 16, 17** | Transient response specification stability<br>Routh's stability criteria<br>Steady state error coefficients |
| **18, 19** | **Lect. 18, 19** | Root locus method of analysis and design<br>Frequency response method of analysis and design |
| **20, 21** | **Lect. 20, 21** | Effect of adding derivative and integral action on system performance<br>PD, PI, PID controllers |
| **22, 23** | **Lect. 22, 23** | **Introduction to Digital Control Digitization Effect of Sampling** |
| **24, 25** | **Lect. 24, 25** | Discrete-Systems Analysis, Discrete Transfer Function Z-Transform, Linear Difference Equations |
| | | |

**Text Books**

**1. Digital Control of Dynamic Systems by Franklin, Powel, and Workman**

**3rd edition, 1998, Addison-Wesley Publisher**

**2. Discrete Time Control Systems** by Ogata

**Useful References**

1.

2.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (list number of assignments and the grade per each) 10% |
| **Quizzes** | (list number of quizzes and the grade of each) **10%** |
| **Midterm Exam** | 30% |
| **Final Exam** | 50% |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

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# MP II - Course Syllabus

**Course Code & Title:** Microprocessor & Microcomputer II

**Department/ College:** Computer Engineering Department

**Credit Hours: 6**

**Course Calendar:** 5 hrs per week, 30 weeks in the semester, 3 theory hrs, 2 lab hrs.

**Lecturer Name:** A.L. Sara Raad Qasim
**Tel:**
**Email:** sararaad_cac@alfarabiuc.edu.iq

**Course Prerequisites:** Knowledge in Electronics I, Electronics II, Microprocessor I and Programming language experience (C and/or C++ or other).

**Course Description:** This course provides an introduction to microprocessors, Developing software for an embedded system, Review of Intel family microprocessors, Memories, I/O Interface, Interrupt, DMA, Introduction to microcontroller, microcontroller interfacing and Microcontroller applications. Laboratories directly related to microprocessor functions and its interfaces.

**Course objectives:**

1. Demonstrate a fundamental knowledge of microprocessors.
2. Demonstrate a fundamental knowledge of assembly language programming.
3. Demonstrate a fundamental knowledge of microcomputer systems including microprocessors, peripherals, and hardware interfaces.
4. Develop an ability to conduct experiments, as well as analyze and interpret data and convert assembly language instructions to machine code.

**Class / Laboratory Schedule:** 3 sessions each week, two sessions of 2 hrs. and 1 session of 1 hrs.

**Course Content & Outlines:**

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| **1** | 1 | Basic I/O interface (8255 Peripheral Programmable Interface) |
| **2** | 1 | Basic I/O interface (8255 Peripheral Programmable Interface) |
| **3** | 1 | Basic I/O interface (8255 Peripheral Programmable Interface) |
| **4** | 2 | Basic I/O interface (8279 programmable keyboard/display interface) |
| **5** | 2 | Basic I/O interface (8279 programmable keyboard/display interface) |
| **6** | 2 | Basic I/O interface (8279 programmable keyboard/display interface) |

| | | |
|---|---|---|
| **7** | 3 | Basic I/O interface (8254 programmable interval timer) |
| **8** | 3 | Basic I/O interface (8254 programmable interval timer) |
| **9** | 3 | Basic I/O interface (8254 programmable interval timer) |
| **10** | 3 | Basic I/O interface (8254 programmable interval timer) |
| **11** | 4 | Basic I/O interface (16550 programmable a communication interface) |
| **12** | 4 | Basic I/O interface (16550 programmable a communication interface) |
| **13** | 5 | Basic I/O interface (Analog/Digital and Digital/Analog converters) |
| **14** | 6 | Developing software for imbedded systems |
| **15** | 6 | Developing software for imbedded systems |
| **16** | 7 | Review of Intel family microprocessors |
| **16** | 7 | Review of Intel family microprocessors |
| **17** | 8 | Memories |
| **18** | 8 | Memories |
| **19** | 8 | Memories |
| **20** | 9 | Interrupt (instruction and hardware interrupt) |
| **21** | 9 | Interrupt (instruction and hardware interrupt) |
| **22** | 9 | Interrupt (8259 programmable interrupt controller) |
| **23** | 10 | DMA |
| **24** | 10 | DMA |
| **25** | 11 | Microcontroller |

**Text Books**

The Intel Microprocessors, Barry B. Brey,8th edition, Prentice Hall,2012

**Useful References**

Computer Organization and Architecture, William Stallings, 8th edition, Prentice Hall,2010

**Grading Policy**

| | |
|---|---|
| **Assignments** | 4 assignments, each 5% then take average of 10% |
| **Quizzes** | 6 quizzes, each 10**%** then take average of 15% |
| **Lab. Assignments** | 4 assignments, each 5% then take average of 10% |
| **Midterm Exam** | 15% |
| **Final Exam** | 50% |

**Academic Policy**

I count attendance at lectures toward student's grade. However, students who actively participate in lectures tend to earn better grades on both coursework and exams. They hear the important announcements, experience the material as I present it, and pick up the various hints and pointers I provide along the way all of which are hard to get from copied notes. Exposure to these sometimes

subtle, but often important, insights allows participating students to achieve higher scores on their assignments, project and exams

Also, regular participation in lectures is the best way to help student to succeed in the course. I am happy to assist students throughout the semester, but I cannot learn the material for them. The students must first take the initiative and do what they can to help themselves. If they have not been attending lectures regularly and come to me seeking help, do not be surprised if my first suggestion is for them to get the notes they have missed from a classmate and start attending lectures

The final grade will be assigned based upon how well the students perform relative to the classmates. There is a common misperception that this means that students with prior knowledge have an advantage. However, history has demonstrated that participation in lectures offers a far greater advantage than prior knowledge.

# Course Syllabus

**Course Code & Title: Operating System**

**Department/ College: Computer Engineering Department\ Al-farabi University College**

**Credit Hours: 3 Hours**

**Course Calendar:** (Three hours, 30 weeks, 90 hours, 0)

**Lecturer Name: Assist. Prof. Ahmed Mohammed Al-Suffar**
**Tel: 07702535591**
**Email: ahmed-Malallah@yahoo.com**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)
Necessary having study Programing, Data Structure before this Course

**Course Description: (**Describe the importance of the course in two or three sentences)
An OS is a program that acts as an intermediary between a user of a computer and the computer hardware. It manages the computer's memory and processes, as well as all of its software and hardware. So It allows the students to communicate with the computer without knowing how to speak the computer's language.

**Course objectives:** (max. 3-4 objectives)

1. The goal behind computer operating system learning is to give students a substantial knowledge in system's components management.

2. The course will cover an introduction on the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems.

3. A successful student will be able to understand the basic components of a computer operating system.
4. To learn the interactions among the various components.

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)
One Session (three hours) each week

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic | |
|---|---|---|---|
| 1 | 1 | **Introduction** | **Teacher's Lecture** |
| 2 | 2 | **Introduction** | Student Seminar and Presentations |
| 3 | 3 | **Introduction** | **Reviewing & Exam** |
| 4 | 4 | **Process concept** | **Teacher's Lecture** |
| 5 | 5 | **Process concept** | Student Seminar and Presentations |
| 6 | 6 | **Process concept** | **Reviewing & Exam** |
| 7 | 7 | **CPU Scheduling** | **Teacher's Lecture** |
| 8 | 8 | **CPU Scheduling** | **Teacher's Lecture** |
| 9 | 9 | **CPU Scheduling** | Student Seminar and Presentations |
| 10 | 10 | **CPU Scheduling** | Student Seminar and Presentations |
| 11 | 11 | **CPU Scheduling** | **Reviewing & Exam** |
| 12 | 12 | **Deadlocks** | **Teacher's Lecture** |
| 13 | 13 | **Deadlocks** | **Teacher's Lecture** |
| 14 | 14 | **Deadlocks** | Student Seminar and Presentations |
| 15 | 15 | **Deadlocks** | Student Seminar and Presentations |
| 16 | 16 | **Deadlocks** | **Reviewing & Exam** |
| 17 | 17 | **Main Memory** | **Teacher's Lecture** |
| 18 | 18 | **Main Memory** | **Teacher's Lecture** |
| 19 | 19 | **Main Memory** | Student Seminar and Presentations |
| 20 | 20 | **Main Memory** | Student Seminar and Presentations |
| 21 | 21 | **Main Memory** | **Reviewing & Exam** |
| 22 | 22 | **Virtual Memory** | **Teacher's Lecture** |
| 23 | 23 | **Virtual Memory** | Student Seminar and Presentations |
| 24 | 24 | **Virtual Memory** | **Reviewing & Exam** |
| 25 | 25 | **Mass-Storage Systems** | **Teacher's Lecture** |
| 26 | 26 | **Mass-Storage Systems** | **Teacher's Lecture** |
| 27 | 27 | **Mass-Storage Systems** | Student Seminar and Presentations |
| 28 | 28 | **Mass-Storage Systems** | Student Seminar and Presentations |
| 29 | 29 | **Mass-Storage Systems** | **Reviewing & Exam** |
| 30 | 30 | **Overall Reviewing** | |
| | | | |

**Useful References \ Text Books**

**1. Abraham-Silberschatz-Operating-System-Concepts---9th2012.12**

**2. Operating System Concepts\ Peterson**

**Grading Policy**

| | |
|---|---|
| **Assignments** | (list number of assignments and the grade per each) % |
| **Quizzes** | (list number of quizzes and the grade of each) **%** |
| **Midterm Exam** | % |
| **Final Exam** | % |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Fourth Year

# Course Syllabus

**Course Code & Title: ROBOTICS AND ARTIFICIAL INTELLIGENCE (ELECTIVE)**

**Department/ College: Computer Engineering**

**Credit Hours: 4**

**Course Calendar:** (3 hours per week)

**Lecturer Name: Dr. Yasameen Fawzi Azeez**
**Tel:**
**Email: Yasmin.fawzi@alfarabiuc.edu.iq**

**Course Prerequisites:**

**Course Description:**

**Course objectives:** (max. 3-4 objectives)
1. Intelligent Robotics
2. Basic Concepts of Artificial Intelligence:
3.
4.

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| **1** | | Automation and Robots |
| **2** | | Robot Classification |
| **3** | | Robot Specifications |
| **4** | | Sensory perception |
| **5** | | Robot control and Intelligence |
| **6** | | Coordinate Frames |
| **7** | | Rotations |
| **8** | | Homogeneous Coordinates |
| **9** | | The arm Equation |

| | | |
|---|---|---|
| **10** | | (DK analysis of - 2 Axis and 3 Axis Planar robot, Four axis SCARA Robot, Five axis Articulated robot) |
| **11** | | General Properties of Solutions |
| **12** | | Tool Configuration |
| **13** | | (IK analysis of - 2 Axis and 3 Axis Planar robot, Four axis SCARA Robot, Five axis Articulated robot) |
| **14** | | Workspace analysis |
| **15** | | Work envelope of 4-axis SCARA Robot |
| **16** | | Work envelope of 5-axis articulated Robot |
| **17** | | Workspace Fixtures |
| **18** | | The pick-and-place operation |
| **19** | | Continuous-Path Motion |
| **20** | | Interpolated Motion |
| **21** | | Straight-Line Motion |
| **22** | | Intelligence |
| **23** | | Problem representation in Artificial Intelligence |
| **24** | | Problem-solution Techniques used in Artificial Intelligence |
| **25** | | Logic |
| **26** | | Production Systems |
| **27** | | Semantic Networks |
| **28** | | Expert Systems |
| **29** | | Task-Level Programming |
| **30** | | Uncertainty |
| **31** | | Configuration Space |
| **32** | | Gross-Motion Planning |
| **33** | | Grasp Planning |
| **34** | | Fine Motion Planning |
| **35** | | Task Planning Problem |
| | | |
| | | |
| | | |

**Text Books**

**1. Introduction to neural network : by Zurada**

**2. Introduction to Artificial Intelligence**

**Useful References**

1.

2.

3.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (5) % |
| **Quizzes** | (5 Quiz) **%** |
| **Midterm Exam** | **20** % |
| **Final Exam** | **70**% |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Information

- Who am I?

❖ D.r. Maryam Khalifa Abboud
  - B.Sc. in Information and Communication Engineering from Baghdad University in 2012.
  - MSc. in Information and Communication Engineering from Al-Nahrain University in 2016.
  - PhD. in Information and Communication Engineering from Al-Nahrain University in 2020
- Assignments :
  - Assignment #1 in week # 10.
  - Assignment #1 in week # 20.

- Mid-term exams :
  - 1.5-hour exam, no-choice, closed-book
- Quizzes :
  - At any time of each lecture.
- References :
  - Cryptography and Network Security", 4/e, by William Stallings.
  - Computer Security Principles and Practices, 2/e by William Stallings and Lawrie Brown.
- lectures scheduling :

| Week No. | **Computer Security** |
|---|---|
| 1 | Lec. #1:<br>Introduction to Computer security |
| **Computer Security Technology and Principles** | |
| 2 | Lec. #2:<br>Cryptographic Tools, Symmetric encryption + Tutorial |
| 3 | Lec. #3:<br>Asymmetric encryption + Tutorial |
| 4 | Lec. #4:<br>User Authentication + Tutorial |
| 5 | Lec. #5:<br>Access Control +Tutorial |
| 6 | Mid Term Exam #1 |
| 7 | Lec. #6:<br>Database Security + Tutorial |
| 8 | Lec. #7:<br>Malicious Software + Tutorial |
| 9 | Lec. #8:<br>Denial of Service Attacks +Tutorial |
| 10 | Lec. 9:<br>Intrusion Detection System + Tutorial |

| | |
|---|---|
| 11 | Lec. #10:<br>Firewall and Intrusion Prevention System + Tutorial |
| 12 | Mid Term Exam #2 |
| **Software Security and Trusted Systems** | |
| 13 | Lec. #11:<br>Buffer Overflow + Tutorial |
| 14 | Lec. #12:<br>Software Security + Tutorial |
| 15 | Lec. #13:<br>Operating System Security + Tutorial |
| 16 | Lec. #14:<br>Trusted Computing + Tutorial |
| 17 | Mid Term Exam #3 |
| **Network Security** | |
| 18 | Lec. #15:<br>Web Security + Tutorial |
| 19 | Lec. #16:<br>Internet Security + Tutorial |
| 20 | Lec. #17:<br>Internet Authentication Applications + Tutorial |
| 21 | Lec. #18:<br>Wireless Network Security + Tutorial |
| 22 | Mid Term Exam #4 |
| 23-25 | Reviews + Tutorials |

# Course Syllabus

**Course Code & Title:** COMPUTER ARCHITECTURE II

**Department/ College: Computer Engineering/ Al-Farabi university college**

**Credit Hours: 3 Hours**

**Course Calendar:** (3 hours per week, 15 weeks in the semester, theory: 3 hours, lab 0 hours)

**Lecturer Name: Hiba Hussein Mirza**
**Tel: 07706365977**
**Email: hiba.hussein@alfarabiuc.edu.iq**

**Course Prerequisites:** (if there is a requirement for taking a course before this course, please mention the course code)
It is advanced course of computer architecture I

**Course Description: (**Describe the importance of the course in two or three sentences)
This course provides an introduction of computer architecture II. We begin with a discussion of computer structure and the types of microprocessors. The CPU performance equation, Amdahl's Law and other speedup models, Parallelism, Pipelining, the types of Hazard, advanced pipeline, Linear pipelines and branch effect on performance and so on.

**Course objectives:** (max. 3-4 objectives)
1. To provide knowledge about advanced computer architecture
2. To study the different techniques that enhances the performance of a processor
3. To study computer structure
4. To study the problems that effects on the performance of processor and how to handle

**Class / Laboratory Schedule** (number of sessions each week and duration of each session)
One lecture each week and 3 Hours per lecture.

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 | Lec-1- | Chapter one/ New Trends in Computer Architecture and CPU's Performance Equations |
| 2 | Lec-2- | Chapter one/The CPU performance equation |
| 3 | Lec-3- | Chapter one/The CPU performance equation |
| 4 | Lec-4- | Chapter two/Pipelining |
| 5 | Lec-5- | Chapter two/RISC architecture |

| | | |
|---|---|---|
| **6** | **Lec-6-** | Chapter two/Pipeline Hazards |
| **7** | **Lec-7-** | Chapter two/Branch Hazard |
| **8** | **Lec-8-** | Chapter three/Advanced pipelining |
| **9** | **Lec-9-** | Chapter three/ Scheduling concepts |
| **10** | **Lec-10** | Chapter four/Dynamic scheduling |
| **11** | **Lec-11-** | Chapter foure/Dynamic scheduling |
| **12** | **Lec-12-** | Chapter five/ Loop Unrolling-static |
| **13** | **Lec-13-** | Chapter five/ Loop Unrolling-dynamic |
| **14** | **Lec-14-** | Chapter five/ Superscalar |
| **15** | **Lec-15-** | Chapter five/ Superscalar |
| **16** | **Lec-16-** | Chapter six/Multithreading |
| **17** | **Lec-17-** | Chapter six/Multithreading |
| **18** | **Lec-18-** | Chapter seven/Memory Hierarchy |
| **19** | **Lec-19-** | Chapter seven/Cache memory and its performance |
| **20** | **Lec-20-** | Chapter seven/Cache memory and its performance |

**Text Books**

**1.** Computer architecture A Quantitative Approach Fifth Edition by John L. Hennessy and David A. Patterson.

**2.** Computer architecture A Quantitative Approach third Edition by John L. Hennessy and David A. Patterson.

**Useful References**

1. Computer architecture A Quantitative Approach Fifth Edition by John L. Hennessy and David A. Patterson.

2. Computer architecture A Quantitative Approach third Edition by John L. Hennessy and David A. Patterson.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (list number of assignments and the grade per each) %5 |
| **Quizzes** | (list number of quizzes and the grade of each) **%5** |
| **Midterm Exam** | %20 |
| **Final Exam** | %70 |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: English**

**Department/ College: Computer Engineering**

**Credit Hours: 2**

**Course Calendar:** (2 hours per week)

**Lecturer Name: Dr. Yasameen Fawzi Azeez**
**Tel:**
**Email: Yasmin.fawzi@alfarabiuc.edu.iq**

**Course Prerequisites:**

**Course Description:**

**Course objectives:** (max. 3-4 objectives)
1. Reading the academic researches
2. Writing an academic assignments
3. rephrase the paragraphs for their graduation project
4.

**Class / Laboratory Schedule**

**Course Content & Outlines:**

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1-3 | | Unit 1-3 |
| 4-8 | | Unit 4-6 |
| 9-10 | | 7-8 |
| 11-12 | | Unit 9 |
| 13-15 | | Unit 10 |
| 16-18 | | Unit 11 |
| 19-21 | | Unit 12 |
| 22-24 | | Rephrase the paragraphs for their graduation project |
| 25-26 | | Reading practice |
| 27-30 | | Listening practice |

**Text Books**

**1. Headway English (Upper level)**

**Useful References**

1.

2.

3.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (5) % |
| **Quizzes** | (5 Quiz) **%** |
| **Midterm Exam** | **20** % |
| **Final Exam** | **70**% |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title: Embedded Systems**

**Department / College: Computer Engineering / Alfarabi University Collage**

**Credit Hours: 6**

**Course Calendar:**

Total number of hours per week: 5

No. of weeks in the semester: 30

Theory hours: 3

Lab hours: 2

**Lecturer Name: Dr. Isam Abdulmunem Abdullah**
**Email: dr.essam.abdelmoneim@alfarabiuc.edu.iq**

**Course Description and Objectives:**
This course emphasizes on comprehensive treatment of embedded hardware and real time operating systems along with case studies, in tune with the requirements of Industry. The objective of this course is to enable the students to understand embedded-system programming and apply that knowledge to design and develop embedded solutions.

**Course Outcomes:**
The student will be able to:

- Understand the concept of embedded system, microcontroller, different components of microcontroller and their interactions.
- Get familiarized with programming environment to develop embedded solutions.
- Understand the key concepts of embedded systems such as I/O, timers, interrupts and interaction with peripheral devices.

**Activities:**

- Identify hardware and software components to build an embedded system.
- Demonstrate the interfacing of peripherals with 8051/ARM microcontroller.
- Porting of OS on to ARM processor board.
- Demonstrate Deadlock situation in RTOS.
- Demonstrate Inter-task communication methods in RTOS.

**Skills:**

- Design of microcontroller based embedded system.
- Interfacing of various peripherals with ARM processors.
- Expertise in writing multiple tasks under RTOS environment.
- To handle shared data issues in RTOS environment

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1 - 3 | | Introduction to Embedded Systems |
| 4 - 9 | | Embedded Software Development |
| 10 - 15 | | Design with ARM Processor |
| 16 - 20 | | Input / Output Interfacing |
| 21 - 25 | | Real-time Operating System |
| 26 - 30 | | Applications of Embedded Systems |

**Text Books**

1. PIC Microcontroller and Embedded Systems Using ASM & C for PIC18

**Useful References**

1. Computers as Components: Principles of Embedded Computing Systems Design" by Wayne Wolf
2. Embedded System Design: A Unified Hardware/Software Introduction" by Frank Vahid and Tony Givargis

**Grading Policy**

| | |
|---|---|
| **Assignments** | **5%** |
| **Quizzes** | **5%** |
| **Midterm Exam** | **20%** |
| **Midterm Exam - Lab** | **20%** |
| **Final Exam** | **50%** |

**Academic Policy**

Please refer to Al-Farabi policy information on attendance, missed Tests, missed lab experiments and ethical behavior policy.

# Course Syllabus

**Course Code & Title:** COE 403: **INTERNET TECHNOLOGY**

**Department/ College: Computer engineering department/ Al-Farabi University College**

**Credit Hours: 5 hrs/ week**

**Course Calendar:** (5 hours per week, 20 weeks in the semester,2 theory hrs,2 lab hrs, 1 Tut. hrs)

**Lecturer Name: Namariq Sami**
**Tel:**
**Email: namariq.aldahwi@yahoo.com**

**Course Prerequisites:** simple knowledge in networking and communication.

**Course Description:** Introductory course exploring the fundamentals of Internet communications with an emphasis on the World Wide Web. Students develop an understanding of the Internet's underlying technologies and learn how to utilize them as contributing members of the Web community. Students become proficient with creating and publishing Web pages using HTML and CSS.

**Course objectives:** (max. 3-4 objectives)
Students successfully completing this course should be able to:
1. Describe the technologies that form the basis of the Internet and, in particular, the World Wide Web. And analyze the interactions among those Internet technologies;
2. Apply those technologies to create, publish, and validate self-generated content on the World Wide Web using languages such as HTML and CSS.
3. Describe and summarize the fundamentals of data network systems, including switches, routing, cabling, topologies, protocols, and architectures, and distinguish between LANs, WANs, intranets, and internets.

**Class / Laboratory Schedule** (3 session / week, 2 theory hrs,2 lab hrs, 1 Tut. hrs )

**Course Content & Outlines: (**Write the chapters and lectures that are intended to be taught depending on the number of the weeks- as needed).

| Week No. | Lecture No. | Chapter / Lecture Topic |
|---|---|---|
| 1,2,3,4 | 1,2,3,4 | Introduction |
| 5,6,7,8,9, 10,11,12, 13,14,15,1 6,17,18,19 | 5,6,7,8 | WAN and MAN Technologies |

| | | |
|---|---|---|
| **20,21,22** | **7** | **Address Resolution protocol** |
| **23,24,25** | **8** | **Domain Name System** |
| **26,27,28** | **9** | **File Transfer Protocol** |
| **29,30** | **10** | **Email** |

**Text Books**

1. S. Sumathi, S. Esakkirajan, "Fundamentals of Relational Database Management Systems", Springer, 2007.

2. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", 4th Edition, Addison Wesley, 2003.

**Useful References**

1. C. J. Date, "An Introduction to Database Systems", 8th Edition, Addison Wesley, 2004.

2. Raghu Ramakrishnan , Johannes Gehrke, "Database Management Systems", 3rd Edition, McGraw Hill, 2003.

**Grading Policy**

| | |
|---|---|
| **Assignments** | (number of assignments: 2, the total 5%) |
| **Quizzes** | (number of quizzes: 6, total average 15**%)** |
| **Lab assignments** | (number of assignments: 5, the total 20%) |
| **Midterm Exam** | **10**% |
| **Final Exam** | **50**% |

**Academic Policy**

**Attendance:** I do not count attendance at lectures toward your grade. However, students who actively participate in lectures tend to earn better grades on both coursework and exams. They hear the important announcements, experience the material as I present it, and pick up the various hints and pointers I provide along the way — all of which are hard to get from copied notes. Exposure to these sometimes subtle, but often important, insights allows participating students to achieve higher scores on their assignments, project and exams.

Also, regular participation in lectures is the best way to help yourself succeed in the course. I am happy to assist students throughout the semester, but I cannot learn the material for you. You must first take the initiative and do what you can to help yourself. If you have not been attending lectures regularly and come to me seeking help, do not be surprised if my first suggestion is for you to get the notes you've missed from a classmate and start attending lectures.

Your final grade will be assigned based upon how well you perform relative to your classmates. There is a common misperception that this means that students with prior knowledge have an advantage. However, history has demonstrated that participation in lectures offers a far greater advantage than prior knowledge.

**Missed Tests and lab experiments**: Exams and quizzes will be announced so that students can plan and study accordingly. Makeups may be allowed at Al-Farabi discretion, but only if students contact the me before the exam or quiz is administered with an unavoidable conflict where there is ability to schedule a makeup time before the I return the graded exam or quiz to the class. I will not drop any exam or quiz scores at the end of the semester.

Ethical behavior policy:

In this course (as with most courses, and indeed life in general) you will be expected to do your own work. All work which you submit and/or display as your own original work must in fact be your own original work. If any portion of the work which you do for this course is an exact replica or derivation of the original work of another, it is your responsibility to obtain the creator's permission to utilize his or her work and indicate the extent of the creator's contribution to your work. You will not receive credit for submitting the work of others, so you should take pains to minimize the extent to which you draw upon it.