وزاره التعليم العالي والبحث العلمي
جهاز الاشراف والتقويم العلمي
دائرة ضمان الجوده والاعتماد
الاكاديمي

وصف البرنامج الاكاديمي والمقرر

قسم هندسة الحاسوب

2025-2024

University: AL-Farabi

College: College of Engineering.
Department: Computer department
Academic or Professional Program Name: Bachelor of Computer Engineering
Final Degree Awarded: Bachelor in Computer Engineering
Study System: Annual
Date of Description Preparation:
Date of File Completion:

اسم الجامعة: جامعة الفارابي

الكلية/ المعهد: كلية الهندسة
القسم العلمي: قسم هندسة الحاسوب
اسم البرنامج الأكاديمي او المهني: بكالوريوس هندسة الحاسوب
اسم الشهادة النهائية: بكالوريوس في .هندسه الحاسوب
النظام الدراسي: سنوي
تاريخ اعداد الوصف:
تاريخ ملء الملف

التوقيع:
اسم رئيس القسم: ا.د. مازن كركلي
التاريخ 2025 / 7/8

التوقيع
مساعد رئيس الجامعة للشؤون العلميه ا.د. مازن كركلي
التاريخ 2025 / 7/8

مصادقة رئيس الجامعة المحترم التاريخ:
التوقيع

ق الملف من قبل
م ضمان الجودة والأداء الجامعي
م مدير شعبة ضمان الجودة والأداء الجامعي: التاريخ
قيع

July 20th, 2025

1. الرؤية

أن يتبوء القسم الراتب العليا في مجال الأختصاص على مستوى البلد من خلال المساهمة بشكل بناء في التنمية التعليمية والاقتصادية والمستدامة للمجتمع. توفير برامج اكاديمية عالية الجودة في مجال هندسة الحاسوب والتي تركز على تطوير المهارات المهنية وتعزيز القابلية للتوظيف في القطاعين الخاص والعام بالإضافة الى الدرجات الأكاديمية.

2. الرسالة

1) تخريج مهندسين يمتلكون الممارسة العملية و المعرفة التي تؤهلهم للعمل في سوق العمل المحلي والعالمي.

2) أن يصبح القسم واحداً من الروافد المهمة في مؤسسات التعليم العالي الرائدة المسؤولة والمستدامة التي تجمع بشكل فاعل بين البيئة التعليمية الرقمية والتعليم وجهاً لوجه.

3) أن يتميز برنامج هندسة الحاسوب في المقدرة على احتضان المعرفة والتعليم المستمر والاعتراف به كأحد البرامج المتميزة على مستوى البلد وتوفير البيئة التي تمنح الطلبة الموارد الضرورية لمعالجة وحل المشاكل الهندسية.

4) المساهمة في البحث الأكاديمي والممارسة المهنية التي تخدم مصالح المجتمع في البلد والتزامات البينية العالمية الأوسع.

5) تشجيع التعلم النشط والتفكير النقدي، والقدرة للحكم على الأنظمة الهندسية وتقديم التدريب وبرامج التعليم المستمر التي تُنتج خريجين لشغل الوظائف المرموقة في مجال التخصص.

3. الاهداف

تقديم تعليم عالي متميز يسهم في :

1) إظهار النجاح في الممارسة المهنية لهندسة الحاسوب من خلال التفاعل مع أعضاء الفرق المهنية في القطاعين الحكومي والخاص.

2) المحافظة على تحديث معارف الطلبة المهنية من خلال التعلم المستمر للمفاهيم الجديدة وتحديد الاتجاهات الجديدة في مجالات هندسة الحاسب وهندسة الشبكات.

3) التحلي بالسلوك الأخلاقي في بيئتهم المهنية وتطوير المهارات لتعزيز حالة ممارستهم في بيئة مهنية

ديناميكية.

4) الانفتاح والتعاون مع الشركات العامة والخاصة العاملة في حقل الاتصالات والحاسبات وتكنلوجيا المعلومات وتحديث المناهج ليتلأم مع متطلبات سوق العمل.

5) موائمة الاهداف الفرعية للمناهج الدراسية مع متطلبات تحقيق اهداف التنمية المستدامة.

4. الاعتماد البرامجي

هل البرنامج حاصل على الاعتماد البرامجي ؟ ومن اي جهة ؟

القسم معترف به في وزارة التعليم العالي والبحث العلمي ويسعى للحصول على الاعتماد البرامجي.

5. المؤثرات الخارجية الأخرى

هل هناك جهة راعية للبرنامج ؟

كلية الهندسة /هندسة الحاسبات /جامعة بغداد

6. هيكلية البرنامج

هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	13	52		
متطلبات الكلية	9	50		
متطلبات القسم	11	62		
التدريب الصيفي	المرحلة الثالثة			
أخرى				

المرحلة الدراسية	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة			الوحدات
			نظري	عملي	مناقشة	
المرحلة الأولى	COE 102	Mathematics	3	-	1	6
	COE 103	Electronics I	2	2	1	6
	COE 104	Electrical Circuits	2	2	1	6
	COE 107	Fundamentals of Digital Systems	2	2	1	6
	COE 108	Computer Programming Methodology	2	2	1	6
	COE 109	Fundamentals of Computer System	2	2	1	6
	GE 103	English 1	1	-	1	2
	GS 101	Human Rights	1	-	1	2
المرحلة الثانية	COE 201	Engineering Mathematics	3	-	1	6
	COE 203	Electronic II	2	2	1	6
	COE 204	Microprocessor & Microcomputer I	2	2	1	6
	COE 207	Digital System Design	2	2	1	6
	COE 208	Data Structures & Algorithms	2	2	-	6
	COE 206	Communications	2	2	1	6
	GE 201	Arabic	1	-	1	2
	GS	English 2	1	-	1	2
المرحلة الثالثة	COE 302	Computer Architecture I	3	-	-	6
	COE 408	Digital Signal Processing	2	-	-	6
	COE 306	Microprocessor & Microcomputer II	2	2	1	6
	COE 307	Operating Systems	3	-	-	6
	COE 304	Computer Networks	2	2	1	6
	COE 305	Digital Control Systems	2	2	1	6
	GE 308	Database Systems	1	2	1	2
	GS 301	English 3	1	-	1	2
المرحلة الرابعة	COE 406	Internet Technology	2	2	1	6
	COE 405	Computer Architecture II	3	-	1	6

المرحلة الرابعة	COE	Embedded Systems	2	2
المرحلة الرابعة	COE	Computer Security	3	
المرحلة الرابعة	COE	Computer Vision & Pattern Recognition (Elective 2)	2	
المرحلة الرابعة	COE	Robotics &Artificial Intelligence (Elective 2)	2	
المرحلة الرابعة	COE	English	1	
المرحلة الرابعة	COE	Engineering Project	1	2

8. مخرجات التعلم المتوقعة للبرنامج

المعرفة

1) القدرة على التحليل الهندسي والتفكير العلمي عن طريق تطبيق القوانين في العلوم والرياضيات والهندسة والالتزام بالارشادات والتعليمات لاي فعالية في الاطار التنظيمي والاداري في تنفيذ مشروع او مواجهة مشكلة هندسية وحلها وتقييمها وتقديم اقتراح او خطة ما او اعادة صياغتها او ترجمتها او تفسيرها.
2) تهيئة الطالب للاستمرار بالتعلم الذاتي وتحصيل التقنيات والمهارات الجديدة في مجال الهندسة. ان يكون عارفا بمعايير الهندسة المدنية الدولية وتخمين احتياجات السوق وتطبيق مفاهيم ادارة الجودة في العمل الهندسي ومكتسبا مهارات في تكنولوجيا المعلومات.

المهارات

1) القدرة على انتقاء واجراء الفحوصات المطلوبة وجمع ومقارنة وتحليل نتائج الفحوصات .
2) التعلم التعاوني عن طريق العمل بشكل جماعي.
3) اداء تصميم متكامل لانظمة الحاسوب والمكونات او العمليات عن طريق الخبرات العملية.

القيم

1) الحصول على تقدير لبعض المشاكل الأخلاقية التي تنشا في ممارسة المهنة.
2) الحصول على فهم تاثير مهنة الخريج في المجتمع.

9. استراتيجيات التعليم والتعلم

1) إعداد تقارير علمية مختبرية ونظرية
2) حل الأسئلة والواجبات التطبيقية الخاصة بتقنيات هندسة البناء والأنشاءات .
3) التدريب الصيفي

10. طرائق التقييم
1) امتحانات يوميه, امتحانات موثقه امتحانات فصليه , امتحانات نهائيه . 2) المحاضرات والمشاريع الهندسيه والواجبات البيتيه 3)كتابه وتقديم التقارير المختبريه

الهيئه التدريسيه				
اعضاء الهيئه التدريسيه				
الرتبه العلميه	**التخصص**	**المتطلبات /المهارات**	**ملاك**	**محاضر**
ا.د مازن سمير علي الحكيم	علوم حاسبات	حاسبات	نعم	
م.م المنتظر محمود عبد الواحد	هندسة حاسبات		نعم	
م.م يسرى عبد الرزاق صالح	علوم حاسبات	حاسبات	نعم	
م.م هدى علي مهدي	هندسه تقنيات الحاسوب	حاسبات	نعم	
م.م ذو الفقار حازم عبد العزيز	هندسه حاسبات		نعم	
م.م ساره خير الله مهدي	هندسه حاسبات		نعم	
م.م ساره يوسف يعقوب	علوم رياضيات		نعم	
م.د لؤلؤة مصطفى	هندسه الكترونيك واتصالات			نعم
م.د ياسمين فوزي عزيز	هندسة الكترونيك واتصالات			نعم
م.م حيدر علي حسين	هندسة حاسبات			نعم

التطوير المهني
توجيه أعضاء هيئة التدريس الجدد
تصف بإيجاز العملية المستخدمة لتوجيه أعضاء هيئة التدريس الجدد والزائرين والمتفرغين وغير المتفرغين على مستوى المؤسسة والقسم.
التطوير المهني لأعضاء هيئة التدريس
تصف بإيجاز خطة وترتيبات التطوير الأكاديمي والمهني لأعضاء هيئة التدريس كاستراتيجيات التدريس والتعلم، وتقييم نتائج التعلم، التطوير المهني وما الى ذلك.

12. معيار القبول
(وضع الأنظمة المتعلقة بالالتحاق بالكلية أو المعهد سواء قبول مركزي او أخرى تذكر)
القبول في برنامج البكالوريوس لقسم هندسة الحاسبات يجب تلبية المتطلبات التالية:
1) على المتقدم او المتقدمة ينبغي ان يكون له شهادة الدراسة الثانوية العراقية او ما يعادلها.
2) يتم التحكم بالقبول من قبل وزارة التعليم العالي والبحث العلمي.
3) يجب على المتقدم تقديم الوثائق المطلوبة خلال المدة المطلوبة.ط

13. أهم مصادر المعلومات عن البرنامج
1) صفحة القسم على الموقع الألكتروني للكلية.
2) دليل قسم هندسة الحاسبات.
3) المناهج الدراسية.
4) اتفاقية التؤامة مع الكليات المناظرة لها.

14. خطة تطوير البرنامج
1. العمل على دمج تقنيات التعليم والتدريب الحديثة بالاستفادة من أحدث تقنيات وتطبيقات التحول الرقمي لخلق بيئة تعليمية تفاعلية وجذابة كاستخدام أدوات التعلم الإلكتروني مثل المنصات التعليمية والمحتوى الرقمي, مع دمج تقنيات الذكاء الاصطناعي في العملية التعليمية لتحسين كفاءة التعلم والتقييم. 2. التركيز على الجانب العملي من حيث زيادة ساعات التطبيق العملي لضمان اكتساب الطلاب المهارات اللازمة لسوق العمل, وتنظيم ورش عمل وفعاليات تفاعلية لربط المعرفة النظرية بالتطبيقات العملية بالتعاون مع المؤسسات والشركات لتوفير فرص التدريب العملي للطلاب. 3. تحديث المناهج الدراسية بالاعتماد على أحدث التحديثات للمصادر العلمية لضمان مواكبة التطورات المتسارعة في مختلف المجالا, مع استحداث مواد جديدة تواكب احتياجات سوق العمل وتوجهات المستقبل. 4. تقييم الأداء والتحسين المستمر من خلال وضع مؤشرات أداء واضحة لقياس مدى فعالية خطة تطوير البرامج , كاجراء تقييمات دورية للبرنامج وتحديد نقاط القوة والضعف.

مخطط مهارات البرنامج

السنة/ المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفه		المهارات			القيم	
				A1	A2	B1	B2	B3	C1	C2
الاولى	GE 102	Mathematics	أساسي	√	√					
	COE 103	Electronic I	أساسي	√	√	√	√	√	√	√
	COE 106	Computer programing Methodology	أساسي	√	√	√	√	√	√	√
	COE 104	Electrical Circuits	أساسي	√	√	√	√	√		
	COE107	Fundamentals of Computer System	أساسي	√	√	√	√		√	√
	COE 105	Fundamentals of Digital systems	أساسي	√	√	√	√			√
	GE 103	English 1	أساسي			√			√	
	GS 101	Human Rights	أساسي			√			√	
الثانيه	COE 201	Engineering Mathematics	أساسي	√	√					
	COE 203	Electronic II	أساسي	√	√	√	√	√	√	√
	COE 204	Microprocessor & Microcomputer I	أساسي	√	√	√	√	√	√	√
	COE 207	Digital System Design	أساسي	√	√	√	√	√	√	√
	COE 208	Data Structures & Algorithms	أساسي	√	√	√	√	√	√	√
	COE 206	Communications	أساسي	√	√	√	√	√	√	√
	GE 201	Arabic	أساسي					√	√	
	GS	English 2	أساسي					√	√	

مخطط مهارات البرنامج

السنة/ المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفه		المهارات			القيم	
				A1	A2	B1	B2	B3	C1	C2
الثالثه	COE 302	Computer Architecture I	أساسي	√	√	√	√	√	√	√
	COE 408	Digital Signal Processing	أساسي	√	√	√	√	√	√	√
	COE 306	Microprocessor & Microcomputer II	أساسي	√	√	√	√	√	√	√
	COE 307	Operating Systems	أساسي	√	√	√	√	√	√	√
	COE 304	Computer Networks	أساسي	√	√	√	√	√	√	√
	COE 305	Digital Control Systems	أساسي	√	√	√	√	√	√	
	GE 308	Database Systems	أختياري		√	√	√	√		
	GS 301	English 3	أساسي					√	√	
الرابعه	COE 406	Internet Technology	أساسي		√	√	√		√	√
	COE 405	Computer Architecture II	أساسي	√	√	√	√		√	√
	COE 404	Embedded Systems	أساسي	√	√	√	√	√	√	√
	COE 402	Computer Security	أساسي	√	√	√	√	√	√	√
	COE 403	Computer Vision & Pattern Recognition	أختياري		√	√	√			
	COE 407	Robotics & Artificial Intelligence	أختياري			√	√	√	√	√
	GS 401	English 4	أساسي					√	√	

المرحلة الاولى

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),7 th edition, Addison Wesley

Useful References

Thomas &Finney "Calculus &Analytic Geometry"(1988),7 th 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.

المرحلة الثانية

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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Mobile: 078023333461- 07712365333

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.

المرحلة الثالثة

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 - Inverse Laplace Transformation
5, 6, 7	**Lect. 5, 6, 7**	Modeling of Dynamic Systems - Electrical Systems - 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 Routh's stability criteria Steady state error coefficients
18, 19	**Lect. 18, 19**	Root locus method of analysis and design Frequency response method of analysis and design
20, 21	**Lect. 20, 21**	Effect of adding derivative and integral action on system performance 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.

بغداد/ الدورة- شارع المصافي قرب جسر ذو الطابقين
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E-mail: info@alfarabiuc-iq.com P.O. Box: 12083 Baghdad/AL-Dora, IRAQ
Mobile: 078023333461- 07712365333

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.

المرحلة الرابعه

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: Introduction to Computer security
Computer Security Technology and Principles	
2	Lec. #2: Cryptographic Tools, Symmetric encryption + Tutorial
3	Lec. #3: Asymmetric encryption + Tutorial
4	Lec. #4: User Authentication + Tutorial
5	Lec. #5: Access Control +Tutorial
6	Mid Term Exam #1
7	Lec. #6: Database Security + Tutorial
8	Lec. #7: Malicious Software + Tutorial
9	Lec. #8: Denial of Service Attacks +Tutorial

11	Lec. #10: Firewall and Intrusion Prevention System + Tutorial
12	Mid Term Exam #2
Software Security and Trusted Systems	
13	Lec. #11: Buffer Overflow + Tutorial
14	Lec. #12: Software Security + Tutorial
15	Lec. #13: Operating System Security + Tutorial
16	Lec. #14: Trusted Computing + Tutorial
17	Mid Term Exam #3
Network Security	
18	Lec. #15: Web Security + Tutorial
19	Lec. #16: Internet Security + Tutorial
20	Lec. #17: Internet Authentication Applications + Tutorial
21	Lec. #18: 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 ~~wh~~ich 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.