Academic Program Description Form

University Name: Baghdad
Faculty/Institute: Engineering
Scientific Department: Electrical
Academic or Professional Program Name: .....
Final Certificate Name: .....
Academic System: Yearly
Description Preparation Date:
File Completion Date: 13/10/2022

Signature: F. M. Tuaima
Head of Department Name: Prof. Dr. Firas M. Tuaimah
Date:

Signature:
Scientific Associate Name:
Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature: Meervat Al-Haire

Approval of the Dean
Ghassan H. Abdul-Majeed

TEMPLATE FOR PROGRAMME SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Programme Specification provides a concise summary of the main features of the programme 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. It is supported by a specification for each course that contributes to the programme.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Programme Title	Electrical Engineering (General)
4. Title of Final Award	B. Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time attendance
6. Accreditation	Intention to conform with ABET accreditation
7. Other external influences	none
8. Date of production/revision of this specification	October , 2022
9. Aims of the Programme	
1- Preparing skilled electrical engineering staff to support various governmental establishments and ministries, besides supporting the work market needs to this important profession.	
2- Prepare a generation of electrical engineers who have a well knowledge of their profession and can use it in a systematic procedure in each aspect related to the field of their specialization.	
3- Support the academic staff at each governmental and civil universities and institutions with highly skilled staff who can catch up with the updates and the developments of this career. A staff who can do further post studied within worldwide well ranked universities and can transfer their knowledge easily to their home country universities.	

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Cognitive goals

A1. Knowledge of basic Electrical Engineering profession requirements.
A2. Knowledge of analytical solution of different electrical engineering topics.
A3. Knowledge of various design procedures for electrical engineering systems.
A4. Knowledge of important precautions when dealing with real electricity.
A5. Knowledge of how the electrical engineering is important in developing countries.

B. The skills goals special to the programme .

B1. Analyze various electrical circuits.
B2. Electrical equipment used in experimentation and their importance to each electrical engineering aspect.
B3. Systematic analysis, design and performance study.

Teaching and Learning Methods

1- Lectures, within department classrooms, and online meetings.
2- Seminars and discussions.
3- HomeWorks, assignments and laboratory experimentation with reports.
4- Graduation projects.

Assessment methods

1- Short tests (quizzes).
2- Long tests (termly tests and finals).

C. Affectional and value goals

C1. Make the students like their profession.
C2. Make the students respect precautions and criteria of their profession.
C3. Make the students understand the importance of their profession to human's daily life, and how important it is in developing their country.

Teaching and Learning Methods

1- Seminars, workshops and discussions.
2- Specific assignments regarding electrical engineering various criteria.
3- Team work.

Assessment methods

None.

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1. Supporting software related to the field of electrical engineering.
D2. Report preparation, problem solving techniques and researching.
D3. Electrical engineering issues

Teaching and Learning Methods

1- Lecturing (online).
2- YouTube videos.
3- Workshops and seminars.
4- Assignments.

Assessment Methods

None.

11. Programme Structure

Level / Year	Course or Module Code	course or Module Title	Credit rating
Year One			
Y1	**GE101**	**Mathematics I**	**6**
Y1	**EE102**	**Computer Programming I**	**4**
Y1	**GE103**	**English**	**2**
Y1	**GE104**	**Fundamental of MechanicalEngineering**	**4**
Y1	**GE105**	**Engineering Drawing**	**2**
Y1	**EE106**	**Electrical Engineering Laboratory**	**3**
Y1	**EE107**	**Fundamentals of Electrical Engineering**	**6**
Y1	**EE108**	**Electronic Physics**	**6**
Y1	**EE109**	**Digital Techniques**	**5**
Y1	**GE110**	**Arabic Language**	**-**
Year Two			
Y2	**EE201**	**Computer Programming II**	**2**
Y2	**GE202**	**Human Rights & Democracy**	**2**
Y2	**EE203**	**Electrical Machines I**	**4**
Y2	**EE204**	**Numerical Analysis and Statistics**	**4**
Y2	**EE205**	**Electromagnetic Fields**	**6**
Y2	**EE206**	**Electronics I**	**4**
Y2	**EE207**	**Electrical Circuits**	**6**
Y2	**EE208**	**Electrical Engineering Laboratory**	**6**
Y2	**GE209**	**Mathematics II**	**5**
Y2	**GE210**	**English II**	**2**
Year Three			
Y3	**EE301**	**Antenna & wave Propagation**	**4**
Y3	**EE302**	**Electronics II**	**4**
Y3	**EE303**	**Engineering Analysis**	**4**
Y3	**EE304**	**Electrical Power I**	**4**
Y3	**EE305**	**Electrical Machines II**	**4**
Y3	**EE306**	**Communications I**	**4**
Y3	**EE307**	**Electrical Engineering Laboratory**	**5**
Y3	**EE308**	**Advanced Microprocessors**	**4**
Y3	**EE309**	**Control System Design I**	**4**
Y3	**EE310**	**English Language**	**2**
Year Four			
Y4	**EE401**	**Control System Design II**	5
Y4	**EE402**	**Engineering Project**	**4**
Y4	**EE403**	**Digital Systems Design**	5
Y4	**EE404**	**Communications II**	**4**
Y4	**EE405**	**Electrical Power II**	5
Y4	**EE406**	**Power Electronics & Special Machines**	5
Y4	**EE407**	**Computer Networks**	**4**
Y4	**EE408**	**Electrical Engineering Laboratory**	5
Y4	**EE409**	**Digital Signal Processing**	2
Y4	**EE410**	**English Language IV**	**2**

12. Awards and Credits

Bachelor Degree
Requires (156) credits

13. Personal Development Planning

14. Admission criteria .

1- High School graduation certificate.

15. Key sources of information about the programme

Curriculum Skills Map

please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Programme Learning Outcomes

Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	Knowledge and understanding					Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skil relevant to employabil and personal development		
				A1	A2	A3	A4	A5	B1	B2	B3		C1	C2	C3	C4	D1	D2	D3
First	GE101	Mathematics I	C		√				√	√			√	√			√		
	EE102	Computer Programming I	C										√	√			√		
	GE103	English	C										√	√	√		√	√	
	GE104	Fundamental of	C	√	√	√	√	√	√	√	√							√	
	GE105	Engineering Drawing	C	√	√	√			√	√	√							√	
	EE106	Electrical Engineering	C	√	√	√	√	√	√	√	√		√	√				√	
	EE107	Fundamentals of Electrical	C	√	√	√	√	√	√	√	√							√	
	EE108	Electronic Physics	C				√	√		√	√								
	EE109	Digital Techniques	C	√	√	√	√	√	√	√	√	√ √							
	GE110	Arabic Language	C										√	√			√	√	
Second	EE201	Computer Programming II	C	√									√	√			√	√	
	GE202	Human Rights &	C														√	√	
	EE203	Electrical Machines I	C	√	√	√	√	√	√	√	√								
	EE204	Numerical Analysis and	C	√	√	√	√	√	√	√	√								
	EE205	Electromagnetic Fields	C	√	√	√			√	√	√								
	EE206	Electronics I	C	√	√	√	√	√	√	√	√								
	EE207	Electrical Circuits	C	√	√	√	√	√	√	√	√								
	EE208	Electrical Engineering	C	√	√	√	√	√	√	√							√	√	√
	GE209	Mathematics II	C	√	√								√	√					
	GE210	English II	C										√	√	√		√	√	

Third	EE301	Antenna & wave	C	√	√	√			√	√	√		√	√					
	EE302	Electronics II	C	√	√	√			√	√	√		√	√					
	EE303	Engineering Analysis	C	√	√								√	√				√	
	EE304	Electrical Power I	C	√	√	√	√	√	√	√	√		√	√					
	EE305	Electrical Machines II	C	√	√	√	√	√	√	√	√		√	√				√	
	EE306	Communications I	C	√	√	√			√	√	√		√	√					
	EE307	Electrical Engineering	C	√	√	√			√	√	√							√	
	EE308	Advanced Microprocessors	C	√	√				√				√	√			√	√	
	EE309	Control System Design I	C	√	√				√										
	EE310	English Language	C														√	√	
Fourth	EE401	Control System Design II	C	√	√	√			√	√	√		√	√				√	
	EE402	Engineering Project	C	√	√	√			√	√	√		√	√					
	EE403	Digital Systems Design	C	√	√	√			√	√	√		√	√				√	
	EE404	Communications II	C	√	√	√			√	√	√		√	√					
	EE405	Electrical Power II	C	√	√	√			√	√	√		√	√					
	EE406	Power Electronics &	C	√	√	√			√	√	√		√	√					
	EE407	Computer Networks	C	√	√	√			√	√	√		√	√			√	√	
	EE408	Electrical Engineering	C	√	√	√	√	√	√	√	√								
	EE409	Digital Signal Processing	C	√	√				√	√			√	√					
	EE410	English Language IV	C										√	√	√		√	√	

COURSE SPECIFICATION – Year One

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Electrical engineering Department
3. Course title/code	**Computer I / EE102**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	60
7. Date of production/revision of this specification	2022

8. Aims of the Course

This course aims to teach students the main principles of the computer programming language and how a computer deals with it, as well as this course, gives a wide view of the purpose of using programming languages and allows students to solve complex algorithms by using a programming language. Also, this course will cover the advanced part of the programming language.

9· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding A1. A2.
B. Subject-specific skills B1. B2. B3.
Teaching and Learning Methods
1.Face to Face Lectures. 2. Seminars 3. Group Exercises.
Assessment methods
A module assessment will have two components: 1.weekly Quizes 30% weight. 2. Final written Exam. 70% weight.
C. Thinking Skills C1. C2. C3. C4.
Teaching and Learning Methods
1.Face to Face Lectures. 2. Seminars 3. Group Exercises.
Assessment methods
A module assessment will have two components: 1.weekly Quizes 30% weight. 2. Final written Exam. 70% weight.
D. General and Transferable Skills (other skills relevant to employability and personal development) D1. D2. D3. D4.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction to programming languages	Face to face lecture	Weekly Quizes and written final Exam
2	2		**C++ Syntax,** Output (Print Text),Comments Variables, User Input	=	=
3	2		**C++ Data Types,** Operators, C++ Strings,Booleans	=	=
4	2		**Arithmetic Operators**	=	=
5	2		Assignment Operators		
6	2		Comparison Operators	=	=
7	2		Logical Operators	=	=
8	2		Conditions and If Statements		
9	2		Conditions and If Statements	=	=
10	2		**While Loop,** For Loop, Break and Continue	=	=
11	2		**While Loop,** For Loop, Break and Continue	=	=
12	2		Flow chart and operation	=	=
13	2		Flow chart and operation	=	=
14	2		1st Midterm exam	=	=
15	2		Intrduction to windows	=	=

16	2		Windows operation system	=	=
17	2		Windows operation system	=	=
18	2		Windows operation system	=	=
19	2		Arrays with operations	=	=
20	2		Arrays and Conditions and If Statements	=	=
21	2		**Arrays and While Loop,** For Loop, Break and Continue	=	=
22	2		Arrays and Loops	=	=
23	2		Conditions and If Statements with Arrays	=	=
24	2		2nd Midterm exam	=	=
25	2		C++ Pointers Get Memory Address and Value Modify the Pointer Value		
26	2		Object-Oriented Programming.	=	=
27	2		Classes and Objects	=	=
28	2		Class Methods	=	=
29	2		C++ Constructors	=	=
30	2		C++ Access Specifiers	=	=

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	• Stroustrop, Bjarne. *The C++ Programming Language.* 4th ed. Addison-Wesley Professional, 2013. ISBN: 9780321563842. • Bjarne Stroustrop is the creator and eternal guru of C++; the 4th edition is very recently updated for C++11, so this is an excellent resource. • Meyers, Scott. *Effective C++: 55 Specefic Ways To Improve Your Programs And Designs.* Addison-Wesley Professional, 2005. ISBN: 9780321334879. [Preview with Google Books] • ———. *More Effective C++: 35 New Ways To Improve Your Programs And Designs.* Addison-Wesley Professional, 1996. ISBN: 9780201633719. [Preview with Google Books] • ———. *Effective STL: 50 Specific Ways to Improve Your Use of Standard Template Library*. Addison-Wesley Professional, 2001. ISBN: 9780201749625.
Special requirements (include for example workshops, periodicals, IT software, websites)	Using IDE (code Block) and implement a programming code as many as you can as well as using internet to get wide range of ideas
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Electrical Engineering Department
3. Course title/code	**English Language (I) / GE103**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	30
7. Date of production/revision of this specification	
8. Aims of the Course	
The aim of this course is to empower students with the language and life skills they need to carry out their goals. To this end it provides ample opportunities for students to build awareness and practice language in real-life scenarios. The integrated skills approach of the course develops the student's self-confidence to survive and succeed in professional and social encounters within an English-speaking global community.	

9· Learning Outcomes, Teaching ,Learning and Assessment Methode

B- Knowledge and Understanding

A1. Understanding texts using effective learning strategies for reading and building vocabulary.

A2. Finding and understanding information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries.

A3. Demonstrating an appropriate level of control of grammatical accuracy and lexical appropriacy in written and oral communication.

B. Subject-specific skills
B1. Building sentences
B2. Writing composition
B3. Making an oral presentation

Teaching and Learning Methods

1. Lectures
2. Exercises about the topics

Assessment methods

1. Oral and written quizzes throughout the academic year 30%
2. Final written exam 70%

C. Thinking Skills
C1. The ability to form a personal opinions about issues through reading and listening
C2. The ability to discuss and defend an attitude in a clear organized way using sources through writing and speech

Teaching and Learning Methods

Lectures and discussions within the classroom

Assessment methods

Oral and written exams throughout the academic year in addition to the final written exam.

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1. Effective written and oral communication in English
D2. Team work

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	1		Introduction to the course	lectures	Oral and written exams throughout the academic year in addition to the final written exam
2			Unit One: Hello (p.6) 1.Grammar[(am/are/ is),(my/your),(This is...)] 2.Vocabulary[(How are you?), (What's this in English?), (Numbers1-10and plurals)] 3. Skills Work[Speaking] 4.Everyday English[Good Morning!...]	=	=
3			Parts of speech and Types of phrases	=	=
4			Types of clauses	=	=
5			Types of sentences	=	=
6			Unit Two: Your World (p.12) 1.Grammar[(he/she/ they, his/her), (Questions)] 2.Vocabulary[(Countries), (Adjectives), (Nouns)] 3. Skills Work[Reading and Speaking] 4.Everyday English[Numbers 11-30]	=	=
7			Unit Three: All about you (p.18) 1.Grammar[(am/is/	=	=

			are), (Negatives), (Questions), (Short answers)] 2.Vocabulary[(Jobs),(Personal Information)] 3. . Skills Work[(Reading and Speaking), (Roleplay)] 4.Everyday English[Social expressions(1)]		
8			Unit Four: Family and Friends (p.24) 1.Grammar [(Possessive adjectives),(Possessive 's),(has/have), (Adjective+ noun)] 2.Vocabulary[(The family),(Describing a friend)] 3. Skills Work[(Reading and Writing), (Listening)] 4.Everyday English[(The alphabet), (On the phone), (Saying email addresses)]	=	=
9			Exam (1)	=	=
10			Unit Five: The Way I live (p.32) 1.Grammar[(Present Simple I/you/we/they),(a and an), (Adjective +noun)] 2.Vocabulary[(Sports/Food/Drink), (Adjectives), (Verbs), (Language and nationalities)] 3. Skills Work[(Listening), (Listening and speaking), (roleplay)]	=	=

			4.Everyday English[How much is it?]		
11			Unit Five: The Way I live (p.32) 1.Grammar[(Present Simple I/you/we/they),(a and an), (Adjective +noun)] 2.Vocabulary[(Sports/Food/Drink), (Adjectives), (Verbs), (Language and nationalities)] 3. Skills Work[(Listening), (Listening and speaking), (roleplay)] 4.Everyday English[How much is it?]	=	=
12			Unit Six: Every day (p.40) 1.Grammar[(Present Simple he/she), (Questions and negatives), (Adverbs of frequency)] 2.Vocabulary[(The time), (Verbs and nouns), (Verbs), (Nouns), (Words that go together)] 3. Skills Work[Speaking] 4.Everyday English[(Days of the week), (Prepositions of time)]	=	=
13			Unit Six: Every day (p.40) 1.Grammar[(Present Simple he/she), (Questions and negatives), (Adverbs of frequency)] 2.Vocabulary[(The	=	=

			time), (Verbs and nouns), (Verbs), (Nouns), (Words that go together)] 3. Skills Work[Speaking] 4.Everyday English[(Days of the week), (Prepositions of time)]		
14			Unit Seven: My favourites (p.48) 1.Grammar [(Question words), (Pronouns), this/that] 2.Vocabulary [(Adjectives), (Opposite adjectives),(Places)] 3. Skills Work[(Reading and Writing), (Roleplay)] 4.Everyday English[Can I…?]	=	=
15			Unit Seven: My favourites (p.48) 1.Grammar [(Question words), (Pronouns), this/that] 2.Vocabulary [(Adjectives), (Opposite adjectives),(Places)] 3. Skills Work[(Reading and Writing), (Roleplay)] 4.Everyday English[Can I…?]	=	=
16			**Mid-Year Break**	=	=
17			**Mid-Year Break**		
18			Unit Eight: Where I live (p56) 1. Grammar	=	=

			[(There is/are…),(Prepositions)] 2.Vocabulary [(Rooms and furniture),(In and out of town)] 3. Skills work ([Reading and vocabulary),(Listening and writing)] 4. Everyday English [Directions]		
19			Unit Eight: Where I live (p56) 1. Grammar [(There is/are…),(Prepositions)] 2.Vocabulary [(Rooms and furniture),(In and out of town)] 3. Skills work ([Reading and vocabulary),(Listening and writing)] 4. Everyday English [Directions]	=	=
20			Exam (2)	=	=
21			Unit Nine: Times past (p.64) 1. Grammar [(was/were born), (Past Simple- irregular verbs)] 2.Vocabulary [(Saying years),(People and jobs), (Irregular verbs),(have,do,go)] 3. Skills work [(Listening and speaking), (Reading and speaking)] 4. Everyday English [When's your birthday?]	=	=

22			Unit Nine: Times past (p.64) 1. Grammar [(was/were born), (Past Simple-irregular verbs)] 2.Vocabulary [(Saying years),(People and jobs), (Irregular verbs),(have,do,go)] 3. Skills work [(Listening and speaking), (Reading and speaking)] 4. Everyday English [When's your birthday?]	=	=
23			Unit Ten: We had a great time! (p.72) 1. Grammar [(Past Simple-regular and irregular),(Questions), (Negatives), (ago)] 2.Vocabulary [(Weekend activities),(Time expressions), (Sports and leisure), (play or go?), (Seasons)] 3. Skills work [(Speaking), (Listening and speaking), (Speaking and writing)] 4. Everyday English [(Making conversation), (showing interest), (Going sightseeing)]	=	=
24			Unit Ten: We had a great time! (p.72) 1. Grammar [(Past Simple-regular and irregular),(Questions), (Negatives), (ago)] 2.Vocabulary [(Weekend activities),(Time	=	=

			expressions), (Sports and leisure), (play or go?), (Seasons)] 3. Skills work [(Speaking), (Listening and speaking), (Speaking and writing)] 4. Everyday English [(Making conversation), (showing interest), (Going sightseeing)]		
25			Unit Eleven: I can do that! (p.80) 1. Grammar [(can/can't), (Adverbs), (Requests and offers)] 2.Vocabulary [(Verbs), (Verb+noun), (Adjective+noun), (Opposite adjectives)] 3. Skills work [Reading and listening] 4. Everyday English [Everyday problems]	=	=
26			Unit Eleven: I can do that! (p.80) 1. Grammar [(can/can't), (Adverbs), (Requests and offers)] 2.Vocabulary [(Verbs), (Verb+noun), (Adjective+noun), (Opposite adjectives)] 3. Skills work [Reading and listening] 4. Everyday English [Everyday problems]	=	=
27			Unit Twelve: Please and thank you (p.88) 1. Grammar	=	=

			([I'd like…), (some and any),(like and would like)] 2.Vocabulary [(Shopping), (Food), (In a restaurant), (Roleplay)] 3. Skills work [(Listening), (Reading and speaking)] 4. Everyday English [(Roleplay), (signs all around)]		
28			Unit Twelve: Please and thank you (p.88) 1. Grammar ([I'd like…), (some and any),(like and would like)] 2.Vocabulary [(Shopping), (Food), (In a restaurant), (Roleplay)] 3. Skills work [(Listening), (Reading and speaking)] 4. Everyday English [(Roleplay), (signs all around)]	=	=
29			Unit Thirteen: Here and now (p.96) 1. Grammar [(Present Continuous), (Present Simple and Present Continuous)] 2.Vocabulary [(Colours), (Clothes), (Opposite verbs)] 3. Skills work [Reading and listening] 4. Everyday English [What's the matter]	=	=
30			Unit Thirteen: Here and now (p.96) 1. Grammar [(Present Continuous), (Present	=	=

			Simple and Present Continuous)] 2.Vocabulary [(Colours), (Clothes), (Opposite verbs)] 3. Skills work [Reading and listening] 4. Everyday English [What's the matter]		
31			Unit Fourteen: It's time to go! (p.104) 1. Grammar [(Future plans), (Revision)] 2.Vocabulary [(Transport), (Revision)] 3. Skills work [(Reading and speaking), (A mini autobiography)] 4. Everyday English [Social expressions (2)]	=	=
32			Unit Fourteen: It's time to go! (p.104) 1. Grammar [(Future plans), (Revision)] 2.Vocabulary [(Transport), (Revision)] 3. Skills work [(Reading and speaking), (A mini autobiography)] 4. Everyday English [Social expressions (2)]		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	(1) New Headway Plus [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2010), (2) Internet links and videos related to the topics discussed in the lectures.
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Electrical engineering Department
3. Course title/code	**Electronic Physics / EE108**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023
6. Number of hours tuition (total)	120
7. Date of production/revision of this specification	20-9-2022
8. Aims of the Course	
1-To understand the physical operation of electronic devices, particulary silicon based devices.	
2-To use electronic devices effectively in the design of circuits	
3-To be able to do device characterization and modeling	

9· Learning Outcomes, Teaching ,Learning and Assessment Methode

C- Knowledge and Understanding

A1. Understanding the physical properties and working principles of electronic devices

A2. Applications of electronic devices across various domains

B. Subject-specific skills

B1.

B2.

B3.

Teaching and Learning Methods

- Lectuers
- Homework
- Discussions

Assessment methods

- Sessional exams (60 minutes) + Quizes (15 minutes) [weight: 30% of the overall grade]
- Final exam (3 hours - written) [weight: 70% of the overall grade]

C. Thinking Skills

C1.

C2.

C3.

C4.

Teaching and Learning Methods

Exams

Assessment methods

Grades achieved in homework, sessional exams, quizzes, and final exam

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.

D2.

D3.

D4.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4		Course Introduction: Syllabus, Policy, Semiconductor History.	Online Lectures	Quizes + Sessional exams
2	4		Atomic structure and bonding theory	=	=
3	4		Atomic structure and bonding theory	=	=
4	4		Atomic structure and bonding theory	=	=
5	4		PN Junction	=	=
6	4		PN junction (open circuit)	=	=
7	4		PN junction with an applied voltage	=	=
8	4		Capacitive effects in PN junction	=	=
9	4		Diodes – The ideal diode	=	=
10	4		Diodes – Terminal characteristics of junction diodes	=	=
11	4		Diodes – Modeling the diode forward characteristics	=	=
12	4		Diodes – Operating in the reverse breakdown region – Zener diode + Voltage regulation and ripple factor	=	=
13	4		Diodes – Rectifier circuits	=	=

14	4		The harmonic components in rectifier circuits	=	=
15	4		Capacitive filters + Inductive filters	=	=
16	4		π-section filters + L-section filters	=	=
			Half – year break		
17	4		BJT – Device structure and physical operation	=	=
18	4		BJT – Device structure and physical operation	=	=
19	4		BJT – Current-voltage characteristics	=	=
20	4		BJT – Circuits at DC	=	=
21	4		BJT – Applying the BJT in amplifier design	=	=
22	4		BJT – Applying the BJT in amplifier design	=	=
23	4		BJT – Applying the BJT in amplifier design	=	=
24	4		MOS – Device structure and physical operation	=	=
25	4		MOS – Current-voltage characteristics	=	=
26	4		MOS – MOSFET circuit at DC	=	=

27	4		MOS – Applying the MOSFET in amplifier design	=	=
28	4		Other devices – Light emitting diode + Other devices – Solar cells	=	=
29	4		Other devices – Laser diode	=	=
30	4		Other devices – SCR + Other devices – Thyristor	=	=
			Electron ballistics		
			Electron ballistics		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Textbook: Sedra, Adel S. and Kenneth C. Smith, "*Microelectronic circuits"*, New York: Oxford University Press
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University Of Baghdad
2. University Department/Centre	College of Engineering/Electrical Engineering Department
3. Course title/code & Description	**Digital Techniques**
4. Modes of Attendance offered	Full time attendance
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	Semester (1) 45 hours Semester (2) 30 hours + 30 hours Partially
7. Date of production/revision of this specification	*2022*
8. Aims of the Course	
Digital techniques is essential to understanding the design and working of a wide range of applications, from consumer and industrial electronics to communications; from embedded systems, and computers to security and military equipment. As the devices used in these applications decrease in size and employ more complex technology, it is essential for engineers and students to fully understand both the fundamentals and also the implementation and application principles of digital electronics.	

9· Learning Outcomes, teaching, learning and assessment methods

1) Common number systems (Binary, Octal, Decimal & Hexadecimal) & numbers base conversion.
2) Knowledge and understanding with skills:
   - ✓ Sign magnitude binary representation & complements of numbers
   - ✓ Arithmetic operations in Binary, BCD, Octal, and Hexadecimal systems
   - ✓ Binary codes (BCD, Excess-3, Gray, etc.), Error Detecting & Correcting codes
3) Logic gates & universal building blocks
   - ✓ Fundamentals of Boolean algebra
   - ✓ Minterms & Maxterms in Boolean S.O.P. AND P.O.S. Expressions
   - ✓ Karnaugh maps (2, 3, 4 & 5 variables) & Don't care conditions
   - ✓ Quine McClusky method
   - ✓ Arithmetic circuits (adders, subtractors, BCD adder & carry look-ahead adder)
   - ✓ Design of Parity Generators / Checkers
   - ✓ Design & Applications of Encoders and Decoders
   - ✓ Design & Applications of Multiplexers & De-multiplexers
   - ✓ Design of Digital Comparators
   - ✓ Design of some common logic circuits
4) Introduction to Sequential Logic Circuits
   - ✓ SR Flip Flops
   - ✓ D, JK, and T Flip Flops
   - ✓ Flip Flop Triggering, Edge – Triggered Flip Flops
   - ✓ Master / Slave Flip Flops
   - ✓ Conversion from One Type of Flip Flop to Another
   - ✓ Analysis of Asynchronous Counters
   - ✓ Design of Asynchronous Counters
   - ✓ Analysis of Synchronous Counters
   - ✓ Design of Synchronous Counters
   - ✓ Up / Down Counters; Shift Registers
   - ✓ Common Types of Counters (Ring Counters, Johnson Counters, etc.)
   - ✓ Ring Oscillator

Teaching and Learning Methods

Lecturing and Class discussions.

Assessment Methods

Exams, quizzes, Homework.

10. Course Structure					
Week	Hours	Unit/Module or topic Title	Teaching Method	Assessment Method	
1	3	Common number systems (Binary, Octal, Decimal & Hexadecimal) & numbers base conversion	Lecturing Discussions and Exercises	Exam	
2	3	Sign magnitude binary representation & complements of numbers	Lecturing Discussions and Exercises	Exam	
3	3	Arithmetic operations in Binary, BCD, Octal, and Hexadecimal systems	Lecturing Discussions and Exercises	Exam	
4	3	Binary codes (BCD, Excess-3, Gray, etc.), Error Detecting & Correcting codes	Lecturing Discussions and Exercises	Exam	
5	3	Logic gates & universal building blocks	Lecturing Discussions and Exercises	Exam	
6	3	Fundamentals of Boolean algebra	Lecturing Discussions and Exercises	Exam	
7	3	Minterms & Maxterms in Boolean S.O.P. AND P.O.S. Expressions	Lecturing Discussions and Exercises	Exam	
8	3	Karnaugh maps (2, 3, 4 & 5 variables) & Don't care conditions	Lecturing Discussions and Exercises	Exam	
9	3	Quine McClusky method	Lecturing Discussions and Exercises	Exam	
10	3	Arithmetic circuits (adders, subtractors, BCD adder & carry look-ahead adder)	Lecturing Discussions and Exercises	Exam	

11	3	Design of Parity Generators / Checkers	Lecturing Discussions and Exercises	Exam	
12	3	Design & Applications of Encoders and Decoders	Lecturing Discussions and Exercises	Exam	
13	3	Design & Applications of Multiplexers & De-multiplexers	Lecturing Discussions and Exercises	Exam	
14	3	Design of Digital Comparators	Lecturing Discussions and Exercises	Exam	
15	3	Design of some common logic circuits	Lecturing Discussions and Exercises	Exam	
16	2	Introduction to Sequential Logic Circuits	Lecturing Discussions and Exercises	Exam	
17	2	SR Flip Flops	Lecturing Discussions and Exercises	Exam	
18	2	D, JK, and T Flip Flops	Lecturing Discussions and Exercises	Exam	
19	2	Flip Flop Triggering, Edge – Triggered Flip Flops	Lecturing Discussions and Exercises	Exam	
20	2	Master / Slave Flip Flops	Lecturing Discussions and Exercises	Exam	
21	2	Conversion from One Type of Flip Flop to Another	Lecturing Discussions and Exercises	Exam	
22	2	Analysis of Asynchronous Counters	Lecturing Discussions and Exercises	Exam	
23	2	Design of Asynchronous Counters	Lecturing Discussions and Exercises	Exam	
24	2	Analysis of Synchronous Counters	Lecturing Discussions and Exercises	Exam	

25	2	Design of Synchronous Counters	Lecturing Discussions and Exercises	Exam	
26	2	Up / Down Counters	Lecturing Discussions and Exercises	Exam	
27	2	Shift Registers	Lecturing Discussions and Exercises	Exam	
28	2	Common Types of Counters (Ring Counters, Johnson Counters, etc.)	Lecturing Discussions and Exercises	Exam	
29	2	Ring Oscillators	Lecturing Discussions and Exercises	Exam	
30	2	Some Applications of Sequential Logic Circuits	Lecturing Discussions and Exercises	Exam	

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	M. MORRIS MANO / MICHAEL D. CILETTI "DIGITAL DESIGN "4th Edition 2007
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet web sites, Digital Techniques
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	Collage of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Fundamentals of electrical engineering EE107**
4. Modes of Attendance offered	Full time attendance
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	120
7. Date of production/revision of this specification	October, 2022
8. Aims of the Course	
1- The course is designed for university students and to give them a detailed knowledge about electrical circuits that might be supplied fron DC sources or AC sources. 2- Some special cases where dependant sources might occure in advanced electrical equipment are also tought to students. 3- The course is designed for 30 weeks. 4 hours a week, three of material various content whereas the forth hour is focused on solving tutorials at various aspects of the course. 4- After finishing the course, students will be able analyise different electrical cirucits with widebroad of applied theorems to circuits inclusing basic component as resistors, inductors and capacitors.	

9- Learning outcomes, Teaching, Learning and Assessment methods

A- Cognitive goals .

A1.

A2.

A3.

A4.

A5.

A6 .

B. The skills goals special to the course.

B1.

B2.

B3.

Teaching and Learning Methods

1- Lecturing (on-line).
2- Discussions during lecturing with storm minding questions.
3- Tutorials, homeworks and assignments.

Assessment methods

1- Short tests (quizzes).
2- Long tests (semesters + finals).

C. Affective and value goals

C1.

C2.

C3.

C4.

Teaching and Learning Methods

Assessment methods

D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)

D1.

D2.

D3.

D4.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4		Introducing the SI units. And resistance-resistivity	Pdf, videos and online lecturing	Quiz
2	4		Temperature coefficients of resitance.	=	=
3	4		Series and parallel connections.	=	=
4	4		Star / delta & delta/star transformation.	=	=
5	4		Ohm's law	=	=
6	4		Kirchhoff's law	=	=
7	4		D.C. networks theorems for dependent & independent source Substitution & reciprocity theorems.	=	=
8	4		Thevenin theorem	=	=
9	4		Norton theorem	=	=
10	4		Superposition theorem	=	=
11	4		Maximum power transfer	=	=
12	4		Spring Break	=	=
13	4		Spring Break	=	=
14	4		Self and mutual inductance in D.C. circuits.	=	=
15	4		Basic electrostatics – capacitors in D.C. circuits.	=	=

16	4		Alternating voltage and current.	=	=
17	4		Single phase circuits	=	=
18	4		Complex notations & phasor diagram	=	=
19	4		Network theorems for dependent &indent. Source	=	=
20	4		Thevenin theorem	=	=
21	4		Norton theorem	=	=
22	4		Superposition theorem	=	=
23	4		Power calculations	=	=
24	4		Power factor corrections	=	=
25	4		Resonance circuits	=	=
26	4		Passive filters	=	=
27	4		Magnetic circuits	=	=
28	4		Hysteresis &eddy current losses.	=	=
29	4		Basic electromagnetic –self inductance.	=	=
30	4		Mutual inductance.	=	=

11. Infrastructure	
1. Books Required reading:	The book we used to teach fundamentals of Electrical circuits to first year students in the Electrical Engineering Department is *Fundamentals of Electric Circuits* by Charles K. Alexander & Mathew N.O. Sadiku (third edition).
2. Main references (sources)	1- Electric Circuits (8th Edition) by James W. Nilson. 2- Introductory Circuit Analysis by Boylestad, 3- Electrical Technology by Hughes. 4- Introductions to Electric Circuits (6th Edition) by R.C. Dorf & J. A. Svoboda
A- Recommended books and references (scientific journals, reports…).	• Available websites related to the subject. • Extracurricular activities.
B-Electronic references, Internet sites…	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Engineering, Baghdad University
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Mathematics I / GE101**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 Annual
6. Number of hours tuition (total)	120
7. Date of production/revision of this specification	September, 2022
8.Aims of the Course	
Build strong electrical engineers with powerful mathematic tools serving to solve problems in Math, Electronics, Power and all other engineering courses.	

9· Learning Outcomes, Teaching ,Learning and Assessment Method
D- Knowledge and Understanding A1. Understanding academic texts and try to solve the problems in the end of each chapter. A2. Learn how to reflect the theoretical functions and definitions to practical applications. A3. Finding and understanding information about mathematics problems and theoties.

B. Subject-specific skills

B1. Solving some specific problems with different ideas related to the subject courses.

B2. Explore the web pages that concerned on Math.

B3. Manipulating some powerful software like Maple and Microsoft Math in order to solve some integrals and graph delicate polar functions.

B4. Making an oral presentation

Teaching and Learning Methods

Lecturing and Exercises and Homework.

Assessment methods

Exams

C. Thinking Skills

C1. Being able to form personal opinions about issues through attempting to solve different mathematic problems.

Teaching and Learning Methods

Lecturing & Class discussions

Assessment methods

Exams that involve problem-solving skills and critical thinking skills

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Effective communication to understand and imagine the idea behind the problem want to be solved.

D2. Team work

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4		Determinant	Lecturing, Discussions & Exercises	Exam
2	4		Matrices	Lecturing, Discussions & Exercises	Exam
3	4		**Transcendental functions:** **Inverse Functions** **Natural logarithm**	Lecturing, Discussions & Exercises	Exam
4	4		**General Form: a^x & $\log_a x$ Growth and Decay Functions**	Lecturing, Discussions & Exercises	Exam
5	4		**Growth Rates Functions Trigonometric Functions and Its Inverses**	Lecturing, Discussions & Exercises	Exam
6	4		**Hyperbolic Functions and its Inverses.**	Lecturing, Discussions & Exercises	Exam
7			New Year Holiday		
8	2		Exam (1)		
9	2		Techniques of Integration	Lecturing, Discussions & Exercises	Exam
10	4		Integration Laws	Lecturing, Discussions & Exercises	Exam
11	4		Improper fraction technique	Lecturing, Discussions & Exercises	Exam

12	4		Trigonometric techniques.	Lecturing, Discussions & Exercises	Exam
13	4		Hyperbolic function techniques	Lecturing, Discussions & Exercises	Exam
14			Mid-Year Break		
15	2		Exam (2)		
16	2		Integral with special cases	Lecturing, Discussions & Exercises	Exam
17	4		Improper Integral type I and type II	Lecturing, Discussions & Exercises	Exam
18	4		Further Application of Integration	Lecturing, Discussions & Exercises	Exam
19	4		Conic sections	Lecturing, Discussions & Exercises	Exam
20	2		Exam (3)		
21	2		Polar functions	Lecturing, Discussions & Exercises	Exam
22	4		Polar functions and Cartesian coordinates	Lecturing, Discussions & Exercises	Exam
23	4		Graphing Polar functions	Lecturing, Discussions & Exercises	Exam
24	4		Area and Length in Polar function	Lecturing, Discussions & Exercises	Exam
25	4		Surfaces and quadrature in Space	Lecturing, Discussions & Exercises	Exam
26	2		Exam (4)		
27	2		Vectors in space		

28	4		Dot Product and Cross product	Lecturing, Discussions & Exercises	Exam
29	4		Lines and Planes in Space	Lecturing, Discussions & Exercises	Exam
30	4		Vector Valued Functions and Motion in space	Lecturing, Discussions & Exercises	Exam
31	4		T, N, B vectors		
32	3		Final Exam		

11. Infrastructure	
1. Books Required reading:	1. Thomas - Calculus Including 2nd Order Differential Equations (Addison-Wesley, 11th edition, 2005). 2. Stroud - Engineering Mathematics 5th edition.
2. Main references (sources)	Lecture notes
A- Recommended books and references (scientific journals, reports…).	None.
B-Electronic references, Internet sites…	Internet links related to the topics discussed in the book and class.

12. The development of the curriculum plan

COURSE SPECIFICATION – Year Two

COURSE SPECIFICATION

1. Teaching Institution	Baghdad University
2. University Department/Centre	College of Engineering/Department of Electrical Engineering
3. Course title/code	**Electrical Machines I / EE203**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	90
7. Date of production/revision of this specification	2022-2023
8. Aims of the Course	
The aim of this course is to introduce the basic theory of dc machine and transformers, learn the construction of dc machine, and enhance the students' skills for the principles of commutation and armature reaction. Then they learn various types of dc machines including characteristics.	

9· Learning Outcomes
E- Knowledge and Understanding A1. Learning the construction of a dc machine A2. Understanding the armature reaction and commutation. A3. Understanding the analysis of the transformers. A4. Explaining the losses in Transformers.
B. Subject-specific skills B1. Analyzing the types of armature winding, Lap and wave windings function B2.presenting the types of DC Motors and Generators B3. Illustrate the types of D.C. motors, power equation, B4. Studying the speed control of dc motors B5. Demonstrating the Transformer, types, and presenting the equivalent circuit of a transformer B6. Studying the Transformer efficiency and regulation

C. Thinking Skills

C1. Getting a knowledge to analysis the dc machines

C2 be able to work in practical with machines and transformers

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Design and implement a dc machine

D2. Increase ability in discussion and cooperate

Teaching and Learning Methods

Lecturing & Class discussions

Assessment methods

Exams, quizzes

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	A+B	Introduction of Machinery Principles, Construction of a dc machine, yoke, poles, armature, brushes, brush gear, bearings	Lecturing, Discussions & Exercises	Exam
2	3	A+B+C+D	Coil pitch and distributed windings	Lecturing, Discussions & Exercises	Exam
3	3	A+B+C+D	Introduction to transformer principle, Phasor diagram of the transformer	Lecturing, Discussions & Exercises	Exam
4	3	A+B+C+D	Types of armature winding, Lap windings	Lecturing, Discussions & Exercises	Exam
5	3	A+B+C+D	Wave windings, comparison of Lap and wave type winding	Lecturing, Discussions & Exercises	Exam
6	3	A+B+C+D	Multiplex windings	Lecturing, Discussions & Exercises	Exam
7	3	A+B+C+D		Lecturing, Discussions & Exercises	Exam, quiz
8	3	A+B+C+D	The E.M.F equation of a d.c machine	Lecturing, Discussions & Exercises	Exam
9	3	A+B+C+D	Winding topologies, single and double layer winding	Lecturing, Discussions & Exercises	Exam
10	3	A+B+C+D	Armature reaction	Lecturing, Discussions & Exercises	Exam
11	3	A+B+C+D	Commutation	Lecturing, Discussions & Exercises	Exam
12	3	A+B+C+D	DC Machinery Fundamentals	Lecturing, Discussions & Exercises	Exam

13	3	A+B+C+D		Lecturing, Discussions & Exercises	Exam
14	3	A+B+C+D	The per-unit system of measurements	Lecturing, Discussions & Exercises	Exam
15	3	A+B+C+D	DC Motors and Generators ,Self-excited dc generators	Lecturing, Discussions & Exercises	Exam
16	3	A+B+C+D	Shunt generator , Series generator	Lecturing, Discussions & Exercises	Exam
17	3	A+B+C+D	Compound generator	Lecturing, Discussions & Exercises	Exam
18	3	A+B+C+D	Speed control of dc series motor, shunt motor, compound motor	Lecturing, Discussions & Exercises	Exam
19	3	A+B+C+D	Voltage building in self-excited dc generator	Lecturing, Discussions & Exercises	Exam
20	3	A+B+C+D	D.C. motors, power equation, Torque equation	Lecturing, Discussions & Exercises	Exam
21	3	A+B+C+D	Types of DC motor	Lecturing, Discussions & Exercises	Exam
22	3	A+B+C+D	Three phase transformers	Lecturing, Discussions & Exercises	Exam
23	3	A+B+C+D	Transformer efficiency	Lecturing, Discussions & Exercises	Exam
24	3	A+B+C+D	Tutorials on dc machines	Lecturing, Discussions & Exercises	Exam
25	3	A+B+C+D	Three phase Transformer connections	Lecturing, Discussions & Exercises	Exam
26	3	A+B+C+D	Three phase transformation using two transformers, open delta connection, open wye-open delta connection, Scott	Lecturing, Discussions & Exercises	Exam

			connection, three phase transformer		
27	3	A+B+C+D	DC series motor, dc compound motor	Lecturing, Discussions & Exercises	Exam
28	3	A+B+C+D	Losses of transformer	Lecturing, Discussions & Exercises	Exam
29	3	A+B+C+D	Rounding up	Transformer, types, and construction of transformer	
30	3		Final Exam		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Two text books : A. Draper, "Electrical Machines" , 2nd edition, Longman, 1979. Stephen J. Chapman, "Electric Machinery Fundamentals", 4th edition,Mc Graw Hill, 2005.
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet websites, seminars
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Electromagnetic Fields / EE205**
4. Program (s) to which it contributes	BSc in Electrical Engineering
5. Modes of Attendance offered	Full time
6. Semester/Year	2022-2023
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	September -2022

9. Aims of the Course

The aim of this course is to reach a student who has the ability to understand and analyze the principles of electromagnetic fields, as well as the ability to solve the problems related to them. In addition to developing his ability to think on his own to reach solutions related to designs of electromagnetic fields.

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

F- Knowledge and Understanding

A1. Understanding the principles of electric fields.

A2. Understanding the principles of magnetic fields.

A3. Using Maxwell's equations.

B. Subject-specific skills

B1.Engineering drawing and imagining the dimensions of the electromagnetic problem.

B2.Solving integral and differential equations.

Teaching and Learning Methods
1. Face to face lectures. 2. Online learning. 3. Problem solving.
Assessment methods
1. One quiz per each chapter.(Total average 30%). 2. Final exam (70%).
C. Thinking Skills C1. C2. C3. C4.
Teaching and Learning Methods
Lectures and online learning.
Assessment methods
D. General and Transferable Skills (other skills relevant to employability and personal development) D1. D2. D3. D4.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Introducing syllabus and introducing Chapter 1 (vector analysis)	Face-to-face lectures + Online learning	One quiz per each chapter + Final exam
2	=		Cylindrical and spherical coordinate systems + Problems	=	=
3	=		Coulomb's law and electric field intensity	=	=
4	=		Infinite line charge to the end of Ch.2	=	=
5	=		Ch2 problems	=	=
6	=		Electric flux density	=	=
7	=		Gauss's law and divergence	=	=
8	=		First Maxwell's equations and CH3 problems	=	=
9	=		Energy and potential	=	=
10	=		Potential gradient and energy of static fields	=	=
11	=		Dipole principles and CH4 problems	=	=
12	=		Conductors and dielectrics	=	=
13	=		Conductor properties and boundary conditions	=	=
14	=		Theory of images	=	=
15	=		Boundary conditions for dielectrics	=	=
16	=		Capacitances and CH5 problems		

	=		**Half – year break**	=	=
17	=		Poisson's and Laplace's equations	=	=
18	=		Examples on Possion's and Laplace's equations and solving CH6 problems	=	=
19	=		Magnetostatic fields (CH7)	=	=
20	=		Stoke's theory and magnetic flux density	=	=
21	=		Derivations of magnetic flux density	=	=
22	=		CH7 problems	=	=
23	=		Mangetic forces	=	=
24	=		Nature of magnetic materials	=	=
25	=		Forces and torques in closed circuits	=	=
26	=		Potential energy and forces in magnetic materials	=	=
27	=		CH8 problems	=	=
28	=		Time-varying fields and Faraday's law (CH9)	=	=
29	=		Point form of Maxwell's equations	=	=
30	=		Integral form of Maxwell's equations	=	=
31			Displacement current		
32			CH9 problems		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Lectrues. 2. The following books a. Engineering electromagnetics by Hayt. b. Electromagnetic field theory by Bakshi.
Special requirements (include for example workshops, periodicals, IT software, websites)	COMSOL, CST, www.wolframalpha.com photomath android app
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the program specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Electrical engineering Department
3. Course title/code	**Electronics I / EE206**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	90
7. Date of production/ revision of this specification	Oct. 2022
8. Aims of the Course	
Build strong electrical engineers able to design electronic amplifier circuits with suitable DC biasing. Solve delicate problems in CMOS and BJT transistors configuration networks. In addition to multistage transistors such as cascade, cascode, current mirrors and Darlington pairs amplifiers. Furthermore, power amplifiers, class A, B, AB and class C are designed and studied.	

10· Learning Outcomes, Teaching, Learning and Assessment Method

G- Knowledge and Understanding

A1. Understanding academic texts and try to solve the problems in the end of each chapter.

A2. Learn how to reflect the theoretical functions and definitions to practical applications.
A3. Finding and understanding information about electronic problems and theories.

B. Subject-specific skills
B1. Solving some specific problems with different ideas related to the subject courses.
B2. Explore the web pages that concerned on Electronic circuits.
B3. Manipulating some powerful software like Multisim in order to solve some delicate problems in electronic circuits.
B4. Making an oral presentation and seminars.

Teaching and Learning Methods

1. Lecturing and Exercises and Homework.
2. PDFs, YOUTUBE, GOOGLE MEET, GOOGLE CLASSROOM and GOOGLE FORM.

Assessment methods

Exams

C. Thinking Skills
C1. Being able to form personal opinions about issues through attempting to solve different problems.

Teaching and Learning Methods

Lecturing & Class discussions

Assessment methods

Exams that involve problem-solving skills and critical thinking skills

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1. Effective Electronic Circuits to understand and imagine the idea behind the problem want to be solved.
D2. Team work

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		MOSFET, Device Structure and Physical Operation	Lecturing, Discussions & Exercises	Exam
2	3		Current-Voltage Characteristics, MOSFET Circuits at DC	Lecturing, Discussions & Exercises	Exam
3	3		Applying the MOSFET in Amplifier Design, Small-Signal Operation and Models	Lecturing, Discussions & Exercises	Exam
4	3		Basic MOSFET Amplifier Configurations.	Lecturing, Discussions & Exercises	Exam
5	3		Biasing in MOS Amplifier Circuits	Lecturing, Discussions & Exercises	Exam
6	3		Discrete-Circuit MOS Amplifiers, The Body Effect and Other Topics	Lecturing, Discussions & Exercises	Exam
7			New Year Holiday		
8	1		Exam (1)		
9	2		BJT, Device Structure and Physical Operation,	Lecturing, Discussions & Exercises	Exam
10	3		Current–Voltage Characteristics, BJT Circuits at DC	Lecturing, Discussions & Exercises	Exam
11	3		Applying the BJT in Amplifier, Design Small-Signal Operation and Models	Lecturing, Discussions & Exercises	Exam

12	3		Basic BJT Amplifier Configurations	Lecturing, Discussions & Exercises	Exam
13	3		Biasing in BJT Amplifier Circuits	Lecturing, Discussions & Exercises	Exam
14			Mid-Year Break		
15	1		Exam (2)		
16	2		Discrete-Circuit BJT Amplifiers, Transistor Breakdown and Temperature Effects	Lecturing, Discussions & Exercises	Exam
17	3		Building Blocks of Integrated-Circuit Amplifiers, Introduction, IC Design Philosophy The Basic Gain Cell	Lecturing, Discussions & Exercises	Exam
18	3		The Cascode Amplifier	Lecturing, Discussions & Exercises	Exam
19	3		IC Biasing—Current Sources, Current Mirrors, and Current-Steering Circuits	Lecturing, Discussions & Exercises	Exam
20	1		Exam (3)		
21	2		Current-Mirror Circuits with Improved Performance	Lecturing, Discussions & Exercises	Exam
22	3		Some Useful Transistor Pairings	Lecturing, Discussions & Exercises	Exam
23	3		Output Stages and Power Amplifiers, Classification of Output Stages, Class A Output Stage	Lecturing, Discussions & Exercises	Exam
24	3		Class B Output Stage	Lecturing, Discussions & Exercises	Exam
25	3		Class AB Output Stage	Lecturing, Discussions & Exercises	Exam

26	1		Exam (4)		
27	2		Biasing the Class AB Circuit		
28	3		CMOS Class AB Output Stages	Lecturing, Discussions & Exercises	Exam
30	3		Power BJTs	Lecturing, Discussions & Exercises	Exam
31	3		Variations on the Class AB Configuration	Lecturing, Discussions & Exercises	Exam
32	3		IC Power Amplifiers MOS Power Transistors		
33	3		Final Exam		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	3. Adel S. Sedra and Kenneth C. Smith, Microelectronic Circuits (Oxford University Press, 1987) 6th Edition. 4. Behzad Razavi, Fundamentals of Microelectronics, Wiley 2014, Second Edition. 5. Malvino, Albert Paul. Electronic Principles, McGraw-Hill Education, Eighth Edition
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet links related to the topics discussed in the book and class.
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the program specification.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Microprocessor and Computer Architecture I / EE201**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	60
7. Date of production/revision of this specification	2022
8. Aims of the Course	
This course introduces the programming, architecture and interfacing of the Intel microprocessors for the second year students. A student, after successfully passing this course will be able to : program and debug in assembly language understand the basic computer architecture understand the memory organization and memory interfacing perform input/output device programming in assembly understand the hardware and software interrupts and their applications.	

10. Course Structure				
Week	**Hours**	**Unit/Module or Topic Title**	**Teaching Method**	Assessment Method
1	2	Computer data representation systems	Lecturing, Discussions & Exercises	Exam
2	2	Addressing modes. Model of microprocessor 8088/8086	Lecturing, Discussions & Exercises	Exam
3	2	Addressing modes. Model of microprocessor 8088/8086	Lecturing, Discussions & Exercises	Exam
4	2	Machines and assembly language programming for IBM PC.	Lecturing, Discussions & Exercises	Exam
5	2	Machines and assembly language programming for IBM PC.	Lecturing, Discussions & Exercises	Exam
6	2	Machines and assembly language programming for IBM PC.	Lecturing, Discussions & Exercises	Exam
7	2	Machines and assembly language programming for IBM PC.	Lecturing, Discussions & Exercises	
8	2	Machines and assembly language programming for IBM PC.	Lecturing, Discussions & Exercises	
9	2	Machines and assembly language	Lecturing, Discussions & Exercises	Exam

		programming for IBM PC.		
10	2	Machines and assembly language programming for IBM PC.	Lecturing, Discussions & Exercises	Exam
11	2	Computer bus classifications and types, timing diagram, decoding of address.	Lecturing, Discussions & Exercises	Exam
12	2	Computer bus classifications and types, timing diagram, decoding of address.	Lecturing, Discussions & Exercises	Exam
13	2	Computer bus classifications and types, timing diagram, decoding of address.	Lecturing, Discussions & Exercises	
14	2	Computer performance measurements	Lecturing, Discussions & Exercises	
15	2	Arithmetic logic unit ALU	Lecturing, Discussions & Exercises	Exam
16	2	CPU Examples	Lecturing, Discussions & Exercises	Exam
17	2	CPU Examples	Lecturing, Discussions & Exercises	Exam
18	2	CPU Examples		
19	2	Memory and Interfacing	Lecturing, Discussions & Exercises	Exam
20	2	Memory and Interfacing	Lecturing, Discussions & Exercises	Exam

21	2	Memory and Interfacing	Lecturing, Discussions & Exercises	Exam
22	2	Interfacing microprocessor, line Drivers, Transceivers, Latches, transducers, relay drivers, ADC, DAC, I/O interfacing	Lecturing, Discussions & Exercises	Exam
23	2	Interfacing microprocessor, line Drivers, Transceivers, Latches, transducers, relay drivers, ADC, DAC, I/O interfacing		
24	2	Interfacing microprocessor, line Drivers, Transceivers, Latches, transducers, relay drivers, ADC, DAC, I/O interfacing	Lecturing, Discussions & Exercises	Exam
25	2	Interfacing microprocessor, line Drivers, Transceivers, Latches, transducers, relay drivers, ADC, DAC, I/O interfacing	Lecturing, Discussions & Exercises	Exam
26	2	Interfacing microprocessor, line Drivers, Transceivers, Latches, transducers, relay drivers, ADC, DAC, I/O interfacing	Lecturing, Discussions & Exercises	Exam
27	2	Instruction design, control unit design and CPU design.	Lecturing, Discussions & Exercises	Exam
28	2	Instruction design, control unit design and CPU design.	Lecturing, Discussions & Exercises	Exam

29	2	Instruction design, control unit design and CPU design.	Lecturing, Discussions & Exercises	Exam
30	2	Instruction design, control unit design and CPU design.	Lecturing, Discussions & Exercises	Exam

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Barry B. Brey The Intel Microprocessors (8th Edition) 8th Edition Computer System Architecture M. Morris Mano
Special requirements (include for example workshops, periodicals, IT software, websites)	None
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Electrical circuits / EE207**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	90
7. Date of production/revision of this specification	October - 2022

8. Aims of the Course

The aim of this course is to introduce students to the fundamental theory and mathematics for the analysis of poly phase system, frequency response, transfer function of circuits and the stability of the system. Through the material presented in this course, students will learn:

The fundamental principles in electric circuit theory and to be able to extend these principles into a way of thinking for problem solving in mathematics, science, and engineering.

Analyze circuits those include energy storage elements in the time and frequency domains.

How to work effectively both individually and in groups.

Evaluate the personal learning process and understanding of the concepts and skills from class.

9· Learning Outcomes, Teaching ,Learning and Assessment Methods

A- Knowledge and Understanding

Upon Completion of this course the students will acquire the following skills:

1. An ability to read and comprehend electrical circuits at an appropriate level
2. An ability both to follow and correctly to analyze the circuits of appropriate degrees of complexity.
3. Understanding of electrical circuits' equations, and an ability to use it correctly.
4. An appreciation of the important connection between the ideas in the electrical circuits theories and the practical applications

B. Subject-specific skills

Upon Completion of this course the students will acquire the following skills:

1. Making an oral presentation
2. Analyzing the circuits of appropriate degrees of complexity.
3. Solve electrical circuits' equations.

Teaching and Learning Methods

Lectures, Seminars and Exercises

Assessment methods

1. Weekly Quiz 30% weight.
2. Final written Exam. 70% weight.

C. Thinking Skills

Arguing for and defending a position in a clear and structured way using academic sources, through analyzing and solving

Teaching and Learning Methods

Lecturing & Class discussions

Assessment methods

Exams that involve problem-solving skills and critical thinking skills

D. General and Transferable Skills (other skills relevant to employability and personal development)

1. Analyzing and solving the electrical circuits' problems.
2. Team work

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	A+B+C +D	Mutual Inductance, A review of Self Inductance	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
2	3	A+B+C +D	The Concept of Mutual Inductance	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
3	3	A+B+C +D	Polarity of Mutually Induced Voltages (The Dot Convention)	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
4	3	A+B+C +D	How to Use the Dot Marking when Writing Circuit Equation	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
5	3	A+B+C +D	Inductance of Inductively-Coupled Coils Connected in Series	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
6	3	A+B+C +D	Poly Phase System, Phase Sequence Star or Way (Y) Connection	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
7	3	A+B+C +D	Delta (Δ) or Mesh Connection, Line Currents and Phase Currents	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
8	3	A+B+C +D	Power (Active, Reactive and Apparent Power)	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
9	3	A+B+C +D	Balanced Three-Phase System	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
10	3	A+B+C +D	Unbalanced Three-Phase System	Online Lecturing,	Weekly Quiz and written final Exam

				Discussions & Exercises	
11	3	A+B+C +D	Transient Response (1st. Order), Transient in RL Circuit	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
12	3	A+B+C +D	Transient in RC Circuit	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
13	3	A+B+C +D	Transient Response (2nd. Order), Transient in Series RLC Circuit	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
14	3	A+B+C +D	Over Damped	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
15	3	A+B+C +D	Critically Damped	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
16	3	A+B+C +D	Under Damped	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
			Half – year break		
17	3	A+B+C +D	Laplace Transform in Circuit Analysis	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
18	3	A+B+C +D	Circuit Elements in the S-Domain	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
19	3	A+B+C +D	The Network Function and Laplace Transform	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam

20	3	A+B+C +D	Applications of Operational Amplifier	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
21	3	A+B+C +D	Inverting Amplifier, Non Inverting Amplifier and Differentiator Amplifier	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
22	3	A+B+C +D	Summing and Differential Amplifier, Voltage Follower Amplifier	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
23	3	A+B+C +D	and Relaxation Operational Amplifier	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
24	3	A+B+C +D	Cascaded Operational Amplifier Circuits	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
25	3	A+B+C +D	Active Filters, LPF Design, HPF Design	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
26	3	A+B+C +D	BPF Design and BRF Design	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
27	3	A+B+C +D	Two Port Networks, Terminal Equations	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
28	3	A+B+C +D	Two Port Parameters, Z- Parameters	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam
29	3	A+B+C +D	Y- Parameters	Online Lecturing, Discussions & Exercises	Weekly Quiz and written final Exam

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	**The text book:** - "Fundamentals of Electric circuits", by Charles K. Alexander and Muthew N. O. Sadiku. **The references:** - "Electric circuits", by James W. Nilsson. - "Introductory Circuit Analysis", by Boylestad. - "Electrical Technology", by Hughes. - "Engineering Circuit Analysis", by William H. Hayt, Jr and Jack E. Kemmerly. In addition to internet links related to the topics discussed in the book and class. **Course materials:** Mutual Inductance, Poly Phase System, Transient Response (1st. Order), Transient Response (2nd. Order), Laplace Transform in Circuit Analysis, Application of Laplace Transform, Operational Amplifiers, Op Amp Circuit Analysis, Active Filters Design, Two Port Networks, The Relationships between Parameters.
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet links related to the topics discussed in the book and class and websites
Community-based facilities (include for example, guest Lectures , internship , field studies)	-

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Electrical Engineering Department
3. Course title/code	**English Language (2) / EE210**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (Annual)
6. Number of hours tuition (total)	30
7. Date of production/revision of this specification	13-12-2022
8. Aims of the Course	
The aim of this course is to empower students with the language and life skills they need to carry out their career goals. To this end it provides ample opportunities for students to build awareness and practice language in real-life scenarios. The integrated skills approach of the course develops the student's self-confidence to survive and succeed in professional and social encounters within an English-speaking global community.	

9· Learning Outcomes, Teaching ,Learning and Assessment Methods

A- Knowledge and Understanding

A1. Understanding texts using effective learning strategies for reading and vocabulary building
A2. Developing conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations
A3. Finding and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries
A4. Demonstrating an appropriate level of control of grammatical accuracy and lexical appropriacy in academic communication

B. Subject-specific skills
B1. Recognizing parts of speech and types of sentences according to structure and function
B2. Producing simple, compound, complex and compound-complex sentences
B3. Producing declarative, interrogative, imperative and exclamatory sentences
B4. Writing paragraphs with topic sentences and supporting details
B5. Writing cohesive coherent essays
B6. Making an oral presentation

Teaching and Learning Methods

Lecturing and Exercises

Assessment methods

Exams

C. Thinking Skills
C1. Being able to form personal opinions about issues through critical reading and listening
C2 Arguing for and defending a position in a clear and structured way using academic sources, through writing and speaking

Teaching and Learning Methods

Lecturing & Class discussions

Assessment methods

Exams

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1.Effective communication in written and spoken English
D2. Team work

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	1		Introduction	Lecturing & doing exercises	Exams
2	1		**Unit One:** Getting to Know you (p.6) **1. Grammar:** Tenses, Questions and Question words **2. Vocabulary:** Using a bilingual dictionary Parts of Speech Words with more than one meaning **3. Everyday English:** Social Expressions 1 **4.Reading:** 'People, the great communicators' **5.Speaking:** Information gap Discussion Roleplay **6.Listening:** Neighbours **7.Writing:** Informal letters	=	=
3	1		**Unit One:** Getting to Know you (p.6) **1. Grammar:** Tenses, Questions and Question words **2. Vocabulary:** Using a bilingual dictionary Parts of Speech Words with more than one meaning **3. Everyday English:** Social Expressions 1	=	=

			4.Reading: 'People, the great communicators' **5.Speaking:** Information gap Discussion Roleplay **6.Listening:** Neighbours **7.Writing:** Informal letters		
4	1		**Unit Two:** The way we live (p.14) **1. Grammar:** Present tenses **2. Vocabulary:** Describing countries Collocation **3. Everyday English:** Making conversation **4.Reading:** 'Living in the USA' **5.Speaking:** Information gap Exchanging information about immigrants to the USA **6.Listening:** 'You drive me mad' **7.Writing:** Linking words	=	=
5	1		**Unit Two:** The way we live (p.14) **1. Grammar:** Present tenses **2. Vocabulary:** Describing countries Collocation **3. Everyday English:** Making conversation **4.Reading:** 'Living in the USA'	=	=

			5.Speaking: Information gap Exchanging information about immigrants to the USA **6.Listening:** 'You drive me mad' **7.Writing:** Linking words		
6	1		**Unit Three:** It all went wrong (p.22) **1. Grammar:** Past tenses **2. Vocabulary:** Irregular verbs Making connections Suffixes to make different parts of speech Making negatives **3. Everyday English:** Time expressions **4.Reading:** 'The burglars' friend' 'The thief, his mother and $2 billion' 'Teenager goes on spending spree' Sherlock Holmes- The Three Students **5.Speaking:** Telling stories **6.Listening:** An extract from The Three Students **7.Writing:** Linking words	=	=
7	1		**Unit Three:** It all went wrong (p.22) **1. Grammar:** Past tenses **2. Vocabulary:** Irregular verbs Making connections	=	=

			Suffixes to make different parts of speech Making negatives **3. Everyday English:** Time expressions **4.Reading:** 'The burglars' friend' 'The thief, his mother and $2 billion' 'Teenager goes on spending spree' Sherlock Holmes- The Three Students **5.Speaking:** Telling stories **6.Listening:** An extract from The Three Students **7.Writing:** Linking words		
8	1		**Unit Four:** Let's go shopping!(p.30) **1. Grammar:** Quantity Articles **2. Vocabulary:** Buying things **3. Everyday English:** Prices and shopping **4.Reading:** Markets around the world **5.Speaking:** Survey Discussion **6.Listening:** 'My uncle's a shopkeeper' Buying things **7.Writing:** Filling in forms	=	=
9	1		**Unit Four:** Let's go shopping!(p.30) **1. Grammar:** Quantity Articles **2. Vocabulary:**	=	=

			Buying things **3. Everyday English:** Prices and shopping **4.Reading:** Markets around the world **5.Speaking:** Survey Discussion **6.Listening:** 'My uncle's a shopkeeper' Buying things **7.Writing:** Filling in forms		
10	1		Exam (1)	=	=
11	1		**Unit Five:** What do you want to do? (p.38) **1. Grammar:** Verb patterns 1 Future intentions **2. Vocabulary:** Hot verbs **3. Everyday English:** How do you feel? **4.Reading:** 'Hollywood kids' **5.Speaking:** What are your plans and ambitions? Being a teenager **6.Listening:** A song **7.Writing:** Writing a postcard	=	=
12	1		**Unit Five:** What do you want to do? (p.38) **1. Grammar:** Verb patterns 1 Future intentions **2. Vocabulary:** Hot verbs **3. Everyday English:** How do you	=	=

			feel? **4.Reading:** 'Hollywood kids' **5.Speaking:** What are your plans and ambitions? Being a teenager **6.Listening:** A song **7.Writing:** Writing a postcard		
13	1		**Unit Six:** Tell me! What's it like? (p.46) **1. Grammar:** What's it like? Comparative and superlative adjectives **2. Vocabulary:** Talking about cities Money Synonyms and antonyms **3. Everyday English:** Directions **4.Reading:** 'A tale of two millionaires' **5.Speaking:** Information gap Discussion **6.Listening:** Living in another country **7.Writing:** Relative clauses 1 Describing a place	=	=
14	1		**Unit Six:** Tell me! What's it like? (p.46) **1. Grammar:** What's it like? Comparative and superlative adjectives **2. Vocabulary:** Talking about cities Money	=	=

			Synonyms and antonyms **3. Everyday English:** Directions **4.Reading:** 'A tale of two millionaires' **5.Speaking:** Information gap Discussion **6.Listening:** Living in another country **7.Writing:** Relative clauses 1 Describing a place		
15	1		**Unit Seven:** Fame (p.54) **1. Grammar:** Present perfect and past simple for and since Tense revision **2. Vocabulary:** Past participles Bands of music Adverbs Word pairs **3. Everyday English:** short answers **4.Reading:** Celebrity interview **5.Speaking:** Mingle Roleplay Project **6.Listening:** An interview with the band style **7.Writing:** Relative clauses 2 Writing a biography	=	=
16			Mid-Year Break	=	=
17			Mid-Year Break		

18	1		**Unit Eight:** Do's and don'ts (p. 62) **1. Grammar:** have (got) to should must **2. Vocabulary:** Jobs Travelling abroad Words that go together Compound nouns **3. Everyday English:** At the doctor's **4.Reading:** Problem page **5.Speaking:** Jobs Discussion Asking questions about places Roleplay Group work **6.Listening:** Holidays in January At the doctor's **7.Writing:** Writing letters/ Formal letters	=	=
19	1		**Unit Eight:** Do's and don'ts (p. 62) **1. Grammar:** have (got) to should must **2. Vocabulary:** Jobs Travelling abroad Words that go together Compound nouns **3. Everyday English:** At the doctor's	=	=

			4.Reading: Problem page **5.Speaking:** Jobs Discussion Asking questions about places Roleplay Group work **6.Listening:** Holidays in January At the doctor's **7.Writing:** Writing letters/ Formal letters		
20	1		Exam(2)		
21	1		**Unit Nine:** Going places (p. 70) **1. Grammar:** Time and conditional clauses What if…? **2. Vocabulary:** Hot verbs Hotels **3. Everyday English:** In a hotel **4.Reading:** The world's first megalopolis **5.Speaking:** What will you do? Discussion What are the biggest cities in the world? **6.Listening:** Life in 2050 **7.Writing:** Linking words	=	=
22	1		**Unit Nine:** Going places (p. 70) **1. Grammar:** Time and conditional clauses What if…?	=	=

			2. Vocabulary: Hot verbs Hotels **3. Everyday English:** In a hotel **4.Reading:** The world's first megalopolis **5.Speaking:** What will you do? Discussion What are the biggest cities in the world? **6.Listening:** Life in 2050 **7.Writing:** Linking words		
23	1		**Unit Ten:** Scared to death (p. 78) **1. Grammar:** Verb patterns 2 Infinitives **2. Vocabulary:** Shops Describing feelings and situations **3. Everyday English:** Exclamations **4.Reading:** 'Don't look down' 'Into the wild' **5.Speaking:** "When I was young' Describing feelings Roleplay **6.Listening:** When I was young The sinking of the Titanic **7.Writing:** Writing letters/ Formal and informal letters	=	=

24	1		**Unit Ten:** Scared to death (p. 78) **1. Grammar:** Verb patterns 2 Infinitives **2. Vocabulary:** Shops Describing feelings and situations **3. Everyday English:** Exclamations **4.Reading:** 'Don't look down' 'Into the wild' **5.Speaking:** "When I was young' Describing feelings Roleplay **6.Listening:** When I was young The sinking of the Titanic **7.Writing:** Writing letters/ Formal and informal letters	=	=
25	1		**Unit Eleven:** Things that changed the world (p. 86) **1. Grammar:** Passives **2. Vocabulary:** Verbs and past participles Verbs and nouns that go together **3. Everyday English:** Notices **4.Reading:** A discovery and an invention that changed the world **5.Speaking:** Exchanging and discussing	=	=

			information about DNA and Google **6.Listening:** The world's most common habit **7.Writing:** Writing a review of a book or film		
26	1		**Unit Eleven:** Things that changed the world (p. 86) **1. Grammar:** Passives **2. Vocabulary:** Verbs and past participles Verbs and nouns that go together **3. Everyday English:** Notices **4.Reading:** A discovery and an invention that changed the world **5.Speaking:** Exchanging and discussing information about DNA and Google **6.Listening:** The world's most common habit **7.Writing:** Writing a review of a book or film	=	=
27	1		**Unit Twelve:** Dreams and Reality (p. 94) **1. Grammar:** Second conditional might **2. Vocabulary:** phrasal verbs **3. Everyday English:** Social	=	=

			expressions 2 **4.Reading:** Supervolcano **5.Speaking:** Giving advice Discussion **6.Listening:** Two students talk about their future plans **7.Writing:** Adverbs Writing a story		
28	1		**Unit Twelve:** Dreams and Reality (p. 94) **1. Grammar:** Second conditional might **2. Vocabulary:** phrasal verbs **3. Everyday English:** Social expressions 2 **4.Reading:** Supervolcano **5.Speaking:** Giving advice Discussion **6.Listening:** Two students talk about their future plans **7.Writing:** Adverbs Writing a story	=	=
29	1		**Unit Thirteen:** Earning a living (p. 102) **1. Grammar:** Present Perfect Continuous Present Perfect Simple versus Continuous **Vocabulary:**	=	=

			Jobs Word formation Adverbs **3. Everyday English:** Telephoning **4.Reading:** A funny way to earn a living **5.Speaking:** Information gap Discussion Roleplay **6.Listening:** Giving news **7.Writing:**Writing letters		
30	1		**Unit Thirteen:** Earning a living (p. 102) **1. Grammar:** Present Perfect Continuous Present Perfect Simple versus Continuous **Vocabulary:** Jobs Word formation Adverbs **3. Everyday English:** Telephoning **4.Reading:** A funny way to earn a living **5.Speaking:** Information gap Discussion Roleplay **6.Listening:** Giving news **7.Writing:**Writing letters	=	=

31	1		**Unit Fourteen:** Family ties (p. 110) **1. Grammar:** Past perfect for clarification Reported speech **Vocabulary:** Hot verbs **3. Everyday English:** Saying goodbye **4.Reading:** Twins reunite after forty years A short story-'The tale of two silent brothers' **5.Speaking:** Telling stories Arguments in families What happened next in the story? Families that live abroad **6.Listening:** An interview with Beth Taylor Families that live abroad **7.Writing:**Writing a story	=	=
32			**Unit Fourteen:** Family ties (p. 110) **1. Grammar:** Past perfect for clarification Reported speech **Vocabulary:** Hot verbs **3. Everyday English:** Saying goodbye **4.Reading:** Twins reunite after forty years		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Textbook: New Headway Plus[Student's Book and Workbook with key for Pre-Intermediate Level] by John and Liz Soars, Oxford: Oxford University Press 2010 2. Internet links related to the topics discussed in the book and class
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

a story

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Engineering, University Of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code & Description	**Numerical Analysis and Statistics / EE204**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (Annual)
6. Number of hours tuition (total)	60 H
7. Date of production/revision of this specification	*2022*
8. Aims of the Course	
The aim of this course is to introduce the methods of Numerical analysis and Probabilities.	

9· Learning Outcomes, Teaching, Learning and assessment methods
A- Review of matrices. B- Knowledge and understanding with skills: B1- **Solution of Non-linear Equations:** B2- **Solving sets of linear equations** B3- Numerical interpolation. B4- Least squares data fitting. B5- Numerical integration and differentiation. B6- Solution of sets of linear equations. B7- Finite difference and their applications. B8- Numerical solution of differential equations. B9- Multistep methods to solve differential equations. C- Knowledge and understanding with skills C1- Basic probability concepts. C2- Conditional probability and dependence C3- Random variables and probability distributions. C4- Expectations and moments. C5- Functions of random variables. C6- Some important discrete distributions. C7- Some important continuous distributions.
Teaching and Learning Methods
Lecturing and Class discussions.
Assessment Methods
Exams, quizzes, Homework.

10. Course Structure					
Week	Hours	Unit/Module or topic Title	Teaching Method	Assessment Method	
1	2	**Solution of Non-linear Equations**	Lecturing Discussions and Exercises	Exam	

		Method of Halving the Interval (Bisection method)			
2	2	**Solution of Non-linear Equations** Method of linear Interpolation(Method of false position)	Lecturing Discussions and Exercises	Exam	
3	2	**Solution of Non-linear Equations** Newton's Method	Lecturing Discussions and Exercises	Exam	
4	2	**Solution of Non-linear Equations** Synthesis Division	Lecturing Discussions and Exercises	Exam	
5	2	Gauss and Gauss-Jordan methods	Lecturing Discussions and Exercises	Exam	
6	2	**Solving sets of linear equations** LU Decomposition	Lecturing Discussions and Exercises	Exam	
7	2	**Solving sets of linear equations** Gauss-Seidel Method	Lecturing Discussions and Exercises	Exam	
8	2	**System of Non-Linear Equations** Newton-Raphson's Method	Lecturing Discussions and Exercises	Exam	
9	2	**Numerical interpolation**	Lecturing Discussions and Exercises	Exam	
10	2	**Least squares date fitting**	Lecturing Discussions and Exercises	Exam	
11	2	**Numerical integration**	Lecturing Discussions and Exercises	Exam	
12	2	**Numerical Differentiation** Finite difference and their applications, Interpolation using	Lecturing Discussions and Exercises	Exam	

		newton –gregory forward polynomial			
13	2	Error of Interpolation using newton – gregory backward polynomial	Lecturing Discussions and Exercises	Exam	
14	2	Numerical solution of differential equations	Lecturing Discussions and Exercises	Exam	
15	2	Multistep methods to solve differential equations	Lecturing Discussions and Exercises	Exam	
16	2	Basic probability concepts	Lecturing Discussions and Exercises	Exam	
17	2	Basic probability concepts	Lecturing Discussions and Exercises	Exam	
18	2	Conditional probability and dependence	Lecturing Discussions and Exercises	Exam	
19	2	Conditional probability and dependence	Lecturing Discussions and Exercises	Exam	
20	2	Random variables and probability distributions	Lecturing Discussions and Exercises	Exam	
21	2	Random variables and probability distributions	Lecturing Discussions and Exercises	Exam	
22	2	Expectations and moments	Lecturing Discussions and Exercises	Exam	
23	2	Expectations and moments	Lecturing Discussions and Exercises	Exam	
24	2	Functions of random variables	Lecturing Discussions and Exercises	Exam	
25	2	Functions of random variables	Lecturing Discussions and Exercises	Exam	

26	2	Some important discrete distributions	Lecturing Discussions and Exercises	Exam	
27	2	Some important discrete distributions	Lecturing Discussions and Exercises	Exam	
28	2	Some important discrete distributions	Lecturing Discussions and Exercises	Exam	
29	2	Some important continuous distributions	Lecturing Discussions and Exercises	Exam	
30	2	Some important continuous distributions	Lecturing Discussions and Exercises	Exam	

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Curtis F. Gerald / Patrick O. Wheatley " Applied Numerical Analysis "3rd Edition 1984 2. Richard L. Burden J. Douglas Faires "Study Guide for Numerical Analysis" 6th Edition 1996.
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet web sites, Numerical Analysis
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

COURSE SPECIFICATION

In This Course Mathematics II Students study advance mathematics that make him be able to make and implementation a blook diagram and representing in mathematical model with functions has servile variables for any Engineering Problem specially for Electrical Engineering.

1. Teaching Institution	Collage of Engineering / University of Baghdad
2. University Department/Centre	Electrical Engineering Department
3. Course title/code	**Mathematics II / EE201**
4. Program (s) to which it contributes	B.Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time attendance
6. Semester/Year	2022-2023 (annual)
7. Number of hours tuition (total)	120
8. Date of production/revision of this specification	Nov. 2022

9. Aims of the Course

The aim of this course (annual) material is to study advance mathematics. The student starts the course by understanding functions has servile variables. Then students will be able to explore advance mathematics, and to solve problems including deferential equations. After finishing this material with successful progression, students will be able to take other courses based on this course like Engineering Mathematics Analysis.

10· Learning Outcomes, Teaching, Learning and Assessment Methods

H- Knowledge and Understanding

A1. Understand what the basic and advanced laws of all in Course Structure.

A2. Make the students be familiar with the theoretical calculation of all in Course Structure.

A3. Make the students able to assess and predict as all in Course Structure.

B. Subject-specific skills

B1.**Solid knowledge of basic mathematics rules, exponents and solving simultaneous system of linear equations using Cramer's rule an so on.**

B2. **Solid knowledge of the all in** Course Structure **.**

Teaching and Learning Methods

1- Lecture notes.
2- Internet based home works.
3- Others like -------Microsoft Mathematics V5 .

Assessment methods

1- Short tests (yes 9).
2- Long test (no).

C. Thinking Skills

C1. Problem solving.

C2. Homework leading to problem solving.

Teaching and Learning Methods

We use the blackboard and wide screen to introduce the students to this course, we also let the students to participate in the problem-solving process in the class and by giving them HomeWorks, and mind storm sudden class questions. All this will done with Internet.

Assessment methods

Quizzes and final examinations

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.**The most important skill students can acquire during the first term of this material is to full Mathematics Calculus via some home works that are arranged in a manner from easy up to hard level. Also, class room mind storm questions prepare students to sudden questions that may be asked face when a graduate starts searching for a job, face-to-face contact is very important skill students must acquire.**

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4		1-Functions of Several Variables 2-Limits and Continuity in Higher Dimensions 3-Partial Derivatives 4-The Chain Rule	e-learning and interactive Lectures	
2	4		5-Directional Derivatives and Gradient Vectors 6-Tangent Planes and Differentials 7-Extreme Values and Saddle Points 8-Lagrange Multipliers	e-learning and interactive Lectures	
3	4		9-Taylor's Formula for Two Variables 10-Partial Derivatives with Constrained Variables *First Quiz 11- Double and Iterated Integrals over Rectangles 12-Double Integrals	e-learning and interactive Lectures	*First Quiz
4	4		13-Area by Double Integration 14-Parametrizations of Plane Curves 15-Calculus with Parametric Curves	e-learning and interactive Lectures	
5	4		16-Polar Coordinates 17-Graphing Polar Coordinate Equations 18- Areas and Lengths in Polar Coordinates 19- Conic Sections	e-learning and interactive Lectures	
6	4		20- Conics in Polar Coordinates *Second Quiz 21- Double Integrals in Polar Form 22-Triple Integrals in Rectangular Coordinates 23-Moments and Centers of Mass	e-learning and interactive Lectures	*Second Quiz
7	4		24-Triple Integrals in Cylindrical and Spherical Coordinates 25- Substitutions in Multiple Integrals *Third Quiz	e-learning and interactive Lectures	*Third Quiz

8	4		26-Three-Dimensional Coordinate Systems 27-Vectors 28-The Dot Product 29-The Cross Product 30-Lines and Planes in Space 31-Cylinders and Quadric Surfaces	e-learning and interactive Lectures	
9	4		Vector-Valued Functions and Motion in Space 32- Curves in Space and Their Tangents 33- Integrals of Vector Functions; Projectile Motion 34- Arc Length in Space	e-learning and interactive Lectures	
10	4		35- Curvature and Normal Vectors of a Curve 36- Tangential and Normal Components of Acceleration 37- Velocity and Acceleration in Polar Coordinates *4th Quiz	e-learning and interactive Lectures	*4th Quiz
11	4		38-Sequences 39-Infinite Series 40-The Integral Test	e-learning and interactive Lectures	
12	4		41-Comparison Tests 42-Absolute Convergence; The Ratio and Root Tests	e-learning and interactive Lectures	
13	4		43- Alternating Series and Conditional Convergence 44-Power Series	e-learning and interactive Lectures	
14	4		45- Taylor and Maclaurin Series 46-Convergence of Taylor Series	e-learning and interactive Lectures	
15	4		47-The Binomial Series and Applications of Taylor Series and Fourier Series *5th Quiz	e-learning and interactive Lectures	*5th Quiz
16	4		First-Order ODEs 48-Basic Concepts. Modeling 49- Geometric Meaning of y\ =f(x, y). Direction Fields, Euler's Method		
17	4		50- Separable ODEs. Modeling		

			51- Exact ODEs, Integrating Factors		
18	4		52- Linear ODEs. Bernoulli Equation. Population Dynamics 27 53- Orthogonal Trajectories. Optional 36 54- Existence and Uniqueness of Solutions for Initial Value Problems *6th Quiz		*6th Quiz
19	4		55-Homogeneous Linear ODEs of Second Order 56-Homogeneous Linear ODEs with Constant Coefficients		
20	4		57- Differential Operators. Optional 58- Modeling of Free Oscillations of a Mass–Spring System		
21	4		59- Euler–Cauchy Equations 60- Existence and Uniqueness of Solutions. Wronskian		
22	4		61- Nonhomogeneous ODEs 62- Modeling: Forced Oscillations. Resonance		
23	4		63- Modeling: Electric Circuits 64-Solution by Variation of Parameters *7th Quiz		*7th Quiz
24	4		Series Solutions of ODEs. Special Functions 65- Power Series Method 66- Legendre's Equation. Legendre Polynomials Pn(x)		
25	4		67- Extended Power Series Method: Frobenius Method 68- Bessel's Equation. Bessel Functions J(x) 69- Bessel Functions of the Y(x). General Solution *8th Quiz		*8th Quiz
26	4		Laplace Transforms 70- Laplace Transform.		

			Linearity. First Shifting Theorem (s-Shifting) 71- Transforms of Derivatives and Integrals. ODEs		
27	4		72- Unit Step Function (Heaviside Function). Second Shifting Theorem (t-Shifting)		
28	4		73- Short Impulses. Dirac's Delta Function. Partial Fractions 74- Convolution. Integral Equations		
29	4		75- Differentiation and Integration of Transforms. ODEs with Variable Coefficients 76- Systems of ODEs		
30	4		77- Laplace Transform: General Formulas 78- Table of Laplace Transforms *9th Quiz		*9th Quiz

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- George B. Thomas Jr., Maurice D. Weir, Joel R. Hass-Thomas' Calculus_ Early Transcendentals (13th Edition)-Pearson 2- Advanced Engineering Mathematics By Erwin Kreyszig 10th edition
Special requirements (include for example workshops, periodicals, IT software, websites)	Microsoft Mathematics V5.
Community-based facilities (include for example, guest Lectures, internship, field studies)	No

12. The development of the curriculum plan

COURSE SPECIFICATION – Year Three

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	Collage of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Electrical Machines II / EE305**
4. Modes of Attendance offered	Full time attendance
5. Semester/Year	2022-2023 (annual)
6. Number of hours tuition (total)	90
7. Date of production/revision of this specification	October, 2022

8. Aims of the Course

The aim of this annual material is to help undergraduate students to understand more about various types of AC Electrical Machines. The student starts the course by understanding how electrical power is generated and what types of machines can do that. Also, AC machines motoring mode of operation will be investigated in the first term. Then students will learn about Asynchronous AC machines focusing on the motoring mode of operation. They will be able to explore these machines analytically and practically, and solve problems including various point of their operating conditions. After finishing this material with successful progression, students will be able to take other courses based on this course like, power electronics and AC motors speed control.

9· Learning Outcomes, Teaching, Learning and Assessment Methods

A- Cognitive goals

A1. Understand what the basics and advanced laws of AC electrical machines.

A2. Make the students be familiar with the theoretical calculation of machines performance parameters.

A3. Make the students able to assess and predict machine operational characteristics.

B. The skills goals special to the course

B1.**Solid knowledge of basic mathematics rules, DC machines and Transformers.**

B2. **Solid knowledge of the Electrical Circuit Fundamentals and analysis techniques .**

Teaching and Learning Methods

1- Lecture notes (Pdf).
2- Google meet lecturing including mind storm questioning.
3- Internet based home works via google classroom like assignments, quizzes and problems solving.
4- Others like you tube videos about electrical machine manufacturing and operation .

Assessment methods

1- Short tests and quizzes (30%).
2- Final long test (70%).

C. Affective and value goals

C1. AC machines problem solving.

C2. Homework leading to problem solving of specified subjects.

Teaching and Learning Methods

1- Interactive on line lecturing including short quizzes.
2- Hand out lecture notes (pdf format).
3- Assignments.
4- Seminars and class discussions.

Assessment methods

E-Quizzes, E-assignments and final examination(s).

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. **The most important skill students can acquire during the first term of this material is to understand the AC machine construction, principles of operation in both generating and motoring modes and testing of synchronous machines. This is very important for future**

employability with the Ministry of Electricity.

D2. **Easy to hard levels home works besides class mind storm questions to prepare students to sudden questions that may be asked face to face when a graduates start seeking a job. Face to face contact is a very important skill that students must acquire.**

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Review on basic principles in electric machinery	E- Pdf Lecture + (Google - meeting)	1st term assignment
2	3		AC machinery principles: Generation of alternating emf; 3-phase AC voltages	=	Mind storm
3	3		Rotating magnetic field waves in AC machines; reversal of magnetic field rotation	=	Mind storm
4	3		Construction of AC synchronous and Asynchronous machines	=	Mind storm
5	3		Winding distribution in Ac machines	=	Mind storm
6	3		Tutorial	Google form	Quiz
7	3		Synchronous generator equivalent circuit and phasor diagram	E- Pdf Lecture + (Google - meeting)	Mind storm
8	3		Synchronous generator: Power and torque, Measuring model parameters	Google form	Quiz
9	3		Synchronous generators operating alone	E- Pdf Lecture + (Google - meeting)	Mind storm
10	3		Parallel operation of synchronous generators	Google form	Quiz
11	3		Parallel operation of synchronous generators	E- Pdf Lecture + (Google - meeting)	Mind storm
12	3		Effect of salient poles	Google form	Quiz

13	3		Synchronous motor: principle of operation and equivalent circuit	E- Pdf Lecture + (Google - meeting)	Mind storm
14	3		Steady state synchronous motor =operation	=	Mind storm
15	3		Synchronous motor: Torque –speed characteristics, effect of load changes, effect of field current changes	=	Mind storm
Midyear break					
16	3		The synchronous capacitor, starting of synchronous motor	Google form	Quiz
17	3		Three phase induction motor: Construction and basic concepts	E- Pdf Lecture + (Google - meeting)	2nd term assignment
18	3		Equivalent circuit of three phase induction motor	E- Pdf Lecture + (Google - meeting)	Mind storm
19	3		Power and torque of three phase induction motor	Google form	Quiz
20	3		Torque speed characteristics of three phase induction motor & starting of three phase induction motor	E- Pdf Lecture + (Google - meeting)	Mind storm
21	3		Speed control of three phase induction motor	E- Pdf Lecture + (Google - meeting)	Mind storm
22	3		Determination circuit model parameters of three phase induction motor	Google form	Quiz
23	3		The three phase induction generator: principle of operation	E- Pdf Lecture + (Google - meeting)	Mind storm
24	3		Single phase induction motor: revolving field theory and cross field theory	Google form	Quiz
25	3		Starting of single phase induction motor	E- Pdf Lecture + (Google - meeting)	Mind storm
26	3		Speed control of single phase induction motor	=	Mind storm
27	3		The circuit model of single phase induction motor	=	Mind storm
28	3		Other types of motors: reluctance motor	Google form	Quiz

				E- Pdf Lecture +	

11. Infrastructure	
1. Books Required reading:	1- Electrical Machines by S. K. Sahdev, Cambridge University Press, 2018. 2- Electric Machinery and Transformers by B. S. Guru and H. R. Hiziroglu, 3ed Ed., Oxford University Press, 2001.
2. Main references (sources)	Lecture notes (pdf files), power point presentations (recorded videos)
A- Recommended books and references (scientific journals, reports…).	Prefer to arrange a visit to a factory or maintenance workshops of electrical machinery, as well as a visit to one of the electrical power generation plants
B-Electronic references, Internet sites…	YouTube recorded videos

12. The development of the curriculum plan
Well organized lecture notes collected from more than 7 reference books in electrical machine analysis and design. Also, some machine graphical tools are used to make some topics of this course be more readable with in depth visualization to machine structure.

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Electrical engineering Department
3. Course title/code	**Electronics-II / EE302**
4. Modes of Attendance offered	Full time
5. Semester/Year	Third Year
6. Number of hours tuition (total)	90
7. Date of production/revision of this specification	Dec. 2022

9. Aims of the Course

- **To teach the analysis and design of analog integrated circuits:**
- Basic amplifier stages at low and high frequencies
- Basic stages of operational amplifier: differentisl amplifier, multistage amplifiers, level shifter, and output stage design
- Bias techniques in ICs
- Feedback amplifier
- Teach the applications of the electronic devices: wave generation, wave shaping circuit,analog multipliers, PLL, and the usage of operational amplifiers in different applications.

9· Learning Outcomes, Teaching ,Learning and Assessment Methods

I- Knowledge and Understanding

A1. Design details, principle of operation, performance, and analysis of analog integrated circuits.

A2. Applications of analog integrated circuits

B. Subject-specific skills

Teaching and Learning Methods

1.Face to Face Lectures.

2. Group Exercises.

Assessment methods

A module assessment will have two components:

1.weekly Quizzes 30% weight.

2. Final written Exam. 70% weight.

C. Thinking Skills

C1.

Teaching and Learning Methods

1.Face to Face Lectures.

2. Group Exercises.

Assessment methods

A module assessment will have two components:

1.weekly Quizzes 30% weight.

2. Final written Exam. 70% weight.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Basic IC amplifier stages at low frequencies	Lectures	Quizes, Assignments, and Seminars
2	3		Biasing techniques for ICs	=	=
3	3		BJT differential amplifier: structure and transfer characteristics	=	=
4	3		BJT differential amplifier: small signal analysis	=	=
5	3		FET differential amplifier: structure and transfer characteristics	=	=
6	3		FET differential amplifier: small signal analysis	=	=
7	3		Differential amplifier with active loads	=	=
8	3		Tutorial	=	=
9	3		Feedback amplifiers: Classifications of amplifiers & feedback amplifier characteristics	=	=
10	3		Feedback amplifiers: Outlines of analysis of feedback amplifiers	=	=
11	3		Feedback amplifiers: Tutorial	=	=

12	3		Output stage: Class A & Class B	=	=
13	3		Output stage: Class AB & Tutorial	=	=
14	3		BJT and BiCMOS operational amplifier design	=	=
15	3		Tutorial: 741 analysis	=	=
16	3		Op-amp applications: linear applications	=	=
17	3		Op-amp applications: nonlinear applications	=	=
18	3		- Equivalent circuit of electronic devices at high frequencies - Frequency response parts of a typical amplifier	=	=
19	3		High frequency response of amplifiers	=	=
20	3		Low frequency response of amplifiers	=	=
21	3		Tutorial	=	=
22	3		Linear oscillator: Basic principles and phase-shift oscillators	=	=
23	3		Wien-Bridge Oscillator	=	=
24	3		LC oscillators: Colpitts and Hartley oscillators	=	=
25	3		Tuned oscillator and Tutorial	=	=

26	3		Multivibrators: transistor based bistable MV	=	=
27	3		Multivibrators:monostable and astable MV	=	=
28	3		IC based Multivibrators	=	=
29	3		Analog multipliers	=	=
30	3		Phase Locked Loop (PLL)	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	A. Module Handout B. The following texts: 1. Analysis and Design of Analog Integrated Circuits" By: Paul R. Gray 2. "Microelectronics: Circuit Analysis and Design" By: Donald A. Neamen 3. "Electronic Devices and Circuits" by Millman & Halkias **4.** "Microelectronic Circuits" By: A. S. Sedra & K.
Special requirements (include for example workshops, periodicals, IT software, websites)	Multisim
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Electrical engineering Department
3. Course title/code	**Engineering Analysis / EE303**
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023
6. Number of hours tuition (total)	90
7. Date of production/revision of this specification	21-11-2022
8. Aims of the Course	
The purpose of this course, is to provide the concepts and theory of signals and systems needed in almost all electrical engineering fields and in many other engineering and science disciplines as well.	

9· Learning Outcomes, Teaching ,Learning and Assessment Methods

J- Knowledge and Understanding

A1. Understanding the continuous and digital electrical systems and identifying their most important characteristics.

A2- Dealing with the signal and systems in the time and frequency domains.

A3- Signals and systems analysis using Fourier Series.

A4- Signal and system analysis using the Laplace Transform.

A5- Analyzing signals and systems using the Z-Transform.

B. Subject-specific skills

B1. Mathematical ability to analyze engineering systems in all time and frequency domains.

B2 - Analyzing the various electrical systems and dealing with them in fields of frequency.

Teaching and Learning Methods

1. Attended lectures
2. Panel discussions
3. Solve examples in groups
4. Weekly homework

Assessment methods

1. Weekly or monthly examinations representing 30% of the assessment score
2. A final written exam that lasts 3 hours, which represents 70% of the assessment score

C. Thinking Skills

C1.

C2.

C3.

Teaching and Learning Methods

Assessment methods

The daily oral and written examinations in addition to the final written examination

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.

D2.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Definition of the signals and the systems with its classifications and an explanation of some of their characteristics	Attended Lectures	A daily written exam for 15 minutes, in addition to the final written exam for a period of 3 hours
2	3		Explanation of some known and required (continuous) signals to deal with electrical systems, with solving illustrative examples	=	=
3	3		Analyzing digital signals with an explanation of their characteristics	=	=
4	3		Explanation of linear time invariant LTI systems	=	=
5	3		Response of a Discrete-Time LTI System and Convolution Sum	=	=
6	3		Systems described by differential equations	=	=
7	3		Characteristics of discrete time systems LTI	=	=
8	3		Systems described by the difference equations	=	=
9	3		Explanation of the Laplace Transform	=	=
10	3		Laplace transforms of some common signals	=	=
11	3		Characteristics of the Laplace Transform	=	=
12	3		Inverse Laplace Transform	=	=
13	3		Transfer function analysis using Laplace transform	=	=
14	3		Unilateral Laplace Transform	=	=
15	3		Solve differential equations using the Laplace Transform	=	=

16	3		Solved various Examples	=	=
	3		**Half – year break**		
17	3		Explanation of Z transform	=	=
18	3		z- Transform of some common sequences	=	=
19	3		Characteristics of z-Transform	=	=
20	3		Explanation of the inverse Z-Transform	=	=
21	3		System functionality for discrete time systems LTI	=	=
22	3		Unilateral Z-Transform	=	=
23	3		Solve differential equations using the z transform	=	=
24	3		Solve various questions	=	=
25	3		Fourier analysis of continuous time signals	=	=
26	3		Representation of the Fourier series of periodic signals	=	=
27	3		Representation properties using Fourier series	=	=
28	3		Explanation of the Fourier transform	=	=
29	3		Properties of the continuous Fourier transform	=	=
30	3		Frequency response for continuous time LTI systems	=	=
31	3		Solving differential equations using the Fourier transform	=	=
32	3		Filtering and Bandwidth		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Daily Lectures 2. The following Books: 1. Hsu, Hwei P. Schaum's outlines of theory and problems of signals and systems. McGraw-Hill, 1995. 2. Willsky, Alan S., and Ian T. Young. Signals and systems. Prentice-Hall International, 1997. 3. Oppenheim, Alan V. Discrete-time signal processing. Pearson Education India, 1999. 4. Haykin, Simon, and Barry Van Veen. Signals and systems. John Wiley & Sons, 2007. 5. Lathi, Bhagwandas Pannalal. Signals and systems. Berkeley-Cambridge Press, 1987.
Special requirements (include for example workshops, periodicals, IT software, websites)	The topic needs to be solved extensive questions so it is preferable to do periodic lectures only to solve tutorials
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development to the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Center	Electrical engineering Department
3. Course title/code	**English Language (3) / EE309**
4. Program (s) to which it contributes	BSc in Electrical Engineering
4. Modes of Attendance offered	Full time
5. Semester/Year	2022-2023 (Annual)
6. Number of hours tuition (total)	30
7. Date of production/revision of this specification	Nov.2022
8. Aims of the Course	

The aim of this course is to empower students with the language and life skills they need to carry out their career goals. To this end it provides ample opportunities for students to build awareness and practice language in real-life scenarios. The integrated skills approach of the course develops the student's self-confidence to survive and succeed in professional and social encounters within an English-speaking global community.

9· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Knowledge and Understanding

A1. Understanding texts using effective learning strategies for reading and vocabulary building
A2. Developing conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations
A3. Finding and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries
A4. Demonstrating an appropriate level of control of grammatical accuracy and lexical appropriacy in academic communication.

B. Subject-specific skills

B1. Recognizing parts of speech and types of sentences according to structure and function
B2. Producing simple, compound, complex and compound-complex sentences
B3. Producing declarative, interrogative, imperative and exclamatory sentences
B4. Writing paragraphs with topic sentences and supporting details
B5. Writing cohesive coherent essays; Making an oral presentation

Teaching and Learning Methods

Lecturing and Exercises

Assessment methods

Exams

C. Thinking Skills

C1. Being able to form personal opinions about issues through critical reading and listening
C2 Arguing for and defending a position in a clear and structured way using academic sources, through writing and speaking.

Teaching and Learning Methods

Lecturing & Class discussions.

Assessment methods

Exams

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Effective communication in written and spoken English

D2. Team work

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	1		Introduction	Lectures & Exercises	Exams
2	1		Unit One: It's a wonderful world (pp.6-11)	=	=
3	1		Unit One: It's a wonderful world (pp. 12 -13) and Writing (p.103)	=	=
4	1		Unit Two: Get Happy (pp.14-17)	=	=
5	1		Unit Two: Get Happy (pp.18-21) and Writing (p.104)	=	=
6	1		Unit Three: Telling Tales (pp.22-25)	=	=
7	1		Unit Three: Telling Tales (pp.26-29) and Writing (p.106)	=	=
8	1		Unit Four: Doing the right thing (pp.30-33)	=	=
9	1		Unit Four: Doing the right thing (pp.34-37) and Writing (p.108)	=	=
10	1		Exam (1)	=	=
11	1		Unit Five: On the move (pp.38-43)	=	=
12	1		Unit Five: On the move (pp 44 -45) and Writing (p.109)	=	=

13	1		Unit Six: I just love it! (pp.46-50)	=	=
14	1		Unit Six: I just love it! (pp.51-53) and Writing (p.110)	=	=
15	1		ESP	=	=
16			Mid-Year Break	=	=
17			Mid-Year Break		
18	1		Unit Seven: The world of work (pp.54-58)	=	=
19	1		Unit Seven: The world of work (pp.59-61) and Writing (p.112)	=	=
20	1		Exam (2)	=	=
21	1		Unit Eight : Just imagine! (pp. 62-67)	=	=
22	1		Unit Eight : Just imagine! (pp. 68-69) and Writing (p.114)	=	=
23	1		Unit Nine: Getting on together (pp. 70-73)	=	=
24	1		Unit Nine: Getting on together (pp. 74-77) and Writing (p.116)	=	=
25	1		Unit Ten: Obsessions (pp.78-83)	=	=
26	1		Unit Ten: Obsessions (pp.84-85) and Writing (p.117)	=	=
27	1		ESP	=	=
28	1		Unit Eleven: Tell me about it! (pp.86-89)	=	=

29	1		Unit Eleven: Tell me about it! (pp.90-93) and Writing (p.118)	=	=
30	1		ESP	=	=
31	1		Unit Twelve: Life's great events! (pp.94-97)	=	=
32	1		Unit Twelve: Life's great events! (pp.98-101) and Writing (p.119)	=	=

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Textbook: New Headway Plus[Student's Book and Workbook with key for Intermediate Level] by John and Liz Soars, Oxford: Oxford University Press 2006 2. Internet links related to the topics discussed in the book and class
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad-College of Engineering
2. University Department/Centre	Electrical engineering Department
3. Course title/code	**Computer Architecture/EE307**
4. Program (s) to which it contributes	BSc in Electrical Engineering
5. Modes of Attendance offered	On-line- full time
6. Semester/Year	2022-2023
7. Number of hours tuition (total)	60
8. Date of production/revision of this specification	2022/12/5

9. Aims of the Course

Provides the basic knowledge necessary to understand the hardware operation of digital computers & covers the three subjects associated with computer hardware. Deals with computer architecture as well as computer organization and design.

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

Knowledge and Understanding

A1. Understanding academic texts, using effective learning strategies .
A2. Developing computer hardware skills necessary for becoming a contributing for designing and solving the scientific problem and research.
A3. Finding and understand information about academic study, designing capabilities, usage, and capability for analysisiing the scientific problems.
A4. Demonstrating an appropriate level of control of analysis of many problems in academic and industrial fields.

B. Subject-specific skills

B1. Firstly cover material needed for the basic understanding of computer organization, design, & programming of simple digital computer.
B2. Give detailed steps that a designer must go through in order to design an elementary basic computer.
B3. Dealing with the organization & architecture of the central processing unit.
B4. Presenting the organization & architecture of input-output & memory.
B5. Introducing the concept of multiprocessing.
B6. Vector Processing: Principles of vector processing, vector operation, Matrix multiplication, Memory interleaving, Supercomputers.
B7.I/O Organization: Introduction to Peripherals & their interfacing. Strobe based and handshake-based communication, DMA based data transfer, I/O processor.
B8. Parallel Processing: Characteristics of Multiple Processors, Interconnection structure and arbitration, Inter process communication and synchronization
B9. Multi-core Computers: Hardware and software performance, Multi-core organization.
B10. Explain the advance in microprocessors

Teaching and Learning Methods

- Lecturing and Exercises
- On-line meeting

Assessment methods

- Exams
- Tutorial
- Homeworks

C. Thinking Skills

C1. Asking the student to give solution for any problem through the lecture
C2. Give many questions and scientific problems using academic sources.

Teaching and Learning Methods

Lecturing & on-line Classroom meeting with discussions, activities.

Assessment methods

Exams that involve problem-solving skills and critical thinking skills, practically and theoretically.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. The sharing among the students to solve the weekly homework.

10. Course Structure					
Week	**Hours**	**ILOs**	**Unit/Module or Topic Title**	**Teaching Method**	**Assessment Method**
1	2	A+B+C+D	Register Transfer & Computer Organization: Data movement around registers. Data movement from/to memory,	Lecturing & on line meeting tests.	Exam
2	2	A+B+C+D	arithmetic and logic micro operations. Concept of bus and timing in register transfer.	Lecturing & on line meeting tests.	Exam
3	2	A+B+C+D	Basic Computer Organization: Computer	Lecturing & on line meeting tests.	Exam
4	2	A+B+C+D	Instructions, Timing and Control, Execution of Instructions,	Lecturing & on line meeting tests.	Exam
5	2	A+B+C+D	Design of Basic Computer.	Lecturing & on line meeting tests.	Exam
6	**Exam (1)**				
7	2	A+B+C+D	Micro programmed Control Unit: Basic organization of micro programmed control unit, Microinstruction formats, Address sequencer.	Lecturing & on line meeting tests.	Exam
8	2	A+B+C+D	CPU Organization: Addressing Modes, Instruction Format..	Lecturing & on line meeting tests.	Exam
9	2	A+B+C+D	CPU organization with large registers, stacks and handling of interrupts & subroutines	Lecturing & on line meeting tests.	Exam
10	**Exam (2)**				

11	2	A+B+C+D	Pipelining: Parallel Processing Principle of pipelining, Instruction and arithmetic pipelines, Hazards of pipelining.,	Lecturing & on line meeting tests.	Exam
12	2	A+B+C+D	Vector Processing: Principles of vector processing, vector operation, Matrix multiplication,	Lecturing & on line meeting tests.	Exam
13	2	A+B+C+D	Memory interleaving, Supercomputers.	Lecturing & on line meeting tests.	Exam
14	2	A+B+C+D	I/O Organization:	Lecturing & on line meeting tests.	Exam
15	2	A+B+C+D	Introduction to Peripherals & their interfacing.	Lecturing & on line meeting tests.	Exam
16	2	A+B+C+D	Strobe based and handshake-based communication,	Lecturing & on line meeting tests.	Exam
			Half – year break		
17	2	A+B+C+D	DMA based data transfer, I/O processor.	Lecturing & on line meeting tests.	Exam
18	2	A+B+C+D	Memory Organization: Concept of RAM/ROM, basic cell of RAM	Lecturing & on line meeting tests.	Exam
19	2	A+B+C+D	Associative memory, Cache memory organization, Virtual memory organization	Lecturing & on line meeting tests.	Exam
20	**Exam (3)**				
21	2	A+B+C+D	Parallel Processing Characteristics of Multiple Processors,	Lecturing & on line meeting tests.	Exam

22	2	A+B+C+D	Interconnection structure and arbitration	Lecturing & on line meeting tests.	Exam
23	2	A+B+C+D	Inter process communication and synchronization.	Lecturing & on line meeting tests.	Exam
24	2	A+B+C+D	Multi-core Computers: Hardware and software performance,	Lecturing & on line meeting tests.	Exam
25	2	A+B+C+D	Multi-core organization.	Lecturing & on line meeting tests.	Exam
26	2	A+B+C+D	Survey of microprocessors: (the 80188/80186, 80286, 80386 and 80486	Lecturing & on line meeting tests.	Exam
27	**Exam (4)**				
28	2	A+B+C+D	microprocessors, the Pentium and Pentium Pro microprocessors	Lecturing & on line meeting tests.	Exam
29	2	A+B+C+D	the Pentium II, Pentium III, Pentium 4, core2 microprocessors).	Lecturing & on line meeting tests.	Exam
30	**Final Exam**				

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Morrise Mano, "computer System architecture", 3rd Edition, Prentice Hall. 2. Mostara Abd-El-Barr, Hesham El-Rewini, "Fundamentals of Computer Organization and Architecture", John Wiley, 2005. 3. David A. Patterson, John L. Hennessy, "Computer Organization and Design", Arm Edition, Elsevier, 2010. 4. .Barry B. Brey, "The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, and Pentium Pro processor Architecture, Programming, and Interfacing", 6th Edition, Prentice-Hall Inc., 2003.

Special requirements (include for example workshops, periodicals, IT software, websites)	Internet links related to the topics discussed in the book, and class.
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	Collage of Engineering / University of Baghdad
2. University Department/Centre	Electrical Engineering Department
3. Course title/code	**Electrical Power I**
4. Program(s) to which it contributes	B.Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time attendance
6. Semester/Year	
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	20/10/2022

9. Aims of the Course

The aim of this annual material is to produce graduate with advanced knowledge and understanding of the principles of Electrical power systems. The student starts the course by understanding conventional topics like the elements of power systems: Radial, Parallel, Ring and interconnected systems and so forth all electrical power parts working and issues principles will be covered within this subject. Students those who understand most subject parts will be able to explore the economic operation of power system and to solve problems including all the above subjects. After finishing this material with successful progression, students will be able to take other courses based on this course like load flow studies, economic load dispatch, state estimation in power system .

10· Learning Outcomes, Teaching, Learning and Assessment Methods

L- Knowledge and Understanding

A1.Understand what the basic and advanced of generation of electrical energy, elements of power system.

A2. Make the students be familiar with the theoretical calculation of the electrical design of the overhead transmission line, corona, sag and stress calculation .

A3. Make the students able to assess and predict performance of electrical power systems.

B. Subject-specific skills

B1√Solid knowledge of basic mathematics rules, exponents and solving simultaneous system of linear equations using matrices rule.

B2. Solid knowledge of the electrical circuit fundamentals.

Teaching and Learning Methods

5- Lecture notes.
6- Internet based HomeWorks.
7- Others like assignments and quiz assignments.

Assessment methods

3- Short tests (30%).
4- Long test (70%).

C. Thinking Skills

C1. Problem solving in electrical power system.

C2. Homework leading to problem solving of electrical power plants, generation, transmission, distribution systems.

Teaching and Learning Methods

We use the blackboard and wide screen to introduce the students to this course, we also let the students to participate in the problem-solving process in the class and by giving them HomeWorks, and mind storm sudden class questions, Now we also use Google classroom application for electronic education, G form and G meet .

Assessment methods

Quizzes and midterm examinations

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.√The most important skill students can acquire during the first term of this material is to understand the elements of electrical power system via some home works that are arranged in a manner from easy up to hard level. Also, class room mind storm questions prepare students to sudden questions that may be asked when a graduate starts searching for a job.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		General background	Lecture	
2	3		Elements of power system	Lecture	
3	3		Radial, Parallel and Ring interconnected system	Lecture	
4	3		Transmission line constants	Lecture	
5	3		Transmission line constants, reactance's	Lecture	Test (short test)
6	3		Transmission line constants, capacitance	Lecture	
7	3		Tutorial	Lecture	
8	3		Performance of short TL	Lecture	
9	3		Performance of medium TL	Lecture	
10	3		Performance of long TL	Lecture	Test (long test)
11	3		Tutorial	Lecture	

12	3		ABCD constant: general 2 port	Lecture	
13	3		ABCD constant: general 2 port	Lecture	Test (short test)
14	3		Overhead TL insulator Low voltage	Lecture	
15	3		Overhead TL insulator Medium voltage	Lecture	
16	3		Overhead TL insulator High Voltage	Lecture	
17	3		Corona	Lecture	
18	3		Overhead TL sag and stress calculations 1	Lecture	
19	3		Overhead TL sag and stress calculations 2	Lecture	
20	3		Tutorial	Lecture	
21	3		Power circle diagram	Lecture	
22	3		Tutorial	Lecture	
23	3		Conductors types	Lecture	
24	3		Tutorial	Lecture	
25	3		Performance of underground cables	Lecture	

26	3		Performance of underground cables	Lecture	
27	3		Tutorial	Lecture	
28	3		Economic operation of power system	Lecture	
29	3		Economic operation of power system	Lecture	
30	3		Tutorial	Lecture	

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- Principles of power system by V.K. Mehta Rohit Mehta. 2- Electrical power systems by C L WADHWA 3- Electrical power by Abd AL sahib Hassan
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship, field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	Baghdad University
2. University Department/Centre	College of Engineering/Department of Electrical Engineering
3. Course title/code	**Antenna and Propagation / EE301**
4. Programme(s) to which it contributes	Electrical Engineering
5. Modes of Attendance offered	Internal
6. Semester/Year	Third Year Class
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	2022
9. Aims of the Course	
1- The student learns the fundamental solutions of time-varying Maxwell's equations, and applies them to design antennas. 2- The student understands radio wave propagation phenomena in modern communication systems, and fundamentals of electromagnetic radiation with application to antenna theory and design.	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

A1. Concepts and theories of mathematics and sciences, appropriate to the antennas.

A2. Characteristics of engineering materials related to the

antennas.

A3. Principles of design including elements design, process and/or a system related to specific antennas.

A4. Current engineering technologies as related to antennas

B. Subject-specific skills

B1. Select appropriate mathematical and computer-based methods for modeling and analyzing problems.

B2. Select appropriate solutions for engineering problems based on analytical thinking.

B3. Investigate the failure of components, systems, and processes.

B4. Analyze results of numerical models and assess their limitations.

B5. Synthesis and integrate electronic systems for certain specific function using the right equipment.

Teaching and Learning Methods

-Lectures

- Tutorials

- case studies

- Research assignments

Assessment methods

- Weekly sheet exercises at class room

- Quizzes

- Case study for more demonstration.

- Midterm, and final exams

C. Thinking Skills

C1 Select appropriate mathematical and computer-based methods for modeling and analyzing problems.

C2. Select appropriate solutions for engineering problems based on analytical thinking.

C3. Investigate the failure of components, systems, and processes.

C4. Analyze results of numerical models and assess their limitations.

C4. Synthesis and integrate electronic systems for certain specific function using the right equipment

Teaching and Learning Methods

-Lectures; - Tutorials ; - Case studies and - Research assignments

Assessment methods

- Weekly sheet exercises at class room

- Quizzes

- Case study for more demonstration.

- Midterm, and final exams

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Collaborate effectively within multidisciplinary team.

D2. Communicate effectively.

D3. Search for information and engage in life-long self-learning antennas.

D4. Refer to relevant literatures

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	B	Introduction to Maxwell's equations	Lectures and Tutorials	Exam
2	3	A+B+C+D	Antenna parameters	Lectures and Tutorials	Exam
3	3	A+B+C+D	Infinitesimal dipole	Lectures and Tutorials	Exam
4	3	A+B+C+D	Small dipole	Lectures and Tutorials	Exam
5	3	A+B+C+D	Finite length dipole	Lectures and Tutorials	Exam
6	3	A+B+C+D	Half wavelength dipole	Lectures and Tutorials	Exam
7	3	A+B+C+D	Image theory	Lectures and Tutorials	Exam

8	3	A+B+C+D	Loop antenna	Lectures and Tutorials	Exam
9	3	A+B+C+D	Helical Antenna	Lectures and Tutorials	Exam
10	3	A+B+C+D	Arrays	Lectures and Tutorials	Exam
11	3	A+B+C+D	Yagi-Uda Antenna	Lectures and Tutorials	Exam
12	3	A+B+C+D	Microstripe antenna	Lectures and Tutorials	Exam
13	3	A+B+C+D	Fractal antenna	Lectures and Tutorials	Exam
14	3	A+B+C+D	Radar Equation	Lectures and Tutorials	Exam
15	3	A+B+C+D	Propagation mechanisms	Lectures and Tutorials	Exam

16	3	A+B+C+D	Wave equation	Lectures and Tutorials	Exam
17	3	A+B+C+D	Type of Mediums	Lectures and Tutorials	Exam
18	3	A+B+C+D	Depth of penetration	Lectures and Tutorials	Exam
19	3	A+B+C+D	Polarization	Lectures and Tutorials	Exam
20	3	A+B+C+D	Reflection, refraction, and diffraction.	Lectures and Tutorials	Exam
21	3	A+B+C+D	Transmission Line	Lectures and Tutorials	Exam
22	3	A+B+C+D	Coupled lines	Lectures and Tutorials	Exam
23	3	A+B+C+D	Impedance matching	Lectures and Tutorials	Exam

24	3	A+B+C+D	S- parameters	Lectures and Tutorials	Exam
25	3	A+B+C+D	Two plate Wave guide	Lectures and Tutorials	Exam
26	3	A+B+C+D	Rectangular Wave guide	Lectures and Tutorials	Exam
27	3	A+B+C+D	Circular Wave guide	Lectures and Tutorials	Exam
28	3	A+B+C+D	Wave guide Resonator	Lectures and Tutorials	Exam
29	3		Final Exam		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	3. C. A. Balanis, “Antenna Theory: A Review,” Proc. IEEE, Vol. 80, No. 1, pp. 7–23, January 1992. 2. L. V. Blake, Antennas, Wiley, New York, 1966, p. 289. 2. J. D. Kraus, Antennas, McGraw-Hill, New York, 1988.
Special requirements (include for example workshops, periodicals, IT software, websites)	CST package, EZNEC software
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12 The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	Collage of Engineering / University of Baghdad
2. University Department/Centre	Electrical Engineering Department
3. Course title/code	**CONTROL ENGINEERING I / EE308**
4. Program (s) to which it contributes	B.Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time attendance
6. Semester/Year	Year 2022/2023
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	12/2022
9. Aims of the Course	
The aim of this course (annual) material is to be able to attach control engineering performances. The student starts the course by understanding the basic concepts of classical control engineering. Then students will be able to explore the control system characteristics, and to solve problems including evaluating and also modifying and calibrating the behavior of different control systems in various applications. After finishing this material with successful progression, students will be able to take other courses based on this course like Control Engineering-II.	

9· Learning Outcomes, Teaching, Learning and Assessment Methods

M- Knowledge and Understanding

A1. Understand what the basic and advanced laws of Classic Control Engineering.

A2. Make the students be familiar with the theoretical calculation of control system behaviors.

A3. Make the students able to assess and predict control system stability, modification to control system responses in different applications.

B. Subject-specific skills

B1. **Solid knowledge of basic mathematics rules, exponents and solving simultaneous system of linear time invariant equations using many procedures and criteria.**

B2. **Solid knowledge of the design, evaluate, modify and implementations of different engineering systems.**

Teaching and Learning Methods:

8- Lecture notes.
9- Internet based home works.
10- Others like text books.
11- Explanation videos (through YouTube channels).

Assessment methods

5- Short tests (quizzes).
6- Long test (monthly exams).

C. Thinking Skills

C1. Problem solving.

C2. Homework leading to problem solving.

Teaching and Learning Methods

Previously, we were using the whiteboard to do lecturing. Nowadays, with Covid-19 worldwide issues, we use the online facilities (google classrooms and google meet) to introduce the students to this course, we also let the students to participate in the problem-solving process in the class and by giving them HomeWorks, and mind storm sudden online - class questions.

Assessment methods

Quizzes and midterm examinations

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. **The most important skill students can acquire during the first term of this material is to practice the subjects via some home works that are arranged in a manner from easy up to hard level. Also, class room mind storm questions prepare students to sudden questions that**

may be asked face when a graduate starts searching for a job, face-to-face contact is very important skill students must acquire.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction to Control Engineering		Direct Questions
2	2		Mathematical Model		Direct Questions
3	2		Describing the control system by differential equations		Direct Questions
4	2		Transfer Function		Direct Questions
5	2		Block Diagram Representation and block diagram reduction		Quiz
6	2		Signal Flow Graph and Mason's gain formula		Direct Questions
7	2		Studied cases and examples		Direct Questions
8	2		Servo motors: Armature controlled and field controlled		Direct Questions
9	2		Overall Exam		Exam
10	2		Time Response of control systems		Direct Questions
11	2		Time Response of first-order control systems		Direct Questions
12	2		Time Response of second-order control systems		Direct Questions
13	2		Impulse Response of control systems		Quiz
14	2		Time Response specifications for second order system in standard form		Direct Questions
15	2		Steady-State Error		Direct Questions
16	2		Overall Exam		Exam
17			MID YEAR HOLIDAY		
18	2		Control system stability		Direct Questions
19	2		Routh's Stability Criterion		Direct Questions

20	2		Special Cases in Routh's Stability Criterion and their indications		Direct Questions
21	2		Applications		Exam
22	2		Root-Locus Technique		Discussion
23	2		Procedure to draw the approximated root-locus		Discussion
24	2		Root-Locus Indications on control systems		Exam
25	2		Frequency Response of Control Systems		Direct Questions
26	2		Frequency response methods		Direct Questions
27	2		Bode plot		Direct Questions
28	2		Applied example		Direct Questions
29	2		Gain margin and phase margin		Direct Questions
30	2		Discussion and exam		Quiz
31	2		Final Exam		Final Exam

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- Given lectures. 2- Text Books.
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	Collage of Engineering / University of Baghdad
2. University Department/Centre	Electrical Engineering Department
3. Course title/code	**Communication I / EE306**
4. Program (s) to which it contributes	B.Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time attendance
6. Semester/Year	2022-2023 (annual)
7. Number of hours tuition (total)	90 H
8. Date of production/revision of this specification	Dec. 2022
9. Aims of the Course	
The aim of this course (annual) material is to make students understand the main objectives of communication system, main parts and differences in operation. The student starts the course by understanding the AM and FM modulations techniques, then proceed with understanding to the systems that can be used in such techniques. After finishing this material with successful progression, students will be able to take other courses based on this course like Comm. II.	

10· Learning Outcomes, Teaching, Learning and Assessment Methods

N- Knowledge and Understanding

A1. Understand what the basic and advanced laws of AM and FM.

A2. Make the students be familiar with the theoretical calculation of -------.

A3. Make the students able to assess and predict ----------.

B. Subject-specific skills

B1.√**Solid knowledge of basic mathematics rules, exponents and solving simultaneous system of linear equations using Cramer's rule.**

B2. **Solid knowledge of the ---------- .**

Teaching and Learning Methods

12- Lecture notes.
13- Internet based home works.
14- Others like experimental work.

Assessment methods

7- Short tests (30%).
8- Long test (70%).

C. Thinking Skills

C1. Problem solving.

C2. Homework leading to problem solving.

Teaching and Learning Methods

We use the blackboard and wide screen to introduce the students to this course, we also let the students to participate in the problem-solving process in the class and by giving them HomeWorks, and mind storm sudden class questions.

Assessment methods

Quizzes and midterm examinations

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. √**The most important skill students can acquire during the first term of this material is to ---------- via some home works that are arranged in a manner from easy up to hard level. Also, class room mind storm questions prepare students to sudden questions that may be asked face when a graduate starts searching for a job, face-to-face contact is very important skill students must acquire.**

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Signals and spectrums	Lecture	
2	3		Reasons for modulation and types of modulations	Lecture	
3	3		Normal AM modulation	Lecture	
4	3		DSB-SC	Lecture	
5	3		SSB-SC	Lecture	Test (short test)
6	3		VSB	Lecture	
7	3		QAM and heterodyne AM receiver	Lecture	
8	3		FM and PM	Lecture	
9	3		NBFM	Lecture	
10	3		WBFM	Lecture	Test (long test)
11	3		Generation of FM signals (wide and narrow).	Lecture	
12	3		Detection of FM signals	Lecture	
13	3		Detection of FM signals	Lecture	Test (short test)
14	3		FDM and Heterodyne FM receiver	Lecture	
15	3		Noise (AWGN)	Lecture	
16	3		PSD of noise	Lecture	

17	3		Effective noise temperature and noise figure	Lecture	
18	3		Noise in normal AM, DSB, **SSB, and in FM**	Lecture	
19	3		Discrete type of modulation	Lecture	
20	3		Digital types of modulation and line Codes	Lecture	
21	3		Baseband digital systems PCM and DPCM	Lecture	
22	3		DM and ADM	Lecture	
23	3		Bandpass digital systems ASK	Lecture	
24	3		FAK, CPFSK, MSK	Lecture	
25	3		PSK, BPSK, QPSK, OQPSK, 8PSK	Lecture	
26	3		Types of digital QAM	Lecture	
27	3		Noise and probability of error in digital systems	Lecture	
28	3		Error detection codes	Lecture	
29	3		CRC	Lecture	
30	3		TDM systems	Lecture	

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	3- Communication systems by Carlson fifth edition. 4- Introduction to communication systems by Stremler 3rd edition.
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION – Year Four

COURSE SPECIFICATION

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. It should be cross-referenced with the program specification.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Digital Systems Design / EE403**
4. Program(s) to which it contributes	B. Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time
6. Semester/Year	2022-2023 (Annual)
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	19/10/2022
9. Aims of the Course	
The aim of the course is to teach those methods of designing logical circuits which have evolved as useful and practical techniques.	

10· Learning Outcomes, Teaching ,Learning and Assessment Method
O- Knowledge and Understanding A1. Understanding the principles and making design of ADC & DAC circuits. A2. Designing sequence generators with applications. A3. Making analysis & design for synchronous and asynchronous state machines A4. Understanding implementation of semiconductor memory circuits and PLDs A5. Understanding principles and characteristics of different logic families.

B. Subject-specific skills
B1. Developing design methods for digital systems.
B2. Deciding which type of logic families is proper for specific digital systems design.
B3. Making oral scientific presentations.

Teaching and Learning Methods

Lecturing and giving examples.

Assessment methods

Exams

C. Thinking Skills
C1. Being able to form personal opinions about issues through critical reading and listening
C2. Arguing for and defending a scientific position in a clear and structured way using academic sources, through writing and speaking

Teaching and Learning Methods

Lecturing, class discussions and home works.

Assessment methods

Exams that involve problem-solving skills and critical thinking skills

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1. Team work.
D2. Effective communication with specialists in digital systems design field.

11. Course Structure

Week	Hours per Week	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 - 4	3	A+B+C +D	ADC & DAC Circuits	Lecturing, Discussions & Home Works	Exam
5 - 6	3	A+B+C +D	Sequence Generators	Lecturing, Discussions & Home Works	Exam
7 - 11	3	A+B+C +D	Analysis & Design of Synchronous State Machines	Lecturing, Discussions & Home Works	Exam
12 - 16	3	A+B+C +D	Analysis & Design of Asynchronous State Machines	Lecturing, Discussions & Home Works	Exam
17 - 18			Mid - Year Break		

19 - 22	3	A+B+C +D	Semiconductor Memory Circuits	Lecturing, Discussions & Home Works	Exam
23 - 26	3	A+B+C +D	Programmable Logic Devices	Lecturing, Discussions & Home Works	Exam
27 - 31	3	A+B+C +D	Logic Families	Lecturing, Discussions & Home Works	Exam
32	3		Final Exam		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	The text book used to teach this course is: M. Morris Mano, " Digital Design", 3rd edition, Prentice - Hall, Inc., 2002. As well as the following recommended references: • M. Morris Mano and C. R. Kime, "Logic and Computer design fundamentals". • V. G. Oklobdzija, "Digital Design and Fabrication". • P. Horowitz and W. Hill, "The Art of Electronics".
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet links related to the topics of the course.
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Electrical engineering Department
3. Course title/code	**Communications II / EE404**
4. Programme(s) to which it contributes	BSc in Electrical Engineering
5. Modes of Attendance offered	Full time
6. Semester/Year	2022-2023 (Annual)
7. Number of hours tuition (total)	60
8. Date of production/revision of this specification	Nov. 2022
9. Aims of the Course	
The aim of the course is to produce graduates with advanced knowledge and understanding of Digital communication systems principles;operation;performances, problem solving and ability to think rigorously and independently to meet higher level expectations of communication systems, academics, research	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

A-Knowledge and Understanding

A1. Understanding academic texts

A2. learns how to reflect the theoretical digital communication systems design to be practical systems

A3. Finding and understanding information about digital communication systems and the advantages and disadvantages of it.

B. Subject-specific skills

B1. Reading some useful papers related to digital communication systems

B2. Explore the web pages that concerned on digital communication systems

B3. Reading an arbitrary device manual to explore the digital communication systems from practical point of view.

Teaching and Learning Methods

1. Google classroom
2. Lecturing & Class discussions.
3. Group Exercises.

Assessment methods

A module assessment will have two components:

1. Quizzes 30% weight.
2. Final written Exam. 70% weight.

C. Thinking Skills

C1. Being able to form personal opinions about issues through attempting constructing the digital communication systems.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.

D2.

D3.

D4.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction to Information Theory	Lecturing, online class, Discussions & Exercises	Quizes and written final Exam
2	2		Source of information	=	=
3	2		Entropy	=	=
4	2		Source Coding Theorem	=	=
5	2		Mathematical model of information source	=	=
6	2		Huffman and Fano codes	=	=
7	2		Shannon code	=	=
8	2		Code Efficiency	=	=
9	2		Net Data transmitted	=	=
10	2		Channel capacity	=	=
11	2		Channel coding	=	=
12	2		Linear Block Code	=	=
13	2		Binary Cyclic Code	=	=
14	2		Convolutional Code	=	=
15	2		Viterbi Algorithm	=	=
			Half – year break	=	=

16	2		Probability of Error for Signal Detection in Additive White Gaussian Noise		
17	2		Probability of Error for Binary Modulation	=	=
18	2		Probability of Error for M-ary PAM	=	=
19	2		Probability of Error for Phase-Coherent PSK Modulation	=	=
20	2		Probability of Error for QAM	=	=
21	2		Comparison of Modulation Methods	=	=
22	2		Spread Spectrum Systems	=	=
23	2		Direct sequence spread spectrum	=	=
24	2		General Principles of CDMA	=	=
25	2		CDMA Transmission Channel Models	=	=
26	2		OFDM System	=	=
27	2		Mathematical description of an OFDM signal	=	=

28	2		OFDM parameters	=	=
29	2		OFDM architecture	=	=
30	2		MB-OFDM signal	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. "COMMUNICATION SYSTEMS ENGINEERING" by John G. Proakis and Masoud Salehi, 2nd edition 2002 2. Schaum's Outlines of analog and digital communications, by Hwei Hsu, Mc Graw Hill, 2003. 3. " Digital and analog communication systems by K. Sam, 1979
Special requirements (include for example workshops, periodicals, IT software, websites)	Prefer to arrange a visit to a communications center or communications companies.
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the program specification.

1. Teaching Institution	University of Baghdad
2. University Department/Centre	College of Engineering/Department of Electrical Engineering
3. Course title/code	**Electric Power II / EE405**
4. Programme(s) to which it contributes	Electrical Engineering
5. Modes of Attendance offered	Internal
6. Semester/Year	Fourth Year Class
7. Number of hours tuition (total)	120
8. Date of production/revision of this specification	2022
9. Aims of the Course	
The student will learn the main components of the power system as well as the per unit system, also the main faults and the analysis of the power system after subjecting to the fault, the student will also learn the power system stability and its classifications, finally the load flow analysis will be learned .	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

1. Full understanding for the global power systems and Iraqi power system.
2. Enhancing the student's skills through presenting real cases.
3. Cooperation with experiences and engineers in industry and in electricity sector in order to transport their knowledge to our students.
4. Involving the students in seminars and workshops to increase his skills through preparing a short seminar.
5. Preparing for small visits to some power stations and electricity control centers.

B. Subject-specific skills

1. full understanding for some power systems and Iraqi power system.
2. learning the students how to read the power station and power network manuals and flowcharts.
3. some knowledge in mathematics and numerical analysis.

Teaching and Learning Methods

Lecturing, slide presentation and Exercises

Assessment methods

Monthly exams and quizzes, participation in class and others.

C. Thinking Skills

1. Questions through the class.
2. Quizzes and exams.
3. Critical thinking skills
4. Team works.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4		Evolution of Electric Power Systems	Lecturing, Discussions & Exercises	Direct questions
2	4		Components of Electric Power Systems	Lecturing, Discussions & Exercises	Direct questions
3	4		Power System Representation	Lecturing, Discussions & Exercises	Direct questions& Exam

4	4		Per-Unit (p.u.) Representation	Lecturing, Discussions & Exercises	Direct questions
5	4		Changing the Base of Per-Unit Quantities	Lecturing, Discussions & Exercises	Direct questions& Exam
6	**Main Exam (1)**				
7	4		Synchronous Generator Construction & Modeling	Lecturing, Discussions & Exercises	Direct questions
8	4		Parallel Operation of AC Generators	Lecturing, Discussions & Exercises	Direct questions& Exam
9	4		Power System Protection Equipments & Devices	Lecturing, Discussions & Exercises	Direct questions
10	4		Application of Protection on Iraqi Electrical Network	Lecturing, Discussions & Exercises	Direct questions& Exam
11	4		Fault Analysis, Symmetrical Components	Lecturing, Discussions & Exercises	Direct questions
12	4		Sequence Impedances for Fault Analysis	Lecturing, Discussions & Exercises	Direct questions& Exam
13	**Mid-Year Break**				
14	**Main Exam (2)**				
15	4		Reactors and balanced faults	Lecturing, Discussions & Exercises	Direct questions
16	4		Unbalanced Network Faults	Lecturing, Discussions & Exercises	Direct questions
17	4		Worked examples	Lecturing, Discussions & Exercises	Direct questions
18	**Main Exam (3)**				
19	4		Power System Stability	Lecturing, Discussions & Exercises	Direct questions

20	4		The Swing Equation	Lecturing, Discussions & Exercises	Direct questions
21	4		Power Angle Relationship	Lecturing, Discussions & Exercises	Direct questions& Exam
22	4		Equal area relationship	Lecturing, Discussions & Exercises	Direct questions
23	**Main Exam (4)**				
24	4		Power Flow Study, Formulation of the [Y] Matrix	Lecturing, Discussions & Exercises	Direct questions
25	4		Gauss Iteration Method and Gauss-Seidal Method	Lecturing, Discussions & Exercises	Direct questions
26	4		Newton-Raphson method	Lecturing, Discussions & Exercises	Direct questions& Exam
27	4		Worked examples	Lecturing, Discussions & Exercises	Direct questions
28	**Final Exam**				

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- **Electric Power System**, B.M.Weedy, 1977 by John Wiley. 2- **Power System Analysis**, John J. Grainger & William D. Stevenson, 1994 by McGraw-Hill. 3- **Generation of Electrical Energy**, B.R.Gupta , 1988. 4- **Power System Analysis and Design**, J.Duncan Glover & Mulukutla S. Sarma, 2002 by Brooks/Cole. 5- **Power System Stability and Control**, P.Kundur, 1994.
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet links related to the topics discussed in the book and class, and some video
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical engineering
3. Course title/code	**Power Electronics and Special Machines**
4. Program (s) to which it contributes	B.Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time
6. Semester/Year	2022-2023 (Annual)
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	Nov 2022
9. Aims of the Course	
The aim of the course is to produce graduates with advanced knowledge and understanding of power semiconductor devices; construction;operation principles and their applications. Also, the operation principles of special machines and there performances are presented.	

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

B- Knowledge and Understanding

A1. Constructional details, principle of operation, Performance, power converters.

A2. Constructional details, principle of operation of Special Machines.

B. Subject-specific skills
B1.
B2.
B3.

Teaching and Learning Methods

1.Face to Face Lectures.
2. Seminars
3. Group Exercises.

Assessment methods

A module assessment will have two components:
1.weekly Quizes 30% weight.
2. Final written Exam. 70% weight.

C. Thinking Skills
C1.
C2.
C3.
C4.

Teaching and Learning Methods

Short quizzes + termly exams

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1.
D2.
D3.
D4.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Introduction to the following: • RL and RC circuits • Fourier series	Face to face lecture	Weekly Quizzes and written final Exam
2	3		Power Semiconductor Devices; construction and operation principles	=	=

3	3		Power Semiconductor Devices losses and heat sink design	=	=
4	3		Harmonic analysis in power electronic converters; power factor definitions and THD	=	=
5	3		Single phase rectifier circuits; operation, design and performances	=	=
6	3		Worked examples on single phase rectifiers	=	=
7	3		Three-phase rectifier circuits; operation, design and performances	=	=
8	3		Worked examples on three phase rectifiers	=	=
9	3		Overlap in single phase rectifier circuits; definitions and the its effect	=	=
10	3		Overlap in three-phase rectifier circuits; definitions and the its effect	=	=
11	3		Inversion and delay angle control	=	=
12	3		Inverters; single phase: square wave and quasi square wave	=	=
13	3		Inverters; three phase: voltage and frequency control techniques	=	=
14	3		Sinusoidal pulse width modulations (SPWM) and sampling techniques	=	=
15	3		SPWM and single phase inverter	=	=

16	3		SPWM and three-phase inverter	=	=
			Half – year break		
17	3		DC-DC converters: constructions and operation principles	=	=
18	3		DC-DC converters; design and performances evaluation	=	=
19	3		Control strategies in DC-DC converters	=	=
20	3		Introduction to speed control of DC machines	=	=
21	3		Universal AC series motors; construction and operation principles	=	=
22	3		Stepper and Servo motors; construction and operation principles	=	=
23	3		Stepper, servo motors, and shaded-Pole-Motors construction and operation principles	=	=
24	3		Permanent Magnet Machines; construction, operation and application	=	=
25	3		DFIG; construction, operation and application	=	=
26	3		Switched reluctance machines; operation and application	=	=
27	3		Hysteresis motor	=	=
28	3		Stepper motor	=	=
29	3		Torque and speed control of machines; permanent magnet reluctance machines	=	=
30	3		Worked examples on different types of machine control	=	=

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	A. Module Handout B. The following texts and articles: ➢ Bose, B. K.. Power Electronics and Variable Frequency Drives-Technology and Applications, IEEE Press, New York, ➢Erickson, R. W. and Maksimovic, D. Fundamentals of Power Electronics, Second Edition, Kluwer Academic Publishers, ➢ Krein, P. T. Elements of Power Electronics. McGraw Hill,. ➢Lander, C. W. Power Electronics. McGraw Hill, ➢Mohan N., UndelandT. M., Robbins W. P., Power Electronics: Converters, Applications and Design., John Wiley and Sons, New York,. ➢Pressman, A. I., Switching Power Supply Design. McGraw Hill New York, 1998. ➢Rashid, M. H. Power Electronics: Circuits, Devices, and Applications., Prentice-Hall Inc., New Jersey,
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

12. The development of the curriculum plan

COURSE SPECIFICATION

The signal for processing is mathematically modeled as a function or a sequence of numbers that represent the state or behavior of a physical system. The examples of the signals range from speech, audio, image and video in multimedia systems, electrocardiograms in medical systems (ECG/EKG), to electronic radar waveforms in military. Digital Signal processing is concerned with the representation, transformation, and manipulation of signals and the information they contain. For example, we may wish to remove the noise in speech to make it clear, or to enhance an image to make it more natural. Signal processing is one of the fundamental theories and techniques to construct modern information systems. During the last half century, lots of theories and methods have been proposed and widely studied in digital signal processing.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Digital Signal Processing / EE409**
4. Program (s) to which it contributes	B.Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time
6. Semester/Year	2022-2023 (Annual)
7. Number of hours tuition (total)	60
8. Date of production/revision of this specification	Oct. 2022
9. Aims of the Course	
Study and review the concepts of processing of digital signals theories, the most important tools and systems implementation. In addition to teaching students how to apply the transforms methods on different frequency signals and filter design using modern techniques.	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

A1. Understanding academic texts and ty to solve the problems in the end of each cha
A2. learns how to reflect the theoretical digital signal processing design to be practical
A3. Finding and understanding information about digital signal processing and the ad and disadvantages of it.

B. Subject-specific skills

B1. Reading some useful papers related to digital signal processing
B2. Explore the web pages that concerned on digital signal processing
B3. Reading an arbitrary device manual to explore the digital signal processing from practical point of view.
B4. Making an oral presentation

Teaching and Learning Methods

Lecturing and Exercises

Assessment methods

Exams

C. Thinking Skills

C1. Being able to form personal opinions about issues through attempting construct the digital signal processing algorithm.

Teaching and Learning Methods

Lecturing & Class discussions

Assessment methods

Exams that involve problem-solving skills and critical thinking skills

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1.Effective communication in the design an applicable Digital signal processing
D2. Team work

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Classification of signals, systems	Lecturing, Discussions & Exercises	Exam
2	2		sampling	Lecturing, Discussions & Exercises	Exam
3	2		Discrete time systems	Lecturing, Discussions & Exercises	Exam
4	2		Convolution	Lecturing, Discussions & Exercises	Exam
5	2		Difference equations	Lecturing, Discussions & Exercises	Exam
6	2		Time-Domain analysis	Lecturing, Discussions & Exercises	Exam
7	2		Discrete Fourier series (DFS)	Lecturing, Discussions & Exercises	Exam
8	2		Frequency Domain analysis and Discrete-Time Fourier transform(DTFT)	Lecturing, Discussions & Exercises	Exam
9	2		Discrete Fourier transform (DFT)	Lecturing, Discussions & Exercises	Exam
10	2		Properties of DFT	Lecturing, Discussions & Exercises	Exam
11	2		Fast Fourier transform FFT	Lecturing, Discussions & Exercises	Exam
12	2		Decimation in time FFT	Lecturing, Discussions & Exercises	Exam
13	2		Decimation in frequency FFT	Lecturing, Discussions & Exercises	Exam
14	2		Z-Transform	Lecturing, Discussions & Exercises	Exam
15	2		Definition of Z-transform	Lecturing, Discussions & Exercises	Exam
16	2		Properties of Z-transform and The	Lecturing, Discussions & Exercises	Exam

			one-sided Z-transform		
17	2		**Half – year break**	Lecturing, Discussions & Exercises	Exam
18	2		Implementation of Discrete-time Systems		Exam
19	2		Digital networks	Lecturing, Discussions & Exercises	Exam
20	2		Structure of FIR systems	Lecturing, Discussions & Exercises	Exam
21	2		Structure of IIR systems	Lecturing, Discussions & Exercises	Exam
22	2		Lattice structure	Lecturing, Discussions & Exercises	Exam
23	2		Introduction to Digital Filter design		Exam
24	2		Filter specifications	Lecturing, Discussions & Exercises	Exam
25	2		FIR filter design	Lecturing, Discussions & Exercises	Exam
26	2		IIR filter design	Lecturing, Discussions & Exercises	Exam
27	2		Bilinear transformation	Lecturing, Discussions & Exercises	Exam
28	2		Butterworth and Chebyshev filters	Lecturing, Discussions & Exercises	Exam
29	2		Butterworth and Chebyshev filters	Lecturing, Discussions & Exercises	Exam
30	2		Butterworth and Chebyshev filters	Lecturing, Discussions & Exercises	Exam

11. Infrastructure	
Required reading: · core texts · course materials · other	**Discrete-time signal processing, 2nd ed, by Oppenheim, Prentice Hall , 2009.** **Schaum's Outlines of digital Signal processing, by Monson Hayes, Mc Graw Hill, 1999.** **Digital Signal Processing: Principles, algorithms, and applications, by Proakis, Prentice Hall 2007.**
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet links related to the topics discussed in the book and class, learn the simulators that have ability to construct digital signal processing algorithms
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Electrical Engineering Department
3. Course title/code	**English Language (4) / EE410**
4. Programme(s) to which it contributes	B.Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time
6. Semester/Year	2022-2023 (Annual)
7. Number of hours tuition (total)	30
8. Date of production/revision of this specification	24-11-2022

9. Aims of the Course

The course is intended to accomplish its goal in one full academic year through developing students' language skills to:

1. Understand long complex speech.
2. Speak fluently without searching for language, communicate effectively in social and professional situations, and express ideas and opinions and relate them to those of other speakers.
3. Understand long and complex factual and literary texts
4. Write well-structured text to express points of view.
5. Exhibit good grammatical control.

10· Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Knowledge and Understanding

A1. Understanding standard spoken language on both familiar and unfamiliar topics normally encountered in personal, social, academic or vocational life

A2. Usingthe language fluently, accurately and effectively on a wide range of general, academic, vocational or leisure topics

B. Subject-specific skills B1. Reading with a high degree of independence, B2. Writing clear, detailed texts on a variety of subjects B3. Exhibiting good grammatical control
Teaching and Learning Methods
1. Lectures and group discussions 2. Incorporating basic grammatical structures 3. Incorporating exercises for interpreting verbal or written texts
Assessment methods
Exams and Quizzes
C. Thinking Skills C1. Being able to form personal opinions about issues through critical reading and listening C2 Arguing for and defending a position in a clear and structured way using academic sources, through writing and speaking
Teaching and Learning Methods
Lecturing & Class discussions
Assessment methods
Exams and Quizzes
D. General and Transferable Skills (other skills relevant to employability and personal development) D1.Effective communication in written and spoken English D2. Team work

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	1	A,B,C & D	Introduction	1. Lectures and group discussions 2. Incorporating basic grammatical structures 3. Incorporating exercises for interpreting verbal or written texts	Exams and quizzes
2	1	=	Unit 1 (No Place like home): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.6-15) and 7. Writing (p.110)	=	=
3	1	=	Unit 1 (No Place like home): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.6-15) and 7. Writing (p.110)	=	=
4	1	=	Unit 2(Been there, done that!): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.16-25) and 7. Writing (p.112)	=	=
5	1	=	Unit 2(Been there, done that!): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.16-25) and 7. Writing (p.112)	=	=
6	1	=	Unit 3 (What a story!): 1. Language focus, 2.	=	=

			Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.26-33) and 7. Writing (p.113)		
7	1	=	Unit 3 (What a story!): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.26-33) and 7. Writing (p.113)	=	=
8	1	=	Unit 4 (Nothing but the truth): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.34-43) and 7. Writing (p.114)		
9	1	=	Unit 4 (Nothing but the truth): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.34-43) and 7. Writing (p.114)	=	=
10	1	=	Exam (1)	=	=
11	1	=	Unit 5 (An eye to the future): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.44-53) and 7. Writing (p.115)	=	=
12	1	=	Unit 5 (An eye to the future): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.44-53) and 7. Writing (p.115)	=	=

13	1	=	Unit 6 (Making it big): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.54-61) and 7. Writing (p.116)	=	=
14	1	=	Unit 6 (Making it big): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.54-61) and 7. Writing (p.116)	=	=
15	1		ESP	=	=
16			Mid-Year Break		
17			Mid-Year Break		
18	1	=	Unit 7 (Getting on together): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.62-69) and 7. Writing (p.118)	=	=
19	1	=	Unit 7 (Getting on together): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.62-69) and 7. Writing (p.118)	=	=
20	1		Exam (2)	=	=
21	1	=	Unit 8 (Going to extremes): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.70-77) and 7. Writing (p.119)	=	=
22	1	=	Unit 8 (Going to extremes): 1. Language focus, 2. Vocabulary, 3.	=	=

			Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.70-77) and 7. Writing (p.119)		
23	1	=	Unit 9 (Things ain't what they used to be!): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.78-85) and 7. Writing (p.120)	=	=
24	1	=	Unit 9 (Things ain't what they used to be!): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.78-85) and 7. Writing (p.120)	=	=
25	1	=	Unit 10 (Risking life and limb): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.86-93) and 7. Writing (p.121)	=	=
26	1	=	Unit 10 (Risking life and limb): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.86-93) and 7. Writing (p.121)	=	=
27	1	=	Unit 11 (In your dreams): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.94-101) and 7. Writing (p.122)	=	=
28	1	=	Unit 11 (In your dreams): 1. Language	=	=

			focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.94-101) and 7. Writing (p.122)		
29	1	=	Unit 12 (It's never too late): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.102-109) and 7. Writing (p.123)	=	=
30	1	=	Unit 12 (It's never too late): 1. Language focus, 2. Vocabulary, 3. Reading, 4. Listening, 5. Speaking, 6. Everyday English(pp.102-109) and 7. Writing (p.123)	=	=
31	1	=	ESP	=	=
32	1	=	ESP		

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Textbook: New Headway Plus Upper-intermediate by Liz and John Soars (Oxford: Oxford University Press) 2009 2. Internet links related to the topics discussed in the book and class
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

COURSE SPECIFICATION

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. It should be cross-referenced with the programmed specification.

1. Teaching Institution	College of Engineering, University of Baghdad
2. University Department/Centre	Department of Electrical Engineering
3. Course title/code	**Computer Network / EE407**
4. Program(s) to which it contributes	B. Sc. in Electrical Engineering
5. Modes of Attendance offered	Full time
6. Semester/Year	2022-2023 (Annual)
7. Number of hours tuition (total)	120
8. Date of production/revision of this specification	Oct. 2022
9. Aims of the Course	
Study the basic principles of computer networks	

10· Learning Outcomes, Teaching ,Learning and Assessment Method
C- Knowledge and Understanding A1. Understanding the principles of computer networks. A2. Learn how to design and implement different networks with different protocols. A3. Measure the performance of networks

B. Subject-specific skills

B1. Solving some specific problems with different ideas related to the subject courses.
B2. Explore the web pages that concerned on networks.
B3. Manipulating some powerful software like packet tracer to design the networks.

Teaching and Learning Methods

Lecturing and Exercises and Homework.

Assessment methods

Exams

C. Thinking Skills

C1. Being able to form personal opinions about issues through attempting to solve different problems in the networks.

Teaching and Learning Methods

Lecturing & Class discussions

Assessment methods

Exams that involve problem-solving skills and critical thinking skills

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Effective communication to understand and imagine the idea behind the problem want to be solved.
D2. Team work

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4		Introduction to Computer Network	Lecturing, Discussions & Lab	Exam
2	4		OSI model, TCP/IP model	Lecturing, Discussions & Lab	Exam
3	4		Performance: Bandwidth, Throughput, Latency,	Lecturing, Discussions & Lab	Exam
4	4		Switching: Circuit Switching, Packet Switching.	Lecturing, Discussions & Lab	Exam
5	4		Transmission Media	Lecturing, Discussions & Lab	Exam
6	4		Data Link Layer	Lecturing, Discussions & Lab	Exam
7			New Year Holiday		
8	4		Exam (1)		
8	4		High Level Data Control Protocol	Lecturing, Discussions & Lab	Exam
9	4		Multiple Access Protocols	Lecturing, Discussions & Lab	Exam
10	4		Media Access Control: Ethernet, 802 Working Group, Encoding	Lecturing, Discussions & Lab	Exam
11	4		Logical Link Layer	Lecturing, Discussions & Lab	Exam
12	4		Switching Devices: Hubs, Repeater, MAUS,	Lecturing, Discussions & Lab	Exam
13			Mid-Year Break		
14	4		Exam (2)		

15	4		Network Layer IPv4, IPv6	Lecturing, Discussions & Lab	Exam
16	4		Subnettiong	Lecturing, Discussions & Lab	Exam
17	4		Routers	Lecturing, Discussions & Lab	Exam
18	4		Address Resolution Protocol	Lecturing, Discussions & Lab	Exam
19	4		Exam (3)		
20	4		Routing Algorithms	Lecturing, Discussions & Lab	Exam
21	4		Shortest Path, Link State, Distance Vector	Lecturing, Discussions & Lab	Exam
22	4		Hierarchical, Routing for Mobile Hosts	Lecturing, Discussions & Lab	Exam
23	4		Routing in the Internet: RIP, OSPF	Lecturing, Discussions & Lab	Exam
24	4		Transport Layer UDP TCP	Lecturing, Discussions & Lab	Exam
25	4		Exam (4)		
26	4		TCP Congestion Control		
27	4		The Application Layer	Lecturing, Discussions & Lab	Exam
28	4		Wireless and Mobile Networks	Lecturing, Discussions & Lab	Exam
29	4		Scheduling: FIFO, Priority, Round Robin	Lecturing, Discussions & Lab	Exam
30	4		and WFQ	Lecturing, Discussions & Lab	
31			Final Exam		

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Data Communication and Networking Behrouz 2013 ➢ Computer Networking A Top – Down Approach Kurose, Ross 2008 ➢ Computer Network Taenboum2004.
Special requirements (include for example workshops, periodicals, IT software, websites)	Software : Packet Tracer
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12. The development of the curriculum plan

COURSE SPECIFICATION

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. It should be cross-referenced with the programme specification.

1. Teaching Institution	Baghdad University
2. University Department/Centre	College of Engineering/Department of Electrical Engineering
3. Course title/code	**Control Engineering II / EE401**
4. Programme(s) to which it contributes	Electrical Engineering
5. Modes of Attendance offered	Internal
6. Semester/Year	Fourth Year Class
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	2022
9. Aims of the Course	
Study and review the concepts of control engineering and modern control theories. In addition to teaching students how to derive the model for a given system, achieve the analysis and accomplish the design based modern techniques.	

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Introduction for frequency domain stability analysis	Lecturing, Discussions & Exercises	Exam
2	3	Nyquist plot	Lecturing, Discussions & Exercises	Exam
3	3	Nyquist stability criterion	Lecturing, Discussions & Exercises	Exam
4	3	Tutorial	Lecturing, Discussions & Exercises	Exam
5	3	Introduction to compensation design	Lecturing, Discussions & Exercises	Exam
6	3	Phase-Lead and Phase-Lag controllers design	Lecturing, Discussions & Exercises	Exam
7	3	Lead-Lag controller design	Lecturing, Discussions & Exercises	Exam
8	3	PID controller design	Lecturing, Discussions & Exercises	Exam
9	3	Tutorial	Lecturing, Discussions & Exercises	Exam
10	3	Introduction to nonlinear systems and types of nonlinearities.	Lecturing, Discussions & Exercises	Exam
11	3	Describing function analysis for nonlinear control systems	Lecturing, Discussions & Exercises	Exam
12	3	Concept of state, state variables, state vector and state space	Lecturing, Discussions & Exercises	Exam
13	3	State-space representation of continuous time systems	Lecturing, Discussions & Exercises	Exam
14	3	Obtaining the transfer function	Lecturing, Discussions & Exercises	Exam

		from state variable model		
15	3	Tutorial	Lecturing, Discussions & Exercises	Exam
Half – year break				
16	3	Obtaining the state variable model from the transfer function	Lecturing, Discussions & Exercises	Exam
17	3	Controllable and observable canonical forms		
18	3	Diagonalization and Jordan canonical form	Lecturing, Discussions & Exercises	Exam
19	3	Solution of linear time invariant state equation	Lecturing, Discussions & Exercises	Exam
20	3	Computation of state transition matrix by Laplace, state transition matrix and Cayley Hamilton theorem	Lecturing, Discussions & Exercises	Exam
21	3	Tutorial	Lecturing, Discussions & Exercises	Exam
22	3	Response of homogeneous and non-homogeneous systems	Lecturing, Discussions & Exercises	Exam
23	3	Tests for controllability and observability for continuous time systems	Lecturing, Discussions & Exercises	Exam
24	3	Time varying case, minimum energy control, time invariant case	Lecturing, Discussions & Exercises	Exam
25	3	Principle of Duality	Lecturing, Discussions & Exercises	Exam

26	3	Tutorial	Lecturing, Discussions & Exercises	Exam
27	3	Pole-placement design	Lecturing, Discussions & Exercises	Exam
28	3	State observer design	Lecturing, Discussions & Exercises	Exam
29	3	Equivalent frequency-domain compensator	Lecturing, Discussions & Exercises	Exam
30	3	Tutorial	Lecturing, Discussions & Exercises	Exam

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	**Modern Control Engineering, 5th ed, by Ogata, Pearson , 2009.** **Modern Control Systems, by Dorf and Bishop, 12th ed., Pearson, 2010.** **Control Systems Engineering, by Nise, 7th ed., Wiley, 2014.**
Special requirements (include for example workshops, periodicals, IT software, websites)	Internet links related to the topics discussed in the book and class, learn the simulators that have ability to model, analyze and design of the control systems.
Community-based facilities (include for example, guest Lectures , internship , field studies)	None

12. The development of the curriculum plan
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