TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

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 / Alkhwarizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Artificial Organs 1
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Course
7. Number of hours tuition (total)	45 Hours
8. Date of production/revision of this specification	2018
9. Aims of the Course	
The students will be able to: 1. Know the theory and background of the design of an artificial organ, the first task is to establish the specification for the device i.e. the function or functions which must be fulfilled by a human made construct and the physical constraints that apply because the device must interface with the human body. 2. Concepts underlie the design and analysis of an artificial medical device that is not surgically implanted and that is used to replace a missing limb, or another external human body part including an artificial limb, hand, or foot	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

Graduates will be able to:

A1.√ A2.√ A3.√

B. Subject-specific skills

B1.√ B2.√ B3.√

Teaching and Learning Methods

Staff involved in the degree program utilize a wide range of teaching methods that they deem the most appropriate for a particular course. These include:

1. Lectures where the students write information presented to them via slide show, overhead or written by the lecturer؛
2. Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture.
3. Question and answer sessions during lectures or staff Office Hours.

Assessment methods

1. Written examinations (Summative assessment)؛
2. Oral presentations of individual and group work
3. Homework؛

C. Thinking Skills

C1.√ C2.√ C3.√ C4.√

Teaching and Learning Methods

1. External lectures from industry or clinicians;
2. Feedback given to students during tutorials;
3. Question and answer sessions during lectures or staff Office Hours

Assessment methods

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

D1.√ D2.√

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
First course					

1	3		Introduction to Artificial Organs		
2	3		Upper and Lower Prostheses		
3	3		Normal gait		
4	3		The Gait Cycle in Detail		
5	3		Ground Reaction Forces		
6	3		Energy Calculation Methods		
7	3		Prosthetic Foot Characteristics		
8	3		prosthetic foot components		
9	3		prosthetic foot designs		
10	3		prosthetic Socket design		
11	3		Artificial Knee Prosthetics		
12	3		Upper Limbs prosthetics		
13	3		Artificial Hand		
14	3		Artificial Elbow		
15	3		Artificial Shoulder		

12. Infrastructure	
Required reading: · Core Texts · Course Materials · Other	**1.** Biomechanics of Lower Limb Prosthetics by Mark R. Pitkin **2.** Advances for Prosthetic Technology by Robert LeMoyne **3.** Artificial Limbs V2 by Paul E. Klopsteg et. al.
Special requirements (include for example workshops, periodicals, IT software, websites)	Check the new modern websites talking about the new modifications
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	20
Maximum number of students	30

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

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 / Alkhwarizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Design control systems 1
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Course
7. Number of hours tuition (total)	75 Hours
8. Date of production/revision of this specification	2018
9. Aims of the Course	
In this course, the students will learn how to use time and frequency response methods in designing control systems. First, we start with understanding the concept of Root-Locus method and then we move on and learn how to use this method in designing phase-lead, phase lag, Lead-lag compensators. We will then utilize the design procedures for tuning P, PD, PI, and PID controllers. At this point, we would cover a good chunk of material in time domain analysis. It's time to convey our learning journey to the frequency domain. To do so, we will analyze the control systems in the frequency domain using Bode diagrams, polar plot, Nyquist plot, and Nicholas plot. These graphical techniques are essential in analyzing the stability of the systems in the frequency domain as well as in designing the control systems. If we have enough time, we probably introduce the concept of state - space analysis in control systems.	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A. Knowledge and Understanding

Graduates will be able to:

A1.√ A2.√ A3.√

B. Subject-specific skills

B1.√ B2.√ B3.√ B4.√

Teaching and Learning Methods

1. Lectures where the students write information presented to them via slide show, or written by the lecturer;
2. Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;
3. Question and answer sessions during lectures or staff Office Hours;
4. Laboratory sessions.

Assessment methods

1. Written examinations (Summative assessment);
2. Oral presentations of individual and group work;
3. Homework;
4. Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
5. Presentation skills through group presentations and poster presentations.

C. Thinking Skills

C1.√ C2.√ C3.√ C4.√

Teaching and Learning Methods

1. External lectures from industry or clinicians;
2. Feedback given to students during tutorials;
3. Question and answer sessions during lectures or staff Office Hours;
4. Completion of web-based exercises or computer based laboratory sessions

Assessment methods

1. Individual written project report(s) of both individual and group projects;
2. Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
3. Presentation skills through group presentations and poster presentations.

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

D1.√ D2.√ D3.√

11. Course Structure

Week	hr	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method

First course					
1	5		Introduction to control systems / Open and close loop systems / Brief review of Laplace transformation		
2	5		Transfer function and block diagram representation of control systems		
3	5		Reduction of block diagram - Signal Flow Graph		Quiz
4	5		Mathematical modeling of Mechanical systems and electrical systems		
5	5		Mathematical modeling of electromechanical and electronic systems		Quiz
6	5		Mathematical modeling of Level Systems		
7	5		Mathematical modeling of selected medical apparatus		
8	5		Transient response analysis - Response of first, second		
9	5		Transient response analysis - Response of higher order systems		
10	5		Mid-term exam		Quiz
11	5		Routh stability criterion (1)		
12	5		Routh stability criterion (2)		Quiz
13	5		Steady-state error analysis in close loop systems		
14	5		Seminar		
15	5		Seminar		

12. Infrastructure	
Required reading: · Core Texts · Course Materials · Other	1. Modern Control Engineering, By: Katsuhiko Ogata. (5th ed.) 2. Control Systems Engineering, By: Norman S. Nise. (7th ed.) 3. Modern Control Systems, By: Richard C. Dorf.(12th ed.) 4. Feedback Control Systems, By John Van De Vegte (3rd ed.)
Special requirements (include for example workshops, periodicals, IT software, websites)	Check the new modern websites talking about the new modifications
Community-based facilities (include for example, guest Lectures , internship , field studies	

13. Admissions	
Pre-requisites	
Minimum number of students	20
Maximum number of students	30

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides rich foundation to learn and acquire English as a second language and use the language for academic purposes. The course prepare undergraduate students to use English language successfully in speaking, reading and writing

1. Teaching Institution	University of Baghdad / Alkhwarizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Bio-Computer Design Lab 1
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Course
7. Number of hours tuition (total)	45 Hours
8. Date of production/revision of this specification	2018
9. Aims of the Course	
By the end of this course the students will get the theory and application of: 1. Software Design and Validation, 2. Microprocessor, 3. Computer Architecture	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A. Knowledge and Understanding

B. Subject-specific skills

Teaching and Learning Methods

1. Lectures where the students write information presented to them via slide show, overhead or written by the lecturer;
2. Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;
3. Question and answer sessions during lectures or staff Office Hours;
4. Laboratory sessions.

Assessment methods

1. Written examinations (Summative assessment);
2. Oral presentations of individual and group work;
3. Homework;
4. Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
5. Presentation skills through group presentations and poster presentations.

C. Thinking Skills

Teaching and Learning Methods

1. External lectures from industry or clinicians;
2. Feedback given to students during tutorials;
3. Question and answer sessions during lectures or staff Office Hours;
4. Completion of web-based exercises or computer based laboratory sessions

Assessment methods

1. Individual written project report(s) of both individual and group projects;
2. Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
3. Presentation skills through group presentations and poster presentations.

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

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
First course					
1	3		Software overview		

2	3		Software Evolution		
3	3		General Structure of the IAS computer		Quiz
4	3		FACTORS AFFECTING THE PERFORMANCE		
5	3		Central Processing Unit (CPU)		Quiz
6	3		System&Applicat-ion Software		
7	3		Elements of an ISA		
8	3		Computer Numbers		
9	3		Software Paradigm		
10	3		Software Development Life Cycle, SDLC		Quiz
11	3		Software Project Management		
12	3		Software Project		Quiz
13	3		Software Project Manager		
14	3		Project Planning		
15	3		Project Management Tools		

12. Infrastructure	
Required reading: · Core Texts · Course Materials · Other	1- John L. Hennessy and David A. Patterson. *Computer Architecture: A Quantitative Approach* (Third Edition ed.). Morgan Kaufmann Publishers. 2- Gamma E. et al.: *Design patterns, WNT, Warszawa 2005* 3- Miles R., Hamilton K.: *Learning UML 2.0, Helion, Gliwice 2007* 4- Pressman R. S.: *Software Engineering: A Practitioner's Approach,* 5- WNT, Warszawa 2004 Sommerville I.: *Software Engineering, WNT, Warszawa 2003*
Special requirements (include for example workshops, periodicals, IT software, websites)	Participate in Classroom discussion in English and Google Class. Writing some formal samples in English and make a presentation in English as well
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	20
Maximum number of students	30

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

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 / Alkhwarizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Design of Machine Elements
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Course
7. Number of hours tuition (total)	45 Hours
8. Date of production/revision of this specification	2018

9. Aims of the Course

1. Machine elements and their design, functional principles, mechanisms, and integration in machinery
2. The functions of some common machine elements and the solution of design and engineering problems associated with these.
3. How to establish structural and dynamics models for mechanical behavior with basis in subsystem or component
4. .The application of design criteria for different (mechanical) functional and design requirements for various machine elements and components.
5. Choice of reasonable design and engineering solutions with basis in basic understanding of mechanical behavior and design criteria.

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A. Knowledge and Understanding

Graduates will be able to:

A1. √ A2. √ A3. √

B. Subject-specific skills

B1. √ B2. √ B3. √

Teaching and Learning Methods

1. Lectures where the students write information presented to them via slide show, overhead or written by the lecturer;
2. Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;
3. Question and answer sessions during lectures or staff Office Hours;

Assessment methods

1. Written examinations (Summative assessment);
2. Oral presentations of individual and group work;
3. Homework;

C. Thinking Skills

C1. √ C2. √ C3. √ C4. √

Teaching and Learning Methods

1. External lectures from industry or clinicians;
2. Feedback given to students during tutorials;
3. Question and answer sessions during lectures or staff Office Hours

Assessment methods

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

D1. √ D1. √

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
First course					
1	3		Introduction to design methods		
2	3		Mechanical Properties of Materials		
3	3		Frictional power screw		

4	3		Design of the kinds of frictional screw		
5	3		The efficiency of power screw		
6	3		Design of clutches		
7	3		The efficiency of clutches		
8	3		Pivot bearing design		
9	3		The required dimension of pivot bearing		
10	3		Design of belt drive		
11	3		The proper length and cross sectional area of the belt		
12	3		Gear system design		
13	3		Gear train system		
14	3		Epicyclic gear train		
15	3		Review		

12. Infrastructure	
Required reading: · Core Texts · Course Materials · Other	1. Mechanics of Materials (James M. Gere and Barry J. Goodno) 2. Mechanics of Materials (R. C. Hibbeler) 3. Mechanics of Materials (Ferdinand P. Beer et. al.)
Special requirements (include for example workshops, periodicals, IT software, websites)	Check the new modern websites talking about the new modifications
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	20
Maximum number of students	30

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

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 / Alkhwarizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Medical Measurements Laboratory 1
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Course
7. Number of hours tuition (total)	60 Hours
8. Date of production/revision of this specification	2018
9. Aims of the Course	
Students in the Course of Biomedical Measurements and Diagnostics learn the underlying science for developing new medical measurement and diagnostic techniques, then use these to conduct fundamental medical research as well as education and research on clinical applications.	

10· Learning Outcomes, Teaching ,Learning and Assessment Method
A. Knowledge and Understanding Graduates will be able to: A1.It gives the introductory idea about human physiology system which is very important with respect to design consideration. With widespread use and requirements of medical instruments, this course gives knowledge of the principle of operation and design of biomedical instruments
B. Subject-specific skills 1- measure biomedical signals and parameters such as ECG, EEG, EMG, blood pressure and temperature. 2- Know the applications and operation of BSP. 3- write programs and virtual instruments in LabVIEW**.**
Teaching and Learning Methods
Lectures
Assessment methods
Written exams
C. Thinking Skills C1. Strategic thinking skills. C2. Translate complex ideas into clear concepts
Teaching and Learning Methods
Lectures
Assessment methods
Written assignment

D. General and Transferable Skills (other skills relevant to employability and personal development) D1. The ability to work in multidisciplinary team.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
First course					
1	4		Introduction to Medical measurements		
2	4		EMG 1 + Introduction to Labview (1)		
3	4		EMG II + Introduction to Labview (2)		
4	4		EEG 1 + Lab view		
5	4		EEG II + Lab view		

6	4		Exam		
7	4		ECG 1 + Lab view		
8	4		ECG II + Lab view		
9	4		Pulmonary Function I		
10	4		Pulmonary Function I		
11	4		Pulmonary Function II		
12	4		Pulmonary Function II		
13	4		EOG I		
14	4		EOG I		
15	4		Exam		

12. Infrastructure	
Required reading: · Core Texts · Course Materials · Other	1. Medical Instrumentation Application and Design, 4th Edition, John G. Webster, February 2009. 2. Biopac students Lab – Laboratory manual
Special requirements (include for example workshops, periodicals, IT software, websites)	Check the new modern websites talking about the new modifications
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	20
Maximum number of students	30

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

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 / Alkhwarizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Biomedical Instrumentation Design I 1
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Course
7. Number of hours tuition (total)	60 Hours
8. Date of production/revision of this specification	2018
9. Aims of the Course	

This course aims at providing the student with the necessary basic and advanced concepts for the followings:

1. General Medical Instrumentation Block Diagram.
2. Static and Dynamic Characteristics of Medical Systems.
3. Basic sensors used in medical systems.
4. Amplifiers used in medical systems.

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

Graduates will be able to:

A1. Use their information and thoughtful of the appropriate modelling, scientific and computational tools that support medical instrumentation, to solve, in depth, analytical, design or theoretical problems in this field.

A2. Apply their data and understanding of physical and clinical laws, arithmetic analysis in order to model medical device and any other similar systems.

A3. Explain the role of Biomedical Engineers in medical instrumentation group of work and the constraints within which their clinical judgment will be exercised.

B. Subject-specific skills

B1. Discuss the principles of general block diagram for medical systems.

B2. Discuss the design requirements and specifications, the preliminary stages of designs and their modified action and work, via series of videos and figures.

B3. Use the preliminary understanding to build a virtual explanation for the desired and undesired plan of design.

B4. Discuss the ability to explain new modification and the new trend of clinical supportive works.

Teaching and Learning Methods

The teaching and learning of such important Couse include the followings:

1. Lectures by the instructor himself explaining the main and important points of design.
2. Free discussion of the brain storm presented at the lecture times and discuss the new and future trends.
3. Seminars presented by the student and discussed directly by the other student and instructor.
4. Discussions of important points and induced ideas through social media

Assessment methods

1. Seminar presented and discussed.
2. Site visited through group of students and under supervising of official medical company.
3. Home works and challenges of design thoughts.
4. Quizzes and exams.

C. Thinking Skills

C1. Apply appropriate analytical mathematics, scientific and engineering tools to the analysis of problems;

C2. Analyze and solve engineering problems;

C3. Design a medical device system, component or process to meet a need;

C4. Integrate knowledge and understanding of other scientific, mathematical,

computational or engineering disciplines in order to support their engineering specialization.

Teaching and Learning Methods

1. Internal lectures from manufacturers or clinicians;
2. Feedback given to students during tutorials;
3. Question and answer sessions during lectures or staff Office Hours;
4. Guided reading of texts, journal articles etc., for individual and group projects

Assessment methods

1. Individual written report(s).
2. Group discussions of group work brainstorm case studies.
3. Practical skills will be assessed through troubleshoot technique.
4. Experimental, research and design skills will be assessed through laboratory experiments write-ups, coursework reports, project reports and presentations;
5. Presentation skills through group presentations and poster presentations.

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

D1. Apply in depth problem solving and analytical thinking to a diverse range of problems;

D2. Use appropriate multi-disciplinary skills to solve medical device problems, combining the biological and engineering knowledge gained through the degree;

D3. Demonstrate numeracy and literacy in written reports, project work and examinations;

D4. Learn effectively for the purpose of continuing professional development and in a wider context throughout their career.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
First course					
1	4		Introduction to BMID		
2	4		General considerations		
3	4		General Block Diagram for Medical s.		Quiz
4	4		Static Characteristics 1		
5	4		Static characteristics 2		Quiz
6	4		Dynamic Characteristics		
7	4		Biomedical Sensors 1		

8	4		Biomedical Sensors 2		
9	4		Med term exam		
10	4		Biomedical Amplifiers 1		Quiz
11	4		Biomedical Amplifiers 2		
12	4		Biomedical Amplifiers 3		Quiz
13	4		Biomedical Amplifiers 4		
14	4		Final term exam		
15	4		Review		

12. Infrastructure	
Required reading: · Core Texts · Course Materials · Other	1. Khandapur, "Medical Instrumentation", 2010. 2. J. G. Webster, "Encyclopedia of Medical Devices and Instrumentation", 2nd edition, John Wiley 2010. 3. J. D. Bronzino, "Biomedical Engineering Handbook, Medical Devices and Systems", 3rd edition, Taylor and Francis Group, 2006.
Special requirements (include for example workshops, periodicals, IT software, websites)	Check the new modern websites talking about the new modifications
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	20
Maximum number of students	30

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

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 / Alkhwarizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Tissue engineering
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Course
7. Number of hours tuition (total)	45 Hours
8. Date of production/revision of this specification	2018
9. Aims of the Course	
This course is an introduction to the field of tissue engineering. It is rapidly emerging as a therapeutic approach to treating damaged or diseased tissues in the biotechnology industry. In essence, new and functional living tissue can be fabricated by delivering cells, scaffolds, DNA, proteins, and/or protein fragments at surgery. It is an applies science and technology to develop novel means for replacing damaged and/or diseased tissues of the body. The course focuses both on fundamental aspects of the field, specifically, cells, materials, biochemical and biophysical stimuli, which are pertinent to new tissue formation, and on select application examples, specifically, bone, cartilage,	

skin, and vascular tissues.

The goal of this course is for students to be able to give a presentation on a product of their choice related to tissue engineering. The lectures, discussions, and design exercises are designed to help you complete each of the following aspects of the project: (1) Motivation/Market Need, (2) Disease/Condition/Anatomy, (3) Design Specifications and Testing Methods, (4) Scientific Basis of Product Technology and (5) Ethical Issues / FDA. There is a final oral presentation at the end.

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A. Knowledge and Understanding

Graduates will be able to:

A2. Apply their knowledge and understanding of Tissue Engineering application and biomaterial and the scaffold in order to model Biomedical Engineering and similar systems;

A4. Explain the role of Biomedical Engineers in society and the constraints within which their engineering judgment will be exercised.

B. Subject-specific skills

B2. Design, from requirement, market need or specification, a biomedical engineering device implant or system, up to the preliminary design stage, and present this design via a series of poster, written and oral presentations from both group and individual work;

B3. Use laboratory and workshop equipment to generate data, including both engineering and physiological measurements, with appropriate rigor;

Teaching and Learning Methods

Staff involved in the degree program utilize a wide range of teaching methods that they deem the most appropriate for a particular course. These include:

1. Lectures where the students write information presented to them via slide show, overhead or written by the lecturer;
2. Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;
3. Small group and large group tutorial sessions;
4. Question and answer sessions during lectures or staff Office Hours;
5. Laboratory sessions.

Assessment methods

Assessment Methods to be used are:

1. Written examinations (Summative assessment)؛
2. Oral presentations of individual and group work؛
3. Homework؛
4. Take home exams;
5. Practical skills will be assessed through laboratory experiments, write – ups, coursework reports, project reports and presentations;

6. Experimental, research and design skills will be assessed through laboratory experiments write-ups, coursework reports, project reports and presentations;
7. Presentation skills through group presentations and poster presentations.
8. Quizzes and exams.

C. Thinking Skills

C2. Analyze and solve engineering problems;
C3. Design a Biomedical Engineering system, component or process to meet a need;
C4. Integrate knowledge and understanding of other scientific, mathematical, computational or engineering disciplines in order to support their engineering specialization.

Teaching and Learning Methods

1. External lectures from industry or clinicians;
2. Feedback given to students during tutorials;
3. Small group and large group tutorial sessions;
4. Question and answer sessions during lectures or staff Office Hours;
5. Guided reading of texts, journal articles etc., for individual and group projects;
6. Completion of web-based exercises or computer based laboratory sessions

Assessment methods

1. Individual written project report(s) of both individual and group projects;
2. Group written project report(s) of group projects;
3. Interview of group project manager and assessment of group project minutes;
4. Poster presentation of group project work;
5. Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
6. Experimental, research and design skills will be assessed through laboratory experiments write-ups, coursework reports, project reports and presentations;
7. Presentation skills through group presentations and poster presentations.

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

D2. Use appropriate multi-disciplinary skills to solve Biomedical Engineering problems, combining the biological and engineering knowledge gained through the degree;
D3. Demonstrate numeracy and literacy in written reports, project work and examinations;
D4. Learn effectively for the purpose of continuing professional development and in a wider context throughout their career.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
First course					
1	3		Introduction to Tissue engineering		
2	3		Cells and tissues		
3	3		biomaterials scaffold		Quiz
4	3		DNA structure, transcription and translation		
5	3		Gene expression		Quiz
6	3		Stem cells		
7	3		scaffold :fibrication		
8	3		Scaffold problems		
9	3		tissue Engineering Techniqes		
10	3		Tissue Engineering Bioreactors		Quiz
11	3		artificial blood		
12	3		applications		Quiz
13	3		Skin Tissue Enginnering		
14	3		Bone & cartilage		
15	3		Term exam		

12. Infrastructure	
Required reading: · Core Texts · Course Materials · Other	1. Tissue engineering , 2007, by John fisher & Antonios mikos :CRC press. Tylor and francess group. 2. Stem cell & Tissue engineering,2011, by, song Li &Nicolas L. etal. Hackinsak,NJ 3. Tissue Engineering A,B,C & Biomaterial
Special requirements (include for example workshops, periodicals, IT software, websites)	Check the new modern websites talking about the new modifications
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	
Minimum number of students	20
Maximum number of students	30

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides rich foundation to learn and acquire English as a second language and use the language for academic purposes. The course prepare undergraduate students to use English language successfully in speaking, reading and writing

1. Teaching Institution	University of Baghdad / Alkhwarizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Biomedical Circuits & Electronics
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	First Course
7. Number of hours tuition (total)	60 Hours
8. Date of production/revision of this specification	2018
9. Aims of the Course	
By the end of this course, The students will be able to: 1. Know the theory and background Transistor Frequency Response. 2. Know the applications and operations of Feed Back Analysis 3. Negative Feed Back. 4. learn about the Feed Back Analysis, Positive Feed Back 5. Investigate the 555 Timer 6. Training on Practical Circuits, Timers, Drivers and Power Supplies	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A. Knowledge and Understanding

Graduates will be able to:

A1. √ A2. √ A3. √

B. Subject-specific skills

B1. √ B2. √ B3. √

Teaching and Learning Methods

1. Lectures where the students write information presented to them via slide show, overhead or written by the lecturer;
2. Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;
3. Question and answer sessions during lectures or staff Office Hours;
4. Laboratory sessions.

Assessment methods

1. Written examinations (Summative assessment);
2. Oral presentations of individual and group work;
3. Homework;
4. Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
5. Presentation skills through group presentations and poster presentations.

C. Thinking Skills

C1. √ C2. √ C3. √ C4. √

Teaching and Learning Methods

1. External lectures from industry or clinicians;
2. Feedback given to students during tutorials;
3. Question and answer sessions during lectures or staff Office Hours;
4. Completion of web-based exercises or computer based laboratory sessions

Assessment methods

1. Individual written project report(s) of both individual and group projects;
2. Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
3. Presentation skills through group presentations and poster presentations

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

D1. √ D2. √

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method

Second course					
1	4		Bipolar Junction Transistors (BJT), Transistor Construction , Transistor Operation , Common-Base Configuration , Common-Emitter Configuration		
2	4		Common-Collector Configuration, Operating Point, Fixed-Bias Configuration Emitter-Bias Configuration, Voltage-Divider Bias Configuration		
3	4		Collector Feedback Configuration, Emitter-Follower Configuration, Common-Base Configuration, Multiple BJT Networks		Quiz
4	4		Current Mirrors, Current Source Circuits, pnp Transistors, Transistor Switching Networks		
5	4		Amplification in the AC Domain, BJT Transistor Modeling, The r e Transistor, Model, Common-Emitter Fixed-Bias, Configuration, Voltage-Divider Bias		Quiz
6	4		CE Emitter-Bias Configuration, Emitter-Follower Configuration, Common-Base Configuration, Collector Feedback Configuration, Collector DC Feedback Configuration, Effect of RL and Rs		
7	4		Determining the Current Gain, Feedback Pair, The Hybrid Equivalent Model		
8	4		FET Transister, Construction and Characteristics of JFETs, Transfer Characteristics, Specification Sheets (JFETs), Depletion-Type MOSFET, Enhancement-Type MOSFET		
9	4		MOSFET Handling, VMOS and UMOS Power and MOSFETs, CMOS, Fixed-Bias Configuration, Self-Bias Configuration		
10	4		Voltage-Divider Biasing, Common-Gate Configuration, Depletion-Type MOSFETs, Enhancement-Type MOSFETs		Quiz
11	4		Combination circuits or Networks, Design of FET, p -Channel FETs, Universal JFET Bias Curve		
12	4		FET A.C model, FET Small-Signal Model, Fixed-Bias Configuration, Self-Bias Configuration, Voltage-Divider Configuration, Common-Gate Configuration, Source-Follower (Common-Drain) Configuration, Depletion-Type MOSFETs, Enhancement-Type MOSFETs		Quiz

13	4		E-MOSFET Drain-Feedback, Configuration, E-MOSFET Voltage-Divider Configuration, Designing FET Amplifier Networks		
14	4		Special Transistor, Darlington pair, Toten boll pair, Transistors in series, Transistors in parallel, Cascade Transistors connection, FET - BJT & BJT - FET connections		
15	4		Mid exam		

12. Infrastructure	
Required reading: · Core Texts · Course Materials · Other	1. Electronic Devices and Circuit Theory by Robert L. 2. Boylestad 3. Electronic devices and circuits by Jicob Milliman 4. ELECTRONIC DEVICES by Thomas L. Floyd
Special requirements (include for example workshops, periodicals, IT software, websites)	Check the new modern websites talking about the new modifications
Community-based facilities (include for example, guest Lectures , internship , field studies	

13. Admissions	
Pre-requisites	
Minimum number of students	20
Maximum number of students	30