Al-Nahrain University

جامعة النهرين

First Cycle – Bachelor's degree (B.Sc.) – Prosthetics and Orthotics Engineering

بكالوريوس علوم في هندسة الاطراف والمساند الصناعية

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1. Mission & Vision Statement

Vision Statement

The academic staff of Prosthetics and Orthotics Engineering department at Al-Nahrain University believe that this development in the learning program can serve opportunity for students to be more precise to attend program outcomes and develop skills through the combination of learning methods which can explore their abilities through course work , lab experiments ,reports and project This program encourage students to presents their labors and activates by several methods of assessments in class , online and home workload .

Mission Statement

The academic staff of Prosthetic and Orthotic Engineering department at Al-Nahrain University seek to introduce a learning program which provides the sufficient basic, fundamental and specialized knowledge in this field of engineering focusing on engineering basics sciences including , prosthetic and orthotic sciences ,biomechanics and medical life sciences .The curriculum and course structure has been designed to encourage students to gain knowledge required for their professional future

2. Program Specification

Program code:	BSc-POE	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

Prosthetic and Orthotic Engineering is the department that is concerned with preparing qualified engineers professional for the noble humanitarian services of peoples with special needs and restore them to their normal lives in society.

The program focus on providing suitable learning outcomes for graduate essential for their professional future to contribute for patient care of amputees and deformity disability .This can be achieved through strengthening the engineering ,medical and biomechanical Knowledge . The engineering side of the program is related to designing, materials selection, manufacturing and optimization .The medical side including biology ,anatomy, physiology, pathology and nerves system .The biomechanical side represents the interaction between the human body with the external devices such as prosthetic limbs and orthotics devices .

At level 1, students are acquainted with the basics of engineering , medical sciences and general college requirements, while at the level 2, they are introduced to the basics of prosthetic and orthotic Engineering. At levels 3 and 4, students will be comprehensively specialized in core topics that prepare the student and provide them with theoretical and practical skills in designing, installing and fitting prosthetic and orthosis devices for replacing the body missing parts of limbs, and correcting the injured deformity. Students are free to select their interested subject through many elective modules . The design ,critical thinking and problem solving are promoted through program theoretical subjects, while team work , research and practical skills are developed and reinforced through labs , clinical practice ,summer training and final project .

3. Program Goals

1. To provide a comprehensive education in prosthetics and orthotics engineering that stresses scientific reasoning and engineering problem solving .

2. To prepare students for a wide variety of post-graduate paths, including Master and Doctorate and other related specialist sciences.

3. To provide extensive hands-on training in prosthetic and orthotic labs ,clinical practices and patient rehabilitation at biomechanical lab and prosthetic centers and hospitals as well as the other fundamental labs in engineering and medicine.

4. To provide thorough training in written and oral communication of scientific information, statistical and data analyzing .

5. To enrich students with opportunities for alternative education in the area of prosthetics and orthotics and biomedical engineering through undergraduate research, internships, and study-abroad

4. Student Learning Outcomes

Prosthetic and Orthotics Engineers is an engineering science that deals with patient care and rehabilitation .Both Engineering and medicine science Knowledge are adopted .The modules learning outcomes are selected to achieve the final program goals .

Outcome 1

Engineering Knowledge……

Prosthetics and Orthotics Engineer should have a solid background understanding of the foundational principles and concepts of engineering and their application.

Outcome 2

Problem Solving……

Graduates should be able to identify, formulate, and solve engineering problems, including those related to prosthetic and orthotic . This involves analyzing problems, designing and implementing solutions, and evaluating their effectiveness.

Outcome 3

Design and Development of Solutions……

Prosthetics and Orthotics Engineer should be capable of designing systems, components, or processes and proper select materials to meet specific needs within realistic constraints, considering factors such as safety, ethics, and societal impacts.

Outcome 4

Experimentation and Data Analysis……

Prosthetics and Orthotics Engineer should be proficient in preparing and conducting experiments, as well as analyzing and interpreting data to draw valuable conclusions and make scientific conclusion .

Outcome 5

Teamwork and Communication……

Graduate will work as part of multidisciplinary teams. And they should be able to effectively collaborate and communicate with team members from diverse backgrounds to achieve common goals.

Outcome 6

Professionalism and Ethics……

Prosthetics and Orthotics Engineer should demonstrate professionalism, ethical behavior, and responsibility in their engineering practice. They should understand the societal and environmental impacts of their work and make ethical decisions accordingly

Outcome7

Lifelong Learning……

Prosthetics and Orthotics Engineer Given the rapidly evolving nature of technology and healthcare, so they should have a commitment to continuous learning and professional development throughout their careers. They should be able to engage in self-directed learning and adapt to new technologies and practices.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

Al-Nahrain University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs. student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C – Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   CGPA of a 4-year B.Sc. degree:

   CGPA = [(1st ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Pre-request
UREQ110	Human Rights + Democracy	30	45	3	S	
UREQ111	Programing	72	28	4	B	
MATH110	Math I	86	64	6	B	
CREQ110	Engineering Drawing I	100	50	6	B	
POER110	Statics	86	64	6	C	
CREQ111	Chemistry	72	53	5	B	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Pre-request
MATH120	Math II	86	64	6	S	MATH110
UREQ120	English Language I	44	31	3	B	
PHYS120	Physics	114	61	7	B	
CREQ120	Engineering Drawing II	86	64	6	B	CREQ110
POER120	Dynamics	86	39	5	C	
CREQ121	Workshop Technology	30	45	3	B	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Pre-request
UREQ210	English Language II	44	31	3	S	UREQ120
UREQ211	Principles of Management	30	20	2	S	
MATH210	Math III	72	53	5	B	MATH120
POER210	Anatomy	86	64	6	C	
POER211	Strength of Materials	86	64	6	C	POER110
POER212	Orthoses I	128	72	8	C	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Pre-request
POER220	Biomaterials	58	42	4	C	
MATH220	Math IV	58	67	5	B	MATH210
POER221	Biomechanics	58	42	4	C	
POER222	Electronics	86	39	5	C	
POER223	Prostheses I	128	72	8	C	
POER224	Elective I	58	42	4	E	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Pre-request
POER310	Automatic Control	86	64	6	C	MATH220
POER311	Prostheses II	128	72	8	C	
POER312	Pathology	58	42	4	C	
CREQ310	Statistics	58	42	4	B	
POER313	Rehabilitation	58	42	4	C	
POER314	CAD/CAM System	58	42	4	C	CREQ120

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Pre-request
POER320	Orthoses II	128	72	8	C	
POER325	Elective II	58	42	4	C	
POER321	Anatomy & Physiology of Nervous System	58	42	4	C	
POER322	Numerical Analysis	72	53	5	C	MATH220
POER323	Analytical Biomechanics	72	53	5	C	POER221
POER324	Computer Applications	58	42	4	S	CREQ120

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Pre-request
UREQ410	Professional Ethics	30	20	2	S	
POER410	Prosthetic Clinical Practice	114	86	8	C	POER212, POER311
POER411	Mechanical Design	100	50	6	C	POER211
POER412	Robotics and Smart Prosthesis	72	53	5	C	POER120
POER413	Elective III	44	31	3	C	
CREQ410	Project I	84	66	6	C	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	ECTS	Module Type	Pre-request
POER420	Research Methods in Health	72	53	5	S	CREQ310
POER421	Orthotic Clinical Practice	114	86	8	C	POER223, POER320
POER422	Elective IV	44	31	3	C	
POER423	Elective V	44	31	3	C	
POER424	Advance Manufacturing	86	39	5	S	POER314
CREQ420	Project II	84	66	6	C	

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