

Bachelor of Civil Engineering (Honors)

Introduction

The Civil engineering is the profession which designs, constructs, operates and manages the basic systems that make civilization possible and which assesses the impacts of such systems on the natural environment. The civil engineer must deal with the human impact of engineering, social, moral, legal and environmental issues that concern us to a far greater degree than ever before. The civil engineering program B.Sc. at MCMST designed to develop and graduate knowledgeable and creative engineers with strong capabilities for innovation and management in different civil engineering disciplines to meet the local community needs in international standards. To prepare a curriculum that realizes these requirements, the committee of the program curriculum conducted an extensive survey on civil engineering programs of many national and international universities. The committee has referred to the civil engineering programs of the following national universities: Nile Valley University, University of Khartoum, Future University, and Jordanian Sudanese College for Science and Technology. Internationally, the committee has referred to the Arizona State University (USA).

Program Duration and the Awarded Degree

The program duration is five years (10 semesters of 15 weeks each). After completing the five-year study, the student is awarded the Bachelor of Science (Honors) degree in Civil Engineering.

Program Aims

The program aims to graduate qualified civil engineers to take a leading role in the development and give innovate solutions for the problems facing the community in this field with high sense of responsibility. Also the program gives the student a strong foundation in civil engineering knowledge, which enables them to guide research activities to create solutions for persistent problems in surrounding communities.

Program Outcomes

Students who have successfully completed the program should be gaining the following:

- a) Ability to apply knowledge of mathematics, science, and engineering.
- b) Ability to design and conduct experiments as well as to analyze and interpret data.
- c) Ability to design a system, component, or process to meet desired needs.
- d) Ability to function in multidisciplinary teams.
- e) Ability to identify, formulate and solve engineering problems.
- f) Understanding of professional and ethical responsibility.
- g) Ability to communicate effectively.
- h) Broad education necessary to understand the impact of engineering solutions in a global and societal context.

- i) Recognition of the need for, and an ability to engage in life-long learning.
- j) Knowledge of contemporary issues.
- k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Program Components

The courses of the program are classified into: Basic science, basic engineering courses, professional engineering courses, and humanities (the university requirements) in addition to Industrial Training. Table (1) below shows the percentage share of each component in the program. The corresponding percentage range recommended by the Engineering Studies Committee, Ministry of Higher Education and Scientific Research (MHESR) is also shown for comparison

Courses Schedule

First Year

	Code	Course Name	Contact Hours				Credit Hours
			Lecture	Tutorial	Lab.	Total	
First Semester	ISL111	Islamic Culture I ثقافة الإسلامية I	2	-	-	2	2
	ARAB112	Arabic Language I اللغة العربية I	2	-	-	2	2
	ENGL113	English Language I اللغة الإنجليزية I	2	-	-	2	2
	MATH114	Calculus الحساب	3	1	-	4	3
	PHYS115	Physics I الفيزياء I	2	1	2	5	3
	MATH116	Analytical Geometry الهندسة التحليلية	3	1	-	4	3
	CPIT117	Introduction to Computer Science & Programming مدخل علم الحاسوب والبرمجة	2	-	2	4	3
		Total		16	3	4	22
Second Semester	ISL121	Islamic Culture II الثقافة الإسلامية II	2	-	-	2	2
	ARAB122	Arabic Language II اللغة العربية II	2	-	-	2	2
	ENGL123	English Language II اللغة الإنجليزية II	2	-	-	2	2
	MATH124	Multivariate and Vector Calculus الدوال متعددة المتغيرات وحساب المتجهات	3	1	-	4	3
	PHYS125	Physics II الفيزياء II	2	-	2	4	3
	CHEM126	Chemistry الكيمياء	2	-	2	4	3
	CPIT127	Computer Programming برمجة الحاسوب	2	-	2	4	3
	WOPI28	Workshop Practice أعمال الورش	-	-	4	4	-
		Total		15	1	10	26

Second Year

First Semester	ISL211	Islamic Culture III	الثقافة الإسلامية III	2	-	-	2	2
	ARAB212	Arabic Language III	اللغة العربية III	2	-	-	2	2
	ENGL213	English Language III	اللغة الإنجليزية III	2	-	-	2	2
	MATH214	Ordinary Differential Equations	المعادلات التفاضلية العامة	3	1	-	4	3
	MATH215	Set Theory and Matrices	نظرية المجموعات والمصفوفات	3	1	-	4	3
	GE216	Surveying I	المساحة I	2	1	2	5	3
	GE217	Introduction to Material Science	مدخل علم المواد	2	-	1	3	2
	GE218	Principle of Electrical Engineering	أساسيات الهندسة الكهربائية	2	-	1	3	2
	GE219	Engineering Drawing	الرسم الهندسي	2	-	3	5	3
	Total			20	3	7	30	22
Second Semester	MATH221	Partial Differential Equations	المعادلات التفاضلية الجزئية	3	1	-	4	3
	SUS222	Sudanese Studies	الدراسات السودانية	2	-	-	2	2
	GE223	Surveying II	المساحة II	2	1	2	5	3
	GE224	Principle of Mechanical Engineering	أساسيات الهندسة الميكانيكية	2	1	-	3	2
	GE225	Mechanics of Material I	ميكانيكا المواد I	2	2	1	5	3
	CE226	Hydrology	الهيدرولوجيا	2	1	-	3	2
	CE227	Engineering Geology	الجيولوجيا الهندسية	2	-	1	3	2
	GE228	Applied Mechanics	الميكانيكا التطبيقية	2	2	-	4	3
		Total			17	8	4	29

Third Year

First Semester	MATH311	Complex Variables	المتغيرات المركبة	3	1	-	4	3
	CE312	Fluid Mechanics I	ميكانيكا الموائع I	2	1	1	4	3
	GE313	Mechanics of Material II	ميكانيكا المواد II	2	2	1	5	3
	CE314	Structural Analysis I	تحليل الإنشاءات I	3	1	-	4	3
	CE315	Building Materials	مواد البناء	2	-	1	3	2
	CE316	Concrete Technology	تكنولوجيا الخرسانة	2	1	2	5	3
	Total			14	6	5	25	17
Second Semester	MATH321	Probability and Statistics	الإحصاء والاحتمالات	3	1	-	4	3
	CE322	Fluid Mechanics II	ميكانيكا الموائع II	2	1	2	5	3
	GE323	Mechanics of Material III	ميكانيكا المواد III	2	2	1	5	3
	CE324	Structural Analysis II	تحليل الإنشاءات II	3	1	-	4	3
	CE325	Soil Mechanics I	ميكانيكا التربة I	2	1	2	5	3
	CE326	Reinforced Concrete Design I	تصميم الخرسانة المسلحة I	3	1	-	4	3
	GE327	Principles of Engineering Profession	أساسيات مهنة الهندسة	2	-	-	2	2
	Total			17	7	5	29	20

Fourth Year

First Semester	MATH411	Numerical Analysis	التحليل العددي	3	1	-	4	3
	CE412	Highway Engineering I	هندسة الطرق I	2	1	2	5	3
	CE413	Hydraulics I	الهيدروليكا I	2	1	1	4	3
	CE414	Civil Engineering Drawing	الرسم الهندسي المدني	2	-	3	5	3
	CE415	Reinforced Concrete Design II	تصميم الخرسانة المسلحة II	3	1	-	4	3
	CE416	Design of Steel Structures I	تصميم منشآت الفولاذ I	2	2	-	4	3
		Total			14	6	6	26
Second Semester	CE421	Soil Mechanics II	ميكانيكا التربة II	2	1	2	5	3
	CE422	Irrigation Engineering	هندسة الري	2	1	-	3	2
	CE423	Highway Engineering II	هندسة الطرق II	2	1	2	5	3
	CE424	Hydraulics II	الهيدروليكا II	2	1	1	4	3
	GE425	Contracts, Specific. & Quantity Surveying	العقود, المواصفات والمسح الكمي	2	1	-	3	2
	CE426	Reinforced Concrete Design III	تصميم الخرسانة المسلحة III	3	1	-	4	3
	GE427	Research Methodology	طرائق البحث العلمي	2	1	-	3	2
	Total			15	7	5	27	18

Fifth Year

Ninth Semester	GE511	Construction Management	إدارة التشييد	2	2	-	4	2
	CE512	Design of Hydraulic Structures	تصميم المنشآت الهيدروليكية	2	1	-	3	2
	CE513	Sanitary Engineering I	الهندسة الصحية I	2	1	1	4	3
	CE514	Design of Steel Structures II	تصميم منشآت الفولاذ II	2	2	-	4	3
	CE515	Foundation Engineering	هندسة الأساسات	2	2	-	3	3
	CE516	Elective I	منهج اختياري I	3	1	-	4	3
	CE517	Project I	مشروع تخرج I	-	-	6	6	3
		Total			13	9	7	29
Second Semester	CE521	Sanitary Engineering II	الهندسة الصحية II	2	1	1	4	3
	CE522	Structural Analysis III	تحليل الإنشاءات III	3	1	-	4	3
	CE523	Computer-aided analysis and design	التحليل والتصميم باستخدام الحاسوب	2	-	1	3	2
	GE524	Engineering Economics	الإقتصاد الهندسي	2	1	-	3	2
	CE525	Introductory Finite Element Method	مقدمة طريقة العنصر المحدد	2	1	-	3	2
	CE526	Elective II	منهج اختياري II	3	1	-	4	3
	CE527	Project II	مشروع تخرج II	-	-	6	6	3
	Total			9	5	8	27	17