Al-Qasim Green University
جامعة القاسم الخضراء

Bachelor's Degree (B.Sc.) - Water Resources Management engineering بكالوريوس هندسة ادارة موارد مائية

Table of Contents

1. Overview

This catalogue is about the courses (modules) given by the program of Water Resources Engineering to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة الموارد المائية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (٤٨) مادة دراسية، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
QWRE2601	Mathematics I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
Mathematics is an essential module in the learning chain of Management engineering. The module is comprising of Coordinates and graphs in the plane, Distance between two points and between point to a line Slopes and equations for lines and circle equation, functions and their graphs, the limits of functions, differentiation, and integration methods.			

Module 2

Code	Course/Module Title	ECTS	Semester
QWRE2602	Engineering Mechanics I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
Students are taught the fundamentals of engineering mechanics, including discuss the concept of the static analysis and understand the two- and three-dimensional force system in addition to analyzing a structure for equilibrium. Moreover, analyze the structures such as trusses, frames and machines.			

Module 3

Code	Course/Module Title	ECTS	Semester
QWRE2403	Engineering Drawing I	4	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
-	3	48	52
Description			
The course is for learning how to draw clear, accurate and detailed drawings. This class will teach the student to understand the fundamental principles of graphic communication. It will also provide you the beginning step to learning the skills for computer-aided drafting and traditional board design. This course leads students to an understanding of			

engineering drawing, an essential means of communication in engineering. Drawing instruments, conventions and standards of engineering drawing, and orthographic drawing of objects in addition to dimensioning and tolerances.

Module 4

Code	Course/Module Title	ECTS	Semester
QWRE3404	Introduction of Water Resources Engineering	4	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	-	63	37
Description			
This course provides a comprehensive introduction to water resource engineering, covering various aspects included definition and scope of water resource engineering and its significance in managing water resources. The course emphasizes the role of water resource engineers in society and examines the specific context of water resources in Iraq. Topics covered include the different sources of water resources, encompassing both conventional and unconventional sources.. Furthermore, the course delves into the fundamental concepts of the water cycle and hydrological processes. Surface water hydrology is explored, focusing on river basins, rainfall patterns, and runoff processes. Groundwater hydrology is also discussed, covering aquifers, groundwater flow, and the interactions between groundwater and surface water.			

Module 5

Code	Course/Module Title	ECTS	Semester
QWRE1305	Computer Principles and Programming	3	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
--	4	63	12
Description			
This course will introduce the student to the fundamentals of using Microsoft Windows 8 and Microsoft office 2010 as well as the Internet.			

Module 6

Code	Course/Module Title	ECTS	Semester

QWRE2506	Engineering Physics	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
This course focuses on the Concepts and definitions. Physics, the most fundamental physical science, is concerned with the basic principles of the Universe. It is the foundation upon which the other sciences— astronomy, biology, chemistry, and geology—are based. The beauty of physics lies in the simplicity of the fundamental physical theories and in the manner in which just a small number of fundamental concepts, equations, and assumptions can alter and expand our view of the world around us.			

Module 7

Code	**Course/Module Title**	**ECTS**	**Semester**
QWRE1207	Arabic Language	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	17
Description			
تهتم هذه المادة بتدريس قواعد اللغة العربية وآدابها ومعاني الالفاظ ومدلولاتها تنمي حسن استعانتهم بمعاجم اللغة والألفاظ تهتم بتحسين الصورة الجمالية للغة العربية			

Module 8

Code	**Course/Module Title**	**ECTS**	**Semester**
QWRE2608	Mathematics II	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
Mathematics is an essential module in the learning chain of Management engineering. The module is comprising of Coordinates and graphs in the plane, Distance between two points and between point to a line Slopes and equations for lines and circle equation, functions and their graphs, the limits of functions, differentiation, and integration methods.			

Module 9

Code	Course/Module Title	ECTS	Semester
QWRE2609	Engineering Mechanics II	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
This course will recognize center of gravity, center of mass, and the centroid, develop a method for determining the moment of inertia for an area, introduce the product of inertia and show how to determine the maximum and minimum moments of inertia for an area. introduce the concept of dry friction.			

Module 10

Code	Course/Module Title	ECTS	Semester
QWRE2410	Autocad	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
--	2	33	67
Description			
The course is for learning how to draw clear, accurate and detailed drawings. This class will teach the student to understand the fundamental principles of graphic communication. It will also provide you the beginning step to learning the skills for computer-aided drafting and traditional board design. This course leads students to an understanding of engineering drawing, an essential means of communication in engineering.			

Module 11

Code	Course/Module Title	ECTS	Semester
QWRE3411	Soil physics	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	22
Description			
This course equips students with the theoretical understanding and modeling skills required to analyze and predict mass and energy transport in the soil-plant-atmosphere continuum. Students will learn to apply analytical and numerical models for diverse transport phenomena including water,			

heat, solute, and gas transport through soil. Applications in hydrology, agronomy, and environmental science will be emphasized.

Module 12

Code	Course/Module Title	ECTS	Semester
QWRE2412	Engineering Statistics	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	37
Description			
This course contains the fundamental concepts, methods of statistics and the principles of statistics for engineering applications. The applications of statistics to everyday life, Methods for acquiring data through observation and experimentation. To organize and describe quantitative and categorical forms of data. Anticipating patterns using basic probability and sampling. Statistical inference through estimation and hypothesis testing. Correlation and simple regression. Ways of describing the strength of relationships between variables. Two main statistical methodologies are used in data analysis: descriptive statistics, which summarizes data from a sample using indexes such as the mean or standard deviation, and inferential statistics, which draws conclusions from data that are subject to random variation. Descriptive statistics are most often concerned with two sets of properties of a distribution (sample or population): central tendency (or location) seeks to characterize the distribution's central or typical value, while dispersion (or variability) characterizes the extent to which members of the distribution depart from its center and each other. Inferences on mathematical statistics are made under the framework of probability theory, which deals with the analysis of random phenomena.			

Module 13

Code	Course/Module Title	ECTS	Semester
QWRE2213	Geology	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	17
Description			
Study of the Earth's crust components, identify the types of rocks and the factors affecting it, the most important constituent of the rocks and minerals properties Study properties of rocks .			

Module 14

Code	Course/Module Title	ECTS	Semester
QWRE1214	English Language	2	2

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	17
Description			
Technical English course have been devised to help students at this level to improve their knowledge and use of English in an engineering environment. Each unit covers vocabulary related to a particular topic area such as bridges, tunnels etc, and is designed to reinforce the grammar knowledge of students and improve their communication skills.			

Module 15

Code	Course/Module Title	ECTS	Semester
QWRE1215	Human Rights and Democracy	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	---	33	17
Description			
يوفر وصف المقرر معرفة باهم خصائص حقوق الانسان في المجتمع والوعي باهميتها			

Module 16

Code	Course/Module Title	ECTS	Semester
QWRE2616	Mathematics III	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	2	93	57
Description			
This course helps the students to use the mathematics in solving different engineering problems later on in their studies.			

Module 17

Code	Course/Module Title	ECTS	Semester
QWRE2617	Fluid Mechanics I	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**

2	3	78	72
Description			
Develop an understanding of fluid mechanics in water resources and hydraulic structures engineering as well as a variety of other fields. Learn to analyze the static forces on the gates and other components of the hydraulic structures. Basic principles and equations for accelerated fluids (angular and linear acceleration). Studying the types of fluid flow and the basic equation in fluid mechanics such as continuity, and Bernoulli's equations.			

Module 18

Code	**Course/Module Title**	**ECTS**	**Semester**
QWRE2618	Engineering Surveying I	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
Introduction to the elements of the discipline of surveying, with concentration on applications for the construction process. Included are topics on: the background and history of the surveying profession and how it interacts with other disciplines; measurement concepts, error consideration, accuracy, precision, and significant figures; methods for distance measuring; elevation measurements and leveling.			

Module 19

Code	**Course/Module Title**	**ECTS**	**Semester**
QWRE3619	Design of Irrigation and drainage systems	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
Irrigation and Drainage is the course that introduces the students to the significant of Irrigation and Drainage in relation to design and construction of irrigation and drainage practices and management. Also, it involves water relation in soils, determination of soil moisture, soil suction, Soil characteristics curve and water movement in the soil. Further more, the course will involve the study of Darcy's law, Poiseuilles law, Laplace equation, Laboratory and field methods of determining hydraulic conductivity, infiltration determination, field capacity, Bulk Density, Permanent Wilting Point, Surface tension, Evaporation, Evapotranspiration and its determination. However, it will assist the students to understand steady and unsteady flow, constant and falling			

head permeameter, single and double auger hole, drainage equations, factors influencing the flow of water in the soil, isotropic and anisotropic soil, Dupiit and forchemer assumptions and flow equations.

Module 20

Code	Course/Module Title	ECTS	Semester
QWRE2420	Computer applications	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	48	52
Description			
Programming to become basic element in Technology influences. Students will be able to apply the skills acquired in this class to the many different fields of engineering.			

Module 21

Code	Course/Module Title	ECTS	Semester
QWRE1221	Baath Crimes in Iraq	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	---	33	17
Description			
يوفر وصف المقرر معرفة الجرائم الشنيعة التي اقترفها نظام البعث في العراق.			

Module 22

Code	Course/Module Title	ECTS	Semester
QWRE2822	Strength of Materials	8	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	1	78	122
Description			
This course covers the relationship between stress and strain on deformable solids. Applies analysis to members subjected to axial, bending, and torsional loads.			

Module 23

Code	Course/Module Title	ECTS	Semester
QWRE2623	Fluid Mechanics II	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
The objectives of this course are to provide the student with a basic understanding of momentum conservation in fluid, pumps with pipeline, pipes in series and in parallel, branching pipe systems, fluid flow measurement instruments, and dimensional analysis.			

Module 24

Code	Course/Module Title	ECTS	Semester
QWRE2624	Engineering Surveying II	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
Introduction to the elements of the discipline of surveying, with concentration on applications for the construction process. measuring angles, bearings and azimuths with transits; traverses and traverse computations. Electromagnetic Distance Measuring Instrument and electronic theodolite(**Total station)** it is also integrated with microprocessor, electronic data collector and storage system. The instrument can be used to measure horizontal and vertical angles as well as sloping distance.			

Module 25

Code	Course/Module Title	ECTS	Semester
QWRE2425	Concrete Technology	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	37
Description			
study the fundamental of concrete technology including concrete materials, manufacturing, concrete properties in both fresh and hardened state, durability, concrete types and methods of mix design. In addition to make the students able to conduct the different tests through the			

laboratory work and check the results with the standard specifications.

Module 26

Code	Course/Module Title	ECTS	Semester
QWRE2426	Construction and Building Materials	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	37
Description			
explain the development of construction materials and methods of construction , and the expected problems that may occur during and after the project execution with brief idea about the solutions.			

Module 27

Code	Course/Module Title	ECTS	Semester
QWRE1227	English Technical writing	2	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	----	33	17
Description			
Technical English course have been devised to help students at this level to improve their knowledge and use of English in an engineering environment. Each unit covers vocabulary related to a particular topic area such as bridges, tunnels etc, and is designed to reinforce the grammar knowledge of students and improve their communication skills.			

Module 28

Code	Course/Module Title	ECTS	Semester
QWRE3728	Open Channel Hydraulics I	7	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	93	82
Description			
The course covers topics related to open channel hydraulics normally covered at the level beyond the undergraduate level in water resources engineering and civil engineering. The focus is on advanced			

topics for open channel flow including basic concepts of the energy and momentum principles, flow resistance in uniform and non uniform channels, flow in compound channels, natural channels, transitions, unsteady flows and flood routing. Application of the basic principles using the commonly used models are also studied.

Module 29

Code	Course/Module Title	ECTS	Semester
QWRE3629	Theory of Structures	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	2	93	57
Description			
Types of Structures; Analysis of determinate structures; Stability and determinacy; Axial force, shear force and bending moment diagrams of frames and arches; Trusses; Influence lines and moving loads; Elastic deformation of structures.			

Module 30

Code	Course/Module Title	ECTS	Semester
QWRE3430	Reinforced Concrete Design I	4	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
Design is an overarching theme in this class. Students focus on design of concrete components under axial, bending, and shear loading. Emphasis on ultimate, allowable, and service design theories is provided. An overall view of component design is taken, by incorporating practical considerations, such as reinforcement placement and member sizing. All homework assignments contain member design problems. Of these, approximately half require students to first determine system load distributions using static analysis procedures. A significant portion of the lectures is designed to guide students as needed to complete design related homework problems and present theoretical background related to member design concepts. A field trip is organized during one lecture period to visit the site nearby to observe concrete construction. In a portion of the weekly discussion/laboratory sessions, component design is discussed (as complemented by lectures) and specifically related to homework design problem sets.			

Module 31

Code	Course/Module Title	ECTS	Semester
QWRE3631	Soil Mechanics	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
In this course, the student will learn how to plan a site investigation, how to classify and characterize soils for foundation design, how to estimate the immediate settlement of the soil under footing, and how to estimate the capacity of foundation.			

Module 32

Code	Course/Module Title	ECTS	Semester
QWRE3432	Engineering Hydrology	4	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
Students will perform a hydrological study of the laws governing the occurrence, distribution, and movement of water in watershed systems. Topics include meteorological considerations, precipitation, evaporation, infiltration, streamflow, hydrograph analysis, flood routing, groundwater flow, well hydraulics and frequency analysis.			

Module 33

Code	Course/Module Title	ECTS	Semester
QWRE3333	Engineering Analysis	3	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	----	33	42
Description			
Study advanced engineering analysis to have the ability to solve engineering problems. Engineering analysis course provides the theoretical and mathematical basis for solving the engineering problems. This course improved and developed student's ability to get the exact solution of mathematical engineering problems.			

Module 34

Code	Course/Module Title	ECTS	Semester
QWRE3734	Open Channel Hydraulics II	7	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	93	82
Description			
The course covers topics related to open channel hydraulics normally covered at the level beyond the undergraduate level in water resources engineering and civil engineering. The focus is on advanced topics for open channel flow including basic concepts of the energy and momentum principles, flow resistance in uniform and non uniform channels, flow in compound channels, natural channels, transitions, unsteady flows and flood routing. Application of the basic principles using the commonly used models is also studied.			

Module 35

Code	Course/Module Title	ECTS	Semester
QWRE3535	Reinforced Concrete Design II	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			
Design is an overarching theme in this class. Students focus on design of concrete components under axial, bending, and shear loading. Emphasis on ultimate, allowable, and service design theories is provided. An overall view of component design is taken, by incorporating practical considerations, such as reinforcement placement and member sizing. All homework assignments contain member design problems. Of these, approximately half require students to first determine system load distributions using static analysis procedures. A significant portion of the lectures is designed to guide students as needed to complete design related homework problems and present theoretical background related to member design concepts. A field trip is organized during one lecture period to visit the site nearby to observe concrete construction. In a portion of the weekly discussion/laboratory sessions, component design is discussed (as complemented by lectures) and specifically related to homework design problem sets.			

Module 36

Code	Course/Module Title	ECTS	Semester
QWRE3536	Foundations	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**

3	1	63	62
Description			
Students will have to present convincing written arguments to define foundation types and testing to solve specific foundation engineering problems. Discussion and evaluation the feasibility of foundation solutions to different types of soil conditions considering the time effect on soil behavior are adopted. The course give the student the necessary theoretical background for design and construction of foundation systems.			

Module 37

Code	Course/Module Title	ECTS	Semester
QWRE3537	Water Quality Control	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
A system of documented procedures and plans established to ensure that the water monitoring program produces data of known precision and bias. This includes student training programs, calibration processes, written procedures and record keeping.			

Module 38

Code	Course/Module Title	ECTS	Semester
QWRE3438	Engineering Economic and Management	4	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
How to manage anything in life, The use of project resources properly and distribution optimization, Know the parties to the engineering project and duties, Find out what is the geometric elements of the economy and the feasibility study. and Control the time, cost and quality.			

Module 39

Code	Course/Module Title	ECTS	Semester
QWRE3439	Numerical Analysis	4	6

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
Study numerical engineering analysis to have the ability to solve engineering problems numerically. Numerical analysis course provides the ability of data analysis, obtained the solutions of difficult equations and deferential equations which cannot solve exactly. This course improved and developed student's ability to get the numerical solution of mathematical engineering problems.			

Module 40

Code	Course/Module Title	ECTS	Semester
QWRE3540	Hydraulics Structures I	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			
Introduction , Types of Hydraulic Structures, Steps for Design of Hydraulic Structures , Causes of Failure of Hydraulic Structures, Bligh's Creep Theory, Lane's Weighted Creep Theory, Khosla's Theory, Hydraulic Design of Regulators, Hydraulic Jump, Vertical Drop, Chutes and Design of Stilling Basins			

Module 41

Code	Course/Module Title	ECTS	Semester
QWRE3541	Structural design of Hydraulic Structures I	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62
Description			

Module 42

Code	Course/Module Title	ECTS	Semester

QWRE3542	Dams Engineering	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	77
Description			
Introduction, Field Investigation and Laboratory Testing, General Design Considerations, Foundation and Abutment Preparation, Seepage Control, Embankment Design, Appurtenant Structures, Stability of Slopes: Introduction, Factor causes failure of slopes, Rapid Determination of Factor of Safety for a homogeneous regular slopes (Taylor Stability Number), Effective Stress Analysis Methods for Determination of Factor of Safety (The Conventional Method, the Simplified Method and the Regorous Method).			

Module 43

Code	**Course/Module Title**	**ECTS**	**Semester**
QWRE3543	GIS & Remote Sensing	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	47
Description			
Learn and show the Remote Sensing principle , Global Positioning System (GPS), Principles of GPS, Point Positioning , NNGS system, GNSS/GPS, Introduction to Digital Data and Imagery, Image Enhancement, Data Analysis in GIS, NETWORK ANALYSIS, Raster Analysis, and Modelling spatial			

Module 44

Code	**Course/Module Title**	**ECTS**	**Semester**
QWRE3544	Estimation and specifications	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	37
Description			
The course presents the methods to estimate the cost of project and the ensuring the right specifications of construction materials.			

Module 45

Code	**Course/Module Title**	**ECTS**	**Semester**
QWRE1245	Engineering Profession Ethics	2	1

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	---	33	17

Description

This course is presented in three parts: theory; case studies; and research and presentation. The greater part of the time in this course is spent in Part 2 on the engineering ethics case studies. The course will be graded from a mid-term covering Part 1 and some topics in Part 2, and from a major paper and presentation. This is a group project on a topic from Part 2, pulling together in-depth research by individuals in Part 3.

- Part 1 consists in ethics, philosophy of engineering, and the engineering ethics case study methodology.. Philosophy of engineering is laid down in the four major categories of philosophy: metaphysics, ethics, epistemology and education.
- Part 2 consists in engineering ethics case studies. Historical cases are taken primarily from the scholarly literatures on engineering ethics, and hypothetical cases are written by students. Each student will write a story by selecting an ancestor or mythic hero as a substitute for a character in a historical case. Students will compare these cases and recommend action.
- Part 3 readies the students for their major papers. Cases are selected and teams are organized around them. The cases are studied in-depth in pairs of approaches as was done in Part 2. The in-depth studies are assigned by the team, but conducted by individuals. Dry runs for the presentations are conducted.

Module 46

Code	Course/Module Title	ECTS	Semester
QWRE2346	Engineering Project I	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
---	5	78	22

Description

The final year project (FYP) for Water Resources Engineering Programme is a one-year independent study under the supervision of a faculty member, which includes either analytical, experimental, computational, or case-study type work. A final report must be submitted near the end of the second semester accompanied with an A3 size poster. The FYP will be assessed through both report writing and oral presentation.

Module 47

Code	Course/Module Title	ECTS	Semester
QWRE3647	Hydraulics Structures II	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**

3	1	63	87
Description			
Introduction , Types of Hydraulic Structures, Steps for Design of Hydraulic Structures , Causes of Failure of Hydraulic Structures, Bligh's Creep Theory, Lane's Weighted Creep Theory, Khosla's Theory, Hydraulic Design of Regulators, Hydraulic Jump, Vertical Drop, Chutes and Design of Stilling Basins			

Module 48

Code	Course/Module Title	ECTS	Semester
QWRE3648	Structural design of Hydraulic Structures II	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			

Module 49

Code	Course/Module Title	ECTS	Semester
QWRE3649	Sanitary Engineering	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			
Study of water Treatment standards and design criteria for each unit)- Treatment of sewage- and biosolids stabilization.			

Module 50

Code	Course/Module Title	ECTS	Semester
QWRE3450	Ground Water Hydraulics	4	8

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
The course contains the principles of ground water movement through the aquifer. Ground water one of the most important sources of water in the life, study and understand it may lead to store a huge power for future as a potential energy. Hydraulic of ground water deals with the movant of ground water and potential energy that serve. Steady and unsteady ground water flow, flow to the wells, flow of the wells with different boundaries (constant head, barrier boundary). Finally Image well method.			

Module 51

Code	Course/Module Title	ECTS	Semester
QWRE3451	Water Resources Management	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
This course focuses on the Concepts and definitions:- Integrated water resources management, water cycle, and characteristics of water. Water Resources Development:- Planning, Design, Construction, and Operation and Maintenance. Storm Water Management:- Water quality and quantity issues, Structural and nonstructural control. The water balance as a result of human interference. Water allocation principles. Water allocation principles :- Balancing demand and supply. Water Demand:- Urban water demand, Agricultural water demand, and Environmental water requirements. Water Resources System Analysis:- Benefit cost analysis, System analysis, Decision maker Requirements:- Problem Definition, Model Construction, Model Validation, Model Solution, Solution Appropriateness, and Results Implementation.			

Module 52

Code	Course/Module Title	ECTS	Semester
QWRE2452	Engineering Project II	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
---	3	48	52
Description			
The final year project (FYP) for Water Resources Engineering Programme is a one-year independent study under the supervision of a faculty member, which includes either analytical, experimental, computational, or case-study type work. A final report must be submitted near			

the end of the second semester accompanied with an A3 size poster. The FYP will be assessed through both report writing and oral presentation.

Contact

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