

**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

**2023**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

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**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

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**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

## Academic Program Description Form

University Name: Baghdad

Faculty/Institute: Engineering

Scientific Department: Environment

Academic or Professional Program Name: .....

Final Certificate Name: .....

Academic System: .....

Description Preparation Date: .....

File Completion Date: .....

Signature:

Prof. Dr. Ayad A. H. Faisal

Head of Department Name:

Signature:

Scientific Associate Name:

Date:

Date:

The file is checked by: Asst. Prof. Dr. Maavat Altaie

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

[Signature]

[Signature]  
Approval of the Dean

## TEMPLATE FOR PROGRAMME SPECIFICATION

### HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

#### PROGRAMME SPECIFICATION

The Department of Environmental Engineering at University of Baghdad - College of Engineering has dedicated faculty applying state of the art technologies, utilizing excellent facilities, small classes, and a supportive staff to help students in the department to reach their academic and career goals. Our graduates, who can be found in agencies and businesses throughout the country, are the best indicator of our dedication to student success. The main department educational program is to convert the student's way of thinking to well organized and more practical in handling engineering problem. The student prepared to face any engineering problem in any field and solves the problem in a scientific engineering manner .In addition, the department provides the student with a principle base of knowledge.

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Programme Title	Environmental Engineering
4. Title of Final Award	Bachelor degree in Environmental Engineering
5. Modes of Attendance offered	Direct and Electronic
6. Accreditation	
7. Other external influences	
8. Date of production/revision of this specification	
9. Aims of the Programme	

The Department of Environmental Engineering provides opportunities to obtain the knowledge, skills and professional perspective needed for:

- 1-Graduate Environmental Engineers to serve in all sectors such as Ministries of Environment, Industry, Petroleum, and others. Also, to provide entry to environmental engineering practice and the pursuit of advanced studies.
- 2-Provide students with a sound foundation in the basic principles and engineering in the field of design and engineering analysis.
- 3-Develop the theoretical study and skills to enable students to apply these skills in the areas of work such as real solutions to real problems and the ability to make appropriate decisions.
- 4-Ensure that there is awareness of the importance of environmental protection in all industrial sectors, and develop methodologies to work out, in addition to search for legal ways to apply them.
- 5-Improve the teaching and research skills of the faculty members to meet international standards and the goals of the Department by joining training programs abroad and continuing professional development through gaining leadership skills in order to provide career success.
- 6-Improve the abilities of administration and technical supporting staff.
- 7- Maximum use of resources and potentials of the department.
- 8-Encourage the cooperation with Universities and Academic Centers in developed countries.
- 9-Encourage the cooperation with local Governmental Institutes.
- 10-Encourage the publishing in International Journal with impact factors.

## 10. Learning Outcomes, Teaching, Learning and Assessment Methods

### A. Cognitive goals

A1. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

A2. Recognized by our peers as a highly effective leader in the conducted interdisciplinary research and the development of innovative approaches to solve environmental engineering problems.

A3. Attract and welcome graduate students into advanced study and to graduate Master of Science and Doctoral students who possess both breadth and depth in their chosen focus area and are heavily recruited by industry and academia for their academic strengths and their leadership skills.

A4. Continuous development of curricula and studying plans for all stages and levels of studying at the Department to keep up with the latest developments in environmental engineering.

### B. The skills goals special to the programme .

B1. Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

B2. Maintain an intellectually challenging, yet supportive and welcoming environment that encourages and enables our students, faculty and staff to achieve their best in a diverse community.

B3. Create, disseminate and integrate knowledge of engineering, science and technology that expands our environmental engineering knowledge base, which in turn enables the betterment of human society.

B4. Cooperating with related public sector institutions to supply scientific and engineering advice, and preparing different training courses in the development and capacity building for their engineering staffs.

### Teaching and Learning Methods

Environmental Engineering Department at the College of Engineering- Baghdad University began as a postgraduate program at the Civil Engineering Department in 1986. In 1997, the present department was established as the Department of Environmental Engineering for postgraduate studies. Undergraduate studies were included in 2005 making the Department a full-fledged one at the College of Engineering.

Comprehensive curricula were prepared for the undergraduate studies to ensure that basic theoretical and applied aspects of environmental engineering are covered. The B.Sc. degree awarded by the department well-prepares its holder for his/her professional or academic career. Graduates are cautioned though that there is no substitute for experience. Their degrees are being gate-passes for the long arduous road engineering capability. Success in achieving this goal will depend not only on hard work but also on proper utilization of acquired engineering principles and knowledge as well as the systematic methodology to problem tackling. This approach results in proactive graduates willing to serve both state and society in various environmental engineering fields.

### Assessment methods

Graduate students with high skills

#### C. Affective and value goals

C1. Prepare students for successful careers in environmental engineering

C2. Provide employers with a well-educated workforce that is ready and able to perform valuable environmental engineering services immediately after graduation.

C3. Encourage the growth of knowledge-based industry and stimulate economic growth in Iraq

C4. Engage in lifelong learning, e.g., through additional formal education, continuing education, professional development, research, and self-study, in order to use state-of-the art knowledge to design safe and effective environmental systems and programs and to provide high quality services to the general public, employers, clients, and other professionals.

#### Teaching and Learning Methods

Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program.

### Assessment methods

Graduate students with high skills



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

- D1. An Ability to apply knowledge of mathematics, science, and engineering
- D2. An ability to design and conduct experiments, as well as to analyze and interpret data
- D3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- D4. An ability to identify, formulate, and solve engineering problems

**Teaching and Learning Methods**

The use of techniques, skills, and modern engineering tools necessary for engineering practice

**Assessment Methods**

Graduate students with high skills

**11. Programme Structure**

Level/Year	Course or Module Code	Course or Module Title	Credit rating
First year	EnE 100		39
Second year	EnE 200		38
Third year	EnE 300		37
Fourth year	EnE 400		38

**12. Awards and Credits**

Bachelor Degree  
Requires ( x ) credits

### 13. Personal Development Planning

personal development planning, or PDP, encompasses the importance of recording, reflection and planning in helping to manage the learning and development in an efficient and effective way. In the same vein, career development planning focuses on the principles and processes that are involved in effective career development, and examines the benefits of developing and/or updating a career plan during your studies and beyond.

The primary objective for PDP is to improve the capacity of individuals to understand what and how they are learning, and to review, plan and take responsibility for their own learning. This will help students:

- Become more effective, independent and confident self-directed learners
- Understand how they are learning and relate their learning to a wider context
- Improve their general skills for study and career management
- Articulate personal goals and evaluate progress towards their achievement
- Develop a positive attitude to learning throughout life.

### 14. Admission criteria .

An applicant for admission to an undergraduate program of Environmental Engineering Department, College of Engineering, University of Baghdad, must satisfy the following minimum requirements:

- The applicant should have an Iraqi secondary school certificate, or its equivalent, and majored in natural or technological sciences. The students must obtain high rate qualification for admission at engineering colleges.

-Acceptance is centrally controlled by the Ministry of Higher Education and Scientific Research.

-Distribution of students to the 13 engineering departments of the college of engineering, including the Department of Environmental Engineering, is made according to the capacity plan of the departments and the rating average of the applicants and their will. The capacity plan of the Department of Environmental Engineering in the last three years was 30 students. The number of students accepted in the Department is determined by the College Council based on the capacity and resources of the College.

-An applicant who has graduated from a secondary school outside Iraq must have completed twelve years of combined primary and secondary school studies from a recognized school. He or she is also required to provide an equivalency certificate from the Iraqi Ministry of Education.

## 15. Key sources of information about the programme

Environmental engineers support the well-being of people and the planet in areas where the two intersect. Over the decades the field has improved countless lives through innovative systems for delivering water, treating waste, and preventing and remediating pollution in air, water, and soil. These achievements are a testament to the multidisciplinary, pragmatic, systems-oriented approach that characterizes environmental engineering.

Environmental Engineering for the 21st Century: Addressing Grand Challenges outlines the crucial role for environmental engineers in this period of dramatic growth and change. Five pressing challenges of the 21st century identify that environmental engineers are uniquely poised to help advance: sustainably supply food, water, and energy; curb climate change and adapt to its impacts; design a future without pollution and waste; create efficient, healthy, resilient cities; and foster informed decisions and actions.





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### **Academic Program Description Form**

**University Name: University of Baghdad**

**Faculty/Institute: College of Engineering**

**Scientific Department: Department of Environmental Engineering**

**Academic or Professional Program Name: English**

**Final Certificate Name: .....**

**Academic System: Polona program**

**Description Preparation Date:**

**File Completion Date: 16-2-2024**

**Signature:**

**Head of Department Name:**

**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:**

**Approval of the Dean**

### **1. Program Vision**

The strategic goal is to raise the readiness of the university formations to be distinguished now and in the future. It further aims to bring about a quantum leap in their strategic performance following international standards within the framework of true citizenship and leadership in its various cognitive, and educational research

roles. It also aims to provide community service, upgrade, and strengthen the position of the university within the framework of universities' international rankings, and within the framework of balancing between contemporaneity with modern trends in higher education and preserving originality represented by adhering to the national constants and values of the country.

## 2. Program Mission

English Language Learning Program (*ELLP*) is to help students from all over the world to achieve their personal and academic goals by providing high-quality, individualized English language instruction in a small-classroom setting and warm, welcoming, inclusive, and friendly cultural environment, while also bringing valuable and diverse international student perspectives to the University.

## 3. Program Objectives

- 1- The aim of this course is to empower students with the language and life skills
- 2- The integrated skills approach of the course develops the student's self-confidence to
- 3- succeed in professional and social encounters within an English-speaking global
- 4- using language to express knowledge of Environment and health impacts hazardous

## 4. Program Accreditation

Does the program have program accreditation? And from which agency?

None

## 5. Other external influences

Is there a sponsor for the program?

None

## 6. Program Structure

Program Structure	Number of	Credit hours	Percentage	Reviews*
-------------------	-----------	--------------	------------	----------

	Courses			
<b>Institution Requirements</b>	<b>1</b>	<b>2</b>		<b>basic</b>
<b>College Requirements</b>	<b>4</b>	<b>2</b>		
<b>Department Requirements</b>	<b>4</b>	<b>2</b>		
<b>Summer Training</b>	<b>0</b>	<b>0</b>		
<b>Other</b>				

\* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
2-2024	<b>EnE 108</b>	English	theoretical	practical
			yes	0

8. Expected learning outcomes of the program	
<b>Knowledge</b>	
Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries,	Become more effective, independent and confident self-directed learners
<b>Skills</b>	
The integrated skills approach of the course develops the student's self-understanding	Understand texts using effective learning strategies for reading and vocabulary building,
using language to express knowledge of Environment and health impacts	Improve their general skills for study and career management
<b>Ethics</b>	

Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations,	Articulate personal goals and evaluate progress towards their achievement
Understand texts using effective learning strategies for reading and vocabulary building,	An ability to identify, formulate, and solve engineering problems

<b>9. Teaching and Learning Strategies</b>
Lecture and classroom discussion

<b>10. Evaluation methods</b>
Assignments and exams

<b>11. Faculty</b>						
<b>Faculty Members</b>						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Asst. Prof.	English	Linguistics/ Discourse Analysis			Current faculty number	

<b>Professional Development</b>
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### **Mentoring new faculty members**

The orientation for new faculty members is arranged by the department chair and may consist of a few informal meetings and the distribution of a handbook and other supplementary material. In contrast, approximately one in four colleges have formalized and uniform faculty mentorship programs across all departments.

### **Professional development of faculty members**

In-depth programs included both intensive, multi-day offerings in a short course or retreat format, and extended offerings with multiple sessions spaced over a term, a year, or even longer. These formats typically enrolled a cohort of participants who continued for the entire program.

## **12. Acceptance Criterion**

**central admission**

## **13. The most important sources of information about the program**

–New Headway Plus [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2006),

–Morphy, A.J (1983) English Grammar in use. Cambridge: CUP

<https://www.englishclub.com/grammar/verb-tenses.htm>

<https://www.ego4u.com/en/cram->

[www.perfect-english-grammar.com/verb-tenses.htm](http://www.perfect-english-grammar.com/verb-tenses.htm)

[https://en.wikipedia.org/wiki/Grammatical\\_tense](https://en.wikipedia.org/wiki/Grammatical_tense)

## **14. Program Development Plan**

The development could be done by consulting more resources and increase lecture length to 3 hours weekly

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2024/level 2	EnE 108	English	Basic			•			•			•			

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

## Course Description Form

1. Course Name: English					
2. Course Code: <b>EnE 108</b>					
3. Semester / Year: Semester					
4. Description Preparation Date: 16/2/2024					
5. Available Attendance Forms: attendance and Google classroom					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2					
7. Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Nagham Ali Hassan					
Email: nagham.ali@coeg.uobaghdad.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>			A1) Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries, (A2) Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations, (A3) Understand texts using effective learn strategies for reading and vocabulary building.....		
9. Teaching and Learning Strategies					
<b>Strategy</b>		Lecture and classroom discussion			
10. Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>



		Outcomes			
Week 1	2	<p>(A) Finding and understanding information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources and English language dictionaries,</p> <p>(B) Developing conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentation</p> <p>(C) Understanding texts using effective learning structures</p>	Introduction to the material	Lecture and class discussion	Questions during lectures, quiz exam, presentation the class
Week 2	2		Unit 1		
Week 3	2		Unit 2,3		
Week 4	2		Unit 4,5		
Week 5	2		Quiz		
Week 6	2		Unit 6,7		
Week 7	2		Midterm exam		
Week 8	2		Unit 8,9		
Week 9	2		Quiz		
Week 10	2		General discussion		
Week 11	2		Unit 10, & assignment		
Week 12	2		Unit 11,12		
Week 13	2		Composition	Writing	
Week 14	2		discussion		
Week 15	2		Unit 13,14		
		English for Specific Purposes			

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, essays .... etc

		Time/Number	Weight (Marks)
Formative assessment	Quizzes	2	20% (20)
	Assignments	1	10% (10)
	Projects / Lab.	0	0
	composition	1	10% (10)
Summative assessment	Midterm Exam	2 hr	10% (10)
	Final Exam	2hr	50% (50)
Total assessment			100% (100 Marks)

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	(1) <i>New Headway Plus [Beginner]</i> by John and Liz Soars, Oxford: Oxford University Press (2006), .
Main references (sources)	1) New Headway Plus [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2006),  (2) <i>Modern scientific articles from the news related to the students' specialty, and</i> (3) <i>Internet links and videos related to topics discussed in General English and English for Specific Purposes lectures</i>
Recommended books and references (scientific journals, reports...)	Dictionaries and supplies supplementary
Electronic References, Websites	<a href="https://www.englishclub.com/grammar/verb-tenses.htm">https://www.englishclub.com/grammar/verb-tenses.htm</a> <a href="https://www.ego4u.com/en/cram-">https://www.ego4u.com/en/cram-</a> <a href="http://www.perfect-english-grammar.com/verb-tenses.htm">www.perfect-english-grammar.com/verb-tenses.htm</a> <a href="https://en.wikipedia.org/wiki/Grammatical_tense">https://en.wikipedia.org/wiki/Grammatical_tense</a>

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	AutoCAD Drawing		Module Delivery	
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	EnE122			
ECTS Credits	5			
SWL (h/sem)	125			
Module Level	1	Semester of Delivery		2
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Halah ali meer hussein		e-mail	<a href="mailto:drhala.a.h@coeng.uobaghdad.edu.iq">drhala.a.h@coeng.uobaghdad.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D	
Module Tutor 1	Raghad Nihad, Eman Jum'a		e-mail	<a href="mailto:r.mohammed1211@coeng.uobaghdad.edu.iq">r.mohammed1211@coeng.uobaghdad.edu.iq</a> , <a href="mailto:e.younos1211@coeng.uobaghdad.edu.iq">e.younos1211@coeng.uobaghdad.edu.iq</a>
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date		Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering Drawing	Semester	1
Co-requisites module	Geographic Information Systems GIS	Semester	7

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	This unit will enable learners to produce engineering drawings of different components, assemblies and circuits using a variety of sketching and drawing using computer-aided drafting techniques.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Create technical drawings digitally using Computer Aided Drafting, better known as CAD, developed and marketed by Autodesk (AutoCAD).</li> <li>2. Changing a design simply by pushing a button, also drawings can be shared instantaneously around the world over a computer network.</li> <li>3. Ability to draw once then copy it hundreds, or even thousands, of times.</li> <li>4. AutoCAD helps the student to develop, modify, and design better infrastructure, deliver scalable and feasible building assignments, supervise production finances, and foresee project results.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	The course offers specialization in selected areas of engineering drawing, for introducing the principle of engineering drawing, identifying different types of lines, engineering operations, projections, sections, isometric drawing, and drawing dimensions.

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation questions and in-class discussions, solving exercises, handling assignments while at the same time testing their skills via exams
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	30% (30)	5, 10, 13	(1,2), (2,3,4), (3,4), (3,4)
	Assignments	10	10% (10)	2, 3, 4, 6, 7, 9, 11, 12, 14, 15	1,2,3 and 4
	Projects / Lab.	---	-----	-----	-----
	Report	---	-----	-----	-----
Summative assessment	Midterm Exam	2 hr	10% (10)	8	1,2,3 and 4
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Auto CAD software.
Week 2	Control page in Auto CAD software.
Week 3	The command line and applications.
Week 4	The command circle, rectangle with solving examples. The hash command.
Week 5	Quiz
Week 6	The modified command (copy, move) with examples
Week 7	The help order in drawing (Grid, trim, Snap, Polar, Object Tracking).
Week 8	Midterm Exam
Week 9	The command array with types, and ellipse with solving examples.
Week 10	Quiz
Week 11	The command scale and aligned with solving example
Week 12	The command layers with solving examples. The command page setup and page layout.
Week 13	Quiz
Week 14	Types of dimensions with application examples Control page in Auto CAD software.
Week 15	the command text and types Preparing and printing options with examples

<b>Week 16</b>	Final Exam
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<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Introduction to Auto CAD – 2012 by George Omura, Willey India Publisher	Yes
<b>Recommended Texts</b>	Text Book of Engineering Graphics & AutoCAD by by K Venugopal	Yes
<b>Websites</b>	<a href="https://www.technicalbookspdf.com/geometric-and-engineering-drawing/">https://www.technicalbookspdf.com/geometric-and-engineering-drawing/</a> <a href="https://doc.lagout.org/science/0_Computer%20Science/9_Others/Textbook%20of%20Engineering%20Drawing.pdf">https://doc.lagout.org/science/0_Computer%20Science/9_Others/Textbook%20of%20Engineering%20Drawing.pdf</a> <a href="https://sctevtodisha.nic.in/wp-content/uploads/2021/03/Engg.Drawing_1st-Year-LM.pdf">https://sctevtodisha.nic.in/wp-content/uploads/2021/03/Engg.Drawing_1st-Year-LM.pdf</a>	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks 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.

# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Dr. Mona Faeq Ali

## COURSE SPECIFICATION

**Better understanding the relationship between theory and applied math as calculus in the first stage and taking the mathematical problems concerning the soil, water, and air pollution into consideration .**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Calculus I
4. Modes of Attendance offered	Presence lectures are delivered third a week
5. Semester/Year	Semester
6. Number of hours tuition (total)	93 hours (6 hours a week)
7. Date of production/revision of this specification	2023-2024
8. Aims of the Course	
	1- Learning the dependent/independent variables and how they relate to.
	2- Tracing curves and studying the behavior of functions as well as their extrema.
	3- Expecting the initial and final values through limits.
	4- Determining the domain and range of certain functions via different methods.
	5- Getting the knowledge of how to sketch and/or graph functions using short cut
	6- Making use of rules of differentiation in solving many extreme problems.
	7- Learning methods of definite integrals using simpler numerical approaches.
	8- Evaluation of arc length, area under the curve, volume and/or surface of rotation.

9. Learning Outcomes, Teaching ,Learning and Assessment Method

## A- Cognitive goals .

- A1. Making the student to be fully aware of how math is being incorporated in
- A2. Making use of up-to-date criteria dealing with manipulating functions and
- A3. Using of most advanced electronic devices in graphing complex functions.

## B. The skills goals special to the course.

- B1- Understanding the nature and behavior of functions in terms of easier
- B2. Making proofs of transcendental, rational, irrational polynomial, etc.,
- B3- Writing out scientific reports concerning the applications of math in Environmental Engineering.

## Teaching and Learning Methods

Extensive description of case studies and applications regarding the Environmental Engineering studies, Lectures, homework and assignments tests, and exams, class oral conservations, questions and discussions, comparison between theory and applications.

## Assessment methods

Homework related to problem solving, student participation through class session, preparation of reports, quizzes, monthly exams, student attendance, and lucrative encouragement.

## C. Affective and value goals

- C1. Getting optimum values through the applications of extreme functions.
- C2. Facilitate the algebraic and solving problems that might be encountered in biochemistry, organic, etc.,
- C3. Getting students to trouble shoot and overcome cumbersome solutions in math.



## Teaching and Learning Methods

Intensive studies of regulations

## Assessment Methods

Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

10. Course Structure					
Week	Assessment Method	Teaching Method	Unit/Module or Topic Title	ILOs	Hours
1	Making questions during the lectures, quizzes, exams, and attendance in the class.	Presence	Review of fundamental concepts	1&2	6 (Theory)
2	Making questions during the lectures, quizzes, exams, and attendance in the class.	Presence	Figuring out functions and equations	1 &2	6 (Theory)
3	Making questions during the lectures, quizzes, exams, and attendance in the class.	Presence	Graphing functions and getting acquainted on function	1 &2	6 (Theory)
4	Making questions during the lectures, quizzes, exams, and attendance in the class.	Presence	Solving problems using inequalities	1 &2	6 (Theory)
5	Making questions during the lectures, quizzes, exams, and attendance in the class.	Presence	Finding out domain and range of certain functions	1 &2	6(Theory)
6	Making questions during the lectures, quizzes, exams, and attendance in the class.	Presence	Determination of function limits	1 &2	6 (Theory)
7	Making questions during the lectures, quizzes, exams, and attendance in the class.	Presence	Knowing the continuity and differentiability	1 &2	6 (Theory)

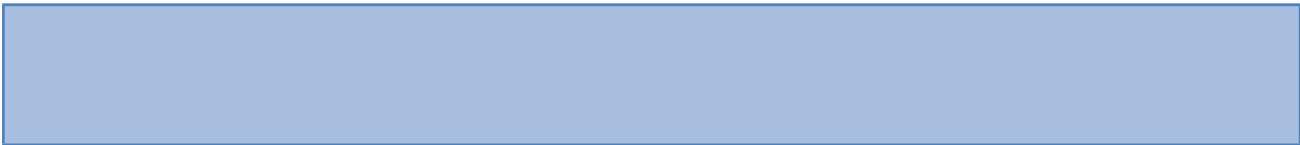
8	Making questions during the lectures ,quizzes, exams, and attendance	Presence	Learning the differentiation, definition and	1 &2	6 (Theory)
9	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Presence	Solving extreme problems using techniques of differentiation	1 &2	6 (Theory)
10	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Presence	Solving definite integrals and methods of integration	1 &2	6 (Theory)
11	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Presence	Evaluation of curve's length, area, volume, and surface area through integration applications	1 &2	6 (Theory)

## 11. Infrastructure

1. Books Required reading:	1-Calculus, Howard Anton, Drexel University, 5 <sup>th</sup> ed, 2019 2-Calculus, Muray Spiegel, Shaum's Outline Series, 2011 3-Engineering Mathematics, Ken Stroud, 2 <sup>nd</sup> ed. 1987.
2. Main references (sources)	Calculus, Thomas and Finney, 7 <sup>th</sup> ed., 2012
A- Recommended books and references (scientific journals, reports...).	American Journal of Mathematics and any textbooks on calculus
B-Electronic references, Internet sites...	<a href="https://www.pdfdrive.com/calculus-and-analytic-geometry-2nd-edition-e31002683.html">https://www.pdfdrive.com/calculus-and-analytic-geometry-2nd-edition-e31002683.html</a> . <a href="https://www.google.com/search?q=calculus+by+howard+anton+11th+edition+pdf+free+download&amp;rlz=1C1SQJL_enIQ924IQ924&amp;oq=calculus+by+Howard++edition+pdf+free+download&amp;aqs=chrome.1.69i57j0i7130j0i517130j0i8i3014.32525j1j4&amp;sourceid=chrome&amp;ie=UTF-8">https://www.google.com/search?q=calculus+by+howard+anton+11th+edition+pdf+free+download&amp;rlz=1C1SQJL_enIQ924IQ924&amp;oq=calculus+by+Howard++edition+pdf+free+download&amp;aqs=chrome.1.69i57j0i7130j0i517130j0i8i3014.32525j1j4&amp;sourceid=chrome&amp;ie=UTF-8</a>

## 12. The development of the curriculum plan

The development must take imposing further math courses in 3<sup>rd</sup> and 4<sup>th</sup> stages into consideration as concrete tools for more applications on mathematics.



# المرحلة الأولى

## MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Analytical Chemistry		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	EnE111			
ECTS Credits	8			
SWL (h/sem)	200			
Module Level	1	Semester of Delivery		1
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Hala N. Abdelkareem		e-mail	hala.n@coeng.uobaghdad.edu.iq
Module Leader's Acad. Title	Lecturer.		Module Leader's Qualification	Ph.D
Module Tutor	Abeer Khaleel Hashim		e-mail	abeerk.hashim@coeng.uobaghdad.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date		Version Number	1.0	

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	To be able to apply chemical concepts to solve qualitative and quantitative problems, gaining proficiency and skills through written problems and laboratory work.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Essential analytical skills required by laboratory technicians, researchers and managers of quality control, production control, research and development and analytical techniques</li> <li>2. Applicable skills to learn calculation of solution concentration, and expression of analytical results</li> <li>3. Learning good laboratory practice</li> <li>4. Learning the principles of inorganic chemical reactions</li> <li>5. Studying unit conversion molarity, normality and the ppm concentration.</li> <li>6. Studying gravimetric analysis.</li> <li>7. Studying precipitation reactions.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	Describes the concepts of analytical chemistry method. The fundamentals, concepts, applications, calculations, instrumentation, solving qualitative and quantitative problems dealing with inorganic mixtures. Review of fundamental concepts, Introduction to Analytical, Chemistry, Good laboratory practice (GLP): reactions, Chemistry of solutions, Type of homogenous mixtures solution properties, Molarity, Normality, Units Conversions, The part per million (ppm) system, Gravimetric Analysis, Precipitation Reactions. This topic is followed by a series of experiments designed to reinforce the concepts developed in texts

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage
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	students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	139	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	9
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	4	10% (10)	5,8, 11,14	1,2,3,4, 5, 6, &7
	<b>Assignments</b>	1	10% (10)	5	1 &2
	<b>Projects / Lab.</b>	10	10% (10)	continuous	All
	<b>Report</b>	2	10% (10)	6, 11	5, 6, &7
<b>Summative assessment</b>	<b>Midterm Exam</b>	1	10%	10	1,2,3,4,5 and 6
	<b>Final Exam</b>	1	50%	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Definitions of term, Review of fundamental concepts
<b>Week 2</b>	Introduction to Analytical, Chemistry
<b>Week 3</b>	Good laboratory practice (GLP): Quality Assurance of analytical chemistry, Concentrations of solutions, Concept of mole, Limiting reagent
<b>Week 4</b>	Stoichiometric calculations(Concentration of solution)

<b>Week 5</b>	Reduction-Oxidation (Redox) reactions
<b>Week 6</b>	Reduction-Oxidation (Redox) reactions.
<b>Week 7</b>	Chemistry of solutions, Type of homogenous mixtures solution properties
<b>Week 8</b>	Molarity, Normality,
<b>Week 9</b>	Molarity, Normality,
<b>Week 10</b>	Mid. Exam.
<b>Week 11</b>	Gravimetric Analysis
<b>Week 12</b>	Gravimetric Analysis
<b>Week 13</b>	Units Conversions, The part per million (ppm) system,
<b>Week 14</b>	Precipitation Reactions
<b>Week 15</b>	Precipitation Reactions
<b>Week 16</b>	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Basic tools and operation of analytical chemistry, Safe use of apparatus. .
<b>Week 2</b>	Lab 2: Titration principles Neutralization titration and Acid-Base titration.
<b>Week 3</b>	Lab 3: Determination of Normality, Molarity volumetric calculation.
<b>Week 4</b>	Lab 4: Oxidation –Reduction Reactions.
<b>Week 5</b>	Lab 5: Titration of Precipitation
<b>Week 6</b>	Lab 6: Titration of strong acid and weak base, Titration of strong acid and strong base.
<b>Week 7</b>	Lab 7: Reaction Mohr Method

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	1. Analytical Chemistry, Gary D. Christian 5th ed. (Text book)	Yes
<b>Recommended Texts</b>	1. Simplified procedures for water examination, Awwa, manual of water supply practices. 2. Fundamentals of Analytical Chemistry, Douglas A. Skoog, Donald M. West, F. James Holler and Stanley	Yes



	R. Crouch, eighth edition 2001. 3. Methods for Environmental Trace Analysis, Dean, John R. John , Wiley & Sons Ltd, 2003	
<b>Websites</b>	<a href="https://chem.libretexts.org/Bookshelves/Analytical%20Chemistry/Book%3A_A">https://chem.libretexts.org/Bookshelves/Analytical Chemistry/Book%3A_A</a> <a href="https://www.sciencedirect.com/book/9780125551601/analytical-chemistry">https://www.sciencedirect.com/book/9780125551601/analytical-chemistry</a> <a href="https://www.nature.com/articles/062292b0">https://www.nature.com/articles/062292b0</a>	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
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	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
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	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks 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.

**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

**المرحلة الاولى**

**2023**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate

description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

### **Academic Program Description Form**

**University Name: University of Baghdad**

**Faculty/Institute: College of Engineering**

**Scientific Department: Department of Environmental Engineering**

**Academic or Professional Program Name: English**

**Final Certificate Name: .....**

**Academic System: Polona program**

**Description Preparation Date:**

**File Completion Date: 16-2-2024**

**Signature:**

**Head of Department Name:**

**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:**

**Approval of the Dean**

### **1. Program Vision**

The strategic goal is to raise the readiness of the university formations to be distinguished now and in the future. It further aims to bring about a quantum leap in their strategic performance following international standards within the framework of true citizenship and leadership in its various cognitive, and educational research

roles. It also aims to provide community service, upgrade, and strengthen the position of the university within the framework of universities' international rankings, and within the framework of balancing between contemporaneity with modern trends in higher education and preserving originality represented by adhering to the national constants and values of the country.

## 2. Program Mission

English Language Learning Program (*ELLP*) is to help students from all over the world to achieve their personal and academic goals by providing high-quality, individualized English language instruction in a small-classroom setting and warm, welcoming, inclusive, and friendly cultural environment, while also bringing valuable and diverse international student perspectives to the University.

## 3. Program Objectives

- 1- The aim of this course is to empower students with the language and life skills
- 2- The integrated skills approach of the course develops the student's self-confidence to
- 3- succeed in professional and social encounters within an English-speaking global
- 4- using language to express knowledge of Environment and health impacts hazardous

## 4. Program Accreditation

Does the program have program accreditation? And from which agency?

None

## 5. Other external influences

Is there a sponsor for the program?

None

## 6. Program Structure

Program Structure	Number of	Credit hours	Percentage	Reviews*
-------------------	-----------	--------------	------------	----------

	Courses			
<b>Institution Requirements</b>	<b>1</b>	<b>2</b>		<b>basic</b>
<b>College Requirements</b>	<b>4</b>	<b>2</b>		
<b>Department Requirements</b>	<b>4</b>	<b>2</b>		
<b>Summer Training</b>	<b>0</b>	<b>0</b>		
<b>Other</b>				

\* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
2-2024	<b>EnE 108</b>	English	theoretical	practical
			yes	0

8. Expected learning outcomes of the program	
<b>Knowledge</b>	
Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries,	Become more effective, independent and confident self-directed learners
<b>Skills</b>	
The integrated skills approach of the course develops the student's self-understanding	Understand texts using effective learning strategies for reading and vocabulary building,
using language to express knowledge of Environment and health impacts	Improve their general skills for study and career management
<b>Ethics</b>	



Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations,	Articulate personal goals and evaluate progress towards their achievement
Understand texts using effective learning strategies for reading and vocabulary building,	An ability to identify, formulate, and solve engineering problems

<b>9. Teaching and Learning Strategies</b>
Lecture and classroom discussion

<b>10. Evaluation methods</b>
Assignments and exams

<b>11. Faculty</b>						
<b>Faculty Members</b>						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Asst. Prof.	English	Linguistics/ Discourse Analysis			Current faculty number	

<b>Professional Development</b>
---------------------------------

### **Mentoring new faculty members**

The orientation for new faculty members is arranged by the department chair and may consist of a few informal meetings and the distribution of a handbook and other supplementary material. In contrast, approximately one in four colleges have formalized and uniform faculty mentorship programs across all departments.

### **Professional development of faculty members**

In-depth programs included both intensive, multi-day offerings in a short course or retreat format, and extended offerings with multiple sessions spaced over a term, a year, or even longer. These formats typically enrolled a cohort of participants who continued for the entire program.

## **12. Acceptance Criterion**

**central admission**

## **13. The most important sources of information about the program**

–New Headway Plus [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2006),

–Morphy, A.J (1983) English Grammar in use. Cambridge: CUP

<https://www.englishclub.com/grammar/verb-tenses.htm>

<https://www.ego4u.com/en/cram->

[www.perfect-english-grammar.com/verb-tenses.htm](http://www.perfect-english-grammar.com/verb-tenses.htm)

[https://en.wikipedia.org/wiki/Grammatical\\_tense](https://en.wikipedia.org/wiki/Grammatical_tense)

## **14. Program Development Plan**

The development could be done by consulting more resources and increase lecture length to 3 hours weekly

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2024/level 2	EnE 108	English	Basic			•			•			•			

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

## Course Description Form

1. Course Name: English					
2. Course Code: <b>EnE 108</b>					
3. Semester / Year: Semester					
4. Description Preparation Date: 16/2/2024					
5. Available Attendance Forms: attendance and Google classroom					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2					
7. Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Nagham Ali Hassan					
Email: nagham.ali@coeg.uobaghdad.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>			A1) Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries, (A2) Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations, (A3) Understand texts using effective learn strategies for reading and vocabulary building.....		
9. Teaching and Learning Strategies					
<b>Strategy</b>		Lecture and classroom discussion			
10. Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>

		Outcomes			
Week 1	2	<p>(A) Finding and understanding information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources and English language dictionaries,</p> <p>(B) Developing conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentation</p> <p>(C) Understanding texts using effective learning structures</p>	Introduction to the material	Lecture and class discussion	Questions during lectures, quiz exam, presentation the class
Week 2	2		Unit 1		
Week 3	2		Unit 2,3		
Week 4	2		Unit 4,5		
Week 5	2		Quiz		
Week 6	2		Unit 6,7		
Week 7	2		Midterm exam		
Week 8	2		Unit 8,9		
Week 9	2		Quiz		
Week 10	2		General discussion		
Week 11	2		Unit 10, & assignment		
Week 12	2		Unit 11,12		
Week 13	2		Composition	Writing	
Week 14	2		discussion		
Week 15	2		Unit 13,14		
		English for Specific Purposes			

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, essays .... etc

		Time/Number	Weight (Marks)
Formative assessment	Quizzes	2	20% (20)
	Assignments	1	10% (10)
	Projects / Lab.	0	0
	composition	1	10% (10)
Summative assessment	Midterm Exam	2 hr	10% (10)
	Final Exam	2hr	50% (50)
Total assessment			100% (100 Marks)

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	(1) <i>New Headway Plus [Beginner]</i> by John and Liz Soars, Oxford: Oxford University Press (2006), .
Main references (sources)	1) <i>New Headway Plus [Beginner]</i> by John and Liz Soars, Oxford: Oxford University Press (2006),  (2) <i>Modern scientific articles from the news related to the students' specialty, and</i> (3) <i>Internet links and videos related to topics discussed in General English and English for Specific Purposes lectures</i>
Recommended books and references (scientific journals, reports...)	Dictionaries and supplies supplementary
Electronic References, Websites	<a href="https://www.englishclub.com/grammar/verb-tenses.htm">https://www.englishclub.com/grammar/verb-tenses.htm</a> <a href="https://www.ego4u.com/en/cram-">https://www.ego4u.com/en/cram-</a> <a href="http://www.perfect-english-grammar.com/verb-tenses.htm">www.perfect-english-grammar.com/verb-tenses.htm</a> <a href="https://en.wikipedia.org/wiki/Grammatical_tense">https://en.wikipedia.org/wiki/Grammatical_tense</a>

# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor: Dr. Mona Faeq Ali

### COURSE SPECIFICATION

This course introduces the description of the environmental geology. Topic covered: Understanding the science of geology. branches of geology ,engineering geology, the earth crust and minerals. Description of common rocks ,environment factors and impacts on rocks. soils formation ,types and physical properties. Understanding mass-volume relations and weight- volume relations. Explain void ratio , porosity ,degree of saturation, Compressive strength and tensile strength.

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Geology
4. Modes of Attendance offered	2 days per week presence
5. Semester/Year	Semester
6. Number of hours tuition (total)	64h
7. Date of production/revision of this specification	2023-2024
8. Aims of the Course	
<b>The main aim of this course are</b>	
. Full knowledge of geology science, regulations, properties of rocks and soils.	
Provide students with the basic concepts of geology science and earth crust profile	

9. Learning Outcomes, Teaching ,Learning and Assessment Method

## A- Cognitive goals.

A1. After completion of the course students should be able to characterization of geology

A2. analysis of geology constituents

A3. Attract and welcome undergraduate students to our Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1. Understand Principles of general geology

B2 Have students learn about Geology engineering problems and then apply theory to particular

B3. Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving

## C. Affective and value goals

C1. Describe the general principal involve of Environmental geology

C3. Prepare students for successful careers in environmental engineering

C3. The impact of geology Engineering in solutions

## Teaching and Learning Methods

Intensive studies of regulations



## Assessment methods

Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2Theory+ 2Lab.	1&2	Science of geology	Presence	Questions during the lectures ,quiz, exam, present in the class
2	2Theory+ 2Lab.	1&2	The earth crust and minerals	Presence	Questions during the lectures ,quiz, exam, present in the class
3	2Theory+ 2Lab.	1&2	Description of the earth crust profile	Presence	Questions during the lectures ,quiz, exam, present in the class
4	2Theory +2Lab.	1&2	Description of common rocks	Presence	Questions during the lectures ,quiz, exam, present in the class
5	2Theory+ 2Lab.	1&2	Description of common rocks	Presence	Questions during the lectures ,quiz, exam, present in the class
6	2Theory+ 2Lab.	1&2	Faults	Presence	Questions during the lectures ,quiz, exam, present in the class
7	2Theory+ 2Lab.	1&2	Folds	Presence	Questions during the lectures ,quiz, exam, present in the class
8	2Theory+ 2Lab.	1&2	Joints	Presence	Questions during the lectures ,quiz, exam, present in the class
9	2Theory+ 2Lab.	1&2	Soils formation ,types and physical properties	Presence	Questions during the lectures ,quiz, exam, present in the class
10	2Theory+ 2Lab.	1&2	Soils formation ,types and physical properties	Presence	Questions during the lectures ,quiz, exam, present in the class
11	2Theory+ 2Lab.	1&2	Compressive strength and tensile strength	Presence	Questions during the lectures ,quiz, exam, present in the class

12	2Theory+ 2Lab.	1&2	Compressive strength and tensile strength	Presence	Questions during the lectures ,quiz, exam, present in the class
13	2Theory+ 2Lab.	1&2	Evaluate deformation and elasticity of rocks , axial and lateral strains and modulus of elasticity	Presence	Questions during the lectures ,quiz, exam, present in the class
14	2Theory+ 2Lab.	1&2	Review	Presence	Questions during the lectures ,quiz, exam, present in the class
15	2		Mid exam		

## 11. Infrastructure

1. Books Required reading:	Douglas A. Skoog, Donald M. West, F. James Holler and Stanley R. Crouch “Fundamentals
2. Main references (sources)	Davis, L., Mackenzie, and Cornwell, A., David. “Introduction to Environmental Engineering” 2nd Edition, McGraw Hill. Inc.1985
A- Recommended books and references (scientific journals, reports...).	
B-Electronic references, Internet sites...	

## 12. The development of the curriculum plan

Full knowledge of science of geology, relationship between the engineering geologist and civil engineering regulations, properties of minerals, and classification

# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Dr. Nahla Shadeed Ajeel

## COURSE SPECIFICATION

**Full knowledge of basics of microbiology, principles of microbiology to the solution of environmental**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Microbiology
4. Modes of Attendance offered	2 days per week electronic
5. Semester/Year	Semester
6. Number of hours tuition (total)	45 h
7. Date of production/revision of this specification	2021-2022
8. Aims of the Course	
	1- Students fulfill understanding of the branches of Environmental Microbiology.
	2- Learn and understand basic principles of microbiology (cell structure)
	3- Cell function, microbial, growth and growth control.
	4-Prevention of the spread through water of pathogens among humans and other species.

9. Learning Outcomes, Teaching ,Learning and Assessment Method

## A- Cognitive goals .

A1. After completion of the course students should be able to treatment of industrial and municipal wastewaters

A2. Biochemical reactions

A3. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1. Restoration of industrial, commercial, and government sites contaminated with hazardous materials.

B2. Reduction in industrial residuals in order to reduce resource consumption and the production of pollutants requiring disposal. and resource recovery/recycling, transport.

1-

2-

B3. Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving

**C. Affective and value goals**

- C1. Microorganisms in the water, air and soil environment
- C2. Aspects of bacteria of special interest to environmental engineering
- C3. Prepare students for successful careers in environmental engineering

**Teaching and Learning Methods**

Intensive studies of regulations

**Assessment methods**

Case studies

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

- D1. Become more effective, independent and confident self-directed learners
- D2. Improve their general skills for study and career management
- D3. Articulate personal goals and evaluate progress towards their achievement
- D4. An ability to identify, formulate, and solve engineering problems

**10. Course Structure**

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Environmental biotechnology	General applications in environmental microbiology	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	3	Protection from contaminants	Protection or restoration of rivers, lakes, estuaries, and coastal waters from contaminants	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	3	Organizations of the microbial world	Bacteria	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	3	Organizations of the microbial world	Archaea	Electronic	Questions during the lectures ,quiz, exam, present in the class

5	3	Organizations of the microbial world	Eukarya (Fungi)	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	3	Fungi	Nutritional and environmental requirement for Fungi	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	3	Organizations of the microbial world	Eukarya (Algae )	Electronic	Questions during the lectures ,quiz, exam, present in the class
8	3	Algae	Reproduction and Growth for Algae	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	3	Protozoa	Reproduction and Growth for Protozoa	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	3	Multicellular organisms	Other multicellular organisms such as (Crustacea, Nematodes and Rotifers)	Electronic	Questions during the lectures ,quiz, exam, present in the class
11	3	Viruses	Typical structures of viruses	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	3	Biochemical reactions	Reactor types	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	3	Reactor configurations	Several reactor configurations are used for treatment of wastewaters or sludges	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	3	Fermenters	Types of Fermenters	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	3	Sterilization	Several types of Sterilization	Electronic	Questions during the lectures ,quiz, exam, present in the class

1. Books Required reading:	1-Environmental Biotechnology principles and Applications Bruce E.Rittman Perry L.MCCarty.
2. Main references (sources)	Microbiology for sanitary Engineers Ross E. McKinney New York, McGraw_Hill Book Company , INC.1962.
A- Recommended books and references (scientific journals, reports...).	Journals Plant Growth-Promoting Bacteria Facilitate the Growth of Barley and Oats in Salt-Impacted Soil: Implications for Phytoremediation of Saline Soils
B-Electronic references, Internet sites...	<ul style="list-style-type: none"> <li>➤ Comparison of Petroleum Hydrocarbons Degradation by <i>Klebsiella pneumoniae</i> and <i>Pseudomonas aeruginosa</i>.</li> <li>➤ Biodegradation of petroleum by <i>Klebsiella pneumoniae</i> isolated from drilling fluid.</li> </ul>

## 12. The development of the curriculum plan

The development could concentrate on more applications through taking 2 courses instead of one.

## TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

**Course Instructor: Asst. prof. Dr. khalid khazzal hummadi**  
**COURSE SPECIFICATION**

This course is concerned with the identification of organic chemistry, preparation & reactions, and properties. Environmental impact of organic compound, petroleum products, halogenated and dehalogenated solvents, pesticides, environmental significance of petroleum products.

1. Teaching Institution	University of Baghdad /College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Organic Chemistry EnE
4. Modes of Attendance offered	Annual System: They attend in electronic mode 2 hrs. a Week.
5. Semester/Year	Annual
6. Number of hours tuition (total)	60 hrs./ 2 hrs per week
7. Date of production/revision of this specification	2019
<b>8. Aims of the Course</b>	
The main objectives of the course are: 1. To understand organic chemistry fundamentals, 2. To understand the principles, instrumentation and applications of chemical. 3. To perform to dealing with organic materials in environmental engineering.	



## **9• Learning Outcomes, Teaching ,Learning and Assessment Method**

### **A- Cognitive goals.**

#### **At the end of the year the students should gain:**

A1. Essential dealing with principles organic chemistry results

A2. Studying the groups of organic chemistry.

A3. Preparation of organic components.

A4. Learning the reaction of organic materials.

A5. Study the mechanical of reactions for the organic reactions.

A6. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

### **B. The skills goals special to the course**

**B1.** Essential of organic and skills in organic chemistry.

**B2.** Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

### **Teaching and Learning Methods**

1- Lectures.

2- Homework and Assignments.

3- Tests and Exams.

4- In-Class Questions and Discussions.

5- Connection between Theory and Application.

6- In- and Out-Class oral conservations.

### **Assessment Methods**

1. Examinations, Tests, and Quizzes.

2. Student Engagement during Lectures.

3. Responses Obtained from Students, Questionnaire about curriculum and faculty member (Instructor).

4. Home work related to problem solving.

### **C. Affective and value goals**

C1. Applicable skills to learn the role of organic chemistry in environmental .

C2. Dealing with organic to solve the pollutants .

C3. Research and analysis.

C4. Prepare students for successful careers in environmental engineering.

<b>Teaching and Learning Methods</b>
Intensive studies of regulations
Assessment methods
Case studies
D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)
D1. Become more effective, independent and confident self-directed learners D2. Improve their general skills for study and career management D3. Articulate personal goals and evaluate progress towards their achievement D4. An ability to identify, formulate, and solve engineering problems.

<b>10. Course Structure</b>					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2 (Theo.)	1&2	Review of fundamental concepts	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	2 (Theo.)	1 &2	Good lab. practice	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	2 (Theo.)	1 &2	Classification and identification of organic compounds	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	2 (Theo.)	1 &2	structural characterization of organic compounds	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	2 (Theo.)	1 &2	Alkanes , definition ,names of alkanes components	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	2 (Theo.)	1,2,&3	Reactions of alkanes	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	2 (Theo.)	1,2,&3	Preparation of alkanes	Electronic	Questions during the lectures ,quiz, exam, present in the class

8	2 (Theo.)	2,3 &4	Alkenes ,definition ,names of components	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	2 (Theo.)	2,3 &4	Reactions and preparation of alkenes	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	2 (Theo.)	-----	Examination	Electronic	-----
11	2 (Theo.)	2,3 &4	Alkynes, definition and names of components	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	2 (Theo.)	2,3 &4	Reactions of alkynes components	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	2 (Theo.)	2,3 &4	Aromatic ,definitions ,names of components	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	2 (Theo.)	2,3 &4	Reactions	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	2 (Theo.)	2,3 &4	Preparation of alkynes components	Electronic	Questions during the lectures ,quiz, exam, present in the class
16	2 (Theo.)	2,3 &4	Alkyl halides	Electronic	Questions during the lectures ,quiz, exam, present in the class
17	2 (Theo.)	2,3 &4	Reaction	Electronic	Questions during the lectures ,quiz, exam, present in the class
18	2 (Theo.)	2,3 &4	preperation	Electronic	Questions during the lectures ,quiz, exam, present in the class
19	2 (Theo.)	2,3 &4	Alcoholes	Electronic	Questions during the lectures ,quiz, exam, present in the class
20	2 (Theo.)	2,3 &4	Reaction and preprations	Electronic	Questions during the lectures ,quiz, exam, present in the class
21	2 (Theo.)	-----	Examination	Electronic	-----
22	2 (Theo.)	5	Ethers	Electronic	Questions during the lectures ,quiz, exam, present in the class
23	2 (Theo.)	5	Aldehydes and ketones	Electronic	Questions during the lectures ,quiz, exam, present in the class

24	2 (Theo.)	5	Carboxylic acids	Electronic	Questions during the lectures ,quiz, exam, present in the class
25	2 (Theo.)	5	Preparations and reactions	Electronic	Questions during the lectures ,quiz, exam, present in the class
26	2 (Theo.)	-----	Examination	Electronic	-----
27	2 (Theo.)		environmental significance of petroleum products	Electronic	Questions during the lectures ,quiz, exam, present in the class
28	2 (Theo.)		selected polymers	Electronic	Questions during the lectures ,quiz, exam, present in the class
29	2 (Theo.)	1,2,3,4 &5	pesticides	Electronic	Questions during the lectures ,quiz, exam, present in the class
30	2 (Theo.)	1,2,3,4 &5	industrial intermediate	Electronic	Questions during the lectures ,quiz, exam, present in the class

11. Infrastructure	
1. Books required reading:	S.Nafls Haider, 2008"Fundamentals of Organic Chemistry". Rajendra printers NewDelhi.
2. Main references (sources)	Schaum s , 1999"Theory and problems of organic chemistry"Third Edition. McGraw-Hill
A- Recommended books and references (scientific journals, reports...).	Smith, 2006" Organic Chemistry". McGraw-Hill Francis A.Carey, 2006" Organic Chemistry". McGraw-Hill
B-Electronic references, Internet sites	<a href="https://chem.libretexts.org/Bookshelves/organic_Chemistry/Book%3A_A">https://chem.libretexts.org/Bookshelves/organic_Chemistry/Book%3A_A</a> <a href="https://www.sciencedirect.com/book/9780125551601/organic-chemistry">https://www.sciencedirect.com/book/9780125551601/organic-chemistry</a> <a href="https://www.nature.com/articles/062292b0">https://www.nature.com/articles/062292b0</a>

## 12. The development of the curriculum plan

Not to rely on traditional examinations but the creation of reports following the reading of textbooks. These reports are validated and transformed into academic credits for graduation purposes.

**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

**المرحلة الثانية**

**2023**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate



description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

### **Academic Program Description Form**

**University Name: University of Baghdad**

**Faculty/Institute: College of Engineering**

**Scientific Department: Department of Environmental Engineering**

**Academic or Professional Program Name: English**

**Final Certificate Name: .....**

**Academic System: Polona program**

**Description Preparation Date:**

**File Completion Date: 16-2-2024**

**Signature:**

**Head of Department Name:**

**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:**

**Approval of the Dean**

### **1. Program Vision**

The strategic goal is to raise the readiness of the university formations to be distinguished now and in the future. It further aims to bring about a quantum leap in their strategic performance following international standards within the framework of true citizenship and leadership in its various cognitive, and educational research

roles. It also aims to provide community service, upgrade, and strengthen the position of the university within the framework of universities' international rankings, and within the framework of balancing between contemporaneity with modern trends in higher education and preserving originality represented by adhering to the national constants and values of the country.

## 2. Program Mission

English Language Learning Program (*ELLP*) is to help students from all over the world to achieve their personal and academic goals by providing high-quality, individualized English language instruction in a small-classroom setting and warm, welcoming, inclusive, and friendly cultural environment, while also bringing valuable and diverse international student perspectives to the University.

## 3. Program Objectives

- 1- The aim of this course is to empower students with the language and life skills
- 2- The integrated skills approach of the course develops the student's self-confidence to
- 3- succeed in professional and social encounters within an English-speaking global
- 4- using language to express knowledge of Environment and health impacts hazardous

## 4. Program Accreditation

Does the program have program accreditation? And from which agency?

None

## 5. Other external influences

Is there a sponsor for the program?

None

## 6. Program Structure

Program Structure	Number of	Credit hours	Percentage	Reviews*
-------------------	-----------	--------------	------------	----------

	Courses			
<b>Institution Requirements</b>	<b>1</b>	<b>2</b>		<b>basic</b>
<b>College Requirements</b>	<b>4</b>	<b>2</b>		
<b>Department Requirements</b>	<b>4</b>	<b>2</b>		
<b>Summer Training</b>	<b>0</b>	<b>0</b>		
<b>Other</b>				

\* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
2-2024	<b>EnE 108</b>	English	theoretical	practical
			yes	0

8. Expected learning outcomes of the program	
<b>Knowledge</b>	
Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries,	Become more effective, independent and confident self-directed learners
<b>Skills</b>	
The integrated skills approach of the course develops the student's self-understanding	Understand texts using effective learning strategies for reading and vocabulary building,
using language to express knowledge of Environment and health impacts	Improve their general skills for study and career management
<b>Ethics</b>	

Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations,	Articulate personal goals and evaluate progress towards their achievement
Understand texts using effective learning strategies for reading and vocabulary building,	An ability to identify, formulate, and solve engineering problems

<b>9. Teaching and Learning Strategies</b>
Lecture and classroom discussion

<b>10. Evaluation methods</b>
Assignments and exams

<b>11. Faculty</b>						
<b>Faculty Members</b>						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Asst. Prof.	English	Linguistics/ Discourse Analysis			Current faculty number	

<b>Professional Development</b>
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### **Mentoring new faculty members**

The orientation for new faculty members is arranged by the department chair and may consist of a few informal meetings and the distribution of a handbook and other supplementary material. In contrast, approximately one in four colleges have formalized and uniform faculty mentorship programs across all departments.

### **Professional development of faculty members**

In-depth programs included both intensive, multi-day offerings in a short course or retreat format, and extended offerings with multiple sessions spaced over a term, a year, or even longer. These formats typically enrolled a cohort of participants who continued for the entire program.

## **12. Acceptance Criterion**

**central admission**

## **13. The most important sources of information about the program**

–New Headway Plus [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2006),

–Morphy, A.J (1983) English Grammar in use. Cambridge: CUP

<https://www.englishclub.com/grammar/verb-tenses.htm>

<https://www.ego4u.com/en/cram->

[www.perfect-english-grammar.com/verb-tenses.htm](http://www.perfect-english-grammar.com/verb-tenses.htm)

[https://en.wikipedia.org/wiki/Grammatical\\_tense](https://en.wikipedia.org/wiki/Grammatical_tense)

## **14. Program Development Plan**

The development could be done by consulting more resources and increase lecture length to 3 hours weekly

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2024/level 2	EnE 108	English	Basic			•			•			•			

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

## Course Description Form

1. Course Name: English					
2. Course Code: <b>EnE 108</b>					
3. Semester / Year: Semester					
4. Description Preparation Date: 16/2/2024					
5. Available Attendance Forms: attendance and Google classroom					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2					
7. Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Nagham Ali Hassan					
Email: nagham.ali@coeg.uobaghdad.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>			A1) Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries, (A2) Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations, (A3) Understand texts using effective learn strategies for reading and vocabulary building.....		
9. Teaching and Learning Strategies					
<b>Strategy</b>		Lecture and classroom discussion			
10. Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>



		Outcomes			
Week 1	2	<p>(A) Finding and understanding information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources and English language dictionaries,</p> <p>(B) Developing conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations</p> <p>(C) Understanding texts using effective learning structures</p>	Introduction to the material	Lecture and class discussion	Questions during lectures, quizzes, exam, presentation in the class
Week 2	2		Unit 1		
Week 3	2		Unit 2,3		
Week 4	2		Unit 4,5		
Week 5	2		Quiz		
Week 6	2		Unit 6,7		
Week 7	2		Midterm exam		
Week 8	2		Unit 8,9		
Week 9	2		Quiz		
Week 10	2		General discussion		
Week 11	2		Unit 10, & assignment		
Week 12	2		Unit 11,12		
Week 13	2		Composition	Writing	
Week 14	2		discussion		
Week 15	2		Unit 13,14		
		English for Specific Purposes			

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, essays .... etc

		Time/Number	Weight (Marks)
Formative assessment	Quizzes	2	20% (20)
	Assignments	1	10% (10)
	Projects / Lab.	0	0
	composition	1	10% (10)
Summative assessment	Midterm Exam	2 hr	10% (10)
	Final Exam	2hr	50% (50)
Total assessment			100% (100 Marks)

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	(1) <i>New Headway Plus [Beginner]</i> by John and Liz Soars, Oxford: Oxford University Press (2006), .
Main references (sources)	1) <i>New Headway Plus [Beginner]</i> by John and Liz Soars, Oxford: Oxford University Press (2006),  (2) <i>Modern scientific articles from the news related to the students' specialty, and</i> (3) <i>Internet links and videos related to topics discussed in General English and English for Specific Purposes lectures</i>
Recommended books and references (scientific journals, reports...)	Dictionaries and supplies supplementary
Electronic References, Websites	<a href="https://www.englishclub.com/grammar/verb-tenses.htm">https://www.englishclub.com/grammar/verb-tenses.htm</a> <a href="https://www.ego4u.com/en/cram-grammar/verb-tenses.htm">https://www.ego4u.com/en/cram-grammar/verb-tenses.htm</a> <a href="https://www.perfect-english-grammar.com/verb-tenses.htm">www.perfect-english-grammar.com/verb-tenses.htm</a> <a href="https://en.wikipedia.org/wiki/Grammatical_tense">https://en.wikipedia.org/wiki/Grammatical_tense</a>

# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Instructor Hayder Muhssin Rashid

## COURSE SPECIFICATION

**Thorough understanding the relationship between theory and applied math as calculus II in the second stage and taking the mathematical problems concerning the soil, water, and air pollution into consideration .**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Calculus II
4. Modes of Attendance offered	Electronic lectures are delivered twice a week
5. Semester/Year	Annual
6. Number of hours tuition (total)	80 hours (3 hours a week)
7. Date of production/revision of this specification	2019
8. Aims of the Course	
	1- Learning the linear algebra through matrices in theory and applications.
	2- Exploring the hyperbolic functions and their applications within Environmental
	3- Connecting the cartesian coordinates with these in polar ones.
	4- Training the students to differentiate more than one variable through partial
	5- Resolving vector components in mechanics and other applications via vectors
	6- Making use of multiple integrals in solving problems regarding moments and
	7- Knowing the convergence/divergence of some infinite series.
	8- Approximating functions in terms of power series.

9. Learning Outcomes, Teaching ,Learning and Assessment Method

A- Cognitive goals .

- A1. Making the student to be fully aware of how math is being incorporated in
- A2. Making use of up-to-date criteria dealing with manipulating functions and
- A3. Using of most advanced electronic devices in graphing complex functions.

B. The skills goals special to the course.

- B1- Understanding the nature and behavior of functions in terms of easier
- B2. Making proofs of hyperbolic, vectors, Lagrange equations, etc.
- B3- Writing out scientific reports concerning the applications of math in Environmental Engineering.

Teaching and Learning Methods

Extensive description of case studies and applications regarding the Environmental Engineering studies, Lectures, homework and assignments tests, and exams, class oral conservations, questions and discussions, comparison between theory and applications.

Assessment methods

Homework related to problem solving, student participation through class session, preparation of reports, quizzes, monthly exams, student attendance, and lucrative encouragement.

C. Affective and value goals

- C1. Getting optimum values through the applications of extreme functions using
- C2. Facilitate the algebraic and solving problems that might be encountered in biochemistry, organic, etc.,.

Teaching and Learning Methods

Teaching and Learning Methods

Intensive studies of regulations

## Assessment Methods

### Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

10. Course Structure					
Week	Assessment Method	Teaching Method	Unit/Module or Topic Title	ILOs	Hours
1	Making questions during the lectures, quizzes, exams, and attendance in the class.	Electronic	Making an overview of the fundamental concepts	1&2	2 (Theory)
2	Making questions during the lectures ,quizzes, exams, and attendance	Electronic	Figuring out linear algebra through matrices	1 &2	2 (Theory)
3	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic	Graphing hyperbolic functions and getting acquainted on	1 &2	2 (Theory)
4	Making questions during the lectures ,quizzes, exams, and attendance	Electronic	Solving problems using polar functions	1 &2	2 (Theory)
5	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic	Finding out vectors in two and three space coordinates	1 &2	2 (Theory)
6	Making questions during the lectures ,quizzes, exams, and attendance	Electronic	Determination of extreme functions via	1 &2	2 (Theory)
7	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic	Knowing the mass, centroid, area, and volume via triple	1 &2	2 (Theory)

8	Making questions during the lectures, quizzes, exams, and attendance in the class.	Electronic	Learning the sequences and power series	1 &2	2 (Theory)

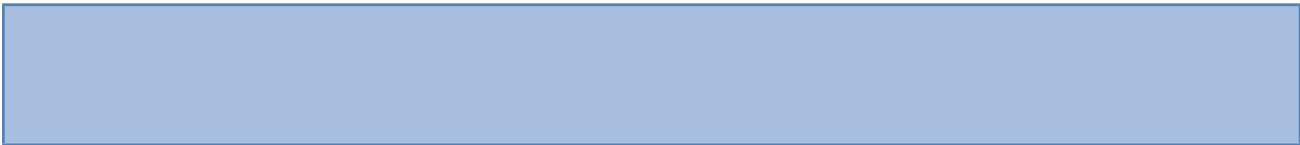
**11. Infrastructure**

1. Books Required reading:	1-Calculus, Howard Anton, Drexel University, 5 <sup>th</sup> ed, 2019. 2-Calculus, Muray Spiegel, Shaum's Outline Series, 2011 3-Engineering Mathematics, DASS, 3 <sup>rd</sup> ed. 2014.
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2. Main references (sources)	Calculus, Thomas and Finney, 7 <sup>th</sup> ed., 2012
A- Recommended books and references (scientific journals, reports...).	American Journal of Mathematics and any textbooks on calculus
B-Electronic references, Internet sites...	<a href="https://www.pdfdrive.com/calculus-and-analytic-geometry-2nd-edition-e31002683.html">https://www.pdfdrive.com/calculus-and-analytic-geometry-2nd-edition-e31002683.html</a> . <a href="https://www.google.com/search?q=calculus+by+howard+anton+11th+edition+pdf+free+download&amp;rlz=1C1SQJL_enIQ924IQ924&amp;oq=calculus+by+Howard++edition+pdf+free+download&amp;aqs=chrome.1.69i57j0i7i30j0i5i7i30j0i8i30i14.32525j1j4&amp;sourceid=chrome&amp;ie=UTF-8">https://www.google.com/search?q=calculus+by+howard+anton+11th+edition+pdf+free+download&amp;rlz=1C1SQJL_enIQ924IQ924&amp;oq=calculus+by+Howard++edition+pdf+free+download&amp;aqs=chrome.1.69i57j0i7i30j0i5i7i30j0i8i30i14.32525j1j4&amp;sourceid=chrome&amp;ie=UTF-8</a>

## 12. The development of the curriculum plan

The development must take imposing further math courses in 3<sup>rd</sup> and 4<sup>th</sup> stages into consideration as concrete tools for more applications on mathematics.





# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor: Lecturer Dr. Hussein Jabar Khadim

## COURSE SPECIFICATION

This course introduces the description of the environmental ecology. Topic covered: Principles of general ecology, Biochemical pathways, Kinetics ecosystem structure and function, Nutrient cycling, Development and application of mass balance for Lake Eutrophication, Preliminary design of waste ponds and constructed wetlands, Transfer of toxic chemicals in food webs

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Ecology
4. Modes of Attendance offered	2 days per week electronic
5. Semester/Year	Semester
6. Number of hours tuition (total)	30 h
7. Date of production/revision of this specification	
8. Aims of the Course	
	The main aim of this course are
	<ul style="list-style-type: none"><li>• Introduce to student the basic concept of Ecology</li><li>• Describe the general principal involve of Environmental ecology</li></ul>

9. Learning Outcomes, Teaching ,Learning and Assessment Method

## A- Cognitive goals.

A1. After completion of the course students should be able to characterization of ecology

A2. analysis of ecology constituents including QA/QC issues.

A3. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1.Understand Principles of general ecology

B2. Development and application of mass balance for lake eutrophication

B3.Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving

## C. Affective and value goals

C1. Describe the general principal involve of Environmental ecology

C2. Economics of the onsite vs. offsite waste management options

C3.Prepare students for successful careers in environmental engineering

## Teaching and Learning Methods

Intensive studies of regulations

## Assessment methods

### Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Definition of ecology	Principles of general ecology	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	2	Definition of ecology	Principles of general ecology	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	2	Energy flow	Biochemical pathways	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	2	Energy flow	Biochemical pathways	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	2	Mass flow	Kinetics ecosystem structure and function	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	2	Nutrient cycling	Kinetics ecosystem structure and	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	2		Nutrient cycling	Electronic	Questions during the lectures ,quiz, exam, present in the class
8	2	Nutrient cycling	Nutrient cycling	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	2	Nutrient cycling	Development and application of mass balance for lake	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	2	mass balance	Development and application of mass balance for lake	Electronic	Questions during the lectures ,quiz, exam, present in the class
11	2	mass balance	Preliminary design of waste ponds and constructed wetlands	Electronic	Questions during the lectures ,quiz, exam, present in the class

12	2	mass balance	Preliminary design of waste ponds and constructed wetlands	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	2	Methods of treatment	Transfer of toxic chemicals in food webs	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	2		Review	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	2		Mid exam	Electronic	

## 11. Infrastructure

1. Books Required reading:	<ul style="list-style-type: none"> <li>• Introduction to Environmental Engineering and Science by G. Masters and W. Ela</li> <li>• Environmental Engineering by G. Kiely</li> </ul>
2. Main references (sources)	<ul style="list-style-type: none"> <li>• Fundamental of Ecology by P. Odum and W. Barrett</li> </ul>
A- Recommended books and references (scientific journals, reports...).	<p>Journals</p> <ol style="list-style-type: none"> <li>1. International Journal of Ecology</li> <li>2. Ecology</li> </ol>
B-Electronic references, Internet sites...	<p><a href="https://www.epa.gov">https://www.epa.gov</a></p> <p><a href="https://youtube.com">https://youtube.com</a></p>

## 12. The development of the curriculum plan

The development could concentrate on more applications and mathematical modeling through taking 2 courses instead of one



# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor: Dr. Mona Faeq Ali

### COURSE SPECIFICATION

This course introduces the description of the environmental geology. Topic covered: Understanding the science of geology. branches of geology ,engineering geology, the earth crust and minerals. Description of common rocks ,environment factors and impacts on rocks. soils formation ,types and physical properties. Understanding mass-volume relations and weight- volume relations. Explain void ratio , porosity ,degree of saturation, Compressive strength and tensile strength.

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Geology
4. Modes of Attendance offered	2 days per week presence
5. Semester/Year	Semester
6. Number of hours tuition (total)	64h
7. Date of production/revision of this specification	2023-2024
8. Aims of the Course	
<b>The main aim of this course are</b>	
. Full knowledge of geology science, regulations, properties of rocks and soils.	
Provide students with the basic concepts of geology science and earth crust profile	

9. Learning Outcomes, Teaching ,Learning and Assessment Method

## A- Cognitive goals.

A1. After completion of the course students should be able to characterization of geology

A2. analysis of geology constituents

A3. Attract and welcome undergraduate students to our Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1. Understand Principles of general geology

B2 Have students learn about Geology engineering problems and then apply theory to particular

B3. Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving

## C. Affective and value goals

C1. Describe the general principal involve of Environmental geology

C3. Prepare students for successful careers in environmental engineering

C3. The impact of geology Engineering in solutions

## Teaching and Learning Methods

Intensive studies of regulations

## Assessment methods

### Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2Theory+ 2Lab.	1&2	Science of geology	Presence	Questions during the lectures ,quiz, exam, present in the class
2	2Theory+ 2Lab.	1&2	The earth crust and minerals	Presence	Questions during the lectures ,quiz, exam, present in the class
3	2Theory+ 2Lab.	1&2	Description of the earth crust profile	Presence	Questions during the lectures ,quiz, exam, present in the class
4	2Theory +2Lab.	1&2	Description of common rocks	Presence	Questions during the lectures ,quiz, exam, present in the class
5	2Theory+ 2Lab.	1&2	Description of common rocks	Presence	Questions during the lectures ,quiz, exam, present in the class
6	2Theory+ 2Lab.	1&2	Faults	Presence	Questions during the lectures ,quiz, exam, present in the class
7	2Theory+ 2Lab.	1&2	Folds	Presence	Questions during the lectures ,quiz, exam, present in the class
8	2Theory+ 2Lab.	1&2	Joints	Presence	Questions during the lectures ,quiz, exam, present in the class
9	2Theory+ 2Lab.	1&2	Soils formation ,types and physical properties	Presence	Questions during the lectures ,quiz, exam, present in the class
10	2Theory+ 2Lab.	1&2	Soils formation ,types and physical properties	Presence	Questions during the lectures ,quiz, exam, present in the class
11	2Theory+ 2Lab.	1&2	Compressive strength and tensile strength	Presence	Questions during the lectures ,quiz, exam, present in the class



12	2Theory+ 2Lab.	1&2	Compressive strength and tensile strength	Presence	Questions during the lectures ,quiz, exam, present in the class
13	2Theory+ 2Lab.	1&2	Evaluate deformation and elasticity of rocks , axial and lateral strains and modulus of elasticity	Presence	Questions during the lectures ,quiz, exam, present in the class
14	2Theory+ 2Lab.	1&2	Review	Presence	Questions during the lectures ,quiz, exam, present in the class
15	2		Mid exam		

## 11. Infrastructure

1. Books Required reading:	Douglas A. Skoog, Donald M. West, F. James Holler and Stanley R. Crouch “Fundamentals
2. Main references (sources)	Davis, L., Mackenzie, and Cornwell, A., David. “Introduction to Environmental Engineering” 2nd Edition, McGraw Hill. Inc.1985
A- Recommended books and references (scientific journals, reports...).	
B-Electronic references, Internet sites...	

## 12. The development of the curriculum plan

Full knowledge of science of geology, relationship between the engineering geologist and civil engineering regulations, properties of minerals, and classification

# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

**Course Instructor: dr.halla ali**  
**COURSE SPECIFICATION**

The course offers specialization in selected areas of engineering hydrology. It addresses classification and evaluation of hydrological data, such as: water cycle, measurements, and variation of metrological data, humidity, wind, precipitation, streamflow and unit hydrograph, groundwater flow, mechanism of transport pollutants, and transportation of contaminants through soil particles.

1. Teaching Institution	University of Baghdad /College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Engineering Hydrology EnE
4. Modes of Attendance offered	Annual System: They attend in electronic mode 2 hrs. a Week.
5. Semester/Year	Annual
6. Number of hours tuition (total)	60 hrs./ 2 hrs per week
7. Date of production/revision of this specification	2019

## 8. Aims of the Course

The main objectives of the course are:

1. To understand hydrology fundamentals,
2. To understand the principles, instrumentation and applications of hydrology.
3. To perform analysis and calculations of hydrological data.

## **9• Learning Outcomes, Teaching, Learning and Assessment Method**

### **A- Cognitive goals.**

**At the end of the year, the students should gain:**

A1. Ability to solve hydrology problems by different techniques and skills in calculation tables and curves for representing hydrological results.

A2. Studying humidity.

A3. Measuring average precipitation over catchment area.

A4. Finding the missing data.

A5. Groundwater flow direction and the expectation of the transportation of pollutants through soil

A6. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations and possess the knowledge and skills required for a wide range of careers and career changes.

### **B. The skills goals special to the course**

**B1.** Ability to solve hydrology problems by different techniques and skills in calculation tables and curves for representing hydrological results.

**B2.** Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

### **Teaching and Learning Methods**

1- Lectures.

2- Homework and Assignments.

3- Tests and Exams.

4- In-Class Questions and Discussions.

5- Connection between Theory and software.

6- In- and Out-Class oral conservations.

### **Assessment Methods**

1. Examinations, Tests, and Quizzes.

2. Student Engagement during Lectures.

3. Responses Obtained from Students, Questionnaire about curriculum and faculty member (Instructor).

4. Home work related to problem-solving.

<p>C. Affective and value goals</p> <p>C1. Practical skills to learn to calculate average precipitation, missing data, surface runoff, and groundwater movement.</p> <p>C2. Research and analytical techniques.</p> <p>C3. Prepare students for successful careers in environmental engineering.</p>
<p>Teaching and Learning Methods</p>
<p>Intensive studies of regulations</p>
<p>Assessment methods</p>
<p>Case studies</p>
<p>D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)</p>
<p>D1. Become more effective, independent, and confident, self-directed learners</p> <p>D2. Improve their general skills for study and career management</p> <p>D3. Articulate personal goals and evaluate progress towards their achievement</p> <p>D4. An ability to identify, formulate, and solve engineering problems.</p>

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2 (Theo.)	1&2	Review of fundamental concepts	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	2 (Theo.)	1 &2	Water cycle	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	2 (Theo.)	1 &2	Measurements and variation of metrological data	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	2 (Theo.)	1 &2	Vapor pressure	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	2 (Theo.)	1 &2	Humidity	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	2 (Theo.)	1,2,&3	Humidity	Electronic	Questions during the lectures ,quiz, exam,

					present in the class
7	2 (Theo.)	1,2,&3	wind	Electronic	Questions during the lectures ,quiz, exam, present in the class
8	2 (Theo.)	2,3 &4	Exam	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	2 (Theo.)	2,3 &4	Precipitation missing data	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	2 (Theo.)	-----	Precipitation calculation	Electronic	-----
11	2 (Theo.)	2,3 &4	Precipitation calculation	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	2 (Theo.)	2,3 &4	Precipitation calculation	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	2 (Theo.)	2,3 &4	Precipitation calculation	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	2 (Theo.)	2,3 &4	Exam	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	2 (Theo.)	2,3 &4	Streamflow measurements	Electronic	Questions during the lectures ,quiz, exam, present in the class
16	2 (Theo.)	2,3 &4	Streamflow routing	Electronic	Questions during the lectures ,quiz, exam, present in the class
17	2 (Theo.)	2,3 &4	Streamflow routing	Electronic	Questions during the lectures ,quiz, exam, present in the class
18	2 (Theo.)	2,3 &4	Streamflow	Electronic	Questions during the lectures ,quiz, exam, present in the class
19	2 (Theo.)	2,3 &4	Streamflow measurements	Electronic	Questions during the lectures ,quiz, exam, present in the class
20	2 (Theo.)	2,3 &4	Exam	Electronic	Questions during the lectures ,quiz, exam, present in the class
21	2 (Theo.)	-----	Groundwater	Electronic	-----
22	2 (Theo.)	5	Ground water	Electronic	Questions during the lectures ,quiz, exam,

					present in the class
23	2 (Theo.)	5	Ground water direction	Electronic	Questions during the lectures ,quiz, exam, present in the class
24	2 (Theo.)	5	Transport the contaminant in groundwater	Electronic	Questions during the lectures ,quiz, exam, present in the class
25	2 (Theo.)	5	Transport models	Electronic	Questions during the lectures ,quiz, exam, present in the class
26	2 (Theo.)	-----	Exam	Electronic	-----
27	2 (Theo.)		Environmental sampling	Electronic	Questions during the lectures ,quiz, exam, present in the class
28	2 (Theo.)		Environmental sampling	Electronic	Questions during the lectures ,quiz, exam, present in the class
29	2 (Theo.)	1,2,3,4 &5	Applications	Electronic	Questions during the lectures ,quiz, exam, present in the class
30	2 (Theo.)	1,2,3,4 &5	Applications	Electronic	Questions during the lectures ,quiz, exam, present in the class

11. Infrastructure	
1. Books required reading:	1. Hydrology for Engineers by “ Ray K. Linsley , Max A. Kohler and Joseph L. H. Paulhus” 2nd edition
3. Main references (sources)	2. Unsaturated zone hydrology for scientists and engineers by James A. Tindall
A- Recommended books and references (scientific journals, reports...).	1. Unsaturated zone hydrology for scientists and engineers by James A. Tindall

B-Electronic references, Internet sites

<https://theconstructor.org/water-resources/hydrology/engineering-hydrology-scope-applications/37597/>

## 12. The development of the curriculum plan

Not to rely on traditional examinations but the creation of reports following the reading of textbooks. These reports are validated and transformed into academic credits for graduation purposes.

## TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

### Course Instructor: Lecturer Dr. Hussein Jabar Khadim COURSE SPECIFICATION

The course offers specialization in selected areas of Mechanical Engineering. The aim of the programme is to give graduates the knowledge and skills which a professional mechanical engineer will need in order to work effectively in a modern engineering environment.

1. Teaching Institution	University of Baghdad /College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Static and Strength of Material EnE
4. Modes of Attendance offered	Annual System: They attend in electronic mode 3 hrs. a Week.
5. Semester/Year	Annual
6. Number of hours tuition (total)	90 hrs./ 3 hrs per week
7. Date of production/revision of this specification	2019
<b>8. Aims of the Course</b>	
The main objectives of the course are: 1. To understand Mechanical Engineering and strength of material fundamentals, 2. To understand the principles, instrumentation and applications of Static and strength of material. 3. To perform analysis and calculations with ease.	



## **9• Learning Outcomes, Teaching ,Learning and Assessment Method**

### **A- Cognitive goals.**

**At the end of the year the students should gain:**

- A1. Identification of force, types of force; systems of force resolution of a two-dimensional force into component
- A2. Identification of moments of a force, the couple and torque
- A3. Static equilibrium; “free body” principle applied to solids.
- A4. Second moment of area; moment of inertia Strength of materials.
- A5. Direct stress and strain; properties of section;; stresses and strains in pin-jointed frames
- A6. Bending and torsion simple beams and thin cylinders

### **B. The skills goals special to the course**

**B1.** Essential analytical techniques and skills in calculation of Mechanical Engineering problems.

**B2.** Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

### **Teaching and Learning Methods**

- 1- Lectures.
- 2- Homework and Assignments.
- 3- Tests and Exams.
- 4- In-Class Questions and Discussions.
- 5- Connection between Theory and Application.
- 6- In- and Out-Class oral conservations.

### **Assessment Methods**

- 1. Examinations, Tests, and Quizzes.
- 2. Student Engagement during Lectures.
- 3. Responses Obtained from Students, Questionnaire about curriculum and faculty member (Instructor).
- 4. Home work related to problem solving.

### **C. Affective and value goals**

- C1. Applicable skills to learn calculation of problem solution.
- C2. Mathematical calculation.
- C3. Research and analytical techniques.
- C4. Prepare students for successful careers in environmental engineering.

### **Teaching and Learning Methods**

Intensive studies of regulations

Assessment methods
Case studies
D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)
D1. Become more effective, independent and confident self-directed learners
D2. Improve their general skills for study and career management
D3. Articulate personal goals and evaluate progress towards their achievement
D4. An ability to identify, formulate, and solve engineering problems.

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3 (Theo.)	1&2	Principles of statics	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	3 (Theo.)	1 &2	Resultants of force systems	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	3 (Theo.)	1 &2	Resultants of force systems	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	3 (Theo.)	1 &2	Equilibrium of force systems	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	3 (Theo.)	1 &2	Equilibrium of force systems	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	3 (Theo.)	1,2,&3	Friction	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	3 (Theo.)	1,2,&3	Friction	Electronic	Questions during the lectures ,quiz, exam, present in the class
8	3 (Theo.)	2,3 &4	Analysis of trusses	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	3 (Theo.)	2,3 &4	Analysis of trusses	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	3 (Theo.)	-----	Forces in space	Electronic	-----
11	3 (Theo.)	2,3 &4	Centroids and moment of inertia	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	3 (Theo.)	2,3 &4	Centroids and moment of inertia	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	3 (Theo.)	2,3 &4	Centroids and moment of inertia	Electronic	Questions during the lectures ,quiz, exam, present in the class

14	3 (Theo.)	2,3 &4	Review	Electronic	-----
15	3 (Theo.)	2,3 &4	Stresses	Electronic	Questions during the lectures ,quiz, exam, present in the class
16	3 (Theo.)	2,3 &4	Stresses	Electronic	Questions during the lectures ,quiz, exam, present in the class
17	3 (Theo.)	2,3 &4	Stresses	Electronic	Questions during the lectures ,quiz, exam, present in the class
18	3 (Theo.)	2,3 &4	Strains	Electronic	Questions during the lectures ,quiz, exam, present in the class
19	3 (Theo.)	2,3 &4	Strains	Electronic	Questions during the lectures ,quiz, exam, present in the class
20	3 (Theo.)	2,3 &4	Strains	Electronic	Questions during the lectures ,quiz, exam, present in the class
21	3 (Theo.)	-----	Examination	Electronic	-----
22	3 (Theo.)	5	Torsion of Circular shafts	Electronic	Questions during the lectures ,quiz, exam, present in the class
23	3 (Theo.)	5	Torsion of Circular shafts	Electronic	Questions during the lectures ,quiz, exam, present in the class
24	3 (Theo.)	5	Shear force & bending moment Daigrams	Electronic	Questions during the lectures ,quiz, exam, present in the class
25	3 (Theo.)	5	Shear force & bending moment Daigrams	Electronic	Questions during the lectures ,quiz, exam, present in the class
26	3 (Theo.)	-----	Shear force & bending moment Daigrams	Electronic	-----
27	3 (Theo.)		Flexural stresses in beams	Electronic	Questions during the lectures ,quiz, exam, present in the class
28	3 (Theo.)		Flexural stresses in beams	Electronic	Questions during the lectures ,quiz, exam, present in the class
29	3 (Theo.)	1,2,3,4 &5	Flexural stresses in beams	Electronic	Questions during the lectures ,quiz, exam, present in the class
30	3 (Theo.)		Examination	Electronic	-----

<b>11. Infrastructure</b>	
1. Books required reading:	<ol style="list-style-type: none"> <li>1. Engineering Mechanics Static 5-6edition by Meriam and Keaige</li> <li>2. Engineering Mechanics Static 10-12-13edition by Hibbeler</li> </ol>
1- Main references (sources)	<ol style="list-style-type: none"> <li>1. Engineering Mechanics Static 8edition by Singer</li> <li>2. Strength of Material by Pytel and Singer</li> </ol>

A- Recommended books and references (scientific journals, reports...).	Elementary Mechanical Engineering
B-Electronic references, Internet sites	<ol style="list-style-type: none"> <li>1 <a href="https://www.youtube">https://www.youtube</a></li> <li>2 <a href="https://www.sciencedirect.com/book/9780125551601/Static">https://www.sciencedirect.com/book/9780125551601/Static</a></li> <li>3 <a href="https://www.nature.com/articles/062292b0">https://www.nature.com/articles/062292b0</a></li> </ol>

12. The development of the curriculum plan

Not to rely on traditional examinations but the creation of reports following the reading of textbooks. These reports are validated and transformed into academic credits for graduation purposes.

# TEMPLATE FOR PROGRAMME SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Dr. Mohammed B. Abdul- Kareem

### PROGRAMME SPECIFICATION

**Give basic concepts for students about the details of thermodynamics application**

1. Teaching Institution	Collage of Engineering
2. University Department/Centre	Department of Environmental Engineering
3. Course title/code	Thermodynamics
4. Modes of Attendance offered	2 days per week
5. Semester/Year	Year
6. Number of hours tuition (total)	90
7. Date of production/revision of this specification	
<b>8. Aims of the Course</b>	
1- The course explains the thermodynamics law and its application	
2- Explain the unit of Heat Engine cycle , Refrigeration cycle	

## 9. Learning Outcomes, Teaching, Learning and Assessment Methods

### A. Cognitive goals

A1. Student should be able to make the application of the thermodynamics laws

A2. Used the laws of thermodynamics in the application of steam power plant unit and Heat pump .

### B. The skills goals special to the Course

B1.study the first , second and third law of thermodynamics

B2.study these law and its application .

## Teaching and Learning Methods

Classroom teaching will involve black board, power point presentations, and case study analysis.

## Assessment methods

Homework related to problem solving

### C. Affective and value goals

C1. Understanding the application of thermodynamic science

C2. Application the laws of thermodynamic on our life

## Teaching and Learning Methods

Intensive studies of regulations

## Assessment methods

Case study

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

- D1. Become more effective, independent and confident self-directed learners
- D2. Improve their general skills for study and career management
- D3. Articulate personal goals and evaluate progress towards their achievement
- D4. An ability to identify, formulate, and solve engineering problems

## **10. Course Structure**

<b>Week</b>	<b>Hours</b>	<b>ILOs</b>	<b>Unit/Module or Topic Title</b>	<b>Teaching Method</b>	<b>Assessment Method</b>
1	3	Introduction	Introduction in thermodynamics	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
2	3	Application of thermodynamic science	Application of thermodynamic science	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
3	3	Definition of thermodynamics properties	Intensive and extensive properties	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
4	3	Introduction of system and surrounding	Definition of type of system	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
5	3	Introduction in force ,density and specific volume and specific weight	Definition in force ,density and specific volume and specific weight	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class

6	3	Definition of pressure	The meaning and its units	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
7	3	Definition of Temperature	The meaning and its units	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
8	3	Heat and work	Definition And its application	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
9	3	Introduction of laws of thermodynamics	Definition laws of thermodynamics	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
10	3	Zero and first law	Application and definition	Class Classroom teaching will involve black board, power point presentations, and case study	Questions during the lectures ,quiz, exam, present in the class
11	3	First law in closed system	application of First law in closed system	Classroom teaching will involve black board, power point presentations, and case study analysis. +	Questions during the lectures ,quiz, exam, present in the class
12	3	First law in open system	application of First law in open system	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
13	3	Steady state processes	Condition and application	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
14	3	Unsteady state process	Meaning and example	Class Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class



15	3	P-V diagram	P-V diagram and its application	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
16	3	P-T diagram	P-T diagram and its application	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
17	3	Ideal gas and its application	Definition	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
18	3	The equation of state	Application The equation of state	Class Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
19	3	Real gas and its application	Definition	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
20	3	Process of thermodynamics	Definition	Classroom teaching will involve black board, power point presentations, and case study analysis. +	Questions during the lectures ,quiz, exam, present in the class
21	3	Constant volume process	Application	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
22	3	Constant pressure process	Application	Classroom teaching will involve black board, power point presentations, and case study analysis. +	Questions during the lectures ,quiz, exam, present in the class
23	3	Isothermal process and adiabatic process	Application	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class

24	3	Polytropic process	Application	Class Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
25	3	Equation of state for real gas	Application	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
26	3	Van der vales equation	Application	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
27	3	Heat effects	Application and definitions	Classroom teaching will involve black board, power point presentations, and case study analysis. +	Questions during the lectures ,quiz, exam, present in the class
28	3	Heat of reaction , heat of formation and heat of reaction	Application and definitions	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
29	3	Sensible heat and Latent heat	Application and definitions	Classroom teaching will involve black board, power point presentations, and case study analysis.	Questions during the lectures ,quiz, exam, present in the class
30	3	Second law and its application	Application and definitions of heat engine	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class

## 11. Infrastructure

1. Books Required reading:	Application of Thermodynamics in chemical engineering



**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

**المرحلة الثالثة**

**2023**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate

description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

### **Academic Program Description Form**

**University Name: University of Baghdad**

**Faculty/Institute: College of Engineering**

**Scientific Department: Department of Environmental Engineering**

**Academic or Professional Program Name: English**

**Final Certificate Name: .....**

**Academic System: Polona program**

**Description Preparation Date:**

**File Completion Date: 16-2-2024**

**Signature:**

**Head of Department Name:**

**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:**

**Approval of the Dean**

### **1. Program Vision**

The strategic goal is to raise the readiness of the university formations to be distinguished now and in the future. It further aims to bring about a quantum leap in their strategic performance following international standards within the framework of true citizenship and leadership in its various cognitive, and educational research



roles. It also aims to provide community service, upgrade, and strengthen the position of the university within the framework of universities' international rankings, and within the framework of balancing between contemporaneity with modern trends in higher education and preserving originality represented by adhering to the national constants and values of the country.

## 2. Program Mission

English Language Learning Program (*ELLP*) is to help students from all over the world to achieve their personal and academic goals by providing high-quality, individualized English language instruction in a small-classroom setting and warm, welcoming, inclusive, and friendly cultural environment, while also bringing valuable and diverse international student perspectives to the University.

## 3. Program Objectives

- 1- The aim of this course is to empower students with the language and life skills
- 2- The integrated skills approach of the course develops the student's self-confidence to
- 3- succeed in professional and social encounters within an English-speaking global
- 4- using language to express knowledge of Environment and health impacts hazardous

## 4. Program Accreditation

Does the program have program accreditation? And from which agency?

None

## 5. Other external influences

Is there a sponsor for the program?

None

## 6. Program Structure

Program Structure	Number of	Credit hours	Percentage	Reviews*
-------------------	-----------	--------------	------------	----------

	Courses			
<b>Institution Requirements</b>	<b>1</b>	<b>2</b>		<b>basic</b>
<b>College Requirements</b>	<b>4</b>	<b>2</b>		
<b>Department Requirements</b>	<b>4</b>	<b>2</b>		
<b>Summer Training</b>	<b>0</b>	<b>0</b>		
<b>Other</b>				

\* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
2-2024	<b>EnE 108</b>	English	theoretical	practical
			yes	0

8. Expected learning outcomes of the program	
<b>Knowledge</b>	
Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries,	Become more effective, independent and confident self-directed learners
<b>Skills</b>	
The integrated skills approach of the course develops the student's self-understanding	Understand texts using effective learning strategies for reading and vocabulary building,
using language to express knowledge of Environment and health impacts	Improve their general skills for study and career management
<b>Ethics</b>	

Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations,	Articulate personal goals and evaluate progress towards their achievement
Understand texts using effective learning strategies for reading and vocabulary building,	An ability to identify, formulate, and solve engineering problems

<b>9. Teaching and Learning Strategies</b>
Lecture and classroom discussion

<b>10. Evaluation methods</b>
Assignments and exams

<b>11. Faculty</b>						
<b>Faculty Members</b>						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Asst. Prof.	English	Linguistics/ Discourse Analysis			Current faculty number	

<b>Professional Development</b>
---------------------------------

### **Mentoring new faculty members**

The orientation for new faculty members is arranged by the department chair and may consist of a few informal meetings and the distribution of a handbook and other supplementary material. In contrast, approximately one in four colleges have formalized and uniform faculty mentorship programs across all departments.

### **Professional development of faculty members**

In-depth programs included both intensive, multi-day offerings in a short course or retreat format, and extended offerings with multiple sessions spaced over a term, a year, or even longer. These formats typically enrolled a cohort of participants who continued for the entire program.

## **12. Acceptance Criterion**

**central admission**

## **13. The most important sources of information about the program**

–New Headway Plus [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2006),

–Morphy, A.J (1983) English Grammar in use. Cambridge: CUP

<https://www.englishclub.com/grammar/verb-tenses.htm>

<https://www.ego4u.com/en/cram->

[www.perfect-english-grammar.com/verb-tenses.htm](http://www.perfect-english-grammar.com/verb-tenses.htm)

[https://en.wikipedia.org/wiki/Grammatical\\_tense](https://en.wikipedia.org/wiki/Grammatical_tense)

## **14. Program Development Plan**

The development could be done by consulting more resources and increase lecture length to 3 hours weekly

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2024/level 2	EnE 108	English	Basic			•			•			•			

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

## Course Description Form

1. Course Name: English					
2. Course Code: <b>EnE 108</b>					
3. Semester / Year: Semester					
4. Description Preparation Date: 16/2/2024					
5. Available Attendance Forms: attendance and Google classroom					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2					
7. Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Nagham Ali Hassan Email: nagham.ali@coeg.uobaghdad.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>			A1) Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries, (A2) Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations, (A3) Understand texts using effective learn strategies for reading and vocabulary building.....		
9. Teaching and Learning Strategies					
<b>Strategy</b>		Lecture and classroom discussion			
10. Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>

		Outcomes			
Week 1	2	<p>(A) Finding and understanding information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources and English language dictionaries,</p> <p>(B) Developing conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentation</p> <p>(C) Understanding texts using effective learning structures</p>	Introduction to the material	Lecture and class discussion	Questions during lectures, quiz exam, presentation the class
Week 2	2		Unit 1		
Week 3	2		Unit 2,3		
Week 4	2		Unit 4,5		
Week 5	2		Quiz		
Week 6	2		Unit 6,7		
Week 7	2		Midterm exam		
Week 8	2		Unit 8,9		
Week 9	2		Quiz		
Week 10	2		General discussion		
Week 11	2		Unit 10, & assignment		
Week 12	2		Unit 11,12		
Week 13	2		Composition	Writing	
Week 14	2		discussion		
Week 15	2		Unit 13,14		
		English for Specific Purposes			

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, essays .... etc

		Time/Number	Weight (Marks)
Formative assessment	Quizzes	2	20% (20)
	Assignments	1	10% (10)
	Projects / Lab.	0	0
	composition	1	10% (10)
Summative assessment	Midterm Exam	2 hr	10% (10)
	Final Exam	2hr	50% (50)
Total assessment			100% (100 Marks)

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	(1) <i>New Headway Plus [Beginner]</i> by John and Liz Soars, Oxford: Oxford University Press (2006), .
Main references (sources)	1) <i>New Headway Plus [Beginner]</i> by John and Liz Soars, Oxford: Oxford University Press (2006),  (2) <i>Modern scientific articles from the news related to the students' specialty, and</i> (3) <i>Internet links and videos related to topics discussed in General English and English for Specific Purposes lectures</i>
Recommended books and references (scientific journals, reports...)	Dictionaries and supplies supplementary
Electronic References, Websites	<a href="https://www.englishclub.com/grammar/verb-tenses.htm">https://www.englishclub.com/grammar/verb-tenses.htm</a> <a href="https://www.ego4u.com/en/cram-">https://www.ego4u.com/en/cram-</a> <a href="http://www.perfect-english-grammar.com/verb-tenses.htm">www.perfect-english-grammar.com/verb-tenses.htm</a> <a href="https://en.wikipedia.org/wiki/Grammatical_tense">https://en.wikipedia.org/wiki/Grammatical_tense</a>



# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor: Dr. Ziad Tark Abd Ali

## COURSE SPECIFICATION

**Full knowledge of differential equations: classification, solution methods, and modeling**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Hazardous Waste
4. Modes of Attendance offered	2 days per week electronic
5. Semester/Year	Year
6. Number of hours tuition (total)	90 h
7. Date of production/revision of this specification	2019
8. Aims of the Course	
1- Classify the differential equations according to type, order, degree, and linearity	
2- Categorize 1st and/or 2nd order ordinary differential equations according to methods of solution. Practice various methods of solutions.	
3- Recognize partial differential equations and learn methods of solution.	
4- Formulate (MODELLING) and solve 1st and/or 2nd order ordinary differential equations related to engineering applications with examples from fluid mechanics, heat and/or mass transfer in addition to microbiology and chemical kinetics.	

9. Learning Outcomes, Teaching, Learning and Assessment Method

A- Cognitive goals.

- A1. Training students to be able to classify differential equations and solve them in correct ways
- A2. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for

B. The skills goals special to the course.

- B1. Employing methods of solving differential equations to convert some environmental phenomena into mathematical relationships through which we can predict what will happen in the future, and this is called "Modeling"
- B2. Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

Teaching and Learning Methods

More description of case studies and applications

Assessment methods

Homework related to problem solving

C. Affective and value goals

- C1. Development of students' mental skills
- C2. Training students to link mathematics with environmental concepts
- C3. Prepare students for successful careers in environmental engineering

Teaching and Learning Methods

Intensive studies of regulations

Assessment methods

Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Introduction to differential equations	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	3		Classification of differential equations.	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	3		Solution approach to ordinary differential equations.	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	3		Categorization of first order differential equations.	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	3		Solution methods of a first order differential equations.	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	3		=	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	3		=	Electronic	Questions during the lectures ,quiz, exam, present in the class

8	3		Categorization of second order differential equations.	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	3		=	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	3		=	Electronic	Questions during the lectures ,quiz, exam, present in the class
11	3		Simultaneous differential equations	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	3		=	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	3		High order differential equations	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	3		Inverse D-operator method	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	3		=	Electronic	Questions during the lectures ,quiz, exam, present in the class
16			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
17			Laplace transformations	Electronic	Questions during the lectures ,quiz, exam, present in the class
18			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
19			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
20			=	Electronic	Questions during the lectures ,quiz, exam, present in the class

21			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
22			partial differential equations and learn methods of solution	Electronic	Questions during the lectures ,quiz, exam, present in the class
23			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
24			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
25			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
26			Formulation and engineering applications of ordinary	Electronic	Questions during the lectures ,quiz, exam, present in the class
27			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
28			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
29			=	Electronic	Questions during the lectures ,quiz, exam, present in the class
30			=	Electronic	Questions during the lectures ,quiz, exam, present in the class

11. Infrastructure	
1. Books Required reading:	<ol style="list-style-type: none"> <li>Differential Equations; 3rd. Ed.; Goode &amp; Annan; Pearson, 2007.</li> <li>Advanced Engineering Mathematics; 5th Ed.; Wylie &amp; Barrett ; McGraw-Hill , 1982</li> </ol>
2. Main references (sources)	Elementary Differential equations ; 6th edition ; by C.Henry Edwards & David E.Perrey ; Pearson-Prentice Hall, 2008

A- Recommended books and references (scientific journals, reports...).	
B-Electronic references, Internet sites...	

## 12. The development of the curriculum plan

The development could concentrate on more applications and mathematical modeling.



# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Prof. Dr. Shahlaa Esmil Ebrahim

## COURSE SPECIFICATION

**Full knowledge of hazardous wastes, regulations, properties of hazardous wastes, and some remediation methods.**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Hazardous Waste
4. Modes of Attendance offered	2 days per week electronic
5. Semester/Year	Semester
6. Number of hours tuition (total)	45 h
7. Date of production/revision of this specification	2020-2021
8. Aims of the Course	
	1- Understanding hazardous waste, industrial waste, etc.
	2- Understanding the hazardous waste accidents.
	3- Knowledge of legal, institutional and financial aspects of management of hazardous wastes
	4- Become aware of Environment and health impacts hazardous waste mismanagement

9. Learning Outcomes, Teaching ,Learning and Assessment Method



## A- Cognitive goals .

A1. After completion of the course students should be able to characterization of hazardous waste

A2. analysis of hazardous waste constituents including QA/QC issues.

A3. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1.Understand health and environmental issues related to hazardous waste management

B2. apply steps in hazardous waste management-waste reduction at source, collection techniques, materials

B3.Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving

## C. Affective and value goals

C1. Optimization of solid waste transport, treatment and disposal techniques

C2. Economics of the onsite vs. offsite waste management options

C3.Prepare students for successful careers in environmental engineering

## Teaching and Learning Methods

Intensive studies of regulations

## Assessment methods

### Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Definition of hazardous waste	General definition of hazardous waste, sources	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	3	Disposal of hazardous waste	Past disposal of HW, Pre regulatory disposal of hazardous waste,	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	3	Environmental legislation	hazardous waste environmental legislation and disposal regulations, RCRA, HSWA, SARA	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	3	Hazardous management	Hazardous management, assessment and control, NCP, Risk	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	3	Cradle to grave of hazardous waste	Source – pathway-receptor analysis	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	3	Nomenclature	Hazardous waste nomenclature, organic, inorganic	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	3	Types of Hazardous wastes	Organic , Inorganic, and radioactive hazardous waste	Electronic	Questions during the lectures ,quiz, exam, present in the class
8	3	Properties of HW	Concentration of HW in water, air, soil , specific activity	Electronic	Questions during the lectures ,quiz, exam, present in the class

9	3	Properties of HW	Water solubility of weak acids and bases	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	3	Properties of HW	Density and specific gravity, Light and dense nonaqueous phase liquid	Electronic	Questions during the lectures ,quiz, exam, present in the class
11	3	Properties of HW	Flammability limits	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	3	Properties of HW	Flash point and ignition temperature	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	3	Methods of treatment	Adsorption, ion exchange	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	3	Methods of treatment	Equilibrium isotherm models	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	3	Transportation of HW	Labels and placards	Electronic	Questions during the lectures ,quiz, exam, present in the class

## 11. Infrastructure

1. Books Required reading:	<p>1-Hazardous materials spills handbook, Gary F. Bennett, McGraw Hills Book Comp. (1982).</p> <p>2-Environmental treatment technology for hazardous and medical wastes-remedial scope and efficacy by Dutta</p> <p>3-2014 HAZARDOUS WASTE REPORT INSTRUCTIONS AND FORMS, Louisiana Department of Environmental Quality, 2014.</p> <p>4- 2016 HAZARDOUS WASTE REPORT, Louisiana Department of Environmental Quality, 2016.</p>
2. Main references (sources)	Hazardous wastes, sources, pathways, receptors, by Richard J. Watts (1997)

<p>A- Recommended books and references (scientific journals, reports...).</p>	<p>Journals</p> <ol style="list-style-type: none"> <li>1. International Journal of Environment and Waste Management</li> <li>2. Waste Management</li> </ol>
<p>B-Electronic references, Internet sites...</p>	<p><a href="https://www.epa.gov/hw/household-hazardous-waste-hhw">https://www.epa.gov/hw/household-hazardous-waste-hhw</a>  <a href="https://nepis.epa.gov/Exe/ZyNET.exe/10001XBX.TXT?ZyActionD=ZyDocument&amp;Client=EPA&amp;Index=1995+Thru+1999&amp;Docs=&amp;Query=&amp;Time=&amp;EndTime=&amp;SearchMethod=1&amp;TocRestrict=n&amp;Toc=&amp;TocEntry=&amp;QField=&amp;QFieldYear=&amp;QFieldMonth=&amp;QFieldDay=&amp;IntQFieldOp=0&amp;ExtQFieldOp=0&amp;XmlQuery=&amp;File">https://nepis.epa.gov/Exe/ZyNET.exe/10001XBX.TXT?ZyActionD=ZyDocument&amp;Client=EPA&amp;Index=1995+Thru+1999&amp;Docs=&amp;Query=&amp;Time=&amp;EndTime=&amp;SearchMethod=1&amp;TocRestrict=n&amp;Toc=&amp;TocEntry=&amp;QField=&amp;QFieldYear=&amp;QFieldMonth=&amp;QFieldDay=&amp;IntQFieldOp=0&amp;ExtQFieldOp=0&amp;XmlQuery=&amp;File</a></p>

## 12. The development of the curriculum plan

The development could concentrate on more applications and mathematical modeling through taking 2 courses instead of one.



# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Prof. Dr. Shahlaa Esmil Ebrahim

## COURSE SPECIFICATION

**Full knowledge of hazardous wastes, regulations, properties of hazardous wastes, and some remediation methods.**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Hazardous Waste
4. Modes of Attendance offered	2 days per week electronic
5. Semester/Year	Semester
6. Number of hours tuition (total)	45 h
7. Date of production/revision of this specification	2020-2021
8. Aims of the Course	
	1- Understanding hazardous waste, industrial waste, etc.
	2- Understanding the hazardous waste accidents.
	3- Knowledge of legal, institutional and financial aspects of management of hazardous wastes
	4- Become aware of Environment and health impacts hazardous waste mismanagement

9. Learning Outcomes, Teaching ,Learning and Assessment Method

## A- Cognitive goals .

A1. After completion of the course students should be able to characterization of hazardous waste

A2. analysis of hazardous waste constituents including QA/QC issues.

A3. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1.Understand health and environmental issues related to hazardous waste management

B2. apply steps in hazardous waste management-waste reduction at source, collection techniques, materials

B3.Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving

## C. Affective and value goals

C1. Optimization of solid waste transport, treatment and disposal techniques

C2. Economics of the onsite vs. offsite waste management options

C3.Prepare students for successful careers in environmental engineering

## Teaching and Learning Methods

Intensive studies of regulations

## Assessment methods

### Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Definition of hazardous waste	General definition of hazardous waste, sources	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
2	3	Disposal of hazardous waste	Past disposal of HW, Pre regulatory disposal of hazardous waste,	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
3	3	Environmental legislation	hazardous waste environmental legislation and disposal regulations, RCRA, HSWA, SARA	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
4	3	Hazardous management	Hazardous management, assessment and control, NCP, Risk	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
5	3	Cradle to grave of hazardous waste	Source – pathway-receptor analysis	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
6	3	Nomenclature	Hazardous waste nomenclature, organic, inorganic	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
7	3	Types of Hazardous wastes	Organic , Inorganic, and radioactive hazardous waste	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
8	3	Properties of HW	Concentration of HW in water, air, soil , specific activity	Direct in the class	Questions during the lectures ,quiz, exam, present in the class



9	3	Properties of HW	Water solubility of weak acids and bases	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
10	3	Properties of HW	Density and specific gravity, Light and dense nonaqueous phase liquid	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
11	3	Properties of HW	Flammability limits	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
12	3	Properties of HW	Flash point and ignition temperature	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
13	3	Methods of treatment	Adsorption, ion exchange	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
14	3	Methods of treatment	Equilibrium isotherm models	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
15	3	Transportation of HW	Labels and placards	Direct in the class	Questions during the lectures ,quiz, exam, present in the class

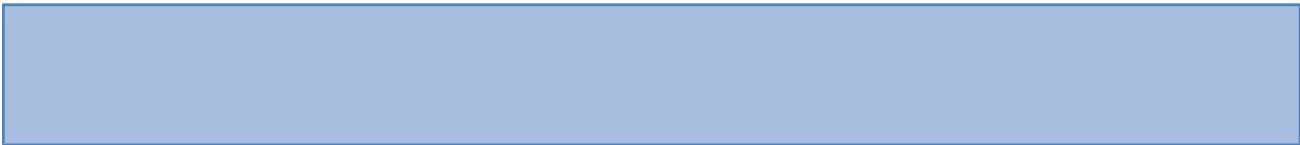
## 11. Infrastructure

1. Books Required reading:	<p>1-Hazardous materials spills handbook, Gary F. Bennett, McGraw Hills Book Comp. (1982).</p> <p>2-Environmental treatment technology for hazardous and medical wastes-remedial scope and efficacy by Dutta</p> <p>3-2014 HAZARDOUS WASTE REPORT INSTRUCTIONS AND FORMS, Louisiana Department of Environmental Quality, 2014.</p> <p>4- 2016 HAZARDOUS WASTE REPORT, Louisiana Department of Environmental Quality, 2016.</p>
2. Main references (sources)	Hazardous wastes, sources, pathways, receptors, by Richard J. Watts (1997)

<p>A- Recommended books and references (scientific journals, reports...).</p>	<p>Journals</p> <ol style="list-style-type: none"> <li>1. International Journal of Environment and Waste Management</li> <li>2. Waste Management</li> </ol>
<p>B-Electronic references, Internet sites...</p>	<p><a href="https://www.epa.gov/hw/household-hazardous-waste-hhw">https://www.epa.gov/hw/household-hazardous-waste-hhw</a>  <a href="https://nepis.epa.gov/Exe/ZyNET.exe/10001XBX.TXT?ZyActionD=ZyDocument&amp;Client=EPA&amp;Index=1995+Thru+1999&amp;Docs=&amp;Query=&amp;Time=&amp;EndTime=&amp;SearchMethod=1&amp;TocRestrict=n&amp;Toc=&amp;TocEntry=&amp;QField=&amp;QFieldYear=&amp;QFieldMonth=&amp;QFieldDay=&amp;IntQFieldOp=0&amp;ExtQFieldOp=0&amp;XmlQuery=&amp;File">https://nepis.epa.gov/Exe/ZyNET.exe/10001XBX.TXT?ZyActionD=ZyDocument&amp;Client=EPA&amp;Index=1995+Thru+1999&amp;Docs=&amp;Query=&amp;Time=&amp;EndTime=&amp;SearchMethod=1&amp;TocRestrict=n&amp;Toc=&amp;TocEntry=&amp;QField=&amp;QFieldYear=&amp;QFieldMonth=&amp;QFieldDay=&amp;IntQFieldOp=0&amp;ExtQFieldOp=0&amp;XmlQuery=&amp;File</a></p>

## 12. The development of the curriculum plan

The development could concentrate on more applications and mathematical modeling through taking 2 courses instead of one.



# TEMPLATE FOR PROGRAMME SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Prof. Dr. Ahmed Abed Mohammed

### PROGRAMME SPECIFICATION

**Give basic concepts for students about the details of mass transfer**

1. Teaching Institution	Collage of Engineering
2. University Department/Centre	Department of Environmental Engineering
3. Course title/code	Mass transfer
4. Modes of Attendance offered	2 days per week electronic
5. Semester/Year	Year
6. Number of hours tuition (total)	90
7. Date of production/revision of this specification	2019
<b>8. Aims of the Course</b>	
1- Understanding the fundamental concepts of mass transfer principles and to apply those concepts to real engineering problems.	
2- This course will provide an overview of mass transfer operations at basic to an intermediate level. Coverage will be relatively broad	

## 9. Learning Outcomes, Teaching, Learning and Assessment Methods

### A. Cognitive goals

A1. The goal is to provide students with the theoretical/analytical background to understand mass transfer operations and to tackle the sort of complex problems.

### B. The skills goals special to the Course

B1. Students will learn about the diffusional mass transfer

B2. Operation of cooling tower will be clearly understood

B3. Operation of Dryer will be understood

B4. Student will understand the mechanism of crystallization and absorption

### Teaching and Learning Methods

Classroom teaching will involve black board, power point presentations, and case study analysis.

### Assessment methods

Homework related to problem solving

### C. Affective and value goals

C1. Optimization of solid waste transport, treatment and disposal techniques

C2. Economics of the onsite vs. offsite waste management options

C3. Prepare students for successful careers in environmental engineering

### Teaching and Learning Methods

Intensive studies of regulations

### Assessment methods

Case study

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

- D1. Become more effective, independent and confident self-directed learners
- D2. Improve their general skills for study and career management
- D3. Articulate personal goals and evaluate progress towards their achievement
- D4. An ability to identify, formulate, and solve engineering problems

## **10. Course Structure**

<b>Week</b>	<b>Hours</b>	<b>ILOs</b>	<b>Unit/Module or Topic Title</b>	<b>Teaching Method</b>	<b>Assessment Method</b>
<b>1</b>	<b>3</b>	<b>General introduction</b>	<b>General introduction</b>	<b>Electronic</b>	<b>Questions during the lectures ,quiz, exam, present in the class</b>
<b>2</b>	<b>3</b>	<b>Diffusional mass transfer</b>	<b>Diffusional mass transfer</b>	<b>Electronic</b>	<b>Questions during the lectures ,quiz, exam, present in the class</b>
<b>3</b>	<b>3</b>	<b>Diffusional mass transfer</b>	<b>Diffusional mass transfer</b>	<b>Electronic</b>	<b>Questions during the lectures ,quiz, exam, present in the class</b>
<b>4</b>	<b>3</b>	<b>Ficks law of diffusion</b>	<b>Ficks law of diffusion</b>	<b>Electronic</b>	<b>Questions during the lectures ,quiz, exam, present in the class</b>
<b>5</b>	<b>3</b>	<b>Ficks law of diffusion</b>	<b>Ficks law of diffusion</b>	<b>Electronic</b>	<b>Questions during the lectures ,quiz, exam, present in the class</b>
<b>6</b>	<b>3</b>	<b>Application to environmental problems</b>	<b>Application to environmental problems</b>	<b>Electronic</b>	<b>Questions during the lectures ,quiz, exam, present in the class</b>

7	3	Application to environmental problems	Application to environmental problems	Electronic	Questions during the lectures ,quiz, exam, present in the class
8	3	Diffusion in concentrated solutions	Diffusion in concentrated solutions	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	3	Diffusion in concentrated solutions	Diffusion in concentrated solutions	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	3	Diffusion through semi-infinte mediums	Diffusion through semi-infinte mediums	Electronic	Questions during the lectures ,quiz, exam, present in the class
11	3	Diffusion through semi-infinte mediums	Diffusion through semi-infinte mediums	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	3	Diffusion coupled with chemical reaction	Diffusion coupled with chemical reaction	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	3	Diffusion coupled with chemical reaction	Diffusion coupled with chemical reaction	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	3	Concept of mass transfer coefficients	Concept of mass transfer coefficients	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	3	Concept of mass transfer coefficients	Concept of mass transfer coefficients	Electronic	Questions during the lectures ,quiz, exam, present in the class
16	3	Mass transfer correlations	Mass transfer correlations	Electronic	Questions during the lectures ,quiz, exam, present in the class
17	3	Mass transfer correlations	Mass transfer correlations	Electronic	Questions during the lectures ,quiz, exam, present in the class
18	3	Application to engineering problems	Application to engineering problems	Electronic	Questions during the lectures ,quiz, exam, present in the class
19	3	Application to engineering problems	Application to engineering problems	Electronic	Questions during the lectures ,quiz, exam, present in the class

20	3	Mass transfer across interface	Mass transfer across interface	Electronic	Questions during the lectures ,quiz, exam, present in the class
21	3	Mass transfer across interface	Mass transfer across interface	Electronic	Questions during the lectures ,quiz, exam, present in the class
22	3	Overall mass transfer coefficient	Overall mass transfer coefficient	Electronic	Questions during the lectures ,quiz, exam, present in the class
23	3	Overall mass transfer coefficient	Overall mass transfer coefficient	Electronic	Questions during the lectures ,quiz, exam, present in the class
24	3	Absorption and Stripping	Absorption and Stripping		Questions during the lectures ,quiz, exam, present in the class
25	3	Absorption and Stripping	Absorption and Stripping	Electronic	Questions during the lectures ,quiz, exam, present in the class
26	3	Design of absorption tower	Design of absorption tower	Electronic	Questions during the lectures ,quiz, exam, present in the class
27	3	Design of absorption tower	Design of absorption tower	Electronic	Questions during the lectures ,quiz, exam, present in the class
28	3	Adsorption	Adsorption	Electronic	Questions during the lectures ,quiz, exam, present in the class
29	3	adsorption	adsorption	Electronic	Questions during the lectures ,quiz, exam, present in the class
30	3	Leaching	Leaching	Electronic	Questions during the lectures ,quiz, exam, present in the class



<b>11. Infrastructure</b>	
<b>1. Books Required reading:</b>	<ol style="list-style-type: none"> <li><b>1. Transport process and separation process principles by geankoplis.</b></li> <li><b>2. Mass transfer operation by treybal.</b></li> <li><b>3. Chemical engineering volume 1&amp;2 coulson &amp;</b></li> </ol>
<b>2. Main references (sources)</b>	<ul style="list-style-type: none"> <li>• <b>Principles of unit operation by foust.</b></li> <li>• <b>Separation process principles by seader.</b></li> </ul>
<b>A- Recommended books and references (scientific journals, reports...).</b>	<b>Heat and mass transfer journal</b>
<b>B-Electronic references, Internet sites...</b>	<a href="https://www.routledge.com/Diffusion-and-Mass-Transfer/Vrentas-Vrentas/p/book/9781466515680">https://www.routledge.com/Diffusion-and-Mass-Transfer/Vrentas-Vrentas/p/book/9781466515680</a>

# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Prof. Dr. Shahlaa Esmil Ebrahim

### COURSE SPECIFICATION

This course presents numerical methods for solving mathematical problems. It deals with the theory and application of numerical approximation techniques as well as their computer implementation. It covers computer arithmetic, solution of nonlinear equations, interpolation and approximation, numerical integration and differentiation, solution of differential equations, and matrix computation.

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Numerical Analysis
4. Modes of Attendance offered	2 days per week electronic
5. Semester/Year	Year ( Annual)
6. Number of hours tuition (total)	90 h
7. Date of production/revision of this specification	2020-2021
8. Aims of the Course	
	<b>The student will be capable of solving the mathematical models that represent different physical and engineering models numerically and find the best fit to the experimental data and widened the engineering image of the student.</b>

9. Learning Outcomes, Teaching ,Learning and Assessment Methode

## A- Cognitive goals

A1. Develop an understanding of the core ideas and concepts of Numerical Methods.

A2. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1. Be able to recognize the power of abstraction and generalization, and to carry out investigative

B2. Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving

## C. Affective and value goals

C1. Be able to apply rigorous, analytic, highly numerate approach to analyze and solve problems using

C2 Prepare students for successful careers in environmental engineering

## Teaching and Learning Methods

Intensive homework and applications

## Assessment methods

Team work and problem solving

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

D1. Be able to communicate problem solutions using correct mathematical terminology and good  
D4. An ability to identify, formulate, and solve engineering problems

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Methods	Assessment Method
1	3	Approximation and round of errors	Studying types of error, Exact and approximate solutions	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
2	3	Approximation and round of errors	truncation, round of error, relative error, absolute, applications	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
3	3	Roots of equations	Open and closed methods Bisection method	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
4	3	Roots of equations	Newton Method	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
5	3	Interpolation	Linear and quadratic	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
6	3	Linear algebraic equations	Jacobi , Gauss Siedal, Gauss Elimination,	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
7	3	Linear algebraic equations	Cramer's rule, matrix inversion	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
8	3	Curve fitting	First and second order	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
9	3	Curve fitting	Applications	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
10	3	Numerical differentiation	Forward, backward, central	Direct in the class	Questions during the lectures ,quiz, exam, present in the class

11	3	Numerical differentiation	Divided difference errors	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
12	3	Numerical differentiation problems	Field applications	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
13	3	Numerical Integration	Elements of numerical integration	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
14	3	Numerical Integration	Composite rule	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
15	3	Ordinary differential equations	Euler method	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
16	3	Ordinary differential equations	Modified Euler method	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
17	3	Advanced numerical differentiation	Two dimensional	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
18	3	Advanced numerical differentiation	Applications	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
19	3	Advance numerical integration	Two dimensional applications	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
20	3	Partial differential equations	Two dimensional problems	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
21	3	Partial differential equations	Two dimensional problems	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
22	3	Solution of set of partial differential equations	Using different techniques	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
23	3	Numerical solution of partial differential equations	Introduction to problem solver	Direct in the class	Questions during the lectures ,quiz, exam, present in the class

24	3	Numerical solution of partial differential equations	Elliptic	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
25	3	Numerical solution of partial differential equations	Parabolic	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
26	3	Numerical solution of partial differential equations	Hhyper bolic	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
27	3	Numerical solution of partial differential equations	Parabolic equations in two spatial dimensions	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
28	3	Numerical solution of nonlinear equations	Application of nonlinear equation solving	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
29	3	Applications	Field applications	Direct in the class	Questions during the lectures ,quiz, exam, present in the class
30	3	Applications	Field applications	Direct in the class	Questions during the lectures ,quiz, exam, present in the class

## 11. Infrastructure

1. Books Required reading:	1- Steven C. Chapra, and Raymond P. Canale, 2006, Numerical Methods for Engineers, Fifth Edition, McGraw Hill. 2- N. S. Asaithambi, Numerical analysis theory and practice 3- James L. Baughn and Turner, Numerical methods and analysis
2. Main references (sources)	George W. and Collins, II, 2003, Fundamental Numerical Methods and Data Analysis
A- Recommended books and references (scientific journals, reports...).	J.B. Dixt, Numerical Methods Acta Numerica Journal Siam Journal on Numerical Analysis
B- Electronic references, Internet sites...	<a href="https://www.coursera.org/learn/intro-to-numerical-analysis">https://www.coursera.org/learn/intro-to-numerical-analysis</a>

## 12. The development of the curriculum plan

The development includes more computer applications using Matlab program and other software





# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor: Prof. Dr. Ayad A.H. Faisal

## COURSE SPECIFICATION

**Full knowledge of Soil science, origin, classification, pollution, and remediation methods.**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Soil Science and Pollution
4. Modes of Attendance offered	2 days per week electronic+ 1 day per week lab (lab for 1 <sup>st</sup> semester only)
5. Semester/Year	Year
6. Number of hours tuition (total)	90 h for theoretical + 30 h for lab
7. Date of production/revision of this specification	2019
8. Aims of the Course	
	1- Understanding origin, composition, classification etc. of soil.
	2- Understanding the flow of water in subsurface medium.
	3- Sources of soil pollution
	4- Theoretical modeling of contaminant transport

9. Learning Outcomes, Teaching ,Learning and Assessment Method

## A- Cognitive goals.

A1. After completion of the course students should be able to characterization of soil and modeling of contaminant transport mathematically to find the required time to reach the water resources

A2. Identification and measurement the main properties of the soil like porosity, void ratio....etc.

A3. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1.Understand health and environmental issues related to soil and groundwater pollution

B2. apply steps in reclamation of soil and contaminated groundwater

B3.Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

- 1- Lectures.
- 2- Tutorials.
- 3- Homework and Assignments.
- 4- Lab. Applications.
- 5- Tests and Exams.
- 6- In-Class Questions and Discussions.
- 7- Connection between Theory and Application.
- 9- Extracurricular Activities.
- 11- In- and Out-Class oral conservations.

## Assessment methods

1. Examinations, Tests, and Quizzes.
2. Extracurricular Activities.
3. Student Engagement during Lectures.
4. Responses Obtained from Students, Questionnaire about curriculum and faculty member (Instructor)

## C. Affective and value goals

C1. Optimization of contaminant transport, treatment and disposal techniques

C2. Behaviour of soil under different types of stresses

C3. Prepare students for successful careers in environmental engineering

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

D1. Become more effective, independent and confident self-directed learners

- D2. Improve their general skills for study and career management  
 D3. Articulate personal goals and evaluate progress towards their achievement  
 D4. An ability to identify, formulate, and solve engineering problems

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3hrs Theor. and 2hrs Lab.	Origin of soils	Mechanical and chemical weathering Water content / Atterberg's (or consistency) limits (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
2	3hrs Theor. and 2hrs Lab.	Composition of soils	Minerals of particles Water content / Atterberg's (or consistency) limits (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
3	3hrs Theor. and 2hrs Lab.	Constituents of soils	Solid, liquid and gaseous phases Water content / Atterberg's (or consistency) limits (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
4	3hrs Theor. and 2hrs Lab.	Soil structure	Layers of the soil Specific gravity (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
5	3hrs Theor. and 2hrs Lab.	Soil structure	classification of the soil Sieve analysis (particle size distribution) (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
6	3hrs Theor. and 2hrs Lab.	Engineering and physical properties of soil	classification of the soil Sieve analysis (particle size distribution) (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
7	3hrs Theor. and 2hrs Lab.	Engineering and physical properties of soil	Gravimetric -volumetric relations Hydrometer analysis (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
8	3hrs Theor. and 2hrs Lab.	Engineering and physical properties of soil	Gravimetric -volumetric relations Hydrometer analysis (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports

9	3hrs Theor. and 2hrs Lab.	Soil permeability	Darcy's Law Constant head permeameter (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
10	3hrs Theor. and 2hrs Lab.	Flow of water through soils	Darcy's Law Constant head permeameter (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
11	3hrs Theor. and 2hrs Lab.	Flow of water through soils	Darcy's Law Falling head permeameter (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
12	3hrs Theor. and 2hrs Lab.	Soil behavior under stress and compressibilit	Deformation and factor of safety  Compaction (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
13	3hrs Theor. and 2hrs Lab.	Soil behavior under stress and compressibilit	Deformation and factor of safety  Compaction (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
14	3hrs Theor. and 2hrs Lab.	Soil behavior under stress and compressibilit	Deformation and factor of safety  Compaction (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
15	3hrs Theor. and 2hrs Lab.	Soil behavior under stress and compressibilit v	Deformation and factor of safety  Compaction (Lab)	Electronic +Lab	Questions during the lectures ,quiz, exam, present in the class, Laboratory reports
16	3hrs Theor.	Environmenta l geo- technology	Environment and soil	Electronic	Questions during the lectures ,quiz, exam, present in the class,
17	3hrs Theor.	Environmenta l geo- technology	Sources of soil pollution	Electronic	Questions during the lectures ,quiz, exam, present in the class,
18	3hrs Theor.	Environmenta l geo- technology	Soil and contaminant migration	Electronic	Questions during the lectures ,quiz, exam, present in the class,
19	3hrs Theor.	Environmenta l geo- technology	Soil and contaminant migration	Electronic	Questions during the lectures ,quiz, exam, present in the class,
20	3hrs Theor.	Modeling	Processes governed the contaminant transport	Electronic	Questions during the lectures ,quiz, exam,
21	3hrs Theor.	Modeling	Processes governed the contaminant transport	Electronic	Questions during the lectures ,quiz, exam, present in the class,

22	3hrs Theor.	Soil erosion	Causes	Electronic	Questions during the lectures ,quiz, exam, present in the class,
23	3hrs Theor.	Soil erosion	Consequences	Electronic	Questions during the lectures ,quiz, exam, present in the class,
24	3hrs Theor.	Ion exchange in soils	Definition and description	Electronic	Questions during the lectures ,quiz, exam, present in the class,
25	3hrs Theor.	Ion exchange in soils	Distribution of contaminants	Electronic	Questions during the lectures ,quiz, exam, present in the class,
26	3hrs Theor.	Ion exchange in soils	Modeling of process	Electronic	Questions during the lectures ,quiz, exam, present in the class,
27	3hrs Theor.	Soil as an aid to waste disposal	Landfills	Electronic	Questions during the lectures ,quiz, exam, present in the class,
28	3hrs Theor.	Soil as an aid to waste disposal	Produced leachate	Electronic	Questions during the lectures ,quiz, exam, present in the class,
29	3hrs Theor.	Soil as an aid to waste disposal	Importance of soil for landfilling	Electronic	Questions during the lectures ,quiz, exam, present in the class,
30	3hrs Theor.	Soil as an aid to waste disposal	Spillage	Electronic	Questions during the lectures ,quiz, exam, present in the class,

## 11. Infrastructure

### 1. Books Required reading:

1- Contaminant Hydrogeology 1999 by Fetter

2- Geo-environmental Engineering 2000 by Reddi

3-2014 HAZARDOUS WASTE REPORT INSTRUCTIONS AND FORMS, Louisiana Department of Environmental Quality, 2014.

2. Main references (sources)	Contaminant Hydrogeology 1999 by Fetter Craig's Soil Mechanics 2004
A- Recommended books and references (scientific journals, reports...).	Journals 1. Journal of contaminant hydrology
B-Electronic references, Internet sites...	Available electronic books related to the soil subject.

## 12. The development of the curriculum plan

The development could concentrate on the using familiar software like COMSOL for simulation the migration of contaminant in subsurface environment.

**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

**المرحلة الرابعة**

**2023**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.



## **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate

description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

### **Academic Program Description Form**

**University Name: University of Baghdad**

**Faculty/Institute: College of Engineering**

**Scientific Department: Department of Environmental Engineering**

**Academic or Professional Program Name: English**

**Final Certificate Name: .....**

**Academic System: Polona program**

**Description Preparation Date:**

**File Completion Date: 16-2-2024**

**Signature:**

**Head of Department Name:**

**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:**

**Approval of the Dean**

### **1. Program Vision**

The strategic goal is to raise the readiness of the university formations to be distinguished now and in the future. It further aims to bring about a quantum leap in their strategic performance following international standards within the framework of true citizenship and leadership in its various cognitive, and educational research

roles. It also aims to provide community service, upgrade, and strengthen the position of the university within the framework of universities' international rankings, and within the framework of balancing between contemporaneity with modern trends in higher education and preserving originality represented by adhering to the national constants and values of the country.

## 2. Program Mission

English Language Learning Program (*ELLP*) is to help students from all over the world to achieve their personal and academic goals by providing high-quality, individualized English language instruction in a small-classroom setting and warm, welcoming, inclusive, and friendly cultural environment, while also bringing valuable and diverse international student perspectives to the University.

## 3. Program Objectives

- 1- The aim of this course is to empower students with the language and life skills
- 2- The integrated skills approach of the course develops the student's self-confidence to
- 3- succeed in professional and social encounters within an English-speaking global
- 4- using language to express knowledge of Environment and health impacts hazardous

## 4. Program Accreditation

Does the program have program accreditation? And from which agency?

None

## 5. Other external influences

Is there a sponsor for the program?

None

## 6. Program Structure

Program Structure	Number of	Credit hours	Percentage	Reviews*
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	Courses			
<b>Institution Requirements</b>	<b>1</b>	<b>2</b>		<b>basic</b>
<b>College Requirements</b>	<b>4</b>	<b>2</b>		
<b>Department Requirements</b>	<b>4</b>	<b>2</b>		
<b>Summer Training</b>	<b>0</b>	<b>0</b>		
<b>Other</b>				

\* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
2-2024	<b>EnE 108</b>	English	theoretical	practical
			yes	0

8. Expected learning outcomes of the program	
<b>Knowledge</b>	
Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries,	Become more effective, independent and confident self-directed learners
<b>Skills</b>	
The integrated skills approach of the course develops the student's self-understanding	Understand texts using effective learning strategies for reading and vocabulary building,
using language to express knowledge of Environment and health impacts	Improve their general skills for study and career management
<b>Ethics</b>	

Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations,	Articulate personal goals and evaluate progress towards their achievement
Understand texts using effective learning strategies for reading and vocabulary building,	An ability to identify, formulate, and solve engineering problems

<b>9. Teaching and Learning Strategies</b>
Lecture and classroom discussion

<b>10. Evaluation methods</b>
Assignments and exams

<b>11. Faculty</b>						
<b>Faculty Members</b>						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Asst. Prof.	English	Linguistics/ Discourse Analysis			Current faculty number	

<b>Professional Development</b>
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### **Mentoring new faculty members**

The orientation for new faculty members is arranged by the department chair and may consist of a few informal meetings and the distribution of a handbook and other supplementary material. In contrast, approximately one in four colleges have formalized and uniform faculty mentorship programs across all departments.

### **Professional development of faculty members**

In-depth programs included both intensive, multi-day offerings in a short course or retreat format, and extended offerings with multiple sessions spaced over a term, a year, or even longer. These formats typically enrolled a cohort of participants who continued for the entire program.

## **12. Acceptance Criterion**

**central admission**

## **13. The most important sources of information about the program**

–New Headway Plus [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2006),

–Morphy, A.J (1983) English Grammar in use. Cambridge: CUP

<https://www.englishclub.com/grammar/verb-tenses.htm>

<https://www.ego4u.com/en/cram->

[www.perfect-english-grammar.com/verb-tenses.htm](http://www.perfect-english-grammar.com/verb-tenses.htm)

[https://en.wikipedia.org/wiki/Grammatical\\_tense](https://en.wikipedia.org/wiki/Grammatical_tense)

## **14. Program Development Plan**

The development could be done by consulting more resources and increase lecture length to 3 hours weekly

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2024/level 2	EnE 108	English	Basic			•			•			•			

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.



## Course Description Form

1. Course Name: English					
2. Course Code: <b>EnE 108</b>					
3. Semester / Year: Semester					
4. Description Preparation Date: 16/2/2024					
5. Available Attendance Forms: attendance and Google classroom					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2					
7. Course administrator's name (mention all, if more than one name)					
Name: Asst. Prof. Nagham Ali Hassan Email: nagham.ali@coeg.uobaghdad.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>			A1) Find and understand information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources, and English language dictionaries, (A2) Develop conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations, (A3) Understand texts using effective learn strategies for reading and vocabulary building.....		
9. Teaching and Learning Strategies					
<b>Strategy</b>		Lecture and classroom discussion			
10. Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>

		Outcomes			
Week 1	2	<p>(A) Finding and understanding information about vocabulary, pronunciation, usage, and grammar in reference texts, online resources and English language dictionaries,</p> <p>(B) Developing conversational English skills necessary for becoming a contributing participant in small group activities, large group discussions, and oral presentations</p> <p>(C) Understanding texts using effective learning structures</p>	Introduction to the material	Lecture and class discussion	Questions during lectures, quizzes, exam, presentation in the class
Week 2	2		Unit 1		
Week 3	2		Unit 2,3		
Week 4	2		Unit 4,5		
Week 5	2		Quiz		
Week 6	2		Unit 6,7		
Week 7	2		Midterm exam		
Week 8	2		Unit 8,9		
Week 9	2		Quiz		
Week 10	2		General discussion		
Week 11	2		Unit 10, & assignment		
Week 12	2		Unit 11,12		
Week 13	2		Composition	Writing	
Week 14	2		discussion		
Week 15	2		Unit 13,14		
		English for Specific Purposes			

## 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, essays .... etc

		Time/Number	Weight (Marks)
Formative assessment	Quizzes	2	20% (20)
	Assignments	1	10% (10)
	Projects / Lab.	0	0
	composition	1	10% (10)
Summative assessment	Midterm Exam	2 hr	10% (10)
	Final Exam	2hr	50% (50)
Total assessment			100% (100 Marks)

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	(1) <i>New Headway Plus [Beginner]</i> by John and Liz Soars, Oxford: Oxford University Press (2006), .
Main references (sources)	1) New Headway Plus [Beginner] by John and Liz Soars, Oxford: Oxford University Press (2006),  (2) <i>Modern scientific articles from the news related to the students' specialty, and</i> (3) <i>Internet links and videos related to topics discussed in General English and English for Specific Purposes lectures</i>
Recommended books and references (scientific journals, reports...)	Dictionaries and supplies supplementary
Electronic References, Websites	<a href="https://www.englishclub.com/grammar/verb-tenses.htm">https://www.englishclub.com/grammar/verb-tenses.htm</a> <a href="https://www.ego4u.com/en/cram-">https://www.ego4u.com/en/cram-</a> <a href="http://www.perfect-english-grammar.com/verb-tenses.htm">www.perfect-english-grammar.com/verb-tenses.htm</a> <a href="https://en.wikipedia.org/wiki/Grammatical_tense">https://en.wikipedia.org/wiki/Grammatical_tense</a>

# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Ass.Prof. Dr. Hussain majeed flayeh

## COURSE SPECIFICATION

**Full knowledge of air pollution, regulations, properties of air pollutant, dispersion of air pollutant, and air pollution control**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Air pollution
4. Modes of Attendance offered	2 days per week electronic
5. Semester/Year	Year
6. Number of hours tuition (total)	90 h
7. Date of production/revision of this specification	2023
8. Aims of the Course	
	1- Understanding air pollution, properties, etc.
	2- Understanding the atmospheric metrology, dispersion of air pollutant.
	3- Understanding air pollutant control
	4- Become aware of Environment and health impacts of air pollution

9. Learning Outcomes, Teaching ,Learning and Assessment Method

## A- Cognitive goals.

A1. After completion of the course students should be able to characterization of air pollutants&dispersion

A2. Effects of air pollution on human, plants, materials, and environment.

A3. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1.Understand health and environmental issues related to air pollution and dispersion

B2. Understanding the dispersion of air pollutants models, and air pollution controls

B3.underatanding Global climate change, stratospheric depletion , and Greenhouse gases

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving, Reports on environmental problems related to air pollution

## C. Affective and value goals

C1. Calculations on air pollutant transport, equipment used to control and techniques

C2. Effect of air pollution in Environment (clamite change, stratosphere ozone depletion, ...

C3.Prepare students for successful careers in environmental engineering

## Teaching and Learning Methods

Intensive studies of regulations

## Assessment methods

### Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Introduction & Definition of air pollution	General definition of air pollutant, sources, and criteria pollutants	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	3	Properties of air pollutants	General properties	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	3	Properties of air pollutants	Criteria Pollutants	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	3	Sources of air pollutants	Urban & industrial sources, Transportation, Process emissions, ...	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	3	Effect of air pollution	Effect on human health. - Effect on vegetation and animals. -Effect on material and structures. - Atmospheric effects	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	3	Meteorology	Atmospheric stability	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	3	Meteorology	Stability and plume behavior	Electronic	Questions during the lectures ,quiz, exam, present in the class

8	3	Dispersion modeling	Dispersion of point source pollutants Effect of inversion layer	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	3	Dispersion modeling	Line source dispersion model	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	3	Dispersion modeling	Area source dispersion model	Electronic	Questions during the lectures ,quiz, exam, present in the class
11	3	Dispersion modeling	Indoor air pollution	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	3	Mid. Exam		Electronic	Questions during the lectures ,quiz, exam, present in the class
13	3	Sampling	Air pollutant sampling	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	3	Analysis equipment's	Air pollutant analysis equipment's Film for sampling and analysis equipment	Electronic	Questions during the lectures ,quiz, exam, present in the class
15		Half-year Break		Electronic	Questions during the lectures ,quiz, exam, present in the class
16		Half-year Break		Electronic	Questions during the lectures ,quiz, exam, present in the class
17		Global Environmental Problems Due to Air	What is it? Earth as a Blackbody	Electronic	Questions during the lectures ,quiz, exam, present in the class
18		Global warming (Green house effect)	Effect of greenhouse gases	Electronic	Questions during the lectures ,quiz, exam, present in the class
19		Ozone depletion		Electronic	Questions during the lectures ,quiz, exam, present in the class
20		Acid Rain		Electronic	Questions during the lectures ,quiz, exam, present in the class
21		Air pollution control	Introduction to air pollution control	Electronic	Questions during the lectures ,quiz, exam, present in the class

22		Control equipment's for particulate mater		Electronic	Questions during the lectures ,quiz, exam, present in the class
23		Settling chamber	General description and design	Electronic	Questions during the lectures ,quiz, exam, present in the class
24		Cyclone	General description and design	Electronic	Questions during the lectures ,quiz, exam, present in the class
25		Filters	General description and design	Electronic	Questions during the lectures ,quiz, exam, present in the class
26		Electrostatic precipitators	General description and design	Electronic	Questions during the lectures ,quiz, exam, present in the class
27		Control equipment's for gases		Electronic	Questions during the lectures ,quiz, exam, present in the class
28		Absorption	General description and design	Electronic	Questions during the lectures ,quiz, exam, present in the class
29		Adsorption	General description and design	Electronic	Questions during the lectures ,quiz, exam, present in the class
30		condensation	General description and design	Electronic	Questions during the lectures ,quiz, exam, present in the class
31		incinerators	General description and design	Electronic	Questions during the lectures ,quiz, exam, present in the class
32		Exam.		Electronic	Questions during the lectures ,quiz, exam, present in the class

## 11. Infrastructure

1. Books Required reading:	Environmental pollution and control Engineering by C.S Rao (1999). Environmental Engineering by G. Kiely(1996)
2. Main references (sources)	Air pollution, meteorology and dispersion by S.Pal Arya(1999). Air pollution by H.C. Perkins(1974)



<p>A- Recommended books and references (scientific journals, reports...).</p>	<p>Journals  1. International Journal of Environment and Waste Management  2. Air pollution</p>
<p>B-Electronic references, Internet sites...</p>	<p>Air pollution control engineering / edited by Lawrence K. Wang, Norman C This volume of Air The Emergence of Air Pollution Science, Engineering, and .. nuclear, and noise areas; biologists ...</p>

## 12. The development of the curriculum plan

The development could concentrate on more applications and mathematical modeling and details of air pollutants control equipment design.

# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Instructor Hayder Muhssin Rashid

## COURSE SPECIFICATION

**Fully understanding the relationship between theory and applied control dynamics in the fourth stage of the Environmental Engineering as well as constructing MM to investigate the forcing functions/ response**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Control dynamics in Environmental Eng.
4. Modes of Attendance offered	Electronic lectures are delivered twice a week
5. Semester/Year	Annual
6. Number of hours tuition (total)	75 hours (3 hours a week)
7. Date of production/revision of this specification	
8. Aims of the Course	
	1- Appreciate significance of control for dynamic systems.
	2- Understand the dynamic characteristics, transfer functions, forcing functions and responses of systems, comprising various elements, mathematically and physically
	3- Differentiate between dynamics of systems in an open- loop or a closed-loop situation.
	4- Understand the basics of feedback control loops, their block diagram algebra, responses as regulatory/servo loops, controller's modes of action, final control elements and stability differentiation.

## 9. Learning Outcomes, Teaching ,Learning and Assessment Method

A- Cognitive goals .

- A1. Making the student to be fully aware of how control variables being manipulated
- A2. Making use of up-to-date criteria dealing with analog and digital controls.
- A3. Using of most advanced electronic devices in controllers.

B. The skills goals special to the course.

- B1- Understanding the nature and behavior of controllers in Env. Eng applications.
- B2. Making Laplace transforms in solving initial values problems.
- B3- Constructing the block diagrams for the dynamic systems
- B4- Making stability investigation for the given control problems.
- B5- Relating the theory to applied control dynamics.

Teaching and Learning Methods

Extensive description of case studies and applications regarding the Environmental Engineering studies, Lectures, homework and assignments tests, and exams, class oral conservations, questions and discussions, comparison between theory and applications and conducting experiments in labs.

Assessment methods

Homework related to problem solving, student participation through class session, preparation of reports, quizzes, monthly exams, student attendance, and lucrative encouragement.

C. Affective and value goals

- C1. Getting optimum values through the applications of control disturbances and transfer functions.
- C2. Facilitate the algebraic and solving problems that might be encountered in

Teaching and Learning Methods

Teaching and Learning Methods

Intensive studies of regulations

## Assessment Methods

### Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

10. Course Structure					
Week	Assessment Method	Teaching Method	Unit/Module or Topic Title	ILOs	Hours
1	Making questions during the lectures, quizzes, exams, and attendance in the class.	Electronic	Making an overview of the Laplace Transforms	1&2	3 (Theory)
2	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic	Constructing the MM through material and energy balances	1 &2	3 (Theory)
3	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic	Determination of the initial and final values	1 &2	3 (Theory)
4	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic	Solving the driving force/ response problems.	1 &2	3 (Theory)
5	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic	Constructing the block diagrams	1 &2	3 (Theory)
6	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic	Investigating the system stability using Routh and Nyquist criteria.	1 &2	3 (Theory)

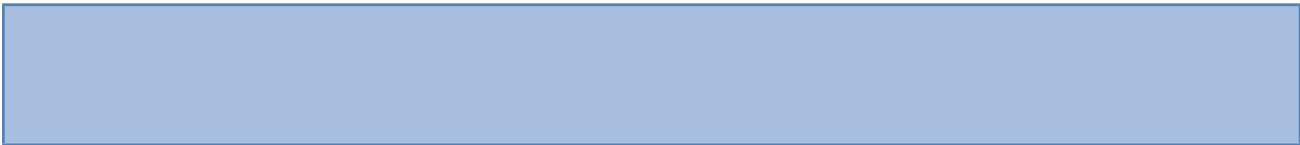
7	Making questions during the lectures ,quizzes, exams, and attendance in the class.	Electronic and lab attendance	Determining the time constant in thermometer	1 &2 + lab	3 (Theory) 3 (Lab)
8	Making questions during the lectures, quizzes, exams, and attendance in the class.	Electronic and lab attendance	Determining the time constant in liquid level tanks	1 &2 + lab	3 (Theory) 3 (Lab)
9	Making questions during the lectures, quizzes, exams, and attendance in the class.	Electronic and lab attendance	Determining the time constant in heating tanks	1 &2 + lab	3 (Theory) 3 (Lab)
10	Making questions during the lectures, quizzes, exams, and attendance in the class.	Electronic and lab attendance	Determining the time constant in interacting tanks	1 &2 + lab	3 (Theory) 3 (Lab)
11	Making questions during the lectures, quizzes, exams, and attendance in the class.	Electronic and lab attendance	Control Valves and identifying the open/close to air types	1 &2 + lab	3 (Theory) 3 (Lab)

## 11. Infrastructure

1. Books Required reading:	1-Modern Control Engineering, OGATA, 4 <sup>th</sup> ed., 2014. 2-Feedback control system and synthesis, John D'Azzo and H. Houpis, international dition, 1965. 3-Principles of control systems, S.P.Eugene and Joseph Babu, S.Chand, 14 <sup>th</sup> ed., 2019.
2. Main references (sources)	Process systems analysis and Control, Coughanowr, 2 <sup>nd</sup> ed., McGraw-Hill, 1991.
A- Recommended books and references (scientific journals, reports...).	Journals of air pollution controls and environment protection and any textbooks on control dynamics
B-Electronic references, Internet sites...	<a href="https://www.amazon.com/Modern-Control-Engineering-Katsuhiko-Ogata/dp/0136156738">https://www.amazon.com/Modern-Control-Engineering-Katsuhiko-Ogata/dp/0136156738</a> <a href="https://www.amazon.com/Feedback-Synthesis-Electrical-Electronic-Engineering/dp/0070851506">https://www.amazon.com/Feedback-Synthesis-Electrical-Electronic-Engineering/dp/0070851506</a> <a href="https://www.amazon.com/Process-Systems-Analysis-Coughanowr-1991-08-01/dp/B01FKRFT8K">https://www.amazon.com/Process-Systems-Analysis-Coughanowr-1991-08-01/dp/B01FKRFT8K</a>

## 12. The development of the curriculum plan

The development must impose field visits for the students to the chemical plants in order to make them well acquainted on the process dynamics and how they be controlled as well as make them fully aware of the connection between the theoretical material and its applications.





# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Assisst. Prof. Dr.Hyader M. Hameed

## COURSE SPECIFICATION

**Full knowledge Environmental management, regulations, legislations, laws, EMP, ESIA, RISK ASSESSMENT, ENVIRONMNETAL PERFORMANCE.**

1. Teaching Institution	College of engineering
2. University Department/Centre	Environmental Eng.Dept.
3. Course title/code	Environmental management
4. Modes of Attendance offered	2 hours per week
5. Semester/Year	year
6. Number of hours tuition (total)	56 hr.
7. Date of production/revision of this specification	2023
8. Aims of the Course	
1-implementation of the sustainability principle	
2-conducting a knowledge of risk management and awareness	
3-applying of the EIA ,ESMP principles for different activities	
4-aquaire a good experience in the WQL,AQL,LC,and EPI for al activities	

9. Learning Outcomes, Teaching ,Learning and Assessment Methode

A1. After completion of the year students should be able to conduct the reporting and management Analysis for the projects

A2. Auditing reporting periodically for the major polluted activities.

A3. Conducting the risk management ,WQI,AQI,EPI for any activity

B.

B1.Understand risk management, environmental policies related to any activity.

B2.conducting different reports regarding ISO14001,environmental auditing and monitoring

B3.reporting as WQI,AQI,EPI with all related management issues

B3.be aware of all related risk management for the dominant activities.

### Teaching and Learning Methods

Class lecturing ,site visits, case studies applications

### Assessment methods

1.national case studies and problems

2.homeworks

3.reporting

C. Affective and value goals:

C1.to be more aware of laws, regulations and instructions.

C2.the students be more succeeded in the good environmental management programs in environmental engineering

### Teaching and Learning Methods

Learning of laws, regulations, legislations, studying the actual and real cases.

### Assessment methods

1.homeworks

2.reporting

3.group discussion

4. Virtual assessment.

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

D1. Improve their knowledge, awareness, motive and skills for environmental management

D2. Learning how to be good decision makers regarding any action related to environmental problems

D3. Learn how to make EMP, ESIA, WQI, AQI, RAR, environmental monitoring and auditing

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Metho	Assessm ent Meth
1	2	Definition and applicatio	Environmental management	Electronic	Exams ,quiz,reports, discussions
2	2	Report structure	EMP reporting	Electronic	Exams ,quiz,reports, discussions
3	2	Report structure	ESIA reporting	Electronic	Exams ,quiz,reports,
4	2	Matrix structure	EMP, matrix	Electronic	Exams ,quiz,reports,
5	2	Matrix	WQI matrix	Electronic	Exams
6	2	Matrix	AQI matrix	Electronic	Exams
7	2	Index componen	Environmental performance index	Electronic	Exams ,quiz,reports,
8	2	componen	Risk assessment reporting	Electronic	Exams ,quiz,reports,
9	2	structure	ISO 14001	Electronic	Exams ,quiz,reports,
10	2	structure	ISO14003,	Electronic	Exams
11	2	methodolo	Environmental auditing	Electronic	Exams
12	2	methodolo gy	Environmental monitoring	Electronic	Exams ,quiz,reports,
13	2	methodolo	ESIA matrix	Electronic	Exams
14	2	structure	ISO14004	Electronic	Exams
15	2	structure	<b>ISO 14063</b> Environmental communication - Guidelines and examples	Electronic	Exams ,quiz,reports, discussions
16	2	structure	<b>ISO 14050</b> Environmental management - Vocabulary; terms and definitions	Electronic	Exams ,quiz,reports, discussions

17	2	structure	<b>ISO 14020 to 14025</b> Environmental labels and declarations	Electronic	Exams ,quiz,reports, discussions
18	2	structure	<ul style="list-style-type: none"> <li><b>ISO 14005</b> Guidelines for a flexible approach to phased implementation</li> </ul>	Electronic	Exams ,quiz,reports, discussions

11. Infrastructure	
1. Books Required reading:	1. Wastewater treatment concept, G.HKARIA 2. Water and Wastewater Treatment Technologies BUUI.X
2. Main references (sources)	As above
A- Recommended books and references (scientific journals, reports...).	Journal of water , by elsiever
B-Electronic references, Internet sites...	<a href="https://www.process.st/environmental-management/">https://www.process.st/environmental-management/</a> <a href="https://www.epa.gov/ems/learn-about-environmental-management-systems">https://www.epa.gov/ems/learn-about-environmental-management-systems</a> <a href="https://www.era-environmental.com/blog/environmental-management">https://www.era-environmental.com/blog/environmental-management</a>

## 12. The development of the curriculum plan

The development could concentrate on more applications



## TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

### Course Instructor: Asst. prof. Dr. Mohanad J. M-Ridha COURSE SPECIFICATION

The course offers specialization in selected areas of Learning the basic principles of geographic information science, satellite imagery, production of environmental maps and geographic information base. Information about maps and satellite images, processing satellite and aerial images, learning Arc view program, making environmental maps

1. Teaching Institution	University of Baghdad /College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	GIS EnE
4. Modes of Attendance offered	Semester System: They attend in electronic mode 4 hrs. a Week.
5. Semester/Year	Semester
6. Number of hours tuition (total)	60 hrs./ 4 hrs per week
7. Date of production/revision of this specification	2023
<b>8. Aims of the Course</b>	
The main objectives of the course are:	
1. To understand GIS fundamentals,	
2. To understand the principles, instrumentation and applications of GIS.	
3. To perform analysis and calculations with ease.	

## **9• Learning Outcomes, Teaching ,Learning and Assessment Method**

### **A- Cognitive goals.**

**At the end of the year the students should gain:**

A1. ArcMap and Arc Catalog

A2. Arc Catalog tools.

A3. Raster and vector graphics.

A4. Learning Remote sensing.

A5. Georeferenced, line, area, point

A6. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

### **B. The skills goals special to the course**

**B1.** The principles, instrumentation and applications of GIS .

**B2.** Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

### **Teaching and Learning Methods**

1- Lectures.

2- Homework and Assignments.

3- Tests and Exams.

4- In-Class Questions and Discussions.

5- Connection between Theory and Application.

6- In- and Out-Class oral conservations.

### **Assessment Methods**

1. Examinations, Tests, and Quizzes.

2. Student Engagement during Lectures.

3. Responses Obtained from Students, Questionnaire about curriculum and faculty member (Instructor).

4. Home work related to problem solving.

### **C. Affective and value goals**

C1. Applicable skills to learn geographic information science, satellite imagery, production of environmental maps and geographic information base.

C2. processing satellite and aerial images.

C3. Learning Arc view program, making environmental maps.

C4. Prepare students for successful careers in environmental engineering.

<b>Teaching and Learning Methods</b>
Intensive studies of regulations
Assessment methods
Case studies
D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)
D1. Become more effective, independent and confident self-directed learners
D2. Improve their general skills for study and career management
D3. Articulate personal goals and evaluate progress towards their achievement
D4. An ability to identify, formulate, and solve engineering problems.

<b>10. Course Structure</b>					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2 (Theo.)	1&2	Review of fundamental concepts of GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	2 (Theo.)	1 &2	ArcMap and Arc Catalog Application on GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	2 (Theo.)	1 &2	Satellite image Application on GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	2 (Theo.)	1 &2	Arc Catalog tools Application on GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	2 (Theo.)	1 &2	Raster and vector graphics Application on GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	2 (Theo.)	1,2,&3	Georeferenced mapping Application on GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	2 (Theo.)	1,2,&3	Create simple environmental project	Electronic	Questions during the lectures ,quiz, exam, present in the class
8	2 (Theo.)	2,3 &4	Create simple environmental project	Electronic	Questions during the lectures ,quiz, exam, present in the class



9	2 (Theo.)	2,3 &4	Georeferenced, line, area, point Application on GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	2 (Theo.)	-----	Examination	Electronic	-----
11	2 (Theo.)	2,3 &4	Insert table and image in ArcMap Application on GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	2 (Theo.)	2,3 &4	Database management Application on GIS	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	2 (Theo.)	-----	Exam	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	2 (Theo.)	2,3 &4	Review the subjects	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	2 (Theo.)	2,3 &4	Summary and questions	Electronic	Questions during the lectures ,quiz, exam, present in the class

11. Infrastructure	
1. Books required reading:	1. Rolf A.de by, et al., (2004)"principles of Geographic Information system", ITC Educational textbook series
3. Main references (sources)	2. Bai Tian , (2016) GIS Technology Applications in Environmental and Earth Sciences 1st Edition
A- Recommended books and references (scientific journals, reports...).	1. Xuan Zhu, (2016) GIS for Environmental Applications A practical approach
B-Electronic references, Internet sites	<a href="https://www.springer.com/gp/book/9783030213435">https://www.springer.com/gp/book/9783030213435</a> <a href="https://www.academia.edu/21312446/Application_of_GIS_in_Environmental_Engineering">https://www.academia.edu/21312446/Application_of_GIS_in_Environmental_Engineering</a>

## 12. The development of the curriculum plan

Not to rely on traditional examinations but the creation of reports following the reading of textbooks. These reports are validated and transformed into academic credits for graduation purposes.

# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Dr. Ziad Tark Abd Ali

### COURSE SPECIFICATION

**Full knowledge of groundwater: definition, creation, characteristics, pollution, and some remediation methods**

1. Teaching Institution	University of Baghdad/ College of Engineering
2. University Department/Centre	Environmental Engineering Department
3. Course title/code	Groundwater pollution
4. Modes of Attendance offered	1 day per week electronic
5. Semester/Year	Year
6. Number of hours tuition (total)	60 h
7. Date of production/revision of this specification	2023
8. Aims of the Course	
1- Groundwater hydrology studies the movement of underground water in the saturated zone.	
3- Analytical solutions to the classic steady-state and transient flow problems in well	
3- -Understanding of physical factors controlling groundwater transport in porous media	
4- -Competence in applying simple analytical solutions of steady state and transient flow	
5- Many different methods ranging from institutional mandates to physical, chemical, and	

9. Learning Outcomes, Teaching, Learning and Assessment Method

## A- Cognitive goals.

A1. After completing the course, students must have a clear idea of groundwater, its characteristics, underground transmission methods, and appropriate methods for treating contaminated groundwater

A2. Finding appropriate solutions to all kinds of groundwater problems

A3. Attract and welcome undergraduate students to our Bachelor of Science program in Environmental Engineering, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

## B. The skills goals special to the course.

B1. Understand health and environmental issues related to groundwater

B2. The application of environmental concepts in the conservation of groundwater as an important water resource that must be preserved from contamination

B3. Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches

## Teaching and Learning Methods

More description of case studies and applications

## Assessment methods

Homework related to problem solving

## C. Affective and value goals

C1. Developing environmental concepts, including the preservation of groundwater as an important water resource

C2. Spreading environmental awareness in the community and trying to contribute to the preservation of the environment

C3. Prepare students for successful careers in environmental engineering

## Teaching and Learning Methods

Intensive studies of regulations

Assessment methods

Case studies

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

D1. Become more effective, independent and confident self-directed learners

D2. Improve their general skills for study and career management

D3. Articulate personal goals and evaluate progress towards their achievement

D4. An ability to identify, formulate, and solve engineering problems

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction	Electronic	Questions during the lectures ,quiz, exam, present in the class
2	2		Porous media characteristics	Electronic	Questions during the lectures ,quiz, exam, present in the class
3	2		Porous media characteristics	Electronic	Questions during the lectures ,quiz, exam, present in the class
4	2		Groundwater definition	Electronic	Questions during the lectures ,quiz, exam, present in the class
5	2		Darcy's Law	Electronic	Questions during the lectures ,quiz, exam, present in the class
6	2		Darcy's Law	Electronic	Questions during the lectures ,quiz, exam, present in the class
7	2		Darcy's Law	Electronic	Questions during the lectures ,quiz, exam, present in the class

8	2		Aquifer system	Electronic	Questions during the lectures ,quiz, exam, present in the class
9	2		Aquifer systems	Electronic	Questions during the lectures ,quiz, exam, present in the class
10	2		General flow equation and its solution	Electronic	Questions during the lectures ,quiz, exam, present in the class
11	2		General flow equation and its solution	Electronic	Questions during the lectures ,quiz, exam, present in the class
12	2		General flow equation and its solution	Electronic	Questions during the lectures ,quiz, exam, present in the class
13	2		General flow equation	Electronic	Questions during the lectures ,quiz, exam, present in the class
14	2		Steady radial flow to a well	Electronic	Questions during the lectures ,quiz, exam, present in the class
15	2		Steady radial flow to a well	Electronic	Questions during the lectures ,quiz, exam, present in the class
16	2		Steady radial flow to a well	Electronic	Questions during the lectures ,quiz, exam, present in the class
17	2		Hydraulic parameters measurement	Electronic	Questions during the lectures ,quiz, exam, present in the class
18	2		Hydraulic parameters measurement	Electronic	Questions during the lectures ,quiz, exam, present in the class
19	2		Groundwater contamination	Electronic	Questions during the lectures ,quiz, exam, present in the class
20	2		Groundwater contamination	Electronic	Questions during the lectures ,quiz, exam, present in the class
21	2		Ground water remedial technologies	Electronic	Questions during the lectures ,quiz, exam, present in the class

22	2		Ground water remedial technologies	Electronic	Questions during the lectures ,quiz, exam, present in the class
23	2		Ground water remedial technologies	Electronic	Questions during the lectures ,quiz, exam, present in the class
24	2		Transport of contaminants in pours' media	Electronic	Questions during the lectures ,quiz, exam, present in the class
25	2		Transport of contaminants in pours' media	Electronic	Questions during the lectures ,quiz, exam, present in the class
26	2		Advection dispersion relations	Electronic	Questions during the lectures ,quiz, exam, present in the class
27	2		Advection dispersion relations	Electronic	Questions during the lectures ,quiz, exam, present in the class
28	2		Advection dispersion relations	Electronic	Questions during the lectures ,quiz, exam, present in the class
29	2		Advection dispersion relations	Electronic	Questions during the lectures ,quiz, exam, present in the class
30	2		Advection dispersion relations	Electronic	Questions during the lectures ,quiz, exam, present in the class

11. Infrastructure	
1. Books Required reading:	<ol style="list-style-type: none"> <li>1. Unsaturated zone hydrology for scientists and engineers by James A. Tindall</li> <li>2. Handbook of complex environmental remediation problems by Kevin John Phillips</li> <li>3. Contaminants Hydrogeology by C.W.Fetter</li> <li>4. Fundamentals of groundwater by Franklin W., Schwartz/Hubao Zhang</li> </ol>
2. Main references (sources)	Ground water by "Freeze"
A- Recommended books and references (scientific journals, reports...).	

B-Electronic references, Internet sites...

## 12. The development of the curriculum plan

The development could concentrate on more applications and mathematical modeling of groundwater remediation.





# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

**Course instructor: Prof. Dr. Zainab Ziad Ismail**

### COURSE SPECIFICATION

This Course provides complete knowledge about the design and arrangements of the major industrial wastewater treatment units and techniques including physical, chemical, and biological methods.

<b>1. Teaching Institution</b>	College of Engineering/University of Baghdad
<b>2. University Department/Centre</b>	Department of Environmental Engineering
<b>3. Course title/code</b>	Industrial wastewater treatment Techniques
<b>4. Modes of Attendance offered</b>	Two days/Week
<b>5. Semester/Year</b>	Two semesters/Year
<b>6. Number of hours tuition (total)</b>	90 hours for each class (Total 180 h)
<b>7. Date of production/revision of this specification</b>	2023-2024
<b>8. Aims of the Course</b>	
1- Understanding the basic concepts of wastewater treatment.	
2- Recognizing the difference between domestic and industrial wastewater characteristics.	
3- Providing full knowledge of how to deal with different types of industrial wastewater.	
4- Learning how to select the suitable treatment unit based on wastewater characteristics	
5- Learn the design and criteria of the most conventional treatment units.	

### 9. Learning Outcomes, Teaching, Learning and Assessment Method

## **A- Cognitive goals.**

A1. Upon completion of the two semesters, the students must be able to design and deal with different types of wastewater treatment units.

A2. Provides understanding environmental engineers capable of performing complete design of wastewater treatment plant.

A3. Encourage and welcome new students to the program of the department of Environmental Engineering as undergraduate and graduate students. Those students can potentially contribute in solving the environmental problems in particular those related to the industry. and they can act as leaders in their organizations. Also, they can offer their knowledge and skills in a wide range of updated carrier applications.

## **B- The skills goals special to the course.**

B1. Articulate an understanding of relevant concepts that underlie environmental processes.

B2. Integrate and apply sophisticated perspectives from multiple disciplinary approaches that address complex industrial environmental problems.

B3. Design and conduct research on industrial environmental topics. Research could include a variety of methods including quantitative, qualitative, artistic, .... etc.

## **Teaching and Learning Methods**

Presenting real case studies and real environmental problems.

## **Assessment methods**

- Home works.
- Classroom groups to design certain industrial treatment units which can solve environmental problems.

## **C. Affective and value goals**

C1. Effective and logical approaches for the design of treatment units.

C2. Knowledge of applicable design procedures of effective cost and efficient performance.

C3. Provide the society and industry with open minded engineers with updated knowledge.

## **Teaching and Learning Methods**

Intensive class work and looking out for real industrial wastewater treatment plants.

## **Assessment methods**

Applied case studies

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

D1. Both cognitive and non-cognitive skills- such as critical thinking, problem solving, collaboration, effective communication, motivation, persistence, and learning to learn.

D2. Skills also include creativity, innovation, and ethics that are important to later success and may be developed in formal or informal learning environments.

D3. Develop skills such as problem solving, critical thinking, communication, collaboration, and self-management - often referred to as "21st century skills."

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Sources and Properties of IWW	Basic raw material balance in industrial processing	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
2	3	Sources and Properties of IWW	Compatibility of industry and municipality	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
3	3	Sources and Properties of IWW	Characteristics of industrial wastes.	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
4	3	Sources and Properties of IWW	Characteristics of industrial wastes.	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
5	3	Management of IWW	The criteria for selecting suitable treatment techniques of industrial wastes.	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
6	3	Management of IWW	Applications and basic design of wastewater treatment	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
7	3	Treatment of IWW	Physical techniques application/ sedimentation	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
8	3	Treatment of IWW	Physical techniques application/ mixing	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
9	3	Treatment of IWW	Physical techniques application/ filtration	Class attendance	Questions during the lectures, quiz, exams, presenting in the class

10	3	Treatment of IWW	Physical techniques application/ air stripping	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
11	3	Treatment of IWW	Physical techniques application/ steam stripping	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
12	3	Treatment of IWW	Physical techniques application/ flocculation	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
13	3	Treatment of IWW	Physical techniques application/ reverse osmosis	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
14	3	Treatment of IWW	Physical techniques application/ adsorption process	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
15	3	Treatment of IWW	Physical techniques application/ A.C adsorption	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
1	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
2	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
3	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
4	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
5	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
6	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
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8	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
9	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
10	3	Treatment of IWW	Biological methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
11	3	Treatment of IWW	Chemical methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
12	3	Treatment of IWW	Chemical methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
13	3	Treatment of IWW	Chemical methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
14	3	Treatment of IWW	Chemical methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class
15	3	Treatment of IWW	Chemical methods applications	Class attendance	Questions during the lectures, quiz, exams, presenting in the class

<b>11. Infrastructure</b>	
1. Books Required reading:	Industrial Water Pollution, Origins, Characteristics, and Treatment  By Nelson L. Nemerow
2. Main references (sources)	
A- Recommended books and references (scientific journals, reports...).	1-Theory and practice of water and wastewater treatment. By Ronald L. Droste. 2- International Journal of Waste Resources. 3- Water and Wastewater Management.

B-Electronic references, Internet sites...

<https://www.watertechonline.com/wastewater/article/15550541/wastewater-treatment-technologies-for-processing-plants>.

[https://www.pseau.org/outils/ouvrages/wrc\\_wastewater\\_treatment\\_technologies\\_a\\_basic\\_guide\\_2016.pdf](https://www.pseau.org/outils/ouvrages/wrc_wastewater_treatment_technologies_a_basic_guide_2016.pdf)

<https://www.epa.gov/eg/industrial-effluent-guidelines>

## **12. The development of the curriculum plan**

This curriculum should be supported by several visits to real field industrial wastewater





# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

**Course instructor: Prof. Dr. Zainab Ziad Ismail**

## COURSE SPECIFICATION

**This Course provides complete knowledge about the design and arrangements of the major industrial wastewater treatment units and techniques including physical, chemical, and biological methods.**

1. Teaching Institution	College of Engineering/University of Baghdad
2. University Department/Centre	Department of Environmental Engineering
3. Course title/code	Industrial wastewater treatment Techniques
4. Modes of Attendance offered	Two days/Week (electronic class)
5. Semester/Year	Two semesters/Year
6. Number of hours tuition (total)	45 hours
7. Date of production/revision of this	2023
8. Aims of the Course	
1- Understanding the basic concepts of wastewater treatment.	
2- Recognizing the difference between domestic and industrial wastewater characteristics.	
3- Providing full knowledge of how to deal with different types of industrial wastewater.	
4- Learning how to select the suitable treatment unit based on wastewater characteristics	
5- Learn the design and criteria of the most conventional treatment units.	

9. Learning Outcomes, Teaching, Learning and Assessment Method

## **A- Cognitive goals.**

A1. Upon completion of the two semesters, the students must be able to design and deal with different types of wastewater treatment units.

A2. Provides understanding environmental engineers capable of performing complete design of wastewater treatment plant.

A3. Encourage and welcome new students to the program of the department of Environmental Engineering as undergraduate and graduate students. Those students can potentially contribute in solving the environmental problems in particular those related to the industry. and they can act as leaders in their organizations. Also, they can offer their knowledge and skills in a wide range of updated carrier applications.

## **B- The skills goals special to the course.**

B1. Articulate an understanding of relevant concepts that underlie environmental processes.

B2. Integrate and apply sophisticated perspectives from multiple disciplinary approaches that address complex industrial environmental problems.

B3. Design and conduct research on industrial environmental topics. Research could include a variety of methods including quantitative, qualitative, artistic, .... Etc.

## Teaching and Learning Methods

Presenting real case studies and real environmental problems.

## Assessment methods

- Home works.
- Classroom groups to design certain industrial treatment units which can solve environmental problems.

## C. Affective and value goals

C1. Effective and logical approaches for the design of treatment units.

C2. Knowledge of applicable design procedures of effective cost and efficient performance.

C3. Provide the society and industry with open minded engineers with updated knowledge.

## Teaching and Learning Methods

Intensive class work and looking out for real industrial wastewater treatment plants.

## Assessment methods

Applied case studies

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

D1. Both cognitive and non-cognitive skills- such as critical thinking, problem solving, collaboration, effective communication, motivation, persistence, and learning to learn.

D2. Skills also include creativity, innovation, and ethics that are important to later success and may be developed in formal or informal learning environments.

D3. Develop skills such as problem solving, critical thinking, communication, collaboration, and self-management - often referred to as "21st century skills."

**10. Course Structure**

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Sources and Properties of IWW	Basic raw material balance in industrial processing	Electronic	Questions during the lectures, quiz, exams, presenting in the class
2	3	Sources and Properties of IWW	Compatibility of industry and municipality	Electronic	Questions during the lectures, quiz, exams, presenting in the class
3	3	Sources and Properties of IWW	Characteristics of industrial wastes.	Electronic	Questions during the lectures, quiz, exams, presenting in the class
4	3	Sources and Properties of IWW	Characteristics of industrial wastes.	Electronic	Questions during the lectures, quiz, exams, presenting in the class
5	3	Management of IWW	The criteria for selecting suitable treatment techniques of industrial wastes.	Electronic	Questions during the lectures, quiz, exams, presenting in the class
6	3	Management of IWW	Applications and basic design of wastewater treatment technologies.	Electronic	Questions during the lectures, quiz, exams, presenting in the class
7	3	Treatment of IWW	Physical techniques application/ sedimentation	Electronic	Questions during the lectures, quiz, exams, presenting in the class
8	3	Treatment of IWW	Physical techniques application/ mixing	Electronic	Questions during the lectures, quiz, exams, presenting in the class
9	3	Treatment of IWW	Physical techniques application/ filtration	Electronic	Questions during the lectures, quiz, exams, presenting in the class
10	3	Treatment of IWW	Physical techniques application/ air stripping	Electronic	Questions during the lectures, quiz, exams, presenting in the class

11	3	Treatment of IWW	Physical techniques application/ steam stripping	Electronic	Questions during the lectures, quiz, exams, presenting in the class
12	3	Treatment of IWW	Physical techniques application/ flocculation	Electronic	Questions during the lectures, quiz, exams, presenting in the class
13	3	Treatment of IWW	Physical techniques application/ reverse osmosis	Electronic	Questions during the lectures, quiz, exams, presenting in the class
14	3	Treatment of IWW	Physical techniques application/ adsorption process	Electronic	Questions during the lectures, quiz, exams, presenting in the class
15	3	Treatment of IWW	Physical techniques application/ A.C adsorption	Electronic	Questions during the lectures, quiz, exams, presenting in the class
		Treatment of IWW	<b>Break</b>		
1	3	Treatment of IWW	Biological methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class
2	3	Treatment of IWW	Biological methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class
3	3	Treatment of IWW	Biological methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class
4	3	Treatment of IWW	Biological methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class
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10	3	Treatment of IWW	Biological methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class
11	3	Treatment of IWW	Chemical methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class
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13	3	Treatment of IWW	Chemical methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class
14	3	Treatment of IWW	Chemical methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class
15	3	Treatment of IWW	Chemical methods applications	Electronic	Questions during the lectures, quiz, exams, presenting in the class

11. Infrastructure	
1. Books Required reading:	Industrial Water Pollution, Origins, Characteristics, and Treatment By Nelson L. Nemerow
2. Main references (sources)	
A- Recommended books and references (scientific journals, reports...).	1-Theory and practice of water and wastewater treatment. By Ronald L. Droste. 2- International Journal of Waste Resources. 3- Wastewater Management journal.
B-Electronic references, Internet sites...	<a href="https://www.watertechnonline.com/wastewater/article/15550541/wastewater-treatment-technologies-for-processing-plants">https://www.watertechnonline.com/wastewater/article/15550541/wastewater-treatment-technologies-for-processing-plants</a> . <a href="https://www.pseau.org/outils/ouvrages/wrc_wastewater_treatment_technologies_a_basic_guide_2016.pdf">https://www.pseau.org/outils/ouvrages/wrc_wastewater_treatment_technologies_a_basic_guide_2016.pdf</a> <a href="https://www.epa.gov/eg/industrial-effluent-guidelines">https://www.epa.gov/eg/industrial-effluent-guidelines</a>

12. The development of the curriculum plan
This curriculum should be supported by several visits to real field industrial wastewater treatment



# TEMPLATE FOR PROGRAMME SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

Course Instructor : Assist. Prof. Dr. Abeer I. Alwared

### PROGRAMME SPECIFICATION

**Give basic concepts for students about the details of water supply system and sewerage**

1. Teaching Institution	College of Engineering
2. University Department/Centre	Department of Environmental Engineering
3. Course title/code	Water Supply and Sewerage
4. Modes of Attendance offered	2 days per week + 1 day lab
5. Semester/Year	Year
6. Number of hours tuition (total)	150
7. Date of production/revision of this specification	2023
<b>8. Aims of the Course</b>	
1- The course explains the impact of various water quality parameters on human health and ecosystem.	
2- Design , operate and maintain working treatment systems	
3- The student will be able to apply the knowledge gained from the subject in EIA studies for water component and water pollution control strategies	

## 9. Learning Outcomes, Teaching, Learning and Assessment Methods

### A. Cognitive goals

- A1. Student should be able to make technology choice to deal with water quality issues
- A2. Operate and maintain working treatment systems and do troubleshooting of the problems in these systems
- A3. Operate and maintain working treatment systems and do troubleshooting of the problems in these systems

### B. The skills goals special to the Course

B1. Understand water supply requirement , quantity and quality of water supply

B2. Design ,construction and operation of water and wastewater systems

B3. understanding the methodology test and analysis water and waste water to know water quality characteristics

## Teaching and Learning Methods

Classroom teaching will involve black board, power point presentations, and case study analysis.

## Assessment methods

Homework related to problem solving

### C. Affective and value goals

- C1. Optimization of solid waste transport , treatment and disposal techniques
- C2. Economics of the onsite vs. offsite waste management options
- C3. Prepare students for successful careers in environmental engineering

## Teaching and Learning Methods

Intensive studies of regulations

## Assessment methods

Case study



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

- D1. Become more effective, independent and confident self-directed learners
- D2. Improve their general skills for study and career management
- D3. Articulate personal goals and evaluate progress towards their achievement
- D4. An ability to identify, formulate, and solve engineering problems

### **10. Course Structure**

<b>Week</b>	<b>Hours</b>	<b>ILOs</b>	<b>Unit/Module or Topic Title</b>	<b>Teaching Method</b>	<b>Assessment Method</b>
1	3 + 2	Introduction + Lab	Introduction + Impurities of water	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
2	3 + 2	Quantity of water + Lab	Quantity of water and sewage: Consumption for various purposes, forecasting population + Impurities of water	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
3	3 + 2	Quantity of water + Lab	Quantity of water and sewage: Consumption for various purposes, forecasting population + turbidity	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
4	3 + 2	Quantity of water + Lab	Quantity of water and sewage: Consumption for various purposes, forecasting population + Turbidity	Classroom teaching will involve black board, power point presentations, and case study analysis. Class + Lab	Questions during the lectures ,quiz, exam, present in the class
5	3 + 2	Quantity of water + Lab	Quantity of water and sewage: Consumption for various purposes, forecasting population + Color	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class

6	3 + 2	Collection of water + Lab	Intakes, intakes of impounding reservoirs, river intakes + Color	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
7	3 + 2	Collection of water + Lab	Intakes, intakes of impounding reservoirs, river intakes + Total solid	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
8	3 + 2	Quality and distribution of water supplies + Total solids	Quality and distribution of water supplies + Total solids	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
9	3 + 2	Quality and distribution of water supplies + Lab	Quality and distribution of water supplies + Lab exam	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
10	3 + 2	Quality and distribution of water supplies + Lab	Quality and distribution of water supplies + Conductivity	Class Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
11	3 +2	Treatment of water + Lab	Treatment of water +conductivity	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
12	3 + 2	Treatment of water + Lab	Treatment of water +pH	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
13	3	Treatment of water	Treatment of water+ pH	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
14	3 + 2	Treatment of water+ Lab	Treatment of water + Lab	Class Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class

15	3 +	Treatment of water+ Lab	Treatment of water+ Lab	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
16	3 +	Amount of storm sewage + Acidity	Amount of storm sewage + Acidity	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
17	3 +	Sewer pipes and appurtenances +Lab	Sewer pipes and appurtenances + Acidity	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
18	3 +	Design construction and maintenance of sewer system+ Lab	Design construction and maintenance of sewer system+ Alkalinity	Class Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
19	3 +	Characteristic of sewage + Lab	Characteristic of sewage + Alkalinity	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
20	3 +	Characteristic of sewage + Lab	Characteristic of sewage +Chloride	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
21	3 +	Sewage treatment and disposal+ Lab	Sewage treatment and disposal + Chloride	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
22	3 +	Sewage treatment and disposal+ Lab	Sewage treatment and disposal+ Hardness	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
23	3 +	Sewage treatment and disposal+ Lab	Sewage treatment and disposal+ Hardness	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class

24	3 +	Sewage treatment and disposal+ Lab	Sewage treatment and disposal+ Water stability	Class Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
25	3 +	preliminary, primary and secondary treatment + Lab	preliminary, primary and secondary treatment + Water stability	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
26	3 +	preliminary, primary and secondary treatment + Lab	preliminary, primary and secondary treatment + Dissolved oxygen	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
27	3 +	preliminary, primary and secondary treatment + Lab	preliminary, primary and secondary treatment + Dissolved oxygen	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
28	3 +	preliminary, primary and secondary treatment + Lab	preliminary, primary and secondary treatment + COD test	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
29	3 +	preliminary, primary and secondary treatment+ Lab	preliminary, primary and secondary treatment+ BOD test	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class
30	3 +	Review and exam	Review and exam	Classroom teaching will involve black board, power point presentations, and case study analysis. + Lab	Questions during the lectures ,quiz, exam, present in the class

## 11. Infrastructure

1. Books Required reading:	Water Supply and Wastewater Engineering (Part 1 and 2) by: D.Lal and A. K. Upadhyay
2. Main references (sources)	Water Supply and Sewerage by: E. W. Steel and T. J. McGhee

<b>A- Recommended books and references (scientific journals, reports...).</b>	Desalination and water treatment
<b>B-Electronic references, Internet sites...</b>	<a href="https://www.unicef.org/wash/files/water_handbook.pdf">https://www.unicef.org/wash/files/water_handbook.pdf</a>