

Undergraduate Program Subject Outline

Faculty of Engineering and Information Sciences

<http://my.uowdubai.ac.ae>

SUBJECT NAME: ENGINEERING DESIGN AND SUSTAINABILITY

Course code:	ENGG105	Section:	Dubai
Credit Points:	6	Year	2023
Session	Autumn	Duration:	11 Weeks
Pre-requisite(s)	None	Co-requisite(s)	None
Mode of Delivery:	F2F		
Final Exam Passing Requirement:	NA		

LECTURE INFORMATION

	Lecture 1 (Groups D, E, F)
Day:	Monday
Time:	08:30 – 11:30
Location:	3.44-Classroom B

	Lecture 2 (Groups A, B, C)
Day:	Tuesday
Time:	08:30 – 11:30
Location:	5.134-Classroom A 5.13 & 5.14

WORKSHOP INFORMATION

Day:	Monday (Group D)	Monday (Group E)	Monday (Group F)	Tuesday (Group A)	Tuesday (Group B)	Tuesday (Group C)
Time:	12:30 – 14:30	12:30 – 14:30	12:30 – 14:30	12:30 – 14:30	12:30 – 14:30	12:30 – 14:30
Location:	5.18-Classroom A	3.46-Classroom A	4.50-Classroom B	6.33-Classroom B	4.52-Classroom A	5.18-Classroom A

COMPUTER LAB INFORMATION

	Computer Lab 1 (Groups C & D)	Computer Lab 2 (Groups E & F)	Computer Lab 3 (Groups A & B)
Day:	Monday	Wednesday	Wednesday
Time:	14:30 – 16:30	10:30 – 12:30	12:30 – 14:30
Location:	6.36-Computer Lab (Single Screen)	4.42-Computer Lab (Single Screen)	3.52-Computer Lab (Network)

Educator's Name:	Karol Sikora	Mohamad Alrifai	Thahsin Saidarakath
Building & Office No:	School of Engineering, Third Floor		
E-mail Address:	KAROLSIKORA@UOWDUBAI.AC.AE	MOHAMADALRIFAI@UOWDUBAI.AC.AE	THAHSINSAIDARAKATH@UOWDUBAI.AC.AE
Consultation:	See Moodle		

Educator's Name:	Habiba Abdesamie	Salah
Building & Office No:	School of Engineering, Third Floor	
E-mail Address:	HASAS730@UOWMAIL.EDU.AU	YAHYASALAH@UOWDUBAI.AC.AE
Consultation:	See Moodle	

1 SUBJECT DESCRIPTION

This subject introduces students to sustainability concepts vital for many engineering disciplines. Students will be taught the concepts of sustainability, ecosystems, life-cycle assessments as well as the factors to assess those and tools to manage which they apply in their project design. Working in teams, students will undertake investigation, concept development, and detailed design that demonstrates innovative and creative thinking of an infrastructural project.

2 CONTRIBUTION TO PROGRAM LEARNING OUTCOMES (PLO)

The activities in this course contribute to achieving the following program learning outcomes:

Program: Engineering	
PLO1	Demonstrate professional knowledge with a strong grounding in engineering and awareness of current local and international trends and challenges.
PLO2	Navigate disciplinary literature with particular skills in gathering & synthesising information independently to support an argument or strategy.
PLO3	Implement common research methods in the field of engineering, analyse data & evaluate the validity of findings and exercise critical judgement in determining new directions and strategies for carrying out further investigation.
PLO4	Draw from established engineering concepts, methods and industry standards to develop innovative solutions to complex engineering problems by completing a research project relating to the respective engineering major.
PLO5	Communicate clearly and coherently in writing to a range of audiences, with an ability to integrate knowledge, research, data, analysis and critical evaluation.
PLO6	Communicate verbally to a range of audiences using appropriate language in presentations, consultation and negotiation.
PLO7	Work productively as part of a team with the capacity for leadership, recognising the roles, responsibilities and accountabilities of team members.
PLO8	Show respect for the views, values and culture of others in settings involving colleagues, clients, communities and end users, and consider alternate perspectives in design and project management.



PLO9	Make complex considerations in regards to professional ethics and accountability, account for and mitigate risk, and operate with a commitment to professionalism in all work.
PLO10	Appreciate the importance of sustainable engineering design, and seek to maximise positive social and environmental outcomes in engineering design, practice and development.

Course ENGG105 Upon successful completion of this subject, a student should be able to:		PLOs
LO1	Explain the roles and responsibilities of the engineering profession in society and various disciplines of engineering	9,10
LO2	Design for sustainable ecosystem to mitigate impact of climate change	1,9,10
LO3	Apply basic engineering principles to produce engineering design briefs with sustainability in mind	1,2,4
LO4	Apply innovation in design and demonstrate creativity in the development of context-appropriate engineered solutions	1,2,4
LO5	Draw 2D and 3D models in CAD software	1
LO6	Effectively communicate design ideas effectively, both in writing and verbally	3,4
LO7	Work as a productive member of a team, recognizing roles, responsibilities and accountabilities of individuals in a team	5

3. SUBJECT SCHEDULE

3.1 LECTURE SCHEDULE

Week	Lecture Topic(s)	Learning Outcomes	Session Type	Delivery format	Related supporting materials	Assessment Formative (F) Summative (S)
1	Introduction to Engineering Design. Sustainability concept introduction. Ecosystems principles.	1, 2	Lecture (L) / Tutorial (T)	F2F	See Moodle	
2	The emerging trends in sustainable architecture and construction.	4	L	F2F	See Moodle	
	The client brief: understanding client needs	1, 2, 6, 7	T			
3	Circular economy: Trends, and examples. Life Cycle Assessment: Multiple Criteria Analysis (MCA); Environmental impact assessment methodologies (EIA).	1, 2	L	F2F	See Moodle	
	Preparing a design Report	1, 2	T			
	CAD 1 – basic 2 D drawings	5	CL			
4	Ethics in engineering. Effective communication and Presentation.	1,2	L	F2F	See Moodle	Design milestone 1 (S)
	Design impact assessment	1,2,7	T			
	CAD 1 – basic 2 D drawings	5	CL			



5	Engineering modelling. CAD. Engineering Drawing.	3,4,5	L	F2F	See Moodle	
	Design concept development	6,7	T			
	CAD 2 – complex 2 D drawings	5	CL			
6	Ecological Footprint & Carbon footprint – definitions and calculation methods	3,4,5	L	F2F	See Moodle	Design milestone 2 (S)
	Progress Presentation/feedback	5,6,7	T			
	CAD 2 – complex 2 D drawings	5	CL			
7	Water footprint – definition and calculation methods.	3,4,5	L	F2F	See Moodle	
	Footprint calculation	3,4,5	T			
	CAD 3 – 3D drawings	5	CL			
8	Project cost Management principles	3,4,5	L	F2F	See Moodle	Design milestone 3 (S)
	Critiquing design – exercise on giving feedback	6,7	T			
	CAD 3 – 3D drawings	5	CL			
9	Sustainable Energy – Thermal, Solar – concepts and examples.	3,4,5	L	F2F	See Moodle	CAD assessment (S)
	Project costing	6,7	T			
	CAD assessment	5	CL			
10	Sustainable Energy II – Hydro, Wind- concepts and examples.	3,4,5	L	F2F	See Moodle	CAD assessment (S)
	Reflection on design	6,7	T			
	CAD assessment	5	CL			
11	Recapitulation	1,2,3,4,5,6	L	F2F	See Moodle	Design milestone 4 (S) Design milestone 5 (S)
	Design proposal presentation - feedback	5,6	T			

3.2 LABORATORY SCHEDULE

Week	Computer Lab Activities	Learning Outcomes
3	Lab 1: CAD 1 – basic 2 D drawings	5
4	Lab 2: CAD 1 – basic 2 D drawings	5
5	Lab 3: CAD 2 – complex 2 D drawings	5
6	Lab 4: CAD 2 – complex 2 D drawings	5
7	Lab 5: CAD 3 – 3D drawings	5
8	Lab 6: CAD 3 – 3D drawings	5
9	CAD assessment	5
10	CAD assessment	5

4. SUPPORTING MATERIALS

Books, Articles, Videos, Podcasts, etc. will be available on our Learning Management System (LMS).

4.1 REQUIRED TEXTBOOK

No required textbook.

4.2 RECOMMENDED READINGS

None.

4.3 ACCESS TO SUPPORTING MATERIALS

The university uses MOODLE as a learning management system (LMS) to support all coursework subjects. The subject site and supporting materials can be accessed via: <https://moodle.uowplatform.edu.au/> and via UOWD library.

5. ASSESSMENT

5.1 ASSESSMENT OF LEARNING OUTCOMES

Learning Outcome	Measures (Elements of Assessment)
LO1: Explain the roles and responsibilities of the engineering profession in society and various disciplines of engineering	Detailed Design Brief and Research (Report), Design progress (Presentation), Design proposal (Presentation), Design proposal (Report)
LO2: Design for sustainable ecosystem to mitigate impact of climate change	Detailed Design Brief and Research (Report), Design progress (Presentation), Design proposal (Presentation), Design proposal (Report)
LO3: Apply basic engineering principles to produce engineering design briefs with sustainability in mind	Detailed Design Brief and Research (Report), Design progress (Presentation), Design proposal (Presentation), Design proposal (Report)
LO4: Apply innovation in design and demonstrate creativity in the development of context-appropriate engineered solutions	Detailed Design Brief and Research (Report), Design progress (Presentation), Design proposal (Presentation), Design proposal (Report)
LO5: Draw 2D and 3D models in CAD software	CAD (Assessment), Design proposal (Report)
LO6: Effectively communicate design ideas effectively, both in writing and verbally	Detailed Design Brief and Research (Report), Design progress (Presentation), Design progress update for peer (Assessment), Design proposal (Presentation), Design proposal (Report)
LO7: Work as a productive member of a team, recognizing roles, responsibilities and accountabilities of individuals in a team	Detailed Design Brief and Research (Report), Design progress (Presentation), Design proposal (Presentation), Design proposal (Report)



5.2 ASSESSMENT TASKS

Learning Outcome	Assessment 1 Detailed Design Brief and Research Report 20%	Assessment 2 Design Progress Presentation 10%	Assessment 3 Design Progress Update for Peer Assessment 10%	Assessment 4 CAD Assessment 15%	Assessment 5 Design Proposal Presentation 10%	Assessment 6 Design Proposal Report 35%
LO 1	x	x			x	x
LO 2	x	x			x	x
LO 3	x	x			x	x
LO 4	x	x			x	x
LO 5				x		x
LO 6	x	x	x		x	x
LO 7	x	x			x	x
Group (G)/ Individual (I)	G	G	I	I	G	G
Total Marks	100	100	100	100	100	100
Due Date	Week 4	Week 6	Week 8	Week 9/10	Week 11	Week 11

Assessment Task:	Detailed Design Brief and Research
Type:	Team Report
Description:	Detailed Design Brief and Research
Learning Outcome Measured:	1, 2, 3, 4, 6, 7
Total Marks:	100
Weighting:	20%
Due Date:	Week 4. Design Milestone 1.
Word Length (if applicable):	15 – 25 pages
Hand in to:	To be submitted online via Moodle
TurnItIn submission required by:	NA

OUTLINE AND REQUIREMENTS

The main group task for the whole semester is to receive the concept proposal that will provide design with sustainable and innovative solutions. The concept proposal should be specific and reasonable enough to confirm feasibility of the project. It is expected, inter alia, to address: Site analysis, Architectural design & Construction Materials, Energy sources, Building services, Estimated Cost. In this assignment the following is required: 1. Detailed Design Brief and Research for 15-25 pages addressing client brief.

MARKING CRITERIA

See Moodle for the Marking rubric.

Assessment Task:	Design progress presentation and declaration of design team roles
Type:	Team oral presentation
Learning Outcome Measured:	1, 2, 3, 4, 6, 7
Description:	Design progress presentation and declaration of design team roles
Total Marks:	100
Weighting:	10%
Due Date:	Week 6. Design milestone 2.
Word Length (if applicable):	NA
Hand in to:	To be delivered in class.
TurnItIn submission required by:	NA

OUTLINE AND REQUIREMENTS

Design progress presentation and declaration of design team roles.

MARKING CRITERIA

See Moodle for the Marking rubric.

Assessment Task:	Design progress update for peer assessment
Type:	Individual peer assessment
Learning Outcome Measured:	6
Description:	Design progress update for peer assessment
Total Marks:	100
Weighting:	10%
Due Date:	Week 8. Design milestone 3. Groups must provide one printed copy in class per member. Marks awarded for quality of feedback. Students who do not provide a report > 20 pages for review will receive a zero mark.
Word Length (if applicable):	NA
Hand in to:	Tutor
TurnItIn submission required by:	NA

OUTLINE AND REQUIREMENTS

You will work independently through the report you are given, providing written feedback on the report AND on the marking sheet. Once finished, return the report and marking sheet to your tutor. Your tutor will then assess the quality of feedback you have provided in this class time.

MARKING CRITERIA

Mark	Criteria
100%	Extensive and detailed review - full marking with significant comments and feedback on both report and review form
80%	Complete review - full marking with comments throughout the report.
60%	Good review - full marking with some comments
40%	Partial review - full marking with no comments, or comments with no marking
20%	Minimal review - minor comments only or partial marking only

Assessment Task:	CAD assessment
Type:	Individual assessment
Learning Outcome Measured:	5
Description:	CAD assessment
Total Marks:	100
Weighting:	15%
Due Date:	Week 9. To be completed in scheduled computer lab classes.
Word Length (if applicable):	NA
Hand in to:	Tutor
TurnItIn submission required by:	NA

OUTLINE AND REQUIREMENTS

Test on AutoCAD skills.

MARKING CRITERIA

Correctness of engineering drawings

Assessment Task:	Design proposal presentation
Type:	Team oral presentation
Learning Outcome Measured:	1, 2, 3, 4, 6, 7
Description:	Design proposal presentation
Total Marks:	100
Weighting:	10%
Due Date:	Week 11. Design milestone 4. To be delivered in class.
Word Length (if applicable):	NA
Hand in to:	Moodle
TurnItIn submission required by:	NA

OUTLINE AND REQUIREMENTS

Design proposal presentation.

MARKING CRITERIA

See Moodle for Marking rubric.

Assessment Task:	Detailed design proposal
Type:	Team report. Individual component of the design
Learning Outcome Measured:	1, 2, 3, 4, 5, 6, 7
Description:	100
Total Marks:	35%
Weighting:	Week 11. Design milestone 5. To be submitted online via Moodle (40 – 60 pages)
Due Date:	Detailed design proposal
Word Length (if applicable):	NA
Hand in to:	Moodle
TurnItIn submission required by:	NA

OUTLINE AND REQUIREMENTS

Detailed design proposal for 40-60 pages addressing client brief.

MARKING CRITERIA

See Moodle for Marking rubric.

LATE SUBMISSIONS:

Please note that late submissions will incur a penalty of 20% per day, including weekends.

5.3 GRADES AWARDED

The approved grades of performance and associated ranges of marks for undergraduate subjects are:

High Distinction (HD)	85 – 100%
Distinction (D)	75 – 84%
Credit (C)	65 – 74%
Pass (P)	50 – 64%
Pass Supplementary (PS)	50%
Fail (F)	0 – 49% (and not meeting the attendance requirements)
Technical Fail (TF)	Not meeting the final exam passing requirements – see the Assessment Policy PP-REG-DB-2.1

5.4 SATISFACTORY COMPLETION REQUIREMENTS

In order to be considered for a grade of Pass (P) or better in this subject, students **must achieve the minimum required mark in the Final Examination (see page 1 for required score)**; students who obtain a composite mark greater than or equal to 50% but do not satisfy the Final Examination minimum pass requirements in the final examination will be awarded a “Technical Fail” grade.

Students must 'reasonably' complete all assessment tasks (including the required score for the Final Examination,) and submit these as specified in the subject outline. 'Reasonable' completion of an assessment task will be determined based on the instructions given to the student including: word length, demonstration of research and analysis where required, adherence to the Plagiarism Policy guidelines, and completion of each section/component of the assessment. Failure to submit all assessment tasks may result in a Fail grade awarded for the subject.

6. RELEVANT POLICIES AND DOCUMENTS

All students must read and be familiar with the following UOWD policies and documents, which are available on the Student Online Resources (my.uowdubai.ac.ae) website by following the Policies link:

- Academic Grievance Policy
- Academic Integrity Policy
- Campus Access and Order Rules
- Code of Conduct – Library Users
- Code of Practice – Students
- Copyright Policy
- Intellectual Property Policy
- Library Regulations
- Minimum Rate of Progress
- Music, Video and Software Piracy
- Non-Discriminatory Language and Practice & Presentation Policy and Guidelines
- Special Consideration Policy & Procedure
- Student Attendance Policy
- Student Conduct Rules
- Rules for use of UOWD ITTS Facilities
- Teaching and Assessment: Code of Practice – Teaching
- Teaching and Assessment: Assessment and Feedback Policy
- Teaching and Assessment: Subject Delivery Policy

7. SSP & STUDIOSTY

SSP (Student Support Program) is a program committed to assisting students in developing their academic skills and getting the most out of their studies. As part of their services, SSP provides Peer Tutoring Program and Academic Workshops (<https://my.uowdubai.ac.ae/ssd/index.php>).

Studiosity is an online study tool that students can access 24 hours, 7 days a week! Students can receive feedback on submitted writing in less than 24 hours and receive one-to-one, personal help in real time with a subject specialist. The service can be accessed through the subject's Moodle site.

For further information, please contact:

SSP Coordinator

ssp@uowdubai.ac.ae

Phone Number: +971 4 278 1756

8. ACADEMIC INTEGRITY

Plagiarism and cheating are serious offences that can lead to expulsion from the university. Students must be familiar with the *Academic Integrity* policy which outlines the procedure that will be followed in case of

academic misconduct including cheating and plagiarism. Please refer to *How to Avoid Plagiarism* available on the Student Online Resources website (<http://my.uowdubai.ac.ae>).

8.1 TURNITIN

Students are required to submit all written assignments in soft copy through the TurnItIn system which is available online at www.turnitin.com. Every student must have a TurnItIn account. Failure to submit an assignment through TurnItIn will result in marks for that assignment being withheld. **Students do NOT need to hand in a printed copy of the TurnItIn Originality Report.** More information about TurnItIn (including how to create an account and add a class) will be provided in the first lecture. Students can download Frequently Asked Questions (FAQs) about TurnItIn from the SSP section of UOWD website (<https://www.uowdubai.ac.ae/academic-resources/student-support-programs>).

TurnItIn information required to add this subject:

Class ID:	Moodle Link
Password:	Moodle Link

8.2 REFERENCE & IN-TEXT CITATION

For information about referencing and in-text citation please review the *Academic Writing Presentation* available on the Student Online Resources website (<http://my.uowdubai.ac.ae>).

8.3 UOWD RULES & POLICIES

For information about UOWD Rules and Policies, please go to the Student Online Resources website (<http://my.uowdubai.ac.ae>) and click on the POLICIES link.

9. ATTENDANCE REQUIREMENTS

Attendance in this subject is compulsory. Failure to attend all tutorials and computer labs as per the Student Attendance Policy may result in a FAIL grade. Students are strongly encouraged to become familiar with this policy (which can be found on the Online Resources website at my.uowdubai.ac.ae).

10. TUTORIAL/COMPUTER LAB ENROLMENTS

All students must sign up for one tutorial and/or computer lab in Week 1. Admission to a tutorial/computer lab will not be possible unless the student's name is on the Attendance List for that class. No changes will be allowed once a student has enrolled in a tutorial/computer lab.

11. SUPPLEMENTARY ASSESSMENTS

A supplementary assessment may be offered to students whose performance in this subject is close (45-49 in the final examination and 48-49 in the composite score) to that required to pass the subject, and are otherwise identified as meriting an offer of a supplementary assessment. The precise form of a supplementary assessment will be determined at the time the offer of a supplementary is made.

12. Lecture Capture

UOWD supports the recording of lectures as a supplemental study tool, to provide students with equity of access, and as a technology-enriched learning strategy to enhance the student experience.

To make your own recording of a lecture you **must** receive the explicit permission of the Educator and those people who are also being recorded.

You may only use recorded lectures, whether they are your own or recorded by the university, for your own educational purposes. Recordings cannot be altered, shared or published on another platform, without permission of the University. UOWD's Lecture Capture policy is underdevelopment.

13. Sustainability

UOWD encourages all students to act in a sustainable manner when planning and submitting assessments. If possible, students should not use plastic items, such as folders, covers, and bindings, and other synthetic materials, for presentations, workshops, and other activities. Students are also encouraged to avoid unnecessary printing; and if printing is required, please consider printing double-sided and only printing essential illustrations avoiding blocks of any colour as the use of ink is harmful to the environment. Always behave in a sustainable way.