PROGRAM SPECIFICATION

Attachment IV

Bachelor of Science in Energy Engineering (2022 – 2023)

Awarding Institution	A'Sharqiyah University	
College / Centre	College of Engineering	
Department	Department of Civil and Environmental Engineering	
Program Title	Bachelor of Science in Energy Engineering	
Final Award	Bachelor of Science in Energy Engineering	
Credit hours	137	
Level of Study	Undergraduate	
Mode of Study	Full time and Part-time	
Language of Study	English	
Benchmarks	1. Weber State University (USA) 2. UPC Universitat Politècnica de Catalunya (Spain) 3. Muscat University (Oman) 4. Butler University (USA) 5. University of Calgary (Canada)	
Entry requirements	a. A student should have successfully passed the courses of all subjects of the general education diploma or its equivalence. b. Certificate issued from outside the Sultanate (need to be equivalent to the Ministry of Education in the Sultanate). c. Certificate issued from within the Sultanate and under the supervision of others other than the Ministry of Education (need to be equivalent from the Ministry of Education). d. A student should achieve the standards set for the subjects of the General Foundation Program. e. A student should have passed the following subjects to qualify for enrollment on the program: Pure Mathematics or Applied mathematics. f. Students who have studied in other educational institutions recognized by the University may be eligible to transfer if the transfer student has earned a grade point average of 2.00 or higher over a four-point grade scale. The head of the academic department or dean in the College in which the student has enrolled shall evaluate all courses taught at the former institution in which the student earned a grade of C or higher. g. A student must be medically fit	
Minimum period of registration	FULL-TIME: 4.5 years	PART-TIME: 8 years

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Maximum period of registration	FULL-TIME: 8 years	PART-TIME: 12 years
Date specification produced	11/11/2021	
Date specification last reviewed	14/09/2022	

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1. THE COLLEGE OF ENGINEERING

The College of Engineering at A'Sharqiyah University (ASU) opened in 2011 and has grown quickly to a current enrollment of over 400 students. The College will continue to grow at this rapid pace in order to accommodate over 700 students in new classrooms and laboratories located in the new College of Engineering building that was completed in September 2017. With a first-rate building and state-of-the-art laboratories, the ASU Engineering College will continue to draw community members and prospective students to the growing campus. The College of Engineering at present offers undergraduate academic programs at Diploma/Degree levels in Civil Engineering, Environmental Engineering, Electronics and Communications Engineering and Construction Project Management.

College Mission
The mission of the College is to educate creative professional engineers, technologists and technicians and to equip them to serve society in a globalized knowledge economy. Working in partnership with its stakeholders; the College is committed to the creation and transfer of new knowledge and technologies through the efforts of faculty, staff and students.

College Vision
The College vision is to achieve national and international stature as a College of Engineering through excellence in engineering education, research and innovation, outreach and external community engagement whilst contributing to the competitiveness, social and economic development and prosperity of the Sultanate of Oman.

College Objectives
The Objectives of the College are to:

1. Enhance the effectiveness of College governance and management structures
2. Develop a set of high value local, regional and international partnerships to leverage strategic priorities
3. Generate maximum funds to invest in our future
4. Achieve cost optimization
5. Improve quality of teaching and learning
6. Develop and maintain innovative curriculum and delivery in the College
7. Contribute to knowledge and innovation through applied research and scholarship in priority areas
8. Ensure innovation in all areas of activity in the College
9. Contribute to the Community's cultural, social and economic development.
10. Provide students with an accessible and supported study experience and transition to employment
11. Improve participation, success and retention of students
12. Recruit, develop and retain talented staff, providing them with an enabling and satisfying work environment.
13. Provide state-of-the-art laboratory equipment and infrastructure for students and staff
14. Promote University values

The proposed Bachelor of Science in Energy Engineering will be delivered by the College of Engineering at A'Sharqiyah University. The College at present runs a successful Bachelor of Engineering in Civil Engineering and Environmental Engineering. The two programs will share some courses.

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2. PROGRAM OUTLINE

Energy is the essential stone for current human civilization. Energy flow is a vitally important cornerstone of modern society life and development. As an Energy engineer, you will learn to use cutting-edge measurement, simulation and data analysis methods for energy in the built and natural environment. By knowing these tools as a student in the energy Engineering Program, you can help to create a sustainable future for our planet's inhabitants.

In order to live comfortably and safely, societies have a high need to clean energy sources. Experts like energy engineers are important for keeping these systems functioning by, for example, operating energy plants, calculating energy flows in the main power plants, and renewable energy development. Energy production demand long-term solutions that require advanced technical know-how in measurement, simulation and data analysis (including machine learning and artificial intelligence)

Study thermal energy, electric energy, renewable energy, and energy transformation as well as their applications in research and development.

3. PROGRAM AIMS

1. Provide students with practical and technical knowledge and understanding of concepts, theories and applications relevant to energy engineering in industry, developing, testing, operation, and maintenance of energy systems.
2. Develop managerial skills which students will be able to apply in reaching professional judgments, solving problems and making decisions.
3. Develop practical and technical skills relevant to energy engineering technology which students will be able to apply in the academic context and their professional careers.
4. Encourage self-motivation and independent thought, such that graduates will be confident in challenging established working practices and responding to the future needs of the energy industry and its associated professions.
5. Promote a culture of intellectual enquiry such that graduates will recognize the importance of lifelong learning for both personal and professional development.
6. Demonstrate good oral and written communication skills with stakeholders, colleagues, team members and the general public.

4. PROGRAM LEARNING OUTCOMES

1. Demonstrate knowledge of energy engineering and management.
2. Apply the principles of energy in the design of energy plant, renewable energy projects, and production stations and demonstrate knowledge of technologies in energy, environmental issues, and energy cost.
3. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
4. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

5. Explore the energy resources in the Sultanate of Oman and re-engineer them to contribute to national wealth.
6. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and social contexts.
7. Develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.

5. DETAILED PROGRAM LEARNING OUTCOMES

Upon completion of the program, students will be able to:

A. KNOWLEDGE AND UNDERSTANDING	• Apply knowledge of basic energy Fundamentals to solve problems associated with design/processing and natural resources of energy. • Apply knowledge of various methods to solve problems associated with design/processing and natural resources of energy. • Understand the different aspects of design and development of energy and renewable energy projects such as oil power plants and renewable energy to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. • Demonstrate a basic understanding of energy technology and production in industrial, administration, domestic, and agricultural sectors.
B. SUBJECT-SPECIFIC INTELLECTUAL SKILLS	• Apply fundamental concepts to solve simple and complex problems of the different aspects of energy engineering such as chemical energy, heat energy, and renewable energy, etc. • Carry out different laboratory experiments on fluid mechanics, thermodynamics, heat transfer, electric engineering, electronics, and renewable energy. • Apply the principles of energy physical chemistry and thermodynamics. • Apply the principles of electric and electronics in the design of power plant, energy transportation, and energy consumption. • Demonstrate an awareness of digital technologies in energy production and design. • Design new experiments, analyze the results, and suggest logical and scientific explanation.
C. PROFESSIONAL PRACTICAL SKILLS	• Recognize the roles of other professionals and parties associated with the design and delivery of energy engineering projects. • Recognize the importance of professional ethics, their impact on the operation of the profession and their influence on society,

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	• Explain the importance of professional registration. • Explore the energy resources in the Sultanate of Oman and re-engineer them to contribute to the national wealth.
D. TRANSFERABLE SKILLS	**Communication** • Develop and apply good oral and written communication skills with a range of stakeholders including colleagues, team members and the general public. • Acknowledge differences and able to adapt to difference of opinions while being open minded. • Recognize and value communication as a tool for negotiating and creating new understanding. **Teamwork and interpersonal skills** • Create and share learning and knowledge and to contribute effectively to teamwork. • Perform live projects as a team and contribute to strengthen each other's weaknesses. • Cooperate and listen to team members. **Information literacy and study skills** • Recognize need for information and distinguish ways of addressing gap and select appropriate sources. • Locate strategically and access information to construct research strategies. • Compare and evaluate information. • Synthesize and create missing information. **Numeracy** • Appreciate issues of sample selection, accuracy, precision and uncertainty during collection, recording and analysis of data in the field and laboratory • Prepare, process, interpret and present data using appropriate qualitative and quantitative techniques and software packages **Leadership and entrepreneurship** • Demonstrate a clear appreciation of innovation and entrepreneurship and their impact on the economy.

6. PROGRAM STRUCTURE

Students must achieve the required credit hours for the program by completing the University Requirements, College Requirements, Major Requirements and Electives listed below:

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6.1 University Requirements — Total Credit Hours 18

Course Code	Course Title	Pre-Requisites	Credits
ARAB101	Arabic		3
ENGL101	English Communication Skills I		3
OMS101	Omani Society		3
MNGT313	Entrepreneurship		3
University Elective (2 Courses)			6
Total			**18**

6.2 University Electives (Choose 2 courses from this list.)

Course Code	Course Title	Pre-Requisites	Credits
ENEN581	Climate Change	CVEN361	3
ARAB412	Arab literature		3
ISLM101	Islamic Civilizations		3
PHIL101	Introduction to Logic (Philosophy)		3
SOCI101	Sociology		3
PSYC100	مقدمة في علم النفس		3
FINA 202 A	Personal Finance		3
ECON101	Principles of Microeconomics		3
FAID101	First Aid		3
PUHE211	Introduction to Public Health		3
LAWC101	القانون في حياتنا		3
LAWC102	التشريعات الوظيفية		3
LAWC103	نظام الأسرة		3
ECEN344	Renewable Energy	EGEN221	3

6.3 College Requirements — Total Credit Hours 32

Course Code	Course Title	Pre-Requisites	Credits
CHEM101	Chemistry		3
CHEM181	Chemistry Lab	Co-CHEM101	1
PHYS111	Applied Physics		3
PHYS181	Physics Lab	Co-PHYS111	1
MATH101	Calculus I		3
ENGR201	Engineering Drawing		3
MATH102	Calculus II	MATH101	3
MATH204	Probability and Statistics	MATH102	3
ENGR322	Summer Internship	Pass 105 Credits	0
ENGR111	Computer Applications		3
MATH203	Deferential Equations	MATH102	3

MATH305	Numerical Methods	MATH102	3
ENGL102	English Communication Skills II	ENGL101	3
Total			**32**

6.4 Major Requirements **Total Credit Hours 87**

Course Code	Course Title	Pre-Requisites	Credits
EGEN201	Energy and Sustainable Development		3
ENGL102	English Communication Skills II	ENGL101	3
EGEN221	Circuit Theory	MATH102	3
CVEN361	Environmental Engineering	CHEM101	3
EGEN222	Circuit Theory Lab	MATH102, CO-EGNE221	1
EGEN251	Fluid Mechanics	MATH102	3
EGEN261	Engineering Mechanics	MATH102	3
EGEN262	Thermodynamics and Heat Transfer	PHYS111	3
EGEN263	Thermo-Fluid Lab	PHYS111, CO-EGEN251, EGEN262	1
EGEN333	Electronics	EGEN221	3
EGEN334	Electronics Lab	EGEN221, CO-EGEN333	1
EGEN320	Combustion and Heat Generation	EGEN201	3
EGEN385	Electrical Machines	EGEN221	3
EGEN344	Power Systems	EGEN221	3
EGEN443	Power Electronics and Drives	EGEN333, EGEN385	3
EGEN482	Instrumentation and Control Systems	EGEN344	3
EGEN422	Solar Energy	EGEN443	3
EGEN421	Wind Energy	EGEN385	3
ENGR404	Engineering Economics	MATH204	3
EGEN461	Energy Storage Technology	EGEN443	2
EGEN471	Modeling and Simulation of Energy Systems	MATH305, MATH203	3
EGEN491	Capstone Design Project I	ENGR404	3
EGEN381	Fossil Fuel Power Plants	EGEN320	3
EGEN561	Hydrogen and Fuel Cell Fundamentals	CVEN361	3
CVEN470	Engineering Project Management	MNGT313	3
EGEN523	Distributed Generation	EGEN344	3
EGEN592	Capstone Design Project II	EGEN491	3

EGEN513	Energy Safety and Risk Assessment	EGEN201	2
EGEN481	Energy Lab I	EGEN421, Co: EGEN422	1
EGEN582	Energy Lab II	EGEN461, Co: EGEN561	1
Energy Engineering Elective (3 Courses)			9
Total			87

6.4 Energy Engineering Electives (Choose 9 Credit Hours)

Course Code	Course Title	Pre-Requisites	Credits
ENEN581	Climate Change	3	CVEN361
EGEN203	Engineering Materials	3	MATH102
EGEN583	Low Carbon Energy Technology	3	CVEN361
EGEN573	Nuclear Energy	3	CVEN361
EGEN575	Energy Buildings	3	CVEN361
EGEN577	Waste and Energy	3	EGEN320
EGEN584	Air Pollution and Control	3	CVEN361
EGEN588	Digital Systems	3	EGEN221
EGEN522	Energy Economics	3	MATH102
EGEN579	Energy Selected Topics	3	CVEN361
EGEN559	Energy Audit and Management	3	CVEN470
EGEN511	Biofuel, Geothermal, & Biomass	3	CVEN361
EGEN372	Tidal and Wave Energy	3	EGEN201
EGEN501	Power Quality	3	EGEN344
EGEN502	Power System Protection	3	EGEN344

7. PROGRAM REFERENCE POINTS

The Bachelor of Science in Energy Engineering has been designed to take account of the University's mission statement in that the program seeks to provide high quality higher education for the intellectual, social and the professional development of the individual and the social and economic development of the Sultanate of Oman.

8. TEACHING AND LEARNING METHODS (indicative)

In accordance with sound educational research and current best practice, the programme will be delivered through a broad range of learning and teaching strategies. The delivery of the programme and its assessment will reflect A'Sharqiyah University's Learning, Teaching and Assessment Strategy and in particular emphasises:

- The development of autonomous learners.
- Provision of learning opportunities that are personally and professionally relevant and quality assured.
- The maintenance of a supportive learning environment.

- The promotion of the scholarship of teaching.

At this level of study, students are encouraged to take responsibility for their own learning with staff facilitating the learning process. The aim is to encourage a high level of student autonomy in learning and the capacity to apply this within the wider environment. These overall aims are achieved through the use of a variety of learning and teaching techniques which include lectures, **tutorials, seminars, laboratory experiments, site visits, self-study, projects, workshops, discussions, debates, group work, case studies, problem-based learning and visiting speakers**.

A learner-centred approach will be adopted with the aim of promoting independent learning; as a consequence, direct face-to-face teaching contact hours will be supplemented by tutor-guided and independent reading and research which will emphasise the need to work in a critical way with theory and empirical research sources.

Additionally, Moodle Virtual Learning Environment will be used for developing interactive activities such as quizzes or forums; it also allows staff and students to create discussion groups. Students are encouraged to make significant use of on-line resources especially journals and e-books.

9. ASSESSMENT METHODS (Indicative)

In developing the assessment strategy, the team members have considered the Learning and Teaching Strategy and International best practice. Additionally, the assessments reflect the University's Academic Regulations.

Students will be assessed on their achievement of the programme learning outcomes which, in turn, are achieved by meeting the learning outcomes of both the core and elective courses. The assessment of the programme learning outcomes will therefore be achieved by assessment at the course level. Selection of the methods for assessment will be determined by the requirements of each individual course and the rationale for selection of those methods will be left to the course descriptors.

Assessments are chosen to examine a student's ability to integrate theory and practice, and to think critically in relation to theory, empirical research and practice. Subject specific, professional and transferable skills are developed within classroom-based and independent learning activities. Most courses assess a variety of skills, either directly or indirectly through the assessment work for the module.

The assessment strategy in the taught elements of the course is designed to allow students to demonstrate subject knowledge, skills, tools and techniques appropriate to the discipline. Examples of assessment methods which will be used include: **Quizzes, midterm exams, final exams, practical assessment in labs, project evaluation, viva questions.**

The research course enables students to study and research into a specific topic in depth, and also develops further the capacities for self-managed learning, critical thinking and the creative application of knowledge to solve problems.

10. CAREER and STUDY OPPORTUNITIES

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Graduates from this program will find employment opportunities in a range of organizations including related municipalities and ministries, plant engineer, energy service, industrial energy, oil refinery, and environmental impact, renewable engineer, hydropower industry.

Graduates from this course can also pursue further study and can improve their academic qualification by doing a Master's degree.

11. STUDENT SUPPORT

Students attend an orientation program at the start of their studies. They are supported by a Course Coordinator and the Head of Department is also available to advise on program-related queries.

Academic advising is an essential element of the educational process. Students are assigned academic advisors who help them in selecting their course of study and in planning their schedules. Academic advisors also approve students' schedules each semester. The academic advisor assists students in obtaining a well-balanced education and in interpreting university policies and procedures, it is ultimately the students' individual responsible for selecting their courses, meeting course prerequisites, and adhering to university policies and procedures. Students may also consult faculty, department or program chairs, program coordinators, and Deans.

Students have access to the University's library with a range of reading materials, online resources and study support.

The University's Student Affairs Office supports students in adjusting to university life and advises on issues such as finance, regulations, legal matters, accommodation, transportation, disabilities and career guidance. Opportunities are also provided for students to participate in various extra-curricular activities.

The Student Council is also an important source of support and guidance.

The University has a Student Fund which considers applications on a case by case basis.

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11.A ASSESSMENT of LEARNING OUTCOMES (Degree)

KEY: [F] = Formative assessment [S] = Summative assessment [FS] = Formative AND Summative assessment

Upon completion of the program, students will be able to:	**REQUIRED COURSES:**	ENGL101	PHYS111	ISLM101	ENGL102	MATH101	MATH102	ENGR111	ENGR322	ENGR201	CHEM101	CHEM181	EGEN201	EGEN203	ENGR203	EGEN221	CVEN361	EGEN222	EGEN251	EGEN261	EGEN262	EGEN263	EGEN333	MATH204	EGEN334	EGEN511	EGEN320	EGEN422	EGEN344	EGEN372	EGEN385	MNGT313	EGEN361	EGEN583	EGEN421	EGEN422	EGEN471	EGEN491	EGEN461	ENGR111	EGEN443	CVEN470	EGEN523	EGEN592	EGEN513
KNOWLEDGE AND UNDERSTANDING																																												
Apply knowledge of basic energy Fundamentals to solve problems associated with design/processing and natural resources of energy.		F	F		F	FS		FS	F	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS

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Apply knowledge of various methods to solve problems associated with design/processing and natural resources of energy.								F		S		FS	FS	FS	FS	FS		S		FS	FS	FS		FS	FS	FS	FS	FS	FS				FS			FS	FS	FS	FS	FS		FS	
Understand the different aspects of design and development of energy and renewable energy projects such as oil power plants and renewable energy to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.								F		FS			FS	FS			FS	FS	FS	FS	FS	FS		FS	FS	FS	FS	FS	FS		FS				FS			FS	FS	FS	FS	FS	FS

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Demonstrate a basic understanding of energy technology and production in industrial, administration, domestic, and agricultural sectors.		F						F		FS				FS	FS	S	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS		FS	FS		FS	FS		FS	FS	FS	FS	FS	FS	FS	FS
SUBJECT-SPECIFIC INTELLECTUAL SKILLS																																												
Apply fundamental concepts to solve simple and complex problems of the different aspects of energy engineering such as chemical energy, heat energy, renewable power, etc.					FS		S	F		FS				FS	FS	S	S	FS	FS	FS	FS	FS	FS		FS	FS	FS	FS	S	FS	S	FS	S	FS	FS	S	FS	FS	FS	FS	FS	FS	FS	
Carry out different laboratory experiments on fluid mechanics, thermodynamics, heat transfer, electrical engineering, electronics, and renewable energy.							F	F		S				FS	FS	S		S	S	FS	FS	FS	S	FS	FS	FS				FS		FS		FS	FS			FS	FS				FS	

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Apply the principles of energy design and operation.		F			F		FS	F	FS		FS	FS	FS	FS	FS	FS	FS					FS			FS	FS			FS		FS	FS	FS	FS		FS	FS	FS	FS	FS	FS	FS	FS	
Apply the principles of physical chemistry, electric and electronic in the design of power plants, energy transportation, and energy efficiency.					F		FS	F	FS	FS							FS	FS	FS	FS	FS	FS	FS			FS			FS		FS		FS	FS	FS	FS			FS	FS	FS		FS	
Demonstrate an awareness of digital technologies in energy production and design.								F		FS								FS	FS							FS		FS	FS	FS		FS		FS					FS				FS	
Design new experiments, analyze the results, and suggest logical and scientific explanation.							FS	F					FS					S		FS			FS		F	F	FS	FS					FS	FS			FS	S	FS			FS	FS	
PROFESSIONAL PRACTICAL SKILLS																																												
Recognize the roles of other professionals and parties associated with the design and delivery of energy engineering projects.		F			F			F	S	S			FS	FS	FS	S	S	S	S		FS	FS	S		FS	FS	S	S	S	FS	S			FS	FS	S	FS	FS	FS		FS		FS	

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Recognize the importance of professional ethics, their impact on the operation of the profession and their influence on society,			F					F						FS	FS		FS				FS	FS	S	FS	FS	FS	FS	FS	FS	FS	FS	FS		FS			FS	FS	FS	FS	FS	FS	FS	FS
Explain the importance of professional registration.	F		F	F			S										FS	S			FS		S	FS			FS	FS	FS		FS	FS	S	FS			FS						FS	
Explore the natural energy resources in the Sultanate of Oman and re-engineer them to contribute to the national wealth.			F					F				FS					FS			FS				FS			FS	FS	FS		FS	FS		FS				S	S		S		FS	
TRANSFERABLE SKILLS (INCLUDING FOR EMPLOYABILITY)																																												
Communication • Develop and apply good oral and written communication skills with a range of stakeholders including colleagues, team members and the general public. • Acknowledge differences and able to adapt to difference	FS			FS			S	F	S			FS	FS	FS	FS		S	S		FS	FS	FS		FS	FS	FS	S	S	S		S		S	FS		S	FS	FS	FS				FS	FS

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of opinions while being open minded. • Recognize and value communication as a tool for negotiating and creating new understanding.																																												
Teamwork and interpersonal skills • Create and share learning and knowledge and to contribute effectively to teamwork. • Perform live projects as a team and contribute to strengthen each other's weaknesses. • Cooperate and listen to team members.	F	F	F	F			FS	F	S		FS			FS	FS		S	S		FS	FS	FS		FS	FS	FS	S	S	S		S		FS	FS			FS	FS	FS	FS		FS	FS	
Information literacy and study skills	F	F		F	F			F	S	S		FS	FS	FS	FS		S	S	S	FS	FS	FS	S	FS	FS	FS	S	S	S		S	FS		FS		S	FS	FS	FS	FS	FS	FS	FS	FS

• Recognize need for information and distinguish ways of addressing gap and select appropriate sources. • Locate strategically and access information to construct research strategies. • Compare and evaluate information. • Synthesize and create missing information.																																												
Numeracy					F			F	S					FS	FS		S	S		FS	FS	FS		FS		FS			S		S	FS		FS		S			FS				F S	

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• Appreciate issues of sample selection, accuracy, precision and uncertainty during collection, recording and analysis of data in the field and laboratory • Prepare, process, interpret and present data using appropriate qualitative and quantitative techniques and software packages																																												
Leadership and entrepreneurship Demonstrate a clear appreciation of innovation and entrepreneurship and their impact on the economy.	F		F	F			S	F	S					FS	FS		S			FS	FS	FS		FS	FS	FS	S	S	S		S	FS	S	FS		S		FS	FS		S		F S	

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4. PROGRAM STRUCTURE DIAGRAM (Bachelor of Science in Energy Engineering (137 Credit Hours)

1		2		3		4		5
Fall	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**
ENGR111 Computer Applications	EGEN201 Energy and Sustainable Development	ENGR201 Engineering Drawing	EGEN251 Fluid Mechanics Pre-R: MATH102	MNGT313 Entrepreneurship	EGEN385 Electrical Machines Pre-R: EGEN221	EGEN482 Instrumentation and Control Systems Pre-R: EGEN344	EGEN471 Modeling and Simulation of Energy Systems Pre-R: MATH305, MATH203	EGEN561 Hydrogen and Fuel Cell Fundamentals Pre-R: CVEN361
ARAB101 Arabic	OMS101 Omani Society	EGEN221 Circuit Theory Pre-R: MATH102	MATH204 Probability and Statistics Pre-R: MATH102	EGEN333 Electronics Pre-R: EGEN221	ENGR404 Engineering Economics Pre-R: MATH204	Energy Engineering Electives	Energy Engineering Electives	Energy Engineering Electives
PHYS111 Applied Physics	MATH102 Calculus II Pre-R: MATH101	ENGR202 Technical Writing and Presentation Pre-R: ENGL102	EGEN261 Engineering Mechanics Pre-R: MAHT102	EGEN320 Combustion and Heat Generation Pre-R: EGEN201	MATH305 Numerical Methods Pre-R: MATH102 - ENGR111	EGEN421 Wind Energy Pre-R: EGEN385	EGEN461 Energy Storage Technology Pre-R: EGEN443	EGEN523 Distributed Generation Pre-R: EGEN344
ENGL101 English Communication Skills I	CHEM101 Chemistry	CVEN361 Environmental Engineering Pre-R: CHEM101	EGEN262 Thermodynamics and Heat Transfer Pre-R: PHYS111	University Elective	EGEN381 Fossil Fuel Power Plants Pre-R: EGEN320	CVEN471 Engineering Project Management Pre-R: MNGT313	EGEN491 Capstone Design Project I Pre-R: ENGR404	EGEN592 Capstone Design Project II Pre-R: EGEN491
MATH101 Calculus I	ENGL102 English Communication Skills II Pre-R: ENGL101	University Elective	EGEN263 Thermo-Fluid Lab Pre-R: PHYS111 Co-R: EGEN251, EGEN262	EGEN344 Power Systems Pre-R: EGEN221	MATH203 Deferential Equations Pre-R: MATH102	EGEN443 Power Electronics and Drives Pre-R: EGEN333, EGEN385	EGEN422 Solar Energy Pre-R: EGEN443	EGEN513 Energy Safety and Risk Assessment Pre-R: EGEN201
PHYS181 Physics Lab Co-R: PHYS111	CHEM181 Chemistry Lab Co-R: CHEM101	EGEN222 Circuit Theory Lab Pre-R: MATH102 Co-R: EGEN221		EGEN334 Electronics Lab Pre-R: EGEN221 Co-R: EGEN333			EGEN481 Energy Lab I Pre-R: EGEN422, Co-R: EGEN421	EGEN582 Energy Lab II Pre-R: EGEN461 Co-R: EGEN561
							ENGR322 Summer Internship	

University Requirement College Requirement Major Requirement

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