The Petroleum Institute

Undergraduate Catalog
2009 – 2010

Policy Regarding On-line and Print Versions of the Petroleum Institute's Catalogs, Manuals and Handbooks

Every effort has been made to provide the most accurate, up-to-date information possible in PI's catalogs, manuals, and handbooks. Each document is revised yearly and limited numbers printed once every two years. There may be times when substantive changes are required during the academic year and between the times the documents are printed. The catalogs, manuals, and handbooks are posted to the Institute's web site at www.pi.ac.ae. Faculty, staff, and students should consult the PI website periodically for updates on catalogs, manuals, and handbooks. In case of a conflict between this catalog and any supplements hereto and any other written or oral statements, this catalog and its supplements shall be deemed to be the official statement. Between print versions of the catalog, additions such as new courses and updated deadlines and fees are published in the online version of the catalog, which is considered a supplement. The most current catalog is available online at www.pi.ac.ae/PI_STU/ro/calendar.php. The Institute reserves the right to change any of the statements herein by reasonable notice in any supplemental catalog or other publication specifically setting forth any such changes.

Academic Calendar 2009 – 2010

Fall 2009		
New Student Orientation	Sunday – Thursday	August 16 – August 20
Fall Semester Classes Begin	Sunday	August 23
Add/Drop Period	Sunday – Sunday	August 23 – August 30
Eid Al Fitr Holiday	Sunday – Tuesday	September 20 – September 22
Last Day to "W"	Thursday	November 19
Eid Al Adha Holiday	Thursday – Sunday	November 26 – November 29
Institute Recess	Monday – Tuesday	November 30 – December 1
National Day Holiday	Wednesday – Thursday	December 2 – 3
Fall Semester Classes End	Wednesday	December 23
Study Day	Thursday	December 24
Final Exams	Sunday – Thursday	December 27 – 31
Final Exams Make-Up Day	Sunday	January 3
Commencement	Saturday	January 9
Spring 2010		
Spring Semester Classes Begin	Sunday	January 31
Add/Drop Period	Sunday – Sunday	January 31 – February 7
Spring Break Begins	Sunday	March 28
Spring Break Ends, Classes Resume	Sunday	April 4
Last Day to "W"	Thursday	April 29
Spring Semester Classes End	Thursday	May 27
Final Exams	Sunday – Thursday	May 30 – June 3
Final Exams Make-Up Day	Sunday	June 6
Summer 2010		
Summer Internships Begin	Sunday	June 6
Summer Session Classes Begin	Sunday	June 13
Add/Drop Period	Sunday – Monday	June 13 – June 14
Last Day to "W"	Monday	July 12
Summer Session Classes End	Thursday	July 22
Final Exams	Sunday	July 24
Summer Internships End	Thursday	July 29

* Islamic holidays are determined after sighting the moon. Thus, actual dates may not coincide with the dates in this calendar. In the event of loss of teaching days due to closings, the semester(s) may be extended.

Telephone and E-mail Directory

UAE code: 971, Abu Dhabi code: 02

Department	Telephone	Fax	E-mail
Admissions	60 75923	60 75618	admissions@pi.ac.ae
Advanced University Placement Department	60 75157	60 75423	aup@pi.ac.ae
Chemical Engineering Program	60 75276	60 75194	ce@pi.ac.ae
College of Arts and Sciences	60 75723	60 75423	as@pi.ac.ae
Electrical Engineering Program	60 75375	60 75194	ee@pi.ac.ae
Finance	60 75110	60 75617	finance@pi.ac.ae
Graduates Studies	60 75880	60 75648	gs@pi.ac.ae
Health, Safety and Environment	60 75931	60 75628	hse@pi.ac.ae
Housing (on-campus)	60 75900	60 75549	housing@pi.ac.ae
Human Resources	60 75743	60 75650	hr@pi.ac.ae
Independent Learning Center	60 75279	60 75423	ilc@pi.ac.ae
Information Technology	60 75793	60 75614	it@pi.ac.ae
Institutional Research and Assessment	60 7 5733	60 75200	ira@pi.ac.ae
Internship and Counseling	60 75943	60 75783	ic@pi.ac.ae
Library – Habshan Building Library – Arzanah Building	60 75802 60 75895	60 75746	library@pi.ac.ae
Mechanical Engineering Program	60 75362	60 75194	me@pi.ac.ae
Petroleum Engineering Program	60 75363	60 75194	pe@pi.ac.ae
Petroleum Geosciences Program	60 75271	60 75194	pg@pi.ac.ae
President	60 75713	60 75646	president@pi.ac.ae
Provost	60 75712	60 75646	provost@pi.ac.ae
Public Relations	60 75613	60 75200	pr@pi.ac.ae
Recreation (students)	60 75874	60 75648	recreation@pi.ac.ae
Registrar	60 75864	60 75648	registrar@pi.ac.ae
Student Affairs	60 75873	60 75647	sa@pi.ac.ae
Women in Science and Engineering Program	60 75973	60 75782	wise@pi.ac.ae
Civil Maintenance	050 7725045	60 20367	
A/C Maintenance	050 3236253	60 20367	
Electrical Maintenance	050 6994059	60 20367	
Medical Hotline (El Wathig Omer)	02 6023265 050 6629664		
Security	050 6726052	60 75200	

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Overview of the Petroleum Institute

The Petroleum Institute (PI) was founded by Emiri Decree in 2000 under the direction of His Highness Sheikh Khalifa bin Zayed Al-Nahyan. The first class was admitted in fall 2001.

The Petroleum Institute is sponsored by Abu Dhabi National Oil Company (ADNOC) and four of its international partners (Shell, British Petroleum, Total, and Japan Oil Development Company). ExxonMobil is also a major contributor. The objective in founding the PI was to provide the UAE and its oil and gas, as well as the broader energy industry, with engineers educated and trained to the highest standards.

The campus is situated in the Sas al Nakheel area of Abu Dhabi. It consists of five buildings devoted to academic and administrative affairs, with additional buildings providing recreation and dining facilities, and student accommodations. The teaching facilities contain state-of-the-art laboratories and equipment. A separate facility for women (Arzanah Building) was established on campus and the first cohort of female students enrolled in fall 2006. The Women in Science and Engineering Program represents 30% of the undergraduate student population.

Currently, there are over 1000 male and female undergraduate students studying at The Petroleum Institute, divided between the Advanced University Placement Department, College of Arts and Sciences and the five degree-awarding programs, namely Chemical Engineering, Electrical Engineering, Mechanical Engineering, Petroleum Engineering and Petroleum Geosciences. June 2006 was a major milestone when PI's first 38 graduates emerged from the engineering programs and started their careers within the ADNOC group of companies.

The 2007-2008 academic year saw the launch of the first graduate programs. The Petroleum Institute offers Master of Science degrees in Chemical Engineering, Electrical Engineering, Mechanical Engineering, Petroleum Engineering and Petroleum Geosciences. It also offers Master of Engineering degrees in Chemical Engineering, Electrical Engineering, Mechanical Engineering and Petroleum Engineering. There are over 100 graduate students currently studying full-time or part time across all disciplines. As the graduate programs grow, so does the research program with the commitment to excellence in undergraduate education supplemented by a strong commitment to excellence in research and technology development. Research is leveraged by close cooperation with industry through the ADNOC-group operating companies, international partners, and with participation from selected internationally recognized universities.

Accreditation and Licensure

The Petroleum Institute located in Abu Dhabi, is officially licensed by the Ministry of Higher Education and Scientific Research of the United Arab Emirates to award degrees in higher education. All Bachelor of Science degrees have received full accreditation from the Ministry. Furthermore, all Master of Science and Master of Engineering degrees have received initial accreditation from the Ministry. In addition, the Advanced University Placement Department's English program has received accreditation from the Commission for English Language Program Accreditation (CEA).

Institutional Mission Statement

The Petroleum Institute will provide a world-class education in engineering and applied sciences in order to support and advance the petroleum and energy industries. The Institute is committed to academic excellence, and to fostering an intellectual environment that leads to the development of our graduates as whole persons and as the future leaders in their respective fields of expertise in the United Arab Emirates and beyond.

Institutional Goals

To achieve its Mission the Petroleum Institute will:

1. Offer programs of instruction leading to baccalaureate degrees to produce graduates that have the skills, knowledge, and competencies that meet the needs of ADNOC and our other sponsors, and contribute to solving the challenges of the energy industry;
2. Practice and infuse in our students the highest standards of health, safety, and environmental awareness;
3. Manage the content, quality, design and continuous innovation of its academic programs in a manner that creates and sustains a reputation for institutional excellence and earns local, regional and international accreditation;
4. Provide programs of study leading to relevant graduate degrees and foster the creation and dissemination of knowledge that is pertinent to the needs of industry and enriches the academic programs of the PI;
5. Provide professional outreach and continuing education programs that serve the on-going needs of practicing professionals;
6. Operate as a center of excellence for education, research, and professional service that interconnects globally with regional and international industrial constituents, and with international partners in education and professional societies;
7. Foster technological innovation and entrepreneurship leading to development of advanced processes and products that provides for economic expansion and promotes business development opportunities.

Profile of the Petroleum Institute Graduate

Recognizing that the most immediate and dominant product of the Petroleum Institute will be baccalaureate graduates, the institutional educational goals for baccalaureate degrees are captured in the following attributes that reflect "the whole person development" of the graduating student:

- The graduating student will exhibit applied and theoretical competence in a field of technical specialization, and will be oriented in engineering practices germane to the oil, gas and petrochemical industries. The student will have the resourcefulness and capability to apply scientific and engineering principles in solving a wide variety of technical problems.
- The graduating student will appreciate the critical role played by verbal, written and graphical communications in engineering practice and project management, and will have the corresponding skills to communicate with a range of audiences, and the skills to employ information technologies where appropriate.
- The graduating student should acknowledge that technologies, economies and societies are in a continuous state of evolution, and should therefore have the flexibility to manage a career path that changes over time, and that is supported by life-long learning, critical thinking, teamwork, leadership and the ability to span several disciplines.
- The graduating student should understand the global nature of modern engineering and business, and in order to succeed in this international arena, the student should have an awareness of customary practices in different countries and the influence of diverse cultures.
- The graduating student should have the professional integrity and maturity to serve humanity and its highest values, and should always make ethical decisions as they relate to society, corporate operations, technology, and the environment.

Campus Facilities

Computer Laboratories

The IT Department operates and maintains open computer labs in each of the main campus buildings. These labs have extensive operating hours and provide Internet access, print services, scanning, and more. Additionally, IT maintains computer labs operated by the various academic programs in which Windows and Linux work stations run specialized, and often, expensive software. Several classrooms are equipped with Video Conferencing and interactive white board technology to connect different campus buildings together, and Adobe Web Connect to provide distance learning capacities. Currently, WI-FI Internet access is available in the student dormitories and most common areas of the major academic buildings. Plans are in place to expand wireless Internet coverage campus wide by the end of the 2009-2010 academic year.

Food Outlets

The Satah building is a dining facility that has a capacity for 750. It serves three meals a day for the PI community. Small cafeterias, open for breakfast, lunch and snacks, are located in Arzanah, Bu Hasa, Habshan, and Zarkuh buildings.

Housing

Male students who do not live within commuting distance of the PI are guaranteed space in one of the dormitories on campus. In some cases, commuting students are also allowed to stay in the dormitories depending on availability. Most of the dormitories have been refurbished and are configured as double furnished rooms. The Umm Al Nar Club, located in building 32, has a fitness room with free weights, Nautalus machines, and aerobic machines, and a computer lab with wireless access. This Club is available for students, faculty and staff.

Information Technology

The Information Technology Department (IT) operates and maintains open computer labs free of charge to students in each of the main campus buildings. These labs provide Internet access, print services, scanning, and more and are an ideal setting for completing homework assignments. Additionally, IT maintains departmental computer labs operated by the various academic programs in which Windows and Linux work stations run specialized, and often, expensive software. Several classrooms are equipped with Video Conferencing and interactive white board technology to connect different campus buildings together, and Adobe Web Connect to provide distance learning capacities to some students. Currently, WI-FI Internet access is available in the student hostiles and most common areas of the major buildings. Plans are in place to expand wireless Internet coverage campus wide by the end of the 2009 calendar year.

Library

The Petroleum Institute libraries enhance and support the university's instructional and research programs with innovative services and collections. The Petroleum Institute libraries are dedicated to serving the learning, teaching and research needs of students, faculty and staff. The print collection focuses on engineering, scientific and humanities titles but also has general interest reading books, as well as maps, videos and select Petroleum Institute archival materials.

The main library occupies part of the ground floor and first floor of the Habshan building. A second library is located on the first floor of the Arzanah building. These inviting learning spaces feature stacks, an information commons area, quiet reading areas, group study rooms, and staff offices. Both libraries offer an environment conducive to individual study and collaborative work. Both networked computers and wireless access for laptop computers are featured. Library users have access to many research databases and thousands of online journals from workstations located in the libraries' Information Common areas, or from anywhere on the campus of the Petroleum Institute. Library holdings are available through an online catalog system. An inter-library loan service is available for the Petroleum Institute community where materials can be obtained from commercial document delivery centers. The library maintains extensive operating hours daily and on weekends.

Sports Complex

Asab is a state-of-the-art building with dedicated female and male sports facilities. It comprises two gymnasiums, four indoor halls (volleyball, handball, basketball, and badminton), two studios (aerobics and martial arts), two indoor tennis courts, two squash courts and a grass football pitch. Regular intramural sports tournaments are organized, including indoor soccer and basketball.

Women in Science and Engineering Facilities

Arzanah is a state-of-the-art building and home of the Women in Science and Engineering Program (WISE). It boosts an area of about 14,000 m^2, accommodating classrooms and laboratories, administrative and faculty offices, student support and service facilities. The facility includes over 40 classrooms and 50 purpose-built computing, engineering and science laboratories, lecture halls and meeting rooms, as well as a 200-seat auditorium and dining hall. There is also an outdoor landscaped area with shaded seating.

Health, Safety and Environment

The Petroleum Institute (PI) will strive to achieve a safe campus that is in full compliance with all relevant Health, Safety and Environment (HSE) regulations and best practices. The PI will achieve an exemplary HSE performance and will be viewed as a model academic institution that is friendly to the environment and is a safe place to work, learn and conduct research.

The Petroleum Institute promotes the highest standards of health and safety practices. All PI members are to adhere to HSE policies and procedures towards better stewardship of the campus and environment at large. If unsafe conditions are noticed, or if an accident/incident of any kind occurs, these should be reported to the instructor or hostel officer and to the Health, Safety and Environment (HSE) Office at (http://www.pi.ac.ae/PI_INS/hse/hseTeam.php)

- ***Fire Safety and Drills:*** The PI's HSE Department conducts fire drills in all buildings on campus. All occupants must evacuate a building if an alarm sounds and go to an assembly point. It is important the fire marshal's instructions are followed closely. For more details on the fire evacuation procedure and fire marshal duties, please refer to (http://www.pi.ac.ae/PI_INS/hse)

- ***Safety in Laboratories and Workshops:*** When working in laboratories and workshops, safety rules must be followed, and any accidents/near miss/first aid cases must be reported immediately to the instructor or lab technician and to HSE Department (http://www.pi.ac.ae/PI_INS/hse/hseTeam.php). Each laboratory and workshop has its own appropriate safety protocols that must be followed at all times.

- ***Driving Safety:*** All members of the PI community must drive safely and follow traffic and parking rules inside and outside campus. Aggressive driving, speeding and illegal parking must be avoided at all times.

- ***Accountability:*** Disciplinary action may be taken against any member of the PI community who do not comply by the PI HSE policies or knowingly performs unsafe acts or cause unsafe conditions to occur.

Student Services

Counseling

Student Affairs maintains an extensive student counseling service. The student counseling office assists faculty in maintaining a positive learning environment in the classroom, deals with disciplinary and academic dishonesty issues, and actively works with students who are experiencing academic or personal problems. Primary responsibilities of the Counseling Office include:

- Counseling, advising, and providing crisis management services for students with academic or personal concerns;
- Communicating with students' guardians regarding these concerns;
- Assisting students as they plan their work placements and internships;
- Working with the students to assist with academic issues and career counseling;
- Improve students' awareness of local and international issues and events;
- Develop students' personal and social skills.

Career Services

The PI does not have a career services program *per se* as all students are guaranteed employment with ADNOC upon graduation. Professional assistance to students in choosing a career path is provided through the required Engineering Success Seminar.

Health Services

The ADNOC Clinic on the PI campus provides primary health care to PI students, faculty, and staff members and their dependents. The Clinic is open Sunday – Thursday 7:00 a.m. to 11:00 p.m. and provides 24-hour accident and emergency care as well. Depending on the nature of the illness, patients may be referred to the main ADNOC Clinic or other hospitals or clinics for further treatment. Students desiring to use the Clinic must bring a Medical Services Report form available from the Reception. A dedicated clinic for female students is available in Arzanah and is open Sunday – Friday 7:30 a.m. to 5:00 p.m.. Students may also be provided health insurance by their Sponsor.

Mail Service

The PI provides mail service on campus. Mail is distributed daily to all Institute offices by staff from General Services Department (GSD). The Mail Room handles all outgoing mail including courier services and is located on the ground floor of the Habshan building. A second mail room is located in Arzanah. All mail intended for Institute offices and for those residing on campus should be addressed to:

The Petroleum Institute,
P. O. Box 2533, Abu Dhabi, U.A.E.

Public Relations

The Public Relations Office ensures a good working relationship between the Institute and the local public and private sectors. It handles all official government documents and transactions for faculty, and staff, including the processing of visas and residence permits, driving licenses, car registration, traffic violations and accident reporting, and medical insurance and claims processing. The Registrar Office provides students with official letters that might be required by various government and/or private organizations.

Information Technology

The IT Department serves the computer-related administrative, instructional, technical, and research needs of students, faculty, and staff. It also provides PI's gateway to the internet for academic purposes. Services provided include e-mail accounts and passwords, computer labs, e-learning systems, and wireless and local area networks

Independent Learning Center

The Independent Learning Center (ILC) provides English language learning and content subject

learning materials for students in the Advanced University Placement Department (AUP) to support their coursework, assignments and research. It assists AUP students over the course of their academic studies at the PI to develop as independent learners with the ability to identify their own learning needs.

In order to support learning, the ILC:

- Provides users with a functional, well-resourced environment that is conducive to study, learning and research;
- Provides users with collections of learning materials and the necessary guidance for their use, thus promoting excellence in the Advanced University Placement study programs;
- Incorporates the use of technology and related educational software to facilitate each stage of learning within the program;
- Provides language support through carefully identified self-access materials;
- Provides users with essential reference materials.

There are two ILC locations on campus – one on the second floor of Bu Hasa building and the second inside the Arzanah Library.

Student Records

A permanent record reflecting the academic achievements of each student who enrolls at the PI is maintained by the Registrar Office. Comprehensive student records contain information related to admission, transfer credit assessment, registration, disciplinary actions, academic assessment, progress towards degree, grade point average, and graduation.

Privacy Rights of Students

Students have the right to:

- Inspect and review information contained in their educational records;
- Request changes or updates to their personal data;
- Consent to disclosure, with the extent of UAE federal and local laws, personally identifiable information from education records.

Transcripts and Other Records

All transcripts and documents submitted from other institutions become the property of the Petroleum Institute, and, as such, come under control of the Registrar Office. The PI is not required to provide copies of these documents. Transcripts submitted to the PI for review of transfer credit also become the property of the PI and cannot be returned to the student or forwarded to other institutions.

Release of Transcripts and Student Information

Students may obtain official transcripts of their academic records at the PI from the Registrar Office. Transcripts will only be released after receipt of a signed Request for Transcript of Record Form from the student concerned. The PI will issue only complete transcripts, not parts of a student record. The PI will not make copies of transcripts on file from other schools. Information in a student's file or about a student may be released to another party only with the written consent of the student or in order to comply with the order of a court or any other body with the authority to require the release of such information.

Admissions

The Petroleum Institute is highly selective, granting admission only to applicants who have demonstrated in their academic performance in secondary or post-secondary school that they are able to do the classroom and laboratory work required, and are motivated to complete and profit from the programs offered. Criteria considered in evaluating students include (1) courses taken in secondary or post-secondary school or college, (2) grades earned in those courses, and (3) English language proficiency. The requirements set out below are the minimum for admission and are subject to change. The Governing Board reserves the right to deviate from published admission requirements. In such cases, changes in policy will be widely publicized. Admission to the Petroleum Institute is primarily reserved for UAE Nationals; however, highly qualified non-nationals may apply and are admitted on a case-by-case basis.

Admission Process

Advertisements are published in the local press and on the PI web site stating the specific requirements for admission and inviting applications from suitably qualified individuals. In order to be considered, an applicant must submit all the required forms and meet the minimum requirements.

On admission, the student will be notified, instructed to take a physical examination and required to report to the Petroleum Institute for orientation prior to the start of classes.

Admission Requirements

The general admission requirements for students who have not previously attended another college or university are as follows:

- Diploma from an accredited secondary school or high school.
- Minimum grades of C (70 percent) and above in grade 10 through 12 in the following:
    - Biology
    - Chemistry
    - English
    - Geology
    - Mathematics
    - Physics
- Demonstrate good physical fitness.
- Have a record of good behavior and conduct in secondary school.

Transfer Students

Students seeking admission to the Institute on transfer status must apply a semester prior to the semester for which he/she is seeking admission. In addition to the Application Form available with the Admissions Office, such students should also complete a "Transfer Credit Evaluation/Approval" Form which is available in the Registrar Office upon payment of the nominal fee of 40 AED.

Applicants should provide the following:

- Completed Application Form available from PI Admissions Office
- Official transcripts from any previously attended colleges or universities
- Official secondary school certificate certified by the appropriate authorities
- Official transcript for grades 10, 11, and 12 (in English)
- Photocopy of applicant's passport
- Photocopy of UAE Nationality Record (Kholasit Al Qaid) – if applicable
- Behavior certificate
- Twelve recent passport-size photographs with red background

In order to be eligible for transfer to the Petroleum Institute, the following conditions apply:

- Only students transferring from a federal or accredited institution in the UAE or a recognized and accredited foreign institution of higher learning are eligible for admission and possible transfer of credit.

- In order to be eligible for admission, transfer applicants must have demonstrated proficiency of the English language that meets the minimum standards of matriculation at the Petroleum Institute.
- Submission of official transcripts from all institutions of higher learning previously attended.
- Submission of official high school transcripts.
- Only students in good academic standing with a minimum cumulative grade point average (CGPA) of 2.5 will be considered for transfer. Applicants with a lower CGPA will be considered on a case-by-case basis.
- Students who are ineligible to enroll at the institution from which they wish to transfer because of their scholastic record or any other reason may not be considered for admission.
- The Registrar Office will inform the applicant of the course(s) transferred for credit and possible equivalencies.
- A minimum of 50 percent of the academic credit applied toward graduation must have been earned from courses taken at the Petroleum Institute.
- Original documents must be in English or accompanied by an official certified English translation.

In order to evaluate a student's file for possible transfer of credit:

- Documents must include the official transcript, academic catalog course description and course syllabi.
- A student's evaluation for possible transfer of a course will be administered only once.
- Transfer files will be evaluated, and students will be awarded possible credit, by the first day of add/drop of the student's first semester at the Petroleum Institute. Students will be notified of the results of their course evaluations by the Registrar Office.
- The decision regarding the awarding of credit is made in the appropriate academic program. The Registrar Office maintains and updates the transfer student files.

The awarding of transfer and non-traditional credit is governed by the provisions below:

- Courses, with a minimum grade of "C" and deemed equivalent in content and level to those offered at the Petroleum Institute, will be transferred as equivalent PI courses. Other appropriate courses, with a minimum grade of "C", may be transferred as free/open electives or unassigned courses in the relevant area.
- Courses completed more than four years prior to matriculating as an undergraduate student at the Petroleum Institute are not transferable. Furthermore, at the time of graduation, no course can be more than six years old if it is to be counted toward the awarding of an undergraduate degree.
- Credit is not granted twice for substantially the same course taken at two different institutions.

Studying at Another Institution

Enrolled PI students wishing to take a course for credit with another higher education institution as a visiting student may be allowed to do so with permission from the Program Chair. The student must complete the appropriate request form, attach the course description and syllabus of the course in which he/she is intending to enroll and submit it to the appropriate Program. Upon Program approval, the form is submitted to the Registrar Office. The process for awarding the credit is the same as other transfer credit.

Credit Awarded through Non-Traditional Sources

Credit awarded through non-traditional sources must meet the minimum established grade, score or level as follows:

- The minimum grades, scores, and levels for evaluating high school credit, such as AP, GCE, A-Levels, IB Higher Levels, etc., are established and reviewed regularly by the Academic Evaluation Committee and on file in the Admissions and Registrar Offices.
- A student's eligibility to sit a challenge exam is established by the appropriate program.

- Credit awarded through other non-traditional sources, such as documented life experience, will be reviewed by the appropriate program on a case-by-case basis. Any resulting recommendation for academic credit must be approved by the Provost (or designee).
- Transferred courses and non-traditional credit will be trascripted with the appropriate number of credit hours. A grade of "TR" will be assigned and is not included in the student's CGPA.

Placement Tests

Before students can enroll in classes at the Petroleum Institute, they must take the Test of English as a Foreign Language (TOEFL) for English placement (PI's code is 4091). International Baccalaureate (IB) and Advanced Placement (AP) scores do not fulfill this requirement. Program chairs and academic advisors use placement test results to help students enroll at appropriate course levels.

The majority of new students will be placed in the Advanced University Placement Department (AUP). This program is designed to help students make the transition from their secondary school courses to the rigorous academic programs at the Petroleum Institute - all of which are taught in English.

Readmitted Students

A former student who wishes to re-enroll and seek re-admission must complete a "Request to Resume Studies" Form available from the Registrar Office. When approved, the form should be submitted to the Registrar Office.

Former students who were suspended or dismissed should refer to the section on "Return after a Missed Semester, Full Withdrawal from a Semester, Suspension or Dismissal."

Non-Degree Students

A non-degree student is a student who does not wish to pursue a degree program at the Petroleum Institute but wishes to take courses for other purposes. Examples could be visiting students from other universities, taking courses to qualify for admission to a graduate program or professional development. Such students may take any course for which they have the pre-requisites or have the permission of the instructor. Official transcripts or officially certified copies of transcripts or other evidence of the pre-requisites is required. An applicant for admission as a degree student who does not meet admission requirements may not fulfill deficiencies through this means. Non-degree students who subsequently become degree students at the PI may receive credit for a maximum of 12 credit hours for courses completed as a non-degree student.

Declaration of a Major

Students admitted to the PI are free to declare the engineering program in which they intend to major at the time of entry into the Advanced University Placement Department. There are no significant differences in the requirements of the Freshman year for the current degree programs. However, to avoid unnecessary delays in graduation, all students should decide on their major by the end of the first semester of the Freshman year. Students wishing to change their major must complete a "Change of Major" Form and submit to the Registrar Office. Once processed within the Academic Management System (CAMS), the student's "Catalog of Record" will automatically be updated. Also refer to "Catalog of Record".

The five undergraduate majors currently offered at the Petroleum Institute are Chemical Engineering, Electrical Engineering, Mechanical Engineering, Petroleum Engineering and Petroleum Geosciences.

Grades and Grade Point Averages

Grades are an important component of the learning assessment process. All courses must be assigned a grade in the middle and end of the semester or session in which the course is offered. It is the responsibility of the course instructor to inform each class at the beginning of the semester or session of the nature of the course assessment and corresponding grades assigned. Each course instructor should include a grading metric in the course syllabus.

When a student registers in a course, one of the following grades will appear on his/her academic record. The assignment of the grade symbol is based on the level of performance. It represents the extent of the student's demonstrated mastery of the material listed in the course syllabus and achievement of the stated course objectives. (add new policy text)

A =	4.00	Excellent
A- =	3.75	
B+ =	3.25	
B =	3.00	Good
B- =	2.75	
C+ =	2.25	
C =	2.00	Satisfactory
C- =	1.75	
D =	1.00	Unsatisfactory
F =	0.00	Failure
XF =	0.00	Failure due to Academic Dishonesty
W =		Withdrawn
WI =		Withdrawn Involuntarily (Terminated)
TR =		Transfer Credit
CR =		Credit (Passing)
NC =		No Credit
I =		Incomplete
PR =		Progress
Z =		Grade not Submitted

"A," and "A-" are honor grades. They are awarded as a mark of outstanding performance and for achievement clearly of a higher order than average. They indicate that the student has demonstrated not only the ability to work successfully, but also the ability to do some creative thinking or problem solving in the field. They will not be given for routine performance of the assigned work in the course.

"B+," "B," and "B-" indicate very good performance, definitely above a satisfactory level, but not as good in analytical thinking and originality as that required for grades of "A" or "A-." Thorough competence to do excellent work in the field is required for these grades and they will not be given for mere compliance with the minimum essential standards of the course.

"C+," "C," and "C-" are the grades given for satisfactory performance. They indicate compliance with the standards set for successful completion of a course.

"D" is recorded to show that the student's performance is marginal and it does not represent satisfactory progress toward a degree.

"F" is a penalty grade. It indicates failure and entirely unsatisfactory performance. It carries the requirement that to obtain credit, the entire course must be repeated.

"XF" is a penalty grade. It indicates that a student has failed due to academic dishonesty.

"W" is a grade awarded to a student withdrawing from a course by the established deadline. After the last day to withdraw, a student will not be permitted to drop the course and will receive the grade earned for the course.

"WI" is a grade awarded to a student who is involuntarily withdrawn. Under certain circumstances, a student may be terminated due to academic or behavioral misconduct. In such extreme situations, a student is terminated and will receive a grade of "WI" for all registered courses in that particular semester.

"TR" is a substitute grade awarded to all transfer or non-traditional credit courses.

"CR" indicates satisfactory performance. The grade does not calculate in the student's grade point average.

"NC" indicates unsatisfactory performance. The grade does not calculate in the student's grade point average.

"I" is an incomplete grade and is given when the student is absent from several sessions of, or the final exam of a course because of illness or other reasons considered beyond the student's control. Approval by the Provost (or designee) must be secured by the instructor before a grade of "I" may be assigned. When the work missed is satisfactorily completed, the final grade must be approved by the Program Chair of the course being offered and subsequently forwarded to the Registrar Office. A student must complete the requirements for the course in which the "I" grade was received by the last day of add/drop period of the next regular semester or the grade will automatically be changed to a grade of "F." If any extension is required, then the deadline will be the end of the next regular semester. All such special requests must be approved by the Provost (or designee). If a grade of an "I" has been given, the instructor must file the specific forms for a final grade signed by the Program Chair with the Registrar Office once the missed work is satisfactorily completed.

"PR" is an in-progress graduate course grade used to indicate that a project, course, thesis or dissertation is in progress but not complete.

"Z" is awarded to show that no grade was submitted by the instructor.

Grade Appeal

The grades earned by a student are determined by the instructor of the course and can be changed only upon the instructor's recommendation, endorsement of the Program Chair and final approval by the Provost (or designee). In case of an official grade appeal, a student must submit a "Grade Appeal" Form to the Registrar Office no later than the first day of classes of the next regular semester. The Registrar Office will review and forward the form to the Academic Appeals Committee. The committee will make a recommendation to the Provost no later than the last day of add/drop. If any extension is required, then the deadline will be the end of the semester.

Under the following exceptional circumstances, a grade may be changed by someone other than the instructor of the course:

- As set forth above, the Provost must approve a grade of "I" and the Program Chair must approve the final grade once the work missed is satisfactorily completed.
- The Provost may, only upon recommendation of the Academic Appeals Committee, change a grade determined to be awarded in an unfair manner or in the best interest of the Institute.

Repeat Provision

Except for Special Topics and Independent Study Courses, a student may repeat a course only one time. An appeal must be submitted to the Provost should a student need to attempt a course a third time. Only courses with a grade of "D" or "F" may be repeated. All grades of the repeated courses will be included in the student's cumulative grade point average, but only the last course credit will count towards the cumulative credit earned.

Grade-Point Averages

In calculating a student's grade point average, all assigned letter grades "A" through "F" will be utilized. The grade point average is calculated on all work for which the student has registered with the exception of the courses with grades of "W", "WI", "TR", "CR", "I", "NC" "PR" and "Z" and courses repeated (see Repeat Provision). The grade point average is the ratio of the number of quality points gained to the number of credit hours attempted. Grade point averages are calculated to two places following the decimal point.

Quality Hours and Quality Points

In order to graduate a student must successfully complete a certain number of required credit hours and must maintain grades at a satisfactory level. The system for expressing the quality of a student's work is based on quality hours and quality points. For example, the grade "A" represents four quality points, "B" three, "C" two, "D" one, "F" and "XF" none. The number of quality points earned in any course is the number of credit hours assigned to that course multiplied by the numerical value of the grade received. The quality hours earned are the number of credit hours in which grades of "A" through "F" are awarded. To compute a grade-point average, the number of cumulative quality points is divided by the cumulative quality hours earned. Grades of "W", "WI", "TR", "CR", "I", "NC", "PR" or "Z" are not counted in determining quality hours.

Transfer Credit Excluded in GPA Calculation

Transfer credit earned at another institution will be recorded on the student's permanent record. Calculation of the grade point averages for transfer students will be based only on grades earned in degree courses completed at the Petroleum Institute.

Credit Hours

The number of times a class meets during a week (for lecture or laboratory) usually determines the number of credit hours assigned to that course. For a small number of courses additional hours of instruction have been added to the lecture part of the course in order to improve students' understanding of the material. As a result, some courses with four or five lecture contact hours will carry only three or four credit hours for the lecture portion of the course. Lecture sessions are normally 50 minutes long and typically represent one hour of credit for each 50 minutes the class meets in a week. Two to four hours of laboratory work per week are typically equivalent to one hour of credit. In order to make satisfactory progress towards graduation in 4 years, undergraduate students should enroll in 15 – 18 credit hours each semester. Students wishing to enroll in 19 or more credit hours in a given semester must obtain written approval from the Provost (or designee). Students on Academic Probation cannot take more than 15 credit hours in a fall or spring semester.

On average, each hour of lecture requires at least two hours of preparation outside of class.

Honor List

A degree-seeking student will be placed on the semester Honor List if he/she satisfies the following requirements for a particular semester:

- The student has entered a degree program;
- The student has earned at least 15 hours in that semester;
- The student has a semester GPA of 3.50 or higher; and
- The student has no grades of incomplete (INC) for that semester.

Graduation Requirements

Catalog of Record

For the purpose of academic standing and verification that all graduation requirements have been met, the Catalog of Record is either that of the academic year the student entered the Major or the academic year the student graduates. Under certain circumstances, a course substitution may be allowed. If approved, the "Course Substitution" Form is submitted to the Registrar Office in order to update the student's degree audit in Academic Management System (CAMS). All substitutions must be approved by the student's degree program and the Provost (or designee). The Petroleum Institute reserves the right to make changes in academic regulations, policies and offerings as circumstances may require.

Time Limit on Study

A student must satisfy all graduation requirements within six years of the first enrolment at the Petroleum Institute as a degree student.

Graduation Requirements

In order to obtain a baccalaureate degree at the Petroleum Institute, students must meet all of the requirements outlined below.

- Students must successfully meet the following requirements to complete the requirements for a bachelor's degree:
    - Complete all coursework in degree program sequence as published in the student's academic catalog of record within six years of first enrollment at the Petroleum Institute as a degree student.
    - Have a minimum cumulative grade point average of 2.00 for all academic work completed in residence (excluding Advanced University Placement courses).
    - Complete a minimum of 50 percent of the academic credit applied toward graduation from courses taken at the Petroleum Institute.
    - Have a minimum cumulative grade point average of 2.00 for all courses either having the subject code of the candidate's major program or being used to satisfy technical elective requirements in the program.
    - Have a minimum of 30 credit hours in 300 and 400 level courses earned in residence at the Petroleum Institute with at least 15 of which taken with Senior standing of which at least 15 credits are in the major.
    - The certification by the Registrar Office that all required academic work is satisfactorily completed.
- Recommendation by the faculty and approval of the Governing Board.
- The grade point average to be computed for graduation purposes shall be based on work for which a student has registered with the following exceptions:
    - Courses from which a student has withdrawn.
    - Courses in the Advanced University Placement Department.
    - Courses taken on a Credit/No Credit basis where credit is earned.
    - Transfer and non-traditional credit from other Institutions.
    - This policy pertains only to the grade point average required for graduation and does not pertain to the grade point average calculated for special academic recognition, graduation honors, admissions requirements for particular programs, or any other academic related standards.

Academic Rules and Regulations

Definition of Student Class Level	
Advanced University Placement (AUP) Student	enrolled in any course below 100 level
Degree Student	enrolled in degree courses
Freshman	0-29 earned credit hours
Sophomore	30 - 59 earned credit hours
Junior	60 - 89 earned credit hours
Senior	≥90 earned credit hours
Non-Degree Student	enrolled in a degree course but not proceeding towards a degree

Full Time Enrollment

Students are required to register for at least 12 credits (12 credits is defined as full-time) each fall and spring semester unless they receive special permission from the Provost (or designee). Full-time registration in fall and spring semesters is necessary to maintain progress towards graduation. In order to ensure timely graduation, please follow to the appropriate program of study listed in the catalog. For the summer session, students are allowed to register for a maximum of two courses. Only one of the two courses may carry a lab component. Students registered for an Internship are not allowed to register for any additional courses.

Academic Standing

At the end of each regular semester, a degree student's academic standing is assessed based on the accumulated total quality hours, cumulative grade point average (CGPA), and the semester grade point average (SGPA). A minimum semester (SGPA) and cumulative (CGPA) grade point average to maintain satisfactory progress toward graduation is detailed below:

Good Standing: Maintain a CGPA and SGPA of at least 2.0 with 12 earned semester credit hours unless less credit hours are approved by Provost (or designee).

Academic Warning: Any semester, in which a student's SGPA or CGPA falls below 2.0 or the student fails to complete 12 credit hours (unless less credit hours are approved by Provost or designee), the student will be placed on "Academic Warning". Academic Warning does not appear on the student's permanent academic record. After "Academic Warning", a student returns to "Good Standing" by completing 12 or more credit hours, achieving a minimum SGPA of 2.0 and a CGPA of 2.0.

Academic Probation: If during the next semester of enrollment after receiving "Academic Warning" a student's SGPA or CGPA is below 2.0 or he/she fails to complete at least 12 credit hours (unless less credit hours are approved by Provost or designee), the student is placed on "Academic Probation". Such a student must consult with an academic advisor and may register for no more than 13 credit hours for the next semester of enrollment or 4 credit hours in a summer session. Students placed on academic probation will not be allowed to add or drop courses, or register, without the approval of their academic advisor. "Academic Probation" will appear on the student's permanent academic record. The Registrar Office will notify the student, guardian, and sponsor of the student's probation status. The notice will include a requirement for the student to meet with his/her academic advisor no later than early registration period.

One of the below outcomes will occur at the end of a regular semester in which a student is on "Academic Probation":

- If the SGPA and CGPA is 2.0 or greater, the student will be returned to "Good Standing" and follow the appropriate rules therein.

- If the CGPA is less than 2.0 and the SGPA is 2.0 or greater, the student will continue on "Academic Probation."
- If both the SGPA and CGPA are less than 2.0, the student shall be suspended. However, this sanction will not be applied at the end of a summer session.

Students with Junior and Senior status will be placed on "Academic Probation" any regular semester in which the cumulative grade point average falls below 2.0.

Suspension: A student on "Academic Probation" who fails to achieve a SGPA or CGPA of 2.0 or successfully complete at least 12 credit hours will be suspended for one semester unless less credit hours were approved by the Provost (or designee). A suspended student is not eligible to attend the Petroleum Institute during the period of suspension nor will credits taken at other schools during this period be accepted by the Institute. A student may enroll in classes at the Petroleum Institute after the suspension by submitting a "Resume Studies" Form to the Registrar Office. The Academic Appeals Committee (AAC) will review the permission to "Resume Studies" request and make its recommendations to the Provost (or designee). If approved, the student will be placed on "Academic Probation" and will follow the appropriate rules therein.

Dismissal: A student returning from a "Suspension" will be dismissed from the Petroleum Institute if achieving a SGPA below 2.0 or failing to successfully complete 12 credit hours in any semester unless less credit hours were approved by the Provost (or designee).

Student Appeals: The Academic Appeals Committee reviews student appeals in regards to academic and financial issues and make its recommendations to the Provost (or designee). The following details the appeals process.

- Appeals must be submitted in writing to the Internship and Counseling Office. The deadline for submitting an Academic Appeal is the first day of classes in the following semester.
- The Academic Appeals Committee will review all appeals no later than a week following the submission deadlines. All recommendations are forwarded to the Provost for approval no later than one week from the date the appeal was submitted.
- Results of the appeal will be given to the student in writing by the Internship and Counseling Office, and a copy of the final decision will be placed in the student's file.

Decisions of the Academic Appeals Committee are final.

Withdrawal from a Course

Students may withdraw from a degree course during the official add/drop period without any record of enrollment in the course appearing on their transcript. Students may withdraw from any degree course during the official withdrawal period. A grade of "W" will be reflected on the student's official academic record.

Students cannot withdraw from individual Advanced University Placement courses except in the case of withdrawal from all courses. Students may withdraw from all Advanced University Placement courses during the official add/drop period without any record of enrollment in the courses appearing on their transcript. Students may withdraw from all Advanced University Placement courses during the official withdrawal period with a grade of "W" in each course.

Students considering withdrawing from any course should discuss the decision with their instructor and academic advisor or with a student counselor. Students should be aware that withdrawing from a course may have an impact on their scholarship terms and timely progress toward graduation.

"Course Add/Drop" Forms are available from the Registrar Office.

Return after a Missed Semester, Full Withdrawal from a Semester, Suspension or Dismissal

Students who have missed a regular semester, voluntarily withdrawn for a semester or have been suspended do not have an automatic right to return to the Petroleum Institute. All requests for re-admission following a missed fall or spring semester, voluntary withdrawal from all courses, a period of suspension, or an appeal of a dismissal must be submitted to the Registrar Office on a "Request to Resume Studies" Form. These are available from the Registrar Office.

A student who has been dismissed must also submit a letter which states clearly the reason(s) why he/she should be readmitted. Appeals for readmission after dismissal will be considered by the Academic Appeals Committee on a case-by-case basis. Factors which may be taken into consideration include the student's previous PI academic record, attendance record, disciplinary issues, relevant medical information, evidence of ability to succeed, the duration of the student's absence, and any other information which the student or the committee feels is relevant. It is the student's responsibility to demonstrate to the satisfaction of the Academic Appeals Committee that he/she has both the motivation and the ability to succeed at the Petroleum Institute.

Final Examination Policy

A final examination shall be held at the end of undergraduate courses according to the examination schedule published by the Registrar Office. In order to reduce scheduling conflicts, final examinations are scheduled in accordance with a pre-established template by the Registrar Office.

- There should be at least one study-day prior to the first day of final examinations.
- The last day of final examination period is designated as Make-Up Examination Day. Students with scheduling conflicts or with permission for rescheduling a final examination may sit the examination on this day.
- If a student is scheduled for more than two final examinations on one day, then he/she must notify the Registrar Office within five days from the publication of the Final examination Schedule to make the necessary adjustment to his/her schedule.
- A student who is absent from a final examination without a valid excuse will normally receive a "zero" for that examination. If a valid excuse is accepted by the instructor, the policies on incompletes or change of grade will apply.

In addition to the final examinations, one or more major examinations may be planned for a course. The examination schedule shall be included in the course syllabus. Such examinations shall not be scheduled during the last week of classes. The course instructor is responsible for notifying students in writing of any change in these examination schedules prior to the scheduled examination.

A student who is absent from a major examination without a valid excuse will normally receive a "zero" for the examination. If a valid excuse is accepted by the instructor, then a make-up examination must be scheduled at a time and place that is mutually agreeable to the instructor and student. The make-up examination timing will not be scheduled during the student's regularly scheduled classes.

The following general rules govern all in-class examination, unless a course instructor has specified other rules regarding his/her examination. Students shall:

- Arrive on time for the examination or they may be denied access. However, in no case shall a student who is 30 minutes or more late for the examination be admitted.
- Not be permitted to leave the first 30 minutes of the examination.
- Leave all unauthorized materials (textbooks, notes, electronic devises, bags, etc.) at the front of the examination room.
- Conform to seating arrangement as established by the proctor(s).
- Cease to talk once seated in the examination room and for the duration of the examination.
- Leave the examination paper/book face down until the proctor announces the beginning of the examination.
- Keep the examination paper/book flat on the desk at all times.
- Keep the examination paper/book stapled or bound.
- Be prepared to show current PI ID.
- Follow all instruction given by the proctor(s).

Students failing to follow the above general rules may be requested by the proctor(s) to leave the examination room. Their examination paper/book may be confiscated and a "zero" assigned for the examination. The proctor(s) or instructor(s) may refer the student to the Academic Honor Council.

The Registrar Office shall publish the above general rules in conjunction with the final examination schedule.

All examinations submitted to the course instructor must be the sole work of the student unless

otherwise specified by the instructor. During an examination, students must refrain from communicating with other students or relying on books, notebooks unless prior approval was obtained from the instructor. All cases of suspected cheating are governed by the PI policy on Academic Integrity.

Rules of Conduct

Academic Integrity

The faculty, administration, and students of the Petroleum Institute have a responsibility for establishing, maintaining, and fostering an understanding for and an appreciation of the principles of academic integrity. Instructors in all classes will clearly define where independent work is required and situations where group work is acceptable.

In many cases, learning situations in and outside of class where students help each other are acceptable and in fact will be encouraged. However, in cases where the instructor defines that individual work is required, it is a violation of academic integrity to offer help to or accept help from others or to use the work of others and claim the work as one's own. In any set of circumstances where the student is unsure of this policy, it is the student's responsibility to resolve this issue before the work is turned in or the examination is taken.

Attendance

Regular class attendance is an important component of the learning process. Students are expected to attend all classes and on time. It is the responsibility of the course instructor to inform each class at the beginning of the semester of the nature of in-class participation expected and the effect of absences and missed class work on the evaluation of the student's work in the course. Each course instructor should develop a particular attendance metric demonstrating how absence will affect the overall course grade. This guidance will also be stated in the course syllabus.

Excused Absence: Excused absences from class may be allowed under special circumstances such as medical reasons, personal or family emergencies, or participation in PI activities at the request of PI authorities. In the case of absence due to a medical condition, the student is required to submit a physician's report to a student counselor in order to obtain permission to make up any course requirements that have been missed. Students with medical reasons and/or personal emergency must contact the Office of Student Affairs within seven calendar days from the date of the event. Students participating in PI-sponsored activities must receive prior approval by a Program Chair or Student Affairs. Notifications of excused absences will be sent to the appropriate faculty by Student Affairs.

Unexcused Absence: As stated above, each course instructor will apply an attendance metric that affects the overall course grade. It is at the faculty's discretion that work missed due to unexcused absences may or may not be made up by the student.

Absence may effect a student's scholarship terms. Sponsors may apply an attendance policy requirement independent of this policy.

Classroom Expulsion

In order to maintain a positive learning environment, rude, disruptive, and inconsiderate behavior by students in class will not be tolerated. Students are required to be present and ready to begin class promptly on the hour, and should plan other activities and transit time between classes accordingly. Students who are chronically late to class or disruptive in other ways are subject to removal from class following one warning by the instructor. Any work missed because of a student's removal from class cannot be made up and will be assigned a score of zero. Students who repeatedly disrupt the class are subject to permanent removal from the course following consultation with the Provost (or designee).

Electronic Devices

Electronic devices including mobile phones must be turned off when entering the PI academic facilities. They are not to be used during class.

Student Complaints

The PI is committed to providing fair and equitable treatment for all students. In the event that a student develops concerns regarding his/her treatment at the PI, they are encouraged to contact to the Student Affairs Director where they will be referred to a student counselor for assistance. The

student counselor will recommend appropriate steps to deal with the issue. Some complaints are best handled with the student counselor acting as an advocate for the student and attempting to resolve the matter with the appropriate person or body. On other occasions, students may be advised to talk with a given faculty member or a program chair Some issues where there is no immediate resolution may require the student to implement a formal appeals process.

Academic Appeals Committee (AAC)

Students who feel that a rule or regulation was applied unfairly may submit an appeal in writing. Appeals will be considered by the Academic Appeals Committee. The appeal should be accompanied by relevant evidence, such as a letter from a medical doctor or official documentation. When considering an appeal, the Academic Appeals Committee may take into consideration the student's total academic record, attendance record or any other information on file which will assist them in reaching a fair decision. Probation may not be appealed.

The Academic Appeals Committee consists of five members drawn from the teaching and student affairs staff. Members, appointed by the Provost beginning of each academic year, serve for one year. A member is eligible to serve for more than one term. A minimum of three members is sufficient to consider any appeal. Decisions of the Academic Appeals Committee are final.

The Internship and Counseling Office will communicate the results of the appeal to the student in writing and a copy of all documents will be placed in the student's file.

Honor Code

The Petroleum Institute is an academic community whose purpose is the pursuit of knowledge and the development of its graduates as leading experts in their academic disciplines. In light of this purpose, it is essential that all members of this community are committed to the principles of truth and academic honesty. To maintain the highest level of academic integrity, this policy defines the standards to which the Institute expects its students to adhere.

Responsibility to Uphold the Honor Code: It is the responsibility of all members of this academic community – students, faculty, and staff alike – to actively deter and report all instances of academic dishonesty in order to safeguard the academic standards of the Institute.

Honor Pledge: The Honor Pledge is a short statement attesting that each student will fully comply with the Petroleum Institute's Honor Code. The Honor Code is published in Arabic and English. It is the students' responsibility to familiarize themselves with the Institute's Honor Code and adhere to it. Every student admitted to the Petroleum Institute will sign the Honor Pledge and receive a copy of the Honor Code upon signing their contract in the Admission Office.

The Honor Pledge is as follows:

"I verify that I have received a copy of the Petroleum Institute's Honor Code and hereby pledge to fully comply with the Code."

_____

Student Signature

Honor Pledge Reaffirmation: The Honor Pledge Reaffirmation is a short statement attesting that each assignment, exercise, examination, project, presentation, report, etc. is the student's own work. It is a reminder to the students that the Institute is committed to academic integrity. The faculty is expected to enforce the use of the pledge. The Honor Pledge Reaffirmation should be typed or handwritten and signed on all graded work submitted in the form of a hard copy; it should be included on electronically submitted work as well, where its inclusion will count as a signature.

The Honor Pledge Reaffirmation is as follows:

"I pledge that I have neither given nor received any unauthorized assistance whatsoever on this academic assignment, exercise, examination, project, presentation, report, etc.".

_____

Student Signature

Academic Honor Council

- The Academic Honor Council (AHC) is appointed by the Provost with no special limits on the length of service.
- The AHC will consist of six (6) members with the chair being appointed by the Provost:
  - Three (3) faculty members including at least one female (voting)
  - One (1) staff member (voting)
  - The Student Council President or designee - female/male (voting)
  - Director of Student Affairs or designee (non-voting)
- The AHC will be charged with maintaining the highest level of academic integrity at the Institute, and deliberating cases of suspected academic violations.

Procedure to Report and Investigate Academic Dishonesty for Minor Violations

- If an instructor suspects that a student has committed a minor violation, s/he should meet with the student to discuss the allegation. The meeting must take place within three (3) working days from when the alleged violation took place.
- If the instructor determines that no academic violation has occurred, the matter is dropped.
- If the instructor determines that a minor violation has occurred, s/he shall:
  - Apply a sanction, if any, in accordance with the "Possible Sanctions for Violations" terms listed below.
  - Notify the student, Program Chair and Internship and Counseling Office of the violation and sanction applied, if any, within two (2) working days from when the meeting with the student took place.
  - Submit a report to the Internship and Counseling Office, with a copy to the Program Chair.
- The third minor violation documented with the Internship and Counseling Office will be referred to the AHC.

Procedure to Report and Investigate Academic Dishonesty for Major Violations

- If an instructor suspects that a student has committed a major violation, s/he should meet with the student to discuss the allegation. The meeting must take place within three (3) working days from when the alleged violation took place.
- If the instructor determines that no academic violation has occurred, the matter is dropped.
- If the instructor determines that a major violation has occurred, s/he shall notify the student, Program Chair and Internship and Counseling Office within two (2) working days from when the meeting with the student took place.
  - All major violations will be referred to the AHC.
  - Student Affairs: Upon receiving the case:
    - The Director of Student Affairs will assign a Representative to the case who will interview the relevant persons. The Representative may not be a member of the AHC.
    - The Representative will gather the evidence and present it, in writing, to the AHC.
    - AHC: Upon receiving the case:

- The AHC will hold a meeting with the Representative and, if necessary, the student and/or instructor for the purpose of examining the evidence and questioning any witnesses or relevant parties.
- Based on the evidence, if the AHC decides that the student has committed the academic violation, they will determine an appropriate sanction. The AHC may impose any sanctions in accordance with the "Possible Sanctions for Violations" terms listed below.
- The Internship and Counseling Office will communicate the AHC decision to the student and instructor no later than five (5) working days from when the AHC received the case. The AHC is required to submit a full report to the Provost (or designee) with a copy to the Internship and Counseling, and the Registrar Offices.

During an Academic Dishonesty Investigation

- A student under investigation for an allegation of an academic violation may not withdraw from the course in question.
- A student may not graduate as long as any allegation of an academic violation remains unresolved.
- Unavailability of any of the concerned parties will not hinder the continuation of the investigation.
- Students may seek advice about the Academic Integrity Policy and its procedures from the Internship and Counseling Office.

Possible Sanctions for Violations

- Reduced grade or 0 for the work: Opportunistic cheating in minor assignments, exercises, examinations, projects, presentations, reports, etc.
- Reduction in course grade by one letter grade: Premeditated cheating in minor assignments, exercises, examinations, projects, presentations, reports, etc.
- XF or reduction in grade for the course: Opportunistic cheating in major assignments, exercises, examinations, projects, presentations, reports, etc. A student may appeal an XF grade recorded two years earlier in accordance with the appeals process stated in this policy.
- Suspension for one semester and an XF for the course: Premeditated cheating in final or major assignments, exercises, examinations, projects, presentations, reports, etc. A student may appeal an XF grade recorded two years earlier in accordance with the appeals process stated in this policy.
- Expulsion from PI: Premeditated cheating in final or major assignments, exercises, examinations, projects, presentations, reports, etc.

Suspension from the Institute

- A student found guilty of academic dishonesty may be suspended for one or more semesters. The AHC will determine the length of suspension.
- Once imposed, the AHC will recommend the effective date for suspension, which could be immediate.
- If suspended during an academic semester, the student will receive a grade of XF (Failure due to Academic Dishonesty) for the concerned course and a WI (Withdrawal Involuntarily-Terminated) for all remaining courses.
- The Institute will report the case to the student's guardian and sponsor.

Appeals

If a student wishes to appeal the instructor's or AHC's decisions, s/he must comply with the following:

- All appeals must be in writing and provide new information not considered previously.
- Appeals regarding minor violations must be submitted to the Internship and Counseling Office within three (3) working days from the decision date of the instructor. The AHC will review, deliberate as needed, and decide on the case within three (3) days from receiving the case. The AHC's decision is final.
- Appeals regarding major violations must be submitted to the Internship and Counseling Office within five (5) working days from the decision date of the AHC. The Provost will review, deliberate as needed, and decide on the case within five (5) working days from receiving the case. The Provost's decision is final.

Record of Sanctions

- All records of sanction for all cases will be kept in the Internship and Counseling Office.
- A record of any sanction requiring action by the Registrar Office will be placed in the student's file at the Registrar Office.
- In every case the Institute will provide a record of the sanction to the student's guardian and sponsor.

Academic Units and Curricula

Academic Environment

The academic environment at the Petroleum Institute is exciting because of the interaction of students with experienced professors and instructors, many of whom have worked in the petroleum industry, and because students are learning in state-of-the-art facilities. Students also meet other students who will become lifelong professional friends. The academic environment is challenging, as expected at a first-class engineering institution, and different from that which most UAE students have experienced in secondary schools.

All classes are conducted in English, and students start with the AUP (Advanced University Placement) which is a rigorous one-year program designed to enable students to develop the study skills, work habits and attitudes students need in order to study successfully at a world-class engineering university. Students have the opportunity to gain university credit for courses in mathematics, chemistry and physics. English language skills will also be developed to meet PI requirements. Students are also required to take computing courses which will assist them in their future studies. The AUP Department will also help students in developing the necessary integrity and personal and interpersonal skills to become successful students and engineers. Courses are designed to develop autonomous learners and provide them with a general understanding of the oil and gas industry. Upon successful completion of the AUP, students move to the degree program.

Students in the engineering programs learn the fundamentals of engineering and science in large part by solving practical engineering problems and in petroleum-related projects, working either individually or in groups. Subjects are interrelated and students integrate knowledge gained in one course with that gained in others. Students average 5 or more contact hours a day with faculty in the classroom and are expected to devote 3-4 hours each day on homework including weekends. Grades are based on mid-term and final examinations, periodic in-class tests, homework, individual and group projects, laboratory exercises, class participation, and attendance. Refer to the syllabus for specific course requirements.

General Education Requirements

The General Education courses are designed to provide students with the basic knowledge in chemistry, mathematics and physics. It is also intended to broaden the curriculum by exposing students to topics in communications, humanities and social sciences. The goal is to better understand the many non-technical disciplines and develop an appreciation of economic factors, history, aesthetics, ethics, and societal and global impact of engineering practice. Along with their discipline study, the general education component helps students develop essential leadership and communication skills, improve writing and computer literacy skills, and enhance their ability to work in teams and think critically.

The Petroleum Institute requires undergraduate students to complete the following courses in general education requirements for a total of 56 credits:

CHEM 131 General Chemistry I

COMM101 Communication I

COMM 151 Communication II

COMP 100 Freshman Computing Applications

ENGR 103 Freshman Success Seminar

ENGR 498 Professional Examination Preparation

HFIT 101 Personal Health and Fitness I

HFIT 102 Personal Health and Fitness II

H&SS 111 Islamic Studies

H&SS 251 Principles of Economics

H&SS XXX Humanities and Social Sciences Elective I

H&SS XXX Humanities and Social Sciences Elective II

MATH 111 Calculus I

MATH 161 Calculus II

MATH 212 Calculus III

PEEG 151 Overview of the Petroleum Industry

PHYS 191 Physics I – Mechanics

PHYS 241 Physics II – Electromagnetism and Optics

STPS 201 Strategies for Team-Based Engineering Problem Solving I

STPS 251 Strategies for Team-Based Engineering Problem Solving II

Electives

Each degree program requires its students to complete at least 3 credits in a major elective course and/or technical elective course. A major elective course is an elective course offered through the program of study. A technical elective course is an elective course offered outside the program of study. For a complete listing of the major elective courses and technical elective courses, and the total number of electives required, refer to the individual program of study in this document.

Internship and Field Experience

A summer practical training program is required for all undergraduate students at the Petroleum Institute. The purpose of the program is to introduce our students to the petroleum industry, and to interweave theory and practice in an actual workplace setting.

For Junior engineering students, the objective of the mandatory 8-week Summer Internship Program is to provide them with valuable work experience in their selected engineering discipline. Students are placed under the direct supervision of a Mentor in the ADNOC group of companies, or with one of the international stakeholders. The Intern is given a significant individual engineering project in a discipline-specific environment. The nature of the work assignment is tailored to the student's intellectual development level, and involves actual engineering project work including, where possible, collection and synthesis of data, analysis, and reporting. The Intern also has a PI Faculty Advisor, who is required to interface with the student and the mentor periodically to assess progress and respond to questions. An engineering report is required at the completion of the internship; this report becomes part of the student's permanent record at the PI and is used as input into the Program's assessment process. A formal evaluation of the student is carried out by the Faculty Advisor at the conclusion of the internship; this information is also be used as part of the Academic Assessment Program.

For Junior Petroleum Geosciences students, a mandatory Field Work Program is required in Italy and Oman for a total of 30 days.

Women in Science and Engineering Program

The mission of the Women in Science and Engineering Program (WISE) is to promote women's education attainment, professional aspirations, social responsibility and personal growth. The Program aspires to develop successful female engineers and scientists who make meaningful contributions to the profession and society at large. The Program was founded in fall 2006 and aims to:

- Inspire lifelong learning.
- Foster leadership skills.
- Encourage civic involvement.
- Promote engagement in applied sciences and engineering.

To meet these goals, a correlated set of objectives is established to ensure proper planning and effective implementation. These include:

- Provide for opportunities that aim at academic involvement, research activities and continuous learning.
- Encourage participation in extra-curricula activities that emphasize a balanced learning experience, leadership and collaborative work.
- Expose students to role models and inspiring individuals who promote women's active involvement in the workforce and society at large.
- Advocate involvement in community-related activities and outreach programs.
- Promote sustainable practices and ethical conduct in all actions.
- Engage in professional activities that highlight women's contributions in the fields of applied sciences and engineering.

Advanced University Placement

The mission of the Advanced University Placement (AUP) Department is to provide an educational culture of personal development, academic excellence and practical competence in English, Mathematics, Physics, Chemistry, and Computing to enable students to successfully pursue Freshman studies at the Petroleum Institute and have an opportunity to gain credits towards graduation requirements. The department includes the following units: English, Advanced Placement, and Computing.

English Unit

The mission of the English Unit is to provide learners with opportunities to achieve a sufficient proficiency in academic and scientific English to succeed in their undergraduate studies. Because of the PI's emphasis on measurable achievements and the practical application of scientific knowledge, the framework of the English Unit curriculum is outcome-based. After completing the English Unit curriculum, students will have sufficient English skills to be able to:

- Listen to and take notes on texts of up to 20 minutes
- Speak clearly in class seminars and team presentations for up to 15 minutes each and field questions appropriately, using notes, relevant graphics and handouts.
- Read and extract general concepts and specific facts, stated or inferred, from texts of approximately 1600 words.
- Write a variety of texts (prose, bulleted and graphic) of approximately 250 to 500 words using notes, reference material and own background knowledge/experience.

The English Unit facilities include fully-equipped language classrooms, two computer laboratories, and a teacher's resource room. Each classroom is equipped with overhead projectors, smart boards and visualizers (in Arzanah Building), white boards, bulletin boards, computers, and overhead projectors.

The English Unit offers the following courses in 8- week modules:

ENGL 031 AUP Module 1 English	(12 hours/week)
ENGL 032 AUP Module 2 English	(12 hours/week)
ENGL 033 AUP Module 3 English	(12 hours/week)
ENGL 034 AUP Module 4 English	(12 hours/week)
ENGL 035 AUP Module 5 English	(12 hours/week)
ENGL 036 AUP University English Readiness Module TOEFL score of 500> or IELTS of 5.5 >)	(6 hours/week - for students with a
ENGL 099 advanced Toefl Preparation	

In addition all the students enrolled in ENGL 031-035 receive an extra 3 hour/week of AP Language Support Course.

Advanced Placement Unit

The mission of the Advanced Placement Unit (AP) is to provide students with a comprehensive, engaging and challenging experience that facilitates the effective learning of Mathematics, Physics and Chemistry in preparation for successful undergraduate studies in the fields of Science, Mathematics and Engineering. Students may also have an opportunity to gain credits towards degree requirements. The objectives of the Advanced Placement Unit are:

- Develop critical thinking and (applied) problem solving skills
- Develop English language proficiency within the context areas of Physics, Chemistry and Mathematics.
- Enhance student communication and study skills.
- Develop in students a sound theoretical and applied knowledge base for further studies.
- Develop student skills in laboratory techniques and procedures and enhance awareness of safety protocols.
- Provide a system of assessment in Mathematics, Physics, and Chemistry which will allow for international accreditation and accelerated progression.

The science facilities include four laboratories (2 Chemistry and 2 Physics) and associated

equipments located in Arzanah and Zarkuh Buildings as well as access to the College of Arts and Sciences laboratories.

The Advanced Placement Unit offers the following courses:

CALC 010 AP Calculus1	(5 hours/week)
CALC 011 AP Calculus 2	(5 hours/week)
CHEM 030 AP Chemistry 1	(8 hours/week)
CHEM 031 AP Chemistry 2	(8 hours/week)
CHEM 034 AUP Chemistry 1	(4 hours/week on average)
CHEM 035 AUP Chemistry 2	(4 hours/week on average)
PHYS 090 AP Physics 1	(8 hours/week)
PHYS 091 AP Physics 2	(8 hours/week)
PHYS 094 AUP Physics 1	(3 hours/week on average)
PHYS 095 AUP Physics 1	(3 hours/week on average)

Computing Unit

The mission of the Computing Unit is to provide learners with opportunities to achieve a sufficient proficiency in computing applications and programming in preparation for their undergraduate studies at the Petroleum Institute. After completing the computing courses, students will have sufficient knowledge and skills to be able to:

- Use spreadsheet programs to gather and present data as well as analyze and solve problems.
- Use word processing programs to write professional looking documents.
- Use presentation programs to communicate effectively with an audience.
- Create simple computer programs using Visual Basic for Applications.
- Use the Internet and social networking sites to gather data and communicate effectively.
- Understand how hardware and software work together to make a computer an effective communication, data gathering and entertainment tool.
- Use a keyboard correctly and effectively to type 30 words a minute.

The Computing Unit facilities include 5 fully-equipped computer laboratories located in Arzanah and Zarkuh Buildings. Each laboratory is equipped with 20 computers with flat screens, overhead projectors, white boards, bulletin boards and a printer. In addition several of the laboratories are equipped with smart boards.

The Computing Unit offers the following courses in 16-week modules:

COMP 030 Computing Applications 1	(3 hours/week)
COMP 031 Computing Applications 2	(3 hours/week)
COMP 100 Freshman Computing Applications	(3 hours/week)

Independent Learning Center

The mission of the Independent Learning Center is to provide AUP students with opportunities for both content subject learning and English language learning, supporting their coursework, project work and research and assisting them over the course of their academic studies to develop as independent learners with the ability to identify their own learning needs and select the means to fulfill them. Within this context, the ILC provides a firm foundation for life-long learning and access to a knowledge-base that enhances the ability of their users to operate optimally within the petroleum industry.

The Independent Learning Center:

- incorporate the PI's Mathematics Learning Support Center (located in the Bu Hasa Building), a drop-in facility managed by faculty volunteers, which provides an alternative type of environment combined with tutorial support designed to assist all PI students - including AUP students - in their learning of mathematics and the development of their math skills;
- provide users with collections of learning materials and guidance that supports excellence in all their study and research;
- provide language support, reference services and educational guidance;

- incorporate the use of technology and educational innovation in order to facilitate each stage of our students' learning process;
- provide users with a functional, well-resourced environment that is conducive to study, learning and research.

There are two ILC facilities located in Arzanah and Bu Hasa Buildings. Together they include:

- Computers – Fifty computers with internet access and printer- and scanner-linked.
- Listening Stations – students on both campuses can listen to audio cassettes and CDs on high-quality equipment. The listening collection includes audio books, recordings of graded readers, listening and pronunciation practice materials.
- Viewing Stations – The ILCs' viewing collection includes selected feature films, history documentaries, video lessons in science and mathematics, and business training films. Students can also watch English language teaching DVDs and VHS cassettes.
- Project Rooms - for students who need a quiet place to plan study and discuss, the ILCs offer excellent private work spaces or offices.
- An ILC Training Room – This room in the Bu Hasa Building offers enhanced resources for students who are working on presentations and need somewhere to practice. It is equipped with nine S710 Compaq computers, a Sharp Notevision Projector, a Polyvision electronic whiteboard, a V-710 g-imaging visualizer. Also available for use are a Philips Blackline TV and VHS Combi player, a Sanyo DVD player, and a classroom whiteboard.

Placement and Exit Requirements

All students sit for a placement exam in English, Mathematics, Physics, and Chemistry. In English, based on the results of the placement exam, students enroll in one of four (4) Modules (I, II, III, IV). Each module lasts 8 weeks. Students will have the chance to move up Modules every 8 weeks. In Mathematics and Sciences, again based on the results of the placement exam, students are placed in 3 AP (Advanced Placement) courses in Mathematics, Chemistry, and Physics or 2 APs in two sciences and a Foundation course in the third subject.

Students must obtain a minimum of C for all their individual courses. In English, students must obtain a C minimum to pass the Course. In addition, students need to achieve a TOEFL score of 500 and above to meet the Ministry of Higher Education requirements. In Mathematics and Sciences, the total grade for the AP courses (Mathematics, Physics, and Chemistry) will reflect partial credit based on performance on the external final exam administered by the College Board that students will take in the month of May.

Attendance

Classes begin promptly at the PI. Students are expected to arrive early, and attendance is taken at the start of the class. If a student arrives during the first five minutes of class, he/she will be marked late; after the first 5 minutes a student is considered absent. Teachers record only students who are physically present at the beginning of class. If students feel they should have an excused absence, they must discuss the case with Student Affairs. If they are unable to complete an assessment/assignment due to absence, students must get an official excuse from Student Affairs upon their return to class. The instructor will then provide extra time and a deadline to complete any missed assignments/class work. Failure to meet the deadline will result in not getting any credit for the assignment. If the proper paperwork is not submitted, students will receive no credit for any assignments, exams, laboratory work, projects or quizzes missed.

College of Arts and Sciences

The mission of the College of Arts and Sciences is to provide undergraduate students with a high quality education which supports their intellectual and practical development through academic excellence and scholarly activity. The College includes the following programs: Chemistry, Communication, Humanities and Social Sciences, Mathematics and Physics.

Chemistry Program

The mission of the Chemistry Program is to provide students with the fundamental knowledge and skills in chemistry that they will require for their engineering and sciences studies and subsequent careers. Its vision is to provide a focal point for chemistry, both in terms of teaching and research, within the PI and in the wider UAE community. The Chemistry Program goals are to:

- Establish a clearly defined role for chemistry within the Petroleum Institute.
- Enhance excellence in undergraduate teaching across campus.
- Promote research in chemistry.
- Enhance faculty and staff development.

The Chemistry Program has a number of state-of-the-art instructional laboratories including:

- General Chemistry laboratories with preparation and storage rooms (4)
- Organic Chemistry laboratories with gas chromatographs, gas chromatograph-mass spectrometers, Fourier Transform Infrared spectrometers, and one 60 MHz NMR (3)
- Access to a 400 MHz NMR spectrometer in the Chemical Engineering Program

The Chemistry Program contributes to courses for the general education requirements of the PI and technical electives for some of the majors. Courses offered include:

CHEM 131 General Chemistry I
CHEM 181 General Chemistry II
CHEM 201 Organic Chemistry I
CHEM 241 Organic Chemistry II
CHEM 301 Physical Chemistry
CHEM 293/393/493 Special Topics in Chemistry
CHEM 394/494 Research Topics in Chemistry
CHEM 396/496 Independent Study in Chemistry

Communication Program

The mission of the Communication Program is to provide PI undergraduate students and community with communication skills required for the 21st century in order that they become creative, critical and articulate professionals. Its vision is to:

- Develop the acculturation transition from secondary to higher education.
- Develop undergraduate language proficiency, communication skills and behavioral competencies.
- Encourage articulation of knowledge through investigation and research.
- Develop autonomous lifelong learners who are able to use higher order thinking and communication skills required by engineering professionals.
- Provide local and regional language services to the ADNOC community.
- Operate to the highest standards in order to be recognized as a center of excellence.

The Communication Program facilities include fully-equipped, dedicated classrooms, a computer laboratory, and two Communication Centers. Each classroom and communication center is well-equipped with networked computer workstations, an overhead projector, a wall-mounted screen, and a document reader, designed to support team work and the development of communication skills.

The Communication Program contributes to courses for the general education requirements of the PI. Courses offered include:

COMM 101 Communication I

COMM 151 Communication II
COMM 293/393/493 Special Topics in Communication
COMM 394/494 Research Topics in Communication
COMM 396/496 Independent Study in Communication

Humanities and Social Sciences Program

H&SS furthers life-long learning by promoting an awareness and understanding of human behavior expressed in students' histories, political and economic systems, faiths, oral and written languages and leadership behaviors in a manner that prepares them for further academic study, professional excellence and contributive citizenship,. H&SS produces innovative research in scholarly and professional media that contributes to an advanced understanding of specific topics within the sphere of H&SS. Its vision is to be a regionally recognized center of teaching and research excellence in the humanities and social sciences.

The Humanities and Social Sciences Program contributes to courses for the general education requirements of the PI. Courses offered include:
H&SS 111 Islamic Studies
H&SS 121 German Language I
H&SS 171 German Language II
H&SS 201 The West in the Middle East
H&SS 221 Introduction to Political Science
H&SS 222 The UAE Before and Since the Discovery of Oil
H&SS 251 Principles of Economics
H&SS 301 The Origins of the Two World Wars
H&SS 311 Leadership
H&SS 321 The Political Economy of Japan
H&SS 333 The History and Politics of the Middle East
H&SS 351 World Petroleum Markets
H&SS 373 Personal Financial Management
H&SS 375 The Economics of Money, Banking and Financial Markets
H&SS 293/393/493 Special Topics in Humanities and Social Sciences
H&SS 394/494 Research Topics in Humanities and Social Sciences
H&SS 396/496 Independent Study in Humanities and Social Sciences

Mathematics Program

The mission of the Mathematics Program serves the PI community through excellence in teaching, research and scholarly activities. Its vision is to be recognized for its contributions in teaching and research both at the national and international levels.

The Mathematics Program contributes to courses for the general education requirements of the PI and technical electives for some of the majors. Courses offered include:
MATH 111 Calculus I
MATH 161 Calculus II
MATH 212 Calculus III
MATH 241 Probability and Statistics for Engineers
MATH 261 Differential Equations
MATH 361 Engineering Mathematics
MATH 365 Numerical Methods
MATH 461 Linear Algebra
MATH 293/393/493 Special Topics in Mathematics
MATH 394/494 Research Topics in Mathematics
MATH 396/496 Independent Study in Mathematics

Physics Program

The mission of the Physics Program is to teach physics courses in innovative ways that will help PI students meet all the requirements for graduation and thereby contribute to their preparation for successful careers as engineers. Its vision is to be recognized within the PI and the wider community as a center for innovative teaching and excellence in research.

The Physics Program has a number of state-of-the-art instructional laboratories including:

- Electromagnetism and Optics Laboratories (2)
- Mechanics and Waves Laboratories (2)
- Modern Physics that allows student experiments such as Franck-Hertz experiment, Moseley's law and determination of the Rydberg constant using X-rays, determination of Planck's constant, Compton effect, conductivity in solids, etc.

The Physics Program contributes to courses for the general education requirements of the PI and technical electives for some of the majors. Courses offered include:

PHYS 191 Physics I - Mechanics
PHYS 241 Physics II – Electromagnetism and Optics
PHYS 341 Modern Physics with Applications
PHYS 293/393/493 Special Topics in Physics
PHYS 394/494 Research Topics in Physics
PHYS 396/496 Independent Study in Physics

Chemical Engineering Program

Bachelor of Science in Chemical Engineering

Mission and Description

The mission of the Chemical Engineering Program at the Petroleum Institute is to provide a world-class education in chemical engineering science and practice, and to produce graduates and future leaders who are capable of meeting or exceeding the needs and expectations of ADNOC, other allied sponsors, and the petroleum and hydrocarbon industry.

The field of chemical engineering deals with the science and engineering of chemical reactions and chemical separations. Accordingly, the degree program begins with basic studies in chemistry, including organic and physical chemistry, and the thermodynamic properties of fluids. The program continues with courses in basic chemical engineering calculations and advanced courses in fluid mechanics, mass and heat transfer, and transport phenomena. Studies in reactor design, and petroleum refining and gas processing are important components of the program as is the use of computer-aided process design and economic analysis of engineering projects. A key factor in the program is students' access to state-of-the-art laboratories in unit operations, reaction engineering, and control systems engineering, where small scale versions of common industrial equipment and instrumentation are presented in a pilot-plant setting.

Educational Objectives

Within the first few years after graduation, the career and professional accomplishments of the Chemical Engineering Program graduates are:

- Design new processes or optimizing existing processes.
- Provide optimal solutions to plant operating problems.
- Provide optimal solutions to product improvement or new product development problems.
- Continue personal and professional growth through self education.
- Meet or exceed expectations of the ADNOC group and corporate sponsors and employers in attaining technical, professional, and personal competencies.

Program Outcomes

On completion of the Chemical Engineering Program, graduates will be able to:

Outcome 1: Apply knowledge of the basic sciences (mathematics, chemistry, and physics) to the identification, formulation, and solution of chemical engineering problems [ABET Criterion 3a, e];
Outcome 2: Apply knowledge of chemical engineering science fundamentals to the identification, formulation, and solution of chemical engineering problems [ABET Criterion 3a, e];
Outcome 3: Use the computational tools necessary for chemical engineering practice [ABET Criterion 3k];
Outcome 4: Design and conduct experiments and process tests and analyze and interpret experimental data from these tests [ABET Criterion 3b];
Outcome 5: Solve open-ended problems that involve design and economic analysis of a process or system to meet specified requirements [ABET Criterion 3c, h];
Outcome 6: Function effectively in inter- and intra-disciplinary teams [ABET Criterion 3d];
Outcome 7: Demonstrate an awareness of professional and ethical responsibility and the impact of contemporary issues with relevance to global and regional issues [ABET Criterion 3c, f, h, j];
Outcome 8: Communicate effectively in English in both oral and written formats [ABET Criterion 3g];
Outcome 9: Engage in life-long learning and self-education [ABET Criterion 3i].

Program Facilities

The Chemical Engineering Program laboratories are located in the Arzanah and Ruwais buildings. These include:

- Catalysis Laboratory
- Computing Laboratory
- Instrumentation Laboratory

- Polymer Chemistry Laboratory
- Polymer Processing Laboratory
- Polymer Properties and Characterization Laboratory
- Reaction Engineering Laboratory
- Thermodynamics Laboratory
- Unit Operations Laboratory

Professional Chapters and Clubs

The Chemical Engineering Program supported the founding of the American Institute of Chemical Engineering (AIChE) Student Chapter in spring 2009. The aim of the chapter is to promote chemical engineering and establish a bridge between PI students and the professional community at large. AIChE holds regular meetings for its members and organizes social and technical activities open to all students.

Degree Requirements

The Chemical Engineering Program at the Petroleum Institute is designed to give students a rigorous education in the fundamentals of chemical engineering science, and specific training in applications of chemical engineering in the oil and gas industries. The program incorporates extensive laboratory work and computer process simulation in order to reinforce the principles and concepts used in the classroom. The program features a summer internship in industry where students will gain significant exposure to the petroleum processing industries in the Middle East or elsewhere in the world. The Chemical Engineering Program requires 136 credits to graduate distributed as follows: 56 credits in General Education Requirements, 71 credits in Major Requirements, and 9 credits in Electives of which at least 6 credits in Major Electives.

Program of Study for Chemical Engineering

Term	Course Code	Course Title	Credit
Freshman Year			
Fall	CHEG 131	General Chemistry I	4
	COMM 101	Communication I	4
	MATH 111	Calculus I	4
	PEEG 151	Overview of the Petroleum Industry	3
	ENGR 103	Freshman Success Seminar	1
	COMP 100	Freshman Computing Applications	0
	HFIT 101	Personal Health and Fitness I	0.5
	TOTAL		**16.5**
Spring	CHEG 181	General Chemistry II	4
	COMM 151	Communication II	4
	MATH 161	Calculus II	4
	PHYS 191	Physics I - Mechanics	4
	HFIT 102	Personal Health and Fitness II	0.5
	TOTAL		**16.5**
Sophomore Year			
Fall	CHEM 201	Organic Chemistry I	4
	MATH 212	Calculus III	3
	PHYS 241	Physics II – Electromagnetism and Optics	4
	STPS 201	Strategies for Team-Based Engineering Problem Solving I	3

	H&SS 251	Principles of Economics	3
	TOTAL		**17**
Spring	CHEM 241	Organic Chemistry II	4
	CHEG 200	Principles of Chemical Engineering	4
	CHEG 220	Computational Methods in Chemical Engineering	3
	MATH 261	Differential Equations	3
	H&SS 111	Islamic Studies	3
	TOTAL		**17**
Junior Year			
Fall	CHEG 301	Fluid Mechanics	3
	CHEG 322	Chemical Engineering Thermodynamics	3
	CHEG 331	Designed Experimentation and Statistical Process Control	3
	STPS 251	Strategies for Team-Based Engineering Problem Solving II	3
	H&SS XXX	Humanities and Social Sciences Elective I	3
	TECH XXX	Technical Elective	3
	TOTAL		**18**
Spring	CHEM 301	Physical Chemistry	4
	CHEG 351	Mass Transfer	3
	CHEG 361	Heat Transfer	3
	CHEG 333	Chemical Engineering Laboratory I	2
	H&SS XXX	Humanities and Social Sciences Elective II	3
	TOTAL		**15**
Summer	CHEG 397	Chemical Engineering Internship	**3**

Senior Year			
Fall	CHEG 401	Engineering Economics	3
	CHEG 411	Reaction Engineering	4
	CHEG 490	Chemical Engineering Design Project I	3
	CHEG 444	Chemical Engineering Laboratory II	2
	CHEG XXX	Major Elective I	3
	TOTAL		**15**
Spring	CHEG421	Petroleum Refining and Processing	3
	CHEG 461	Process Dynamics and Control	4
	CHEG 481	Gas Processing Engineering	3
	CHEG 491	Chemical Engineering Design Project II	3
	ENGR 498	Professional Examination Preparation	2
	CHEG XXX	Major Elective II	3
	TOTAL		**18**
	TOTAL CREDIT HOURS		**136**

Chemical Engineering Major Electives (at least 6 credits)			
	CHEG 325	Fundamentals of Nanotechnology	3
	CHEG/MEEG 380	Introduction to Polymer Science and Engineering	3
	CHEG 381	Polymer Chemistry and Reaction Engineering	3
	CHEG 415	Combustion and Air Pollution Control	3
	CHEG 416	Corrosion Engineering	3
	CHEG 470	Industrial Catalysis	3
	CHEG 472	Water Treatment and Membrane Processes	3
	CHEG 488	Polymer Properties	3
	CHEG 293/393/493	Special Topics in Chemical Engineering	1-4
	CHEG 394/494	Research Topics in Chemical Engineering	1-4
	CHEG 396/496	Independent Study in Chemical Engineering	1-6

Chemical Engineering Technical Electives (up to 3 credits)			
	ENGR 201	Statics	3
	ELEG 205	Electric Circuits I	4
	ELEG 206	Introduction to C++ Programming	3
	MEEG 324	Engineering Dynamics	3
	MEEG 334	Materials Science	3
	MEEG 344	Mechanics of Materials	3
	MEEG 454	Refrigeration/Air Conditioning and Cryogenics	3
	MEEG 459	Turbo Machinery	3
	MATH 361	Engineering Mathematics	3
	MATH 461	Linear Algebra	3
	PEEG 252	Statics and Strength of Materials	3
	PEEG 339	Overview of Petroleum Reservoir Engineering	3
	PEEG 342	Production Facilities	3
	PHYS 341	Modern Physics	3

- *Courses not on the list require approval from the Chemical Engineering Program Chair.*
- *For a list of H&SS Elective courses, refer to the College of Arts and Sciences section of this document.*

Electrical Engineering Program

Bachelor of Science in Electrical Engineering

Mission and Description

The mission of the Electrical Engineering Program is to provide a world-class education in electrical engineering with emphasis on power and control systems, and instrumentation engineering that prepares graduates for successful professional careers in ADNOC, other allied sponsors, and the broader energy industry. In addition, graduates will engage in life-long learning that will enable them to continue their education throughout their career.

The Electrical Engineering Program at the Petroleum Institute is designed to give students a sound education that covers the major subjects of electrical engineering and draws applications from the oil and gas industries. In their senior year, the electrical engineering students take a variety of courses in power engineering, which comprises power generation, transmission, and distribution systems, and in instrumentation and control, which involves instrumentation and measurements, modern control, computer control techniques, real-time programming, and industrial automation.

The electrical engineering curriculum combines strength in electrical engineering fundamentals with extensive laboratory experience to reinforce the principles and concepts used in classroom, design experiences to apply learned knowledge to solve representatives of real-world problems and an environment that stresses leadership and teamwork. In addition, the curriculum emphasizes the development of computer and oral and written communication skills of electrical engineering students.

The Electrical Engineering laboratories are equipped with state-of-the-art instrumentation components, development systems tools for teaching and research.

Educational Objectives

Consistent with the institutional vision and mission and those of the Electrical Engineering Program, with input from program constituencies, the faculty has adopted a number of educational objectives. The overall goal is to provide students with an outstanding learning environment and the necessary education so they will have the tools and resources to compete successfully in the global workplace or to pursue advanced studies. The program will strive to use novel technologies and methodologies for teaching. Within the first few years of graduation, the career and professional accomplishments of our Electrical Engineering Program graduates will be to:

- Communicate effectively in English and function well on teams;
- Demonstrate understanding of and practice professional attitudes and ethics within a global and societal context; and engage in lifelong learning.
- Succeed in pursuing a career or graduate studies in electrical engineering using appropriate theoretical and experimental, problem-solving, and design skills.
- Design new or improve power and/or control systems.
- Develop solutions to engineering problems utilizing diverse knowledge from a variety of sources.
- Function well and succeed in the future work environment with ADNOC Group and corporate sponsors through attainment of sponsors' competency targets.

Program Outcomes

On completion of the Electrical Engineering Program, graduates will be able to:

Outcome 1: Apply knowledge of the basic sciences (math, chemistry, and physics) and electrical engineering to identify, formulate, analyze/design, and solve Electrical Engineering problems [ABET Criterion 3a, e];

Outcome 2: Design and conduct experiments and process tests and analyze and interpret experimental data [ABET Criterion 3b];
Outcome 3: Use techniques, skills, and modern engineering tools [ABET Criterion 3k];
Outcome 4: Design a system, component, or process to meet certain needs [ABET Criterion 3c, h];
Outcome 5: Function effectively on intra and inter disciplinary teams [ABET Criterion 3d];

Outcome 6: Demonstrate an awareness of professional and ethical responsibility and of contemporary issues with relevance to global and regional issues [ABET Criteria 3h, c, f, j];
Outcome 7: Communicate effectively in English in oral, written, and graphical formats [ABET Criterion 3g];
Outcome 8: Demonstrate awareness of, and engage in, life-long learning and self-education [ABET Criterion 3i];
Outcome 9: Demonstrate knowledge of probability and statistics, and advanced mathematics, typically including differential equations, and linear algebra [ABET Criterion 3l].

Program Facilities

The Electrical Engineering Program laboratories are located in the Arzanah and Ruwais buildings. These laboratories include:

- Computing Laboratories (2)
- Digital and Microprocessing Laboratory
- Electric Circuits and Electronic Laboratories (2)
- Electric Machines Laboratory
- Electronics and Digital Laboratory
- Electronics Workshop
- Feedback Control Laboratories (2)
- High Voltage Laboratory (STI)
- Instrumentation and Measurement Laboratories (2)
- Power Electronics and Drives Laboratories (2)
- Power Distribution Laboratory
- Power Systems Laboratory
- Signals and Systems Laboratory

Professional Chapters and Clubs

The student chapter of the Electrical and Electronics Engineers (IEEE) and the IEEE Women Affinity Group were established in 2007 and 20008 respectively. Their purpose is to provide students with the opportunity to be actively involved in their professional society. The chapter raises awareness about the profession and provides students with leadership opportunities. The PI IEEE chapter is actively involved in local and regional events organizing lectures and field trips, participating in conference and competitions, and involved in social activities and community services. The IEEE student members have won several national and international awards for the design and community service projects and have actively participated in local, regional and international conferences.

Degree Requirements

The Electrical Engineering Program begins with basic studies in engineering science coupled with fundamental studies in electrical engineering. The program continues with advanced courses in power, and controls and instrumentations engineering. To reinforce the principles and concepts introduced in the classroom, the program incorporates extensive hands-on laboratory work, design experiences to apply learned knowledge to solve representatives of real-world problems, and an environment that stresses teamwork and leadership. In addition, the program emphasizes the development of computer, and oral and written communication skills. The Electrical Engineering Program features a summer internship in industry where students will gain significant exposure to the petroleum processing industries in the Middle East and elsewhere in the world. The Electrical Engineering Program requires 140 credits to graduate distributed as follows: 56 credits in General Education Requirements, 66 credits in Major Requirements, at least 12 credits in Major Electives (at the 400-level) and 6 credits in Technical Electives.

Program of Study for Electrical Engineering

Term	Course Code	Course Title	Credit
Freshman Year			
Fall	CHEM 131	General Chemistry I	4
	COMM 101	Communication I	4
	ENGR 103	Freshman Success Seminar	1
	MATH 111	Calculus I	4
	PEEG 151	Overview of the Petroleum Industry	3
	COMP 100	Freshman Computing Applications	0
	HFIT 101	Personal Health and Fitness I	0.5
	TOTAL		**16.5**
Spring	H&SS 111	Islamic Studies	3
	COMM 151	Communication II	4
	MATH 161	Calculus II	4
	PHYS 191	Physics I – Mechanics	4
	HFIT 102	Personal Health and Fitness II	0.5
	TOTAL		**15.5**
Sophomore Year			
Fall	ELEG 205	Electric Circuits I	4
	ELEG 206	Introduction to C++ Programming	3
	MATH 212	Calculus III	3
	PHYS 241	Physics II – Electromagnetism and Optics	4
	STPS 201	Strategies for Team-Based Engineering Problem Solving I	3
	TOTAL		**17**
Spring	ELEG 305	Electric Circuits II	4
	ELEG 380	Logic and Digital Design	4
	H&SS 251	Principles of Economics	3
	MATH 261	Differential Equations	3
	STPS 251	Strategies for Team-Based Engineering Problem Solving II	3
	TOTAL		**17**

Junior Year			
Fall	ELEG 315	Signals and Systems	3
	ELEG 330	Fundamentals of Electric Machines	4
	ELEG 325	Electronic Devices and Circuits	4
	H&SS XXX	Humanities and Social Sciences Elective I	3
	MATH 241	Probability and Statistics for Engineers	3
	TOTAL		**17**
Spring	ELEG 350	Power Systems Analysis	3

	ELEG 360	Feedback Control Systems	4
	ELEG 385	Microprocessors and Microcontrollers	4
	ELEG 410	Fundamentals of Power Electronics	3
	ELEG 430	Electric Machines	4
	TOTAL		**18**
Summer	ELEG 397	Electrical Engineering Internship	**3**
Senior Year			
Fall	ELEG 490	Electrical Engineering Design Project I	2
	ELEG 440	Instrumentation and Measurement	4
	ELEG 4XX	Major Elective I	3
	ELEG 4XX	Major Elective II	3
	H&SS XXX	Humanities and Social Sciences Elective II	3
	TECH XXX	Technical Elective I	3
	TOTAL		**18**
Spring	ELEG 491	Electrical Engineering Design Project II	3
	ELEG 465	Industrial Automation	4
	ENGR 498	Professional Examination Preparation	2
	ELEG 4XX	Major Elective III	3
	ELEG 4XX	Major Elective IV	3
	TECH XXX	Technical Elective II	3
	TOTAL		**18**
	TOTAL CREDIT HOURS		**140**

Electrical Engineering Major Electives (at least 12 credits)			
	ELEG 420	Modern Control Systems	3
	ELEG 450	Electric Power Distribution Systems	3
	ELEG 460	Digital Signal Processing	3
	ELEG 470	Advanced Power Electronics	3
	ELEG 475	Power Systems Protection and Relays	3
	ELEG 480	Digital Control Systems	3
	ELEG 293/393/493	Special Topics in Electrical Engineering	1-4
	ELEG 394/494	Research Topics in Electrical Engineering	1-4
	ELEG 396/496	Independent Study in Electrical Engineering	1-6

Electrical Engineering Technical Electives (at least 6 credits)			
	ENGR 201	Statics	3
	MATH 361	Engineering Mathematics	3
	MATH 461	Linear Algebra	3
	MEEG 311	Engineering Thermodynamics	3

	MEEG 324	Engineering Dynamics	3
	MEEG 354	Fluid Mechanics	3
	PHYS 341	Modern Physics with Applications	3
	CHEM 181	General Chemistry II	4

- *Courses not on the list require approval from the Electrical Engineering Program Chair.*
- *For a list of H&SS Elective courses, refer to the College of Arts and Sciences section of this document.*

Mechanical Engineering Program

Bachelor of Science in Mechanical Engineering

Mission and Description

The mission of the Mechanical Engineering Program at the Petroleum Institute is as follows:

Mechanical engineering is an essential discipline in the production and processing of petroleum and natural gas, and the broader energy sector at large. The Mechanical Engineering Program will meet or exceed the international standards of excellence in mechanical engineering education, research, and life-long learning. We are dedicated to invest time and resources in educating students with the expectation that they will develop as leading experts in their respective fields of expertise and long-term contributors to the industrial sponsors, the UAE, and beyond.

The Mechanical Engineering Program at the Petroleum Institute is designed to give students a rigorous education in the fundamentals of the science of engineering mechanics, and specific training in applications of mechanical engineering in the oil and gas industries. The program incorporates extensive laboratory work which is used to reinforce the principles and concepts explored in the classroom.

Educational Objectives

The Mechanical Engineering Program educational objectives, deriving from the Program and Institutional Vision statements and informed by the Program constituencies, are as follows:

- Provide an integrated experience to develop skills for responsible teamwork, effective communication skills, and life-long learning to prepare graduates for successful careers in mechanical engineering with a particular focus on applications in the petroleum and energy industries.
- Provide a broad education, well grounded in the fundamental principles of science and engineering, which enables students to solve successfully mechanical engineering problems and progress rapidly towards the satisfactory attainment of sponsor's competency targets.
- Educate conscientious mechanical engineers of diverse backgrounds capable of becoming leaders in their respective field of expertise who understand their ethical and professional responsibilities and the impact of engineering solutions on society and the environment.
- Provide students with practical design, internship, and research experiences through partnership with PI's sponsoring industry and/or through collaboration with international institutions.

Program Outcomes

Eight major program outcomes were developed to achieve the program objectives. The outcomes are also designed to achieve ABET Criterion. They express what the students will be able to do upon graduation from The Petroleum Institute.

Outcome 1: An ability to apply fundamentals of mathematics, science, and engineering to identify, formulate, and solve mechanical engineering problems [ABET criterion 3a, e];

Outcome 2: An ability to utilize state-of-the-art engineering software, computers, and instrumentation as tools to identify, solve, and effectively communicate engineering problems [ABET criterion 3e, k];

Outcome 3: An ability to work in multidisciplinary teams effectively to address practical engineering problems [ABET criterion 3d];

Outcome 4: An ability to use the product development process to design a system, component, or process that meets client needs with realistic constraints and addresses contemporary issues, such as technology innovation and entrepreneurship, energy sustainability, and global environmental protection [ABET criterion 3c, h, j];

Outcome 5: An ability to communicate effectively in oral presentations and in writing [ABET criterion 3g];

Outcome 6: An ability to design and conduct experiments and interpret and generalize from the results [ABET criterion 3b];

Outcome 7: An understanding of professional and ethical responsibility and the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental

and societal context [ABET criterion 3f, h];

Outcome 8: An ability to acquire new knowledge independently and to engage in life-long learning through workshops, short courses, professional societies, and other specialized training programs [ABET criterion h, i].

Program Facilities

The Mechanical Engineering Program laboratories are located in the Arzanah and Ruwais buildings. They include the following:

- Machine Shop and Manufacturing Laboratory
- Basic Measurement Laboratory
- Core Measurement Laboratory
- Material Science Laboratory
- Mechatronics Laboratory
- Automation and Machine Condition Monitoring Laboratory

In addition to the teaching laboratories listed above, following research laboratories are available on campus:

- Multi-Phase Flow Laboratory
- Electro-Hydro-Dynamics Laboratory
- Micro-Channel and Condensation Laboratory
- Solid Oxide Fuel Cell Laboratory (SOFC)
- Materials Science Laboratory
- Fatigue-Corrosion Laboratory

Professional Chapters and Clubs

An ASME Student Section was established at the Petroleum Institute in October 2004. The ASME Student Section has been involved in many Mechanical Engineering Program activities, including organizing social events, student competitions, exhibitions, promotional displays, and student study sessions. Some of ASME Section activities include: - Promoting the ASME Student Section and increasing membership - Organizing professional development seminars and presentations - Planning educational field trips and recreational outings.

Degree Requirements

The field of Mechanical Engineering deals with the science and engineering of mechanical devices and processes. Accordingly, the degree program begins with basic studies in engineering science including statics, dynamics, fluid mechanics, thermodynamics, and mechanics of materials. The program continues with advanced courses in machine design, computer-aided engineering, heat transfer, control, engineering vibrations and turbo machinery. A two-semester capstone mechanical design sequence is required of all students. The program emphasizes computer-aided system and component design strategies.

The program features a summer internship in the industry where students will gain significant exposure to the petroleum processing industries in the Middle East or elsewhere in the world. The Mechanical Engineering Program requires 137 credits to graduate distributed as follows: 56 credits in General Education Requirements, 69 credits in Major Requirements, at least 6 credits in Major Electives and 6 credits in Technical Electives.

Program of Study for Mechanical Engineering

Term	Course Code	Course Title	Credit
Freshman Year			
Fall	CHEM 131	General Chemistry I	4
	COMM 101	Communication I	4
	ENGR 103	Freshman Success Seminar	1
	MATH 111	Calculus I	4
	COMP 100	Freshman Computing Applications	0
	HFIT 101	Personal Health and Fitness I	0.5
	PEEG 151	Overview of the Petroleum Industry	3
	TOTAL		**16.5**
Spring	PHYS 191	Physics I - Mechanics	4
	COMM 151	Communication II	4
	MATH 161	Calculus II	4
	HFIT 102	Personal Health and Fitness II	0.5
	H&SS 111	Islamic Studies	3
	TOTAL		**15.5**
Sophomore Year			
Fall	ENGR 201	Statics	3
	H&SS 251	Principles of Economics	3
	MEEG 275	Basic Measurement Laboratory	2
	MATH 212	Calculus III	3
	PHYS 241	Physics II – Electromagnetism and Optics	4
	STPS 201	Strategies for Team-Based Engineering Problem Solving I	3
	TOTAL		**18**
Spring	MATH 261	Differential Equations	3
	MEEG 205	Introduction to Modern Mechanical Engineering	2
	MEEG 344	Mechanics of Materials	3
	MEEG 345	Introduction to Manufacturing Processes	3
	MEEG 365	Thermodynamics	4
	STPS 251	Strategies for Team-Based Engineering Problem Solving II	3
	TOTAL		**18**
Junior Year			
Fall	ELEG 205	Electric Circuits I	4
	MEEG 221	Engineering MATLAB	3
	MEEG 324	Engineering Dynamics	3
	MEEG 334	Materials Science	3
	MEEG 335	Materials Science Laboratory	1

	MEEG 354	Fluid Mechanics	3
	TOTAL		**17**
Spring	MATH 241	Probability and Statistics	3
	MEEG 374	Machine Design	3
	MEEG 376	Core Measurement Laboratory	2
	MEEG 384	System Dynamics and Control	3
	MEEG 385	Heat Transfer	3
	TECH XXX	Technical Elective I	3
	TOTAL		**17**
Summer	MEEG 397	Mechanical Engineering Internship	**3**
Senior Year			
Fall	MEEG 404	Computer Aided Engineering	3
	MEEG 444	Engineering Vibration	3
	MEEG 490	Mechanical Engineering Design Project I	3
	MEEG XXX	Major Elective I	3
	H&SS XXX	Humanities and Social Sciences Elective I	3
	TOTAL		**15**
Spring	MEEG 459	Turbo Machinery	3
	MEEG 491	Mechanical Engineering Design Project II	3
	ENGR 498	Professional Examination Preparation	2
	TECH XXX	Technical Elective II	3
	MEEG XXX	Major Elective II	3
	H&SS XXX	Humanities and Social Sciences Elective II	3
	TOTAL		**17**
	TOTAL CREDIT HOURS		**137**

Mechanical Engineering Major Electives (at least 6 credits)			
	Course Code	**Course Title**	**Credit Hour**
	MEEG/CHEG 380	Introduction to Polymer Science and Engineering	3
	MEEG 405	Introduction to Modern Control	3
	MEEG 410	Viscous and Compressible Fluid Flows	3
	MEEG 436	Failure of Engineering Materials	3
	MEEG 438	Introduction to Measurements and Instrumentation	3
	MEEG 439	Machine Dynamics	3
	MEEG 454	Refrigeration/Air Conditioning and Crypgenics	3
	MEEG 479	Engineering Project Management	3
	MEEG 480	Renewable Energy Technologies	3
	MEEG 293/393/493	Special Topics in Mechanical Engineering	1-4
	MEEG 394/494	Research Topics in Mechanical Engineering	1-4
	MEEG 396/496	Independent Study in Mechanical Engineering	1-6

Mechanical Engineering Technical Electives (at least 6 credits)			
	Course Code	**Course Title**	**Credit Hour**
	CHEG 331	Designed Experimentation	4
	CHEG 401	Engineering Economics	3
	CHEG 482	Polymer Processing	4
	ELEG 305	Electric Circuits II	4
	ELEG 315	Signals and Systems	3
	ELEG 325	Electronic Devices and Circuits	4
	ELEG 330	Fundamentals of Electric Machines	3
	ELEG 465	Industrial Automation	4
	ELEG 480	Digital Control Systems	3
	ENGR 469	Technology Development Ventures and Entrepreneurship	3
	MATH 361	Engineering Mathematics	3
	MATH 365	Numerical Methods	3
	MATH 461	Linear Algebra	3
	PEEG 321	Drilling Engineering	3
	PEEG 353	Petroleum Economics	3
	PEEG 342	Production Facilities	3
	PHYS 341	Modern Physics	3

- *Courses not on the list require approval from the Mechanical Engineering Program Chair.*
- *For a list of H&SS Elective courses, refer to the College of Arts and Sciences section of this document.*

Petroleum Engineering Program

Bachelor of Science in Petroleum Engineering

Mission and Description

The mission of the Petroleum Engineering Program at the Petroleum Institute is to become a leading international center of excellence in education, training, research and professional service dedicated to serving the competence, training and technology development needs of the petroleum industry, in general, and ADNOC and other allied sponsors, in particular. Our mission is to provide a platform for life-long learning while also emphasizing the importance of interdisciplinary approach, ethical conduct, and health, safety and environmental issues.

The Petroleum Engineering Program at the PI has a modern curriculum that emphasizes not only petroleum engineering fundamentals but also the business processes applied to reach optimal engineering solutions for field development and operations. With access to the local operating company facilities, our well-equipped state-of-the-art modern laboratory and computer facilities, we are uniquely positioned to offer a curriculum that is well balanced and hands on. We are also accredited to offer IWCF certification and training for drilling engineers. Course content, projects and other assignments are selected to help prepare graduates to launch careers within ADNOC and other allied sponsors as willing and eager contributors, equipped with knowledge and skills of basic engineering and science, fundamental understandings of reservoir, well, production and surface facilities.

Educational Goals

The goals of the Petroleum Engineering Program are to prepare its graduates through formal education and preparation for life-long learning and continuing education to:

- Progress through ADNOC and industry-standards of Competency-Based Development Programs at a rate that is faster than that of the average of new hires from other educational institutions.
- Demonstrate highest levels of technical, ethical and behavioral competencies.
- Develop and establish themselves as Engineering Specialists, Supervisors and Managers.
- Become a major source of highly competent UAE National engineers and managers to serve the country's objectives of nationalization.
- Undertake graduate studies, become involved in research and development, and potentially work as Petroleum Institute faculty.

Program Outcomes

On completion of the Petroleum Engineering Program, graduates will be able to:

Outcome 1: Function as a member of a multidisciplinary team and communicate effectively in English [ABET Criterion 3d];
Outcome 2: Apply knowledge of mathematics and basic science and engineering to the identification, formulation and solution of petroleum engineering problems [ABET Criteria 3a, e];
Outcome 3: Design and conduct experiments and analyze and interpret experimental data [ABET Criterion 3b];
Outcome 4: Design, construct and analyze petroleum engineering systems and models using modern engineering tools and skills [ABET Criteria 3c, e, h, j, k];
Outcome 5: Ethically manage and adapt to professional and societal changes through life-long learning and knowledge of contemporary issues in a global context [ABET Criteria 3f, h, i, j];
Outcome 6: Acquire, quality control, manage and utilize engineering data for optimal technical and economic decisions [ABET Criteria 3a, b, k];
Outcome 7: Communicate effectively in oral English [ABET Criterion 3g];
Outcome 8: Communicate effectively in written English [ABET Criterion 3g].

Program Facilities

The Petroleum Engineering Program laboratories are currently located in the Ruwais building. The following laboratories are currently operational:

- Analytical Instrument Laboratory
- Core Preparation Laboratory
- Drilling Fluids Laboratory
- Drilling Simulation Laboratory
- Fluid Properties Laboratory
- Reservoir Simulation Laboratory
- Rock Mechanics Laboratory
- Rock Properties Laboratory
- Production and Facilities Laboratory
- Production Chemistry Laboratory

Professional Chapters and Clubs

The student chapter of the Society of Petroleum Engineers (SPE) opened in 2004 and is affiliated with the Abu Dhabi SPE section. Activities of the PI SPE Student Chapter are broadly divided into technical and social functions. Examples of major technical activities include sponsoring students to conferences and Education Weeks organized annually by SPE in conjunction with a major oil and gas conferences in the region, field trips, company visits, technical presentations delivered by industry professionals or student paper contests that offer students the chance to showcase their research skills, competing with other students for honors both regionally and internationally. Social activities include the annual Petroleum Engineering Sports Day, BBQ dinners, dhow cruises, visits to other chapters, etc.

Degree Requirements

The Petroleum Engineering Program at the Petroleum Institute is designed to give students a rigorous education in the fundamentals of petroleum engineering science, and specific training in applications of petroleum engineering to the production of hydrocarbon resources in the oil and gas industries. The program incorporates extensive laboratory work which is used to reinforce the principles and concepts used in the classroom. The program features a summer internship in industry where students will gain significant exposure to the petroleum production and processing industries in the Middle East or elsewhere in the world. The Petroleum Engineering Program requires 140 credits to graduate distributed as follows: 56 credits in General Education Requirements, 78 credits in Major Requirements, at least 6 credits in Major and/or Technical Electives.

Program of Study for Petroleum Engineering

Term	Course Code	Course Title	Credit
Freshman Year			
Fall	CHEM 131	General Chemistry I	4
	COMM 101	Communication I	4
	ENGR 103	Freshman Success Seminar	1
	MATH 111	Calculus I	4
	PEEG 151	Overview of the Petroleum Industry	3
	COMP 100	Freshman Computing Applications	0
	HFIT 101	Personal Health and Fitness I	0.5
	TOTAL		**16.5**
Spring	CHEM 181	General Chemistry II	4
	COMM 151	Communication II	4
	MATH 161	Calculus II	4
	PHYS 191	Physics I – Mechanics	4
	HFIT 102	Personal Health and Fitness II	0.5
	TOTAL		**16.5**
Sophomore Year			
Fall	CHEG 222	Introduction to Engineering Thermodynamics	3
	MATH 212	Calculus III	3
	PGEG 221	Introduction to Geology and Geophysics	3
	PEEG 214	Reservoir Rock Properties	2
	PEEG 215	Reservoir Rock Properties Laboratory	1
	PHYS 241	Physics II - Electromagnetism and Optics	4
	STPS 201	Strategies for Team-Based Engineering Problem Solving I	3
	TOTAL		**19**
Spring	H&SS 251	Principles of Economics	3
	MATH 261	Differential Equations	3
	PEEG 216	Reservoir Fluid Properties	2
	PEEG 217	Reservoir Fluid Properties Laboratory	1
	PEEG 252	Strength of Materials	3
	PGEG 220	Geology of the Middle East	3
	STPS 251	Strategies for Team-Based Engineering Problem Solving II	3
	TOTAL		**18**
Junior Year			
Fall	CHEG 302	Heat and Mass Transfer	3
	PEEG 314	Well Logging	3
	PEEG 321	Drilling Engineering I	3

	PEEG 331	Reservoir Engineering I	3
	PGEG 311	Sedimentary Petrology	4
	TOTAL		**16**
Spring	PEEG 315	Reservoir Characterization	3
	PEEG 324	Drilling Engineering II	2
	PEEG 325	Drilling Engineering II Laboratory	1
	PEEG 334	Reservoir Engineering II	3
	PEEG 341	Completion and Workover	3
	PEEG 342	Production Facilities	3
	PEEG 353	Petroleum Project Economics	3
	TOTAL		**18**
Summer	PEEG 397	Petroleum Engineering Internship	3
Senior Year			
Fall	H&SS 111	Islamic Studies	3
	PEEG 435	Reservoir Simulation	3
	PEEG 443	Production Systems Design and Analysis	3
	PEEG 454	Uncertainty and Risk Analysis in the Petroleum Industry	3
	PEEG 490	Petroleum Engineering Design Project I	1
	PEEG or TECH XXX	Major or Technical Elective I	3
	TOTAL		**16**
Spring	ENGR 498	Professional Examination Preparation	2
	PEEG 436	Reservoir Evaluation and Monitoring	3
	PEEG 491	Petroleum Engineering Design Project II	3
	PEEG or TECH XXX	Major or Technical Elective II	3
	H&SS XXX	Humanities and Social Sciences Elective I	3
	H&SS XXX	Humanities and Social Sciences Elective II	3
	TOTAL		**17**
	TOTAL CREDIT HOURS		**140**

Petroleum Engineering Major Electives (up to 6 credits)			
	PEEG 359	Health, Safety, and the Environment	3
	PEEG423	Horizontal and Multilateral Well Technology	3
	PEEG 424	Underbalanced Drilling Technology	3
	PEEG 425	Pressure Control	3
	PEEG437	Natural Gas Engineering	3
	PEEG 444	Artificial Lift	3
	PEEG 445	Production Enhancement	3

	PEEG 446	Hydraulic Fracturing	3
	PEEG 456	Petroleum Related Rock Mechanics	3
	PEEG 457	Introduction to Artificial Intelligence Applications	3
	PEEG 293/393/493	Special Topics in Petroleum Engineering	1-4
	PEEG 394/494	Research Topics in Petroleum Engineering	1-4
	PEEG 396/496	Independent Study in Petroleum Engineering	1-6

Petroleum Engineering Technical Electives (up to 6 credits)			
	CHEG 416	Corrosion Engineering	3
	CHEG/MEEG380	Introduction to Polymer Science and Engineering	3
	CHEM 201	Organic Chemistry I	3
	CHEM 241	Organic Chemistry II	3
	ELEG 205	Electric Circuits I	4
	ENGR 496	Technology Development Ventures and Entrepreneurship	3
	MATH 361	Engineering Mathematics	3
	MATH 365	Numerical Methods	3
	MATH 461	Linear Algebra	3
	MEEG 334	Materials Science	3
	MEEG 374	Machine Design	3
	PGEG 321	Structural Interpretation	4
	PGEG 323	Remote sensing for Earth Science Applications and GIS	2
	PGEG 351	Petroleum Geophysics	4
	PGEG 361	Sedimentology and Stratigraphy	3
	PGEG 451	Environmental Geology	3
	PHYS 341	Modern Physics with Applications	3

- *Courses not on the list require approval from the Petroleum Engineering Program Chair.*
- *For a list of H&SS Elective courses, refer to the College of Arts and Sciences section of this document.*

Petroleum Geosciences Program

Bachelor of Science in Petroleum Geosciences

Mission and Description

The educational mission of the Petroleum Geosciences Program at the Petroleum Institute is to provide a high-quality education in petroleum geology and geophysics and to produce graduates for successful and socially and ethically responsible careers in the petroleum industry that meet or exceed the needs and expectations of ADNOC and other industry sponsors.

The Petroleum Geosciences Program at the Petroleum Institute is a blend of geology and geophysics as they relate to the discovery and exploitation of oil and gas. Strengths of the Petroleum Geosciences curriculum include an emphasis on geosciences project work and use of modern software applications. In addition, emphasis is placed on the development of "soft skills" during coursework. Petroleum Geosciences laboratories, including a computer laboratory, are well equipped, and up-to-date geophysical equipment is available for field exercises. The program features a summer field geology course.

Students who successfully complete the Bachelor of Science program will be able to enter the petroleum industry as petroleum geologists or geophysicists, and have a solid educational base if they decide to continue to a graduate program.

Educational Objectives

The Petroleum Geosciences graduates will accomplish the following:

- Apply geological and geophysical knowledge and skills to recognize exploration, development, and production problems and design technically, economically, and environmentally sound solutions to find and maximize the value of petroleum resources in the UAE.
- Contribute effectively, including in leadership roles, in multi-disciplinary exploration and production teams.
- Function ethically and with integrity such that society benefits from their work as petroleum geoscientists.
- Continue personal and professional growth through self education.
- Meet or exceed expectations of the ADNOC Group and corporate sponsors in attaining technical and personal competencies.

Program Outcomes

On completion of the Petroleum Geosciences Program, graduates will be able to.

Outcome 1: Apply knowledge of math, chemistry, physics, geology, and geophysics to solve petroleum geosciences problems [ABET Criteria 3a, e];

Outcome 2: Formulate solutions to geoscience problems involving design of geophysical surveys, acquisition and processing of geophysical data, and making reasonable geological interpretations from results [ABET Criteria 3a, b, c, e, k];

Outcome 3: Design and construct 3-dimensional Earth models to solve E&P-type problems from appropriate geological, petrophysical, and geophysical data [ABET Criteria 3a, c, e, k];

Outcome 4: Function effectively on multi-disciplinary teams [ABET Criterion 3d];

Outcome 5: Demonstrate an awareness of social, ethical, and professional responsibilities in the exploitation of petroleum resources and an awareness of major regional and global social and environmental issues [ABET Criteria 3f, h, j];

Outcome 6: Demonstrate an ability to communicate in oral and written forms in English appropriate to the petroleum industry [ABET Criterion 3g];

Outcome 7: Demonstrate recognition of the need for and an ability to engage in continual self-education [ABET Criteria 3j].

Program Facilities

The Petroleum Geosciences sixteen laboratories are located in the Arzanah, Bu Hasa, and Ruwais buildings. The laboratories in the Arzanah building include geology and geophysics teaching laboratories, dedicated core-lay-out areas, laboratories for sample and equipments preparation, and a dedicated geosciences computer laboratory equipped with a wide range of industry-standard geoscience software. In the Ruwais and Bu Hasa buildings the laboratories focus on undergraduate

teaching and research support. These laboratories include a scanning electron microscopy laboratory, a geosciences computing laboratory, petrographic microscopy laboratory and geophysical equipment storage and testing laboratory.

Professional Chapters and Clubs

American Association of Petroleum Geologists (AAPG) Student Chapter

The American Association of Petroleum Geologists (AAPG) student chapter in the Petroleum Geosciences Program is the first AAPG Chapter established in the UAE. The PI's AAPG student chapter provides a variety of programs and opportunities for students to have contact with the professional geosciences community, to have access to unique learning and leadership opportunities, to receive member benefits and to be eligible for grants.

The Geosciences Student Society (G.S.S)

The Petroleum Geosciences Student Society aims to help and support students at the Petroleum Institute as they prepare to start their career within the Petroleum Geosciences. As well as supporting the next generation of geoscientists, the society also provides a range of social activities for geosciences students at the Petroleum Institute. Recent activities included guest seminars and lectures, field trips, social evenings and sporting events.

The PI Society of Exploration Geophysicists (SEG) Student Chapter

The student chapter's affiliation with SEG provides a means of contact with the geoscience profession both inside and outside of academia. Active participation in the Student Chapter provides students with an opportunity to develop leadership and management skills. A sense of professionalism is developed by actively running an organization and networking with professionals.

Degree Requirements

The Petroleum Geosciences Program begins its course offerings in the Sophomore year with an overview of the petroleum industry and introduction to geology and geophysics. The program continues with advanced courses in geology and geophysics. Several courses are taken with students in the Petroleum Engineering Program. The Program incorporates extensive laboratory, field, and project work. A highlight of the program is a Field Petroleum Geology course to Italy and Oman. The Petroleum Geosciences Program requires 134 credits to graduate distributed as follows: 56 credits in General Education Requirements, 75 credits in Major Requirements, and 3 credits in Major or Technical Electives.

Program of Study for Petroleum Geosciences

Term	Course Code	Course Title	Credit
Freshman Year			
Fall	CHEM 131	General Chemistry I	4
	COMM 101	Communication I	4
	ENGR 103	Freshman Success Seminar	1
	HFIT 101	Personal Health and Fitness I	0.5
	MATH 111	Calculus I	4
	PEEG 151	Overview of the Petroleum Industry	3
	COMP 100	Freshman Computing Applications	0
	TOTAL		**16.5**
Spring	CHEM 181	General Chemistry II	4
	COMM 151	Communication II	4
	HFIT 102	Personal Health and Fitness II	0.5
	MATH 161	Calculus II	4
	PHYS 191	Physics I - Mechanics	4
	TOTAL		**16.5**
Sophomore Year			
Fall	CHEG 222	Introduction to Thermodynamics	3
	PGEG 221	Introduction to Geology and Geophysics	3
	MATH 212	Calculus III	3
	PHYS 241	Physics II - Electromagnetism and Optics	4
	STPS 201	Strategies for Team Based Engineering Problem Solving I	3
	TOTAL		**16**
Spring	PEEG 216	Reservoir Fluid Properties	2
	PEEG 217	Reservoir Fluid Properties Laboratory	1
	PEEG 353	Petroleum Project Economics	3
	PGEG 210	Earth Materials	3
	PGEG 220	Geology of the Middle East	3
	STPS 251	Strategies for Team Based Engineering Problem Solving II	3
	TOTAL		**15**
Junior Year			
Fall	H&SS 251	Principles of Economics	3
	PGEG 311	Sedimentary Petrology	4
	PGEG 321	Structural Interpretation	4
	PGEG 331	Igneous and Metamorphic Petrology	2
	PGEG 341	Paleontology	3
	TOTAL		**16**
Spring	H&SS 111	Islamic Studies	3

	PGEG 351	Petroleum Geophysics	4
	PGEG 361	Sedimentology and Stratigraphy	3
	PGEG 371	Data Analysis and Geostatistics	4
	PGEG 381	Rock Mechanics and Reservoirs	3
	TOTAL		**17**
Summer	PGEG 397	Field Petroleum Geology	**4**
Senior Year			
Fall	PGEG 401	Petrophysics and Logging	4
	PGEG 411	Reflection Seismology	4
	PGEG 421	Petroleum Geosciences Engineering Computing Project	4
	H&SS XXX	Humanities and Social Sciences Elective I	3
	TOTAL		**15**
Spring	PGEG 451	Environmental Geology	3
	PGEG 461	Reservoir Characterization Project	4
	PGEG 471	Petroleum Systems Project	3
	PGEG or TECH XXX	Major or Technical Elective	3
	ENGR 498	Professional Examination Preparation	2
	H&SS XXX	Humanities and Social Sciences Elective II	3
	TOTAL		**18**
	TOTAL CREDIT HOURS		**134**

Petroleum Geosciences Major Electives (up to 3 credits)			
	PGEG 323	Remote Sensing for Earth Science Applications and GIS	2
	PGEG 293/393/493	Special Topics in Petroleum Geosciences	1-4
	PGEG 394/494	Research Topics in Petroleum Geosciences	1-4
	PGEG 396/496	Independent Study in Petroleum Geosciences	1-6

Petroleum Geosciences Technical Electives (up to 3 credits)			
	MATH 261	Differential Equations	3
	MATH 361	Engineering Mathematics	3
	MATH 461	Linear Algebra	3
	PEEG 331	Reservoir Engineering I	3
	PHYS 341	Modern Physics with Applications	3

- *Courses not on the list require approval from the Petroleum Geosciences Program Chair.*
- *For a list of H&SS Elective courses, refer to the College of Arts and Sciences section of this document.*

Course Descriptions

This section includes course descriptions listed alphabetically by subject area. The descriptions provide information on subject, course codes, titles and level in the first line. This is followed by content, pre-requisites, Co-requisites and restrictions, and finally lecture and lab hours and weight or credit hours as shown in the following example:

Example:

CHEM 181 GENERAL CHEMISTRY II

A continuation of CHEM 131, this course concentrates on chemical kinetics, thermodynamics, electrochemistry, and chemical equilibrium.

Prerequisite	CHEM 131
Co-requisite	MATH 111
Restrictions	None
5:3:4	

Key	
Subject code	The area of study or discipline *e.g. CHEM = Chemistry*
Course code	
001 - 099	Department of Advanced University Placement
100 - 199	Freshman year *e.g. 181 is a Freshman course*
200 - 299	Sophomore year
300 - 399	Junior year
400 - 499	Senior year
Title / Level	Name of the Course *e.g. General Chemistry II*
Description	Course Content
Prerequisite	Course(s) students must have passed before enrolment *e.g. CHEM 131*
Co-requisite	Courses students must have passed or be currently enrolled in *e.g. MATH 111*
Restrictions	Limitations on who may and may not take the course
Hours	*e.g. 5:3:4 = 5 class hours per week: 3 lab hours per week: 4 credit hours*

Advanced University Placement Courses

Calculus (CALC)

CALC 010 AP CALCULUS I

In addition to encouraging the understanding of important mathematical concepts this course is designed to develop in each student the ability to solve problems and to enhance their capacity for critical thinking. Coursework includes techniques and applications of derivatives of functions, which include polynomial, trigonometric, logarithmic, and exponential functions. Topics include, but are not limited to, Rates of Change and Limits, Derivatives, Applications of Differentiation. In working through this course students will become familiar with the format of the AP examination and learn strategies to optimize his/her score.

Pre-requisite: Placement Test
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:0:4

CALC 011 AP CALCULUS II

This course, as a continuation of the AP Calculus 1 course, provides ongoing students with similar learning experiences. Coursework covers technique and the application of derivatives of polynomial, trigonometric, logarithmic, and exponential functions. Topics include, but are not limited to, The Definite Integral, Applications of Integration, Differential Equations and Mathematical Modeling, Review for AP Exam (including practice exams). The use of a graphics calculator remains an integral part of this course.

Pre-requisite: Placement Test or completion of CALC 010.
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:0:4

Chemistry (CHEM)

CHEM 030 AP CHEMISTRY I

In this course students closely follow guidelines set out by the College Board for the Advanced Placement (AP) examinations. It presents the principles of Chemistry and also develops students' practical skills. Students examine topics involving both descriptive and mathematical skills that are reinforced by appropriate laboratory work. This course is at an academic level equivalent to a first semester Chemistry course in a USA college. Topics include: atoms, molecules and ions; naming organic compounds; mass relationships in chemical reactions; reactions in aqueous solutions; thermochemistry; quantum theory and the structure of atoms; periodic relationships among the elements; and chemical bonding.

Prerequisite: Placement Test
Co-requisites: None
Restrictions: None
Lecture/Lab/Credits: 5:3:4

CHEM 031 AP CHEMISTRY II

In this course, students closely follow guidelines set out by the College Board for the Advanced Placement (AP) Chemistry examination. It presents the principles of Chemistry and also develops students' practical skills. Students examine topics involving both descriptive and mathematical skills that are reinforced by appropriate laboratory work. This course is at an academic level equivalent to a second semester Chemistry course in a USA college. Topics include: intermolecular forces & liquids & solids; physical properties of solutions; chemical kinetics; chemical equilibrium; acids & bases; acid-base & solubility equilibria; entropy; free energy & equilibrium; and

electrochemistry.

Prerequisite: Placement Test or completion of CHEM 030.
Co-requisites: None
Restrictions: None
Lecture/Lab/Credits: 5:3:4

CHEM 034 AUP CHEMISTRY I

This course is designed for students not studying CHEM. 030 and CHEM. 031 and provides a preparation for Freshman Chemistry. Students will develop their understanding of Chemistry in English and develop independent learning and study skills as well as their higher-level thinking and hands-on laboratory skills. Topics include: elements, compounds and reactions; atomic structure; bonding; and reactions of ions in solution.

Prerequisite: Placement Test.
Co-requisites: None
Restrictions: None
Lecture/Lab/Credits: 2:2:2

CHEM 035 AUP CHEMISTRY II

This course is designed for students not studying CHEM. 030 and CHEM. 031 and provides a preparation for Freshman Chemistry. Students will develop their understanding of Chemistry in English and develop independent learning and study skills as well as their higher-level thinking and hands-on laboratory skills. Topics include: oxidation and reduction; the mole; concentrations; solutions and solubility.

Prerequisite: Placement Test or completion of CHEM 034.
Co-requisites: None
Restrictions: None
Lecture/Lab/Credits: 2:2:2

Computing (COMP)

COMP 030 COMPUTING APPLICATIONS I

This course consists of an introduction to the Windows Operating System using the Windows interface, an introduction to computing concepts, including how a computer works, computing security concepts and issues, social networking, keyboard touch-typing, file management, and using commercial software applications as problem-solving and communication tools. These include word processing using MS Word, spreadsheet applications for analyzing information using MS Excel, and making clear and concise presentations using MS PowerPoint. No textbook is given on this course. All course material is provided by the course instructor.

Pre-requisite: None
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:2

COMP 031 COMPUTING APPLICATIONS II

This course consists of using commercial software applications as problem-solving and communication tools. These include advanced functions of spreadsheet applications for analyzing information using MS Excel and acquiring basic programming skills using VB scripting in macros. Students will learn advanced features of Word and have a brief review of Power Point. No textbook is given on this course. All course material is provided by the course instructor.

Pre-requisite: None
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:2

COMP 100 FRESHMAN COMPUTING APPLICATIONS

This is an introductory course that provides students with the necessary computing skills to generate and present data or various laboratory reports, surveys and presentations. Topics include: 1. Spreadsheets and Graphs (MS Excel) – Introduction, formatting, formulas, charts, lookup, math functions, statistic functions, advanced graphs, if/nested functions, financial functions, macros, VB script. 2. Word Processing Skills (MS Word) – Editing, formatting, tables, images. 3. Presentations (MS PowerPoint). 4. Introduction to Programming using Visual Basic for Applications (VBA in Excel) – Introduction, simple variables, input boxes, simple I statements, debugger, message boxes, do until loops, cell commands, more variables, complex if statements, or/next loops, flowcharts, calculations inside variables.

Pre-requisites: Freshman year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 0:3:0

English (ENGL)

ENGL 031 ENGLISH MODULE I

In this module, students further develop the English language skills they were taught in secondary school. Students focus on improving their reading, writing, listening, and speaking levels. During the module, students listen to and read texts related to general study skills, working in groups, and describing objects. Students learn a basic set of language skills that enable them to get meaning from these texts, and then learn basic skills that enable them to speak and write about them. Special emphasis is given to the vocabulary and grammar needed to understand, write about and speak about these texts. Students are introduced to general TOEFL test taking strategies.

Pre-requisite: Placement Test.
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 12:0:6

ENGL 032 ENGLISH MODULE II

In this module, students continue to develop their English language skills. Reading, writing, listening and speaking activities are integrated to give students opportunities to gain a more holistic understanding of ways in which academic language is used. Students listen to and read texts related to mechanics (physics), and health, safety and the environment. Students work individually and in groups on a project in which academic research is introduced. Students write about the findings of their research and make oral presentations demonstrating what was learned. Students further develop their TOEFL test taking skills.

Pre-requisite: Placement Test OR completion of Module I
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 12:0:6

ENGL 033 ENGLISH MODULE III

In this module, students extend their knowledge of academic English and broaden their reading, writing, listening and speaking skills. Students listen to and read texts pertaining to the oil industry. They take notes and annotate these texts, and then demonstrate what was learned, both orally and in writing. Students work in groups on a project related to the oil industry. The results of their research are written and then presented orally. Students continue to develop their TOEFL test taking skills.

Prerequisite: Completion of Module II
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 12:0:6

ENGL 034 ENGLISH MODULE IV

In this module, students demonstrate that they have the English language skills needed to meet the requirements of the Petroleum Institute's Freshman classes. They read and listen to academic texts related to alternative sources of energy, and then show their understanding orally and in writing. Students attend discussions led by Freshman professors in which the professors share their expectations of what a properly prepared university student will be able to do. Students develop the requisite TOEFL skills that enable them to achieve a TOEFL score greater than 500.

Pre-requisite: Completion of Module III
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 12:0:6

ENGL 035 ENGLISH MODULE V

This module is for students who have not yet achieved a score of 500 on TOEFL. In this module, students review the materials covered in the previous modules and refine their English reading, writing, listening and speaking skills so they will be able to meet the requirements of their Freshman classes. Emphasis is given to developing the requisite TOEFL skills that enable them to achieve a score greater than 500 on the test.

Pre-requisite: Completion of Module IV
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 12:0:6

ENGL 036 ENGLISH MODULE VI

This is an academic readiness module for students who have already achieved a TOEFL score greater than 500 but still need to refine their academic English skills prior to enrolling in Communication 101. In this module, students develop academic research skills and then present their research findings both orally and in writing on a topic related to the business of alternative sources of energy.

Pre-requisite: TOEFL score >500, or IELTS score >5.5.
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 12:0:6

ENGL 099 ADVANCED TOEFL PREPARATION COURSE

This is an intensive course specifically designed for PI students who have successfully completed their necessary English course work, but have not yet achieved a score of 500 or more on the TOEFL. Students practice TOEFL listening, sentence structure and reading skills. They are also shown test taking skills and ways to manage their time while taking the actual TOEFL.

Prerequisites: TOEFL ≤499
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 15:0:0

Physics (PHYS)

PHYS 090 AP PHYSICS I

This is a calculus based Mechanics course that closely follows the guidelines set forth by the College Board. The basic format of the course is lecturing and small group problem-solving sessions. In Addition, laboratory experiments demonstrating important principles and concepts will be performed. Topics include: Projectiles, Newton's Laws of Motion, Work, Energy and Power, Circular Motion and Rotation, Linear Momentum, Gravitation, Oscillations.

Pre-requisite: Placement Test

Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:3:4

PHYS 091 AP PHYSICS II

This is a calculus based Electricity and Magnetism course that closely follows the guidelines set forth by the College Board. The basic format of the course is lecturing and small group problem-solving sessions. In Addition, laboratory experiments demonstrating important principles and concepts will be performed. Topics include: Electric Charge, Electric Field, Gauss' Law, Electric Potential and Potential Energy, Capacitance, DC Circuits, Magnetic Fields, Faraday's Law of Inductance, Maxwell's Equations.

Pre-requisite: Placement Test or completion of PHYS 090
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:3:4

PHYS 094 AUP PHYSICS I

This course is designed to give students a solid understanding of the basics of Mechanics in the English language and to develop independent learning and study, higher-level thinking and hands-on laboratory skills. Topics include: Describing Motion: Kinematics in One Dimension, Kinematics in Two Dimensions, Vectors, Dynamics: Newton's Laws of Motion, Circular Motion; Gravitation, Work and Energy.

Pre-requisite: Placement Test.
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:2:2

PHYS 095 AUP PHYSICS II

This course is designed to give students a solid understanding of the basics of Electricity and Magnetism in the English language and to develop independent learning and study, higher-level thinking and hands-on laboratory skills. Topics include: Electric Charge and Electric Field, Electric Potential, Electric Currents, DC Circuits, Magnetism, Electromagnetic Induction and Faraday's Law.

Pre-requisite: Placement Test or completion of PHYS 094.
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:2:2

Degree Courses

Chemical Engineering (CHEG)

CHEG 200 PRINCIPLES OF CHEMICAL ENGINEERING

Introduction to the principles of conservation of mass and energy. Applications to chemical processing systems. Relevant aspects of computer-aided process simulation.

Pre-requisites: CHEM 181, PHYS 191, MATH 161
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 4:0:4

CHEG 220 COMPUTATIONAL METHODS IN CHEMICAL ENGINEERING

Introduction to MATLAB and solution of engineering problems with applications in chemical engineering. Data representation, functions, plotting, matrix manipulations, structured programming (if statements, loops, functions), numerical integration and differentiation, curve fitting, differential equations, and symbolic mathematics.

Pre-requisites: MATH 212
Co-requisites: MATH 261, CHEG 200
Restrictions: None
Lecture/Lab/Credit: 2:2:3

CHEG 222 INTRODUCTION TO ENGINEERING THERMODYNAMICS

This course is designed to introduce students to the fundamental concepts of thermodynamics and how they are applied in energy transformation systems. Topics covered include first, second, and third laws of thermodynamics, phase behavior of simple and multicomponent systems, and transport properties.

Pre-requisites: CHEM 181
Co-requisites: None
Restrictions: Not open to Chemical Engineering students
Lecture/Lab/Credit: 3:0:3

CHEG 301 FLUID MECHANICS

Theory and application of momentum transport and fluid flow in chemical engineering. Fundamentals of microscopic phenomena and application to macroscopic systems. Relevant aspects of computer-aided process simulation.

Pre-requisites: MATH 261
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 302 FLUID MECHANICS AND HEAT TRANSFER

This course introduces the principles of momentum transfer and overall mass, energy and momentum balances including an introduction to multiphase flow in pipes. Topics also include the principles of steady-state and unsteady-state heat transfer. Specific applications such as measurement of fluid flow, pumps, gas-moving equipment, prediction of pressure drop in pipes, restrictions and manifold systems, heat exchangers, and thermal gradient and heat transfer in oil and gas wells are stressed.

Pre-requisites: CHEG 222
Co-requisites: None
Restrictions: Not open to Chemical Engineering students
Lecture/Lab/Credit: 3:0:3

CHEG 322 CHEMICAL ENGINEERING THERMODYNAMICS

Fundamentals of thermodynamics for application to chemical engineering processes and systems. Properties of materials, first and second law of thermodynamics, phase and reaction equilibria, and thermophysical properties.

Pre-requisites: CHEG 200
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 325 FUNDAMENTALS OF NANOTECHNOLOGY

This course introduces students to the fundamental principles which govern product and process design in nano-engineering. In particular, the course will discuss such topics as building a nanoparticle by self assembly, methods for nanoparticle characterization and stability, thermodynamics at nano scale, Brownian motion and diffusion of nanoparticles. Laboratory techniques to study nanoparticles and nanostructures will also be discussed. The course may contain a short laboratory project in the new light-scattering lab to measure nanoparticle average size and size distribution.

Pre-requisites: CHEG 222 or CHEG 322, and CHEG 301 or CHEG 302
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 331 DESIGNED EXPERIMENTATION AND STATISTICAL PROCESS CONTROL

This course gives students the ability to solve important engineering problems by applying statistical tools. The course starts with description of random variables and probability distributions. The use of statistical decision-making tools is then discussed. The next section of the course covers application of empirical models to optimize engineering systems which is followed application of designed experimentation. The last section coves application of statistical process control in process control, management of operating costs, and optimization in the transactional environment.

Pre-requisites: MATH 212
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 333 CHEMICAL ENGINEERING LABORATORY I

This is the first in a sequence of two lab courses that covers laboratory work pertinent to thermodynamics, fluid mechanics, heat, and mass transfer. In this laboratory course, experiments relevant to fluid mechanics and thermodynamics are covered. Students run experiments and analyze laboratory data using appropriate statistical methods, and produce oral and written technical reports.

Pre-requisites: CHEG 301, CHEG 322, CHEG 331
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 0:3:2

CHEG 351 MASS TRANSFER

Fundamentals of stage-wise and diffusional mass transport with applications to chemical engineering systems and processes. Relevant aspects of computer-aided process simulation.

Pre-requisites: CHEG 322
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 361 HEAT TRANSFER

Theory and applications of energy transport: conduction, convection and radiation. Fundamentals of microscopic phenomena and application to macroscopic systems. Relevant aspects of computer-aided process simulation

Pre-requisites: CHEG 301
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 380 INTRODUCTIION TO POLYMER SCIENCE AND ENGINEERING

This course includes definitions, industry overview, nomenclature, basic organic chemistry, polymerization, molecular weight and molecular weight distribution. It also covers basic polymer structure and thermomechanical behavior and structure property relationship as well as mechanical properties, definitions, viscoelasticity, other mechanical properties and composites. Other topics include rheology and introduction to polymer processing techniques and recycling. (cross-listed as MEEG 380, only one of the two courses can be taken for credit)

Pre-requisites: CHEM 131, PHYS 191
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 381 POLYMER CHEMISTRY AND REACTION ENGINEERING

This course introduces the chemistry of polymerization and the polymer manufacturing process. It begins with basic concepts about polymers and polymerization and covers each major type of polymerization with relevant kinetics. The qualitative effect of reactor design on polymer manufacture is discussed as well as actual polymer manufacturing processes including those taking place in the UAE.

Pre-requisites: CHEM/MEEG 380
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

CHEG 397 CHEMICAL ENGINEERING INTERNSHIP

The course requires students to complete a program of full time training to gain practical experience and apply their academic learning in an off-campus work or research environment.

Pre-requisites: Junior year standing in Chemical Engineering or permission of Program Chair
Co-requisites: None
Restrictions: Students enrolled in CHEG 397 cannot register for additional courses
Lecture/Lab/Credit: 0:0:3

CHEG 401 ENGINEERING ECONOMICS

Analysis, costing, and economic evaluation of processes and projects applied to the chemical process industries. Investment analysis, rate of return, time value of money, discounted cash flow. Applications of the principles of depreciation, depletion, and amortization to analysis of the economic viability of projects.

Pre-requisites: Senior standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 411 REACTION ENGINEERING

Applications of the fundamentals of thermodynamics, physical chemistry, and organic chemistry to the engineering of reactive processes. Reactor design; acquisition and analysis of rate data; heterogeneous catalysis. Relevant aspects of computer-aided process simulation.

Pre-requisites: CHEM 241, CHEG 351, CHEG 361
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

CHEG 415 COMBUSTION AND AIR POLLUTION CONTROL

This course presents the fundamentals of air pollution impact on the environment. Topics covered include hydrocarbon fuel energy, the different combustion devices and systems, pollutant emission predictions from chemical equilibrium and ideal flow reactors, design of flues and chimneys, atmospheric dispersion models, air pollution sampling and measurement, and air pollution control methods and equipment. Applications in the petroleum industry are stressed.

Pre-requisites: CHEG 301, CHEG 322, CHEG 361, CHEG 351
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 416 CORROSION ENGINEERING

This course presents fundamental material on corrosion and oxidation thermodynamics and electrochemical thermodynamics. The course then describes commonly encountered corrosion environments and discusses typical forms of corrosion encountered in each environment typical to the petroleum industry. Methods of corrosion control are then described, and the course concludes with a description of important corrosion and oxidation monitoring techniques.

Pre-requisites: CHEM 131, CHEM 181
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 421 PETROLEUM REFINING AND PROCESSING

Characterization of crude oil. Unit operations of petroleum refining including distillation, catalytic cracking, reforming, hydrotreating and hydrocracking, coking and gas treatment. Refinery products and economics. Manufacture of petrochemical feedstocks from petroleum and petroleum products. Relevant aspects of computer-aided process simulation.

Pre-requisites: CHEG 351
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 444 CHEMICAL ENGINEERING LABORATORY II

This course is the second in a sequence of two courses that covers the laboratory work for the thermodynamics and the transport (fluid, heat, and mass) courses. The present course consists of laboratory experiments in heat and mass transfer. Students run experiments and analyze laboratory data using appropriate statistical methods, and produce oral and written technical reports.

Pre-requisites: CHEG 331, CHEG 351, CHEG 361
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 0:3:2

CHEG 461 PROCESS DYNAMICS AND CONTROL

Mathematical modeling and analysis of transient systems. Applications of control theory to response of dynamic chemical engineering systems and processes.

Pre-requisites: CHEG 411
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

CHEG 470 INDUSTRIAL CATALYSIS

The course presents basic concepts of catalysis and briefly reviews different categories of catalysts with commercial importance for oil and gas processing as well as for petrochemical and other chemical commodities manufacturing. The core of the course is focused on heterogeneous catalysis and to a smaller extent to homogeneous catalysis. Catalytic materials, their properties and preparation, catalyst characterization and selection are presented with an emphasis on new synthesis and characterization methods. Several case studies of industrial processes are selected to offer an insight into the strong interaction among catalyst type, catalytic reactor design and process operating variables. The selected processes are analyzed in their evolution, limits and challenges and new technological solutions are suggested.

Pre-requisites: CHEM 241, CHEM 301, CHEG 411
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 472 WATER TREATMENT AND MEMBRANE PROCESSES

This course deals with the fundamental principles and practical applications of membrane processes in water and wastewater treatment facilities. The topics covered in this course are water chemistry, membrane structure and performance, membrane transport, concentration polarization, membrane fouling and fouling characterization in relation to water and wastewater engineering. Applications of nano-filtration (NF), ultra-filtration (UF), micro-filtration (MF), reverse osmosis (RO) electro- dialysis, and pervaporation membranes in various water and wastewater treatment facilities will be discussed.

Pre-requisites: CHEG 351, CHEG 301, MATH 261
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 481 GAS PROCESSING ENGINEERING

This course deals with characterization of natural gas and gas reservoirs with particular emphasis on the unique qualities of gas from the UAE. Unit operations of gas processing including compression, transportation, acid gas removal, gas liquefaction, cryogenic distillation are covered. Gas processing products and economics, and the manufacture of petrochemical feedstocks from natural gas are also discussed.

Pre-requisites: CHEG 351
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 488 POLYMER PROPERTIES

Review and discussion of the properties of polymers with emphasis on structure-property-correlations. The principles and practical applications of the main techniques used for polymer characterization will be discussed. Some applications of polymers in relationship to their properties are illustrated.

Pre-requisites: CHEG/MEEG 380
Co-requisites: None

Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 490 CHEMICAL ENGINEERING DESIGN PROJECT I

Applications of the principles and theory of process design to synthesis of chemical processes and systems. Computer-aided process simulation and design; process optimization.

Pre-requisites: Senior standing or permission of Program Chair
Co-requisites: None
Restrictions: Open to Chemical Engineering students only
Lecture/Lab/Credit: 2:3:3

CHEG 491 CHEMICAL ENGINEERING DESIGN PROJECT II

Continuation of CHEG 490-Chemical Engineering Design Project I. Simulation of chemical processes. Synthesis, analysis, and evaluation of chemical processes. Costing and economic evaluation with emphasis on applications in petroleum refining and gas processing. Application of computer-aided process simulation to plant and process design.

Pre-requisites: CHEG 401, CHEG 490
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

CHEG 293/393/493 SPECIAL TOPICS IN CHEMICAL ENGINEERING

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CHEG 293 is open to Sophomore students and above, CHEG 393 is open to Junior students and above, CHEG 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

CHEG 394/494 RESEARCH TOPICS IN CHEMICAL ENGINEERING

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CHEG 394 is open to Junior students and above, CHEG 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

CHEG 396/496 INDEPENDENT STUDY IN CHEMICAL ENGINEERING

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, CHEG 396 is open to Junior students and above, CHEG 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Chemistry (CHEM)

CHEM 131 GENERAL CHEMISTRY I

This course presents a comprehensive study of the facts, concepts and laws of chemistry including elementary atomic structure, the Periodic Table, chemical bonding and structure, stoichiometry, chemical reactions in aqueous solutions, thermochemistry and the gas laws. This is a combined lecture and laboratory course that is designed to meet the requirements of students majoring in any engineering program requiring a strong background in chemistry.

Pre-requisites: Freshman year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:3:4

CHEM 181 GENERAL CHEMISTRY II

This course is a continuation of CHEM 131 concentrating on chemical kinetics, thermodynamics, electrochemistry, and chemical equilibrium.

Pre-requisites: CHEM 131, MATH 111
Co-requisites: MATH 111
Restrictions: None
Lecture/Lab/Credit: 5:3:4

CHEM 201 ORGANIC CHEMISTRY I

This is the first course of a two-semester sequence introducing the fundamental principles of organic chemistry. Topics include structure, physical and chemical properties, reactions of several important functional classes, reaction mechanisms, and stereochemical considerations. Computational chemistry software is introduced as an aid to understanding the relationship between structure, properties, and chemical reactivity.

Pre-requisites: CHEM 181
Co-requisites: None
Restrictions: None
4:3:4

CHEM 241 ORGANIC CHEMISTRY II

This course is a continuation of CHEM 201. It concentrates on reactions of organic compounds, analysis of chemical reaction mechanisms, and design of chemical synthesis pathways. Computational chemistry software is used to clarify the relationships between structure, properties, and chemical reactivity.

Pre-requisites: CHEM 201
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 4:3:4

CHEM 301 PHYSICAL CHEMISTRY

This course includes topics in thermodynamics, interfacial chemistry, theory of rate processes, electrochemical kinetics, aqueous-solution equilibria, absorption thermodynamics and reactions on surfaces. Colloidal systems including aerosol particles dispersed in gases, colloids in aqueous solutions, emulsion polymers and fine liquid droplets are covered. The application of these topics in chemical and petroleum engineering is described.

Pre-requisites: CHEG 322
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

CHEM 293/393/493 SPECIAL TOPICS IN CHEMISTRY

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CHEM 293 is open to Sophomore students and above, CHEM 393 is open to Junior students and above, CHEM 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

CHEM 394/494 RESEARCH TOPICS IN CHEMISTRY

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CHEM 394 is open to Junior students and above, CHEM 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

CHEM 396/496 INDEPENDENT STUDY IN CHEMISTRY

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, CHEM 396 is open to Junior students and above, CHEM 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Communications – COMM

COMM 101 COMMUNICATION I

This course raises student awareness of meta-cognitive and critical thinking skills in a context of humanities and social sciences. In the required research projects, students undertake both individual and team assignments that introduce them to time management tools and provide a platform for the cultivation of critical reading and writing, and presentation skills.

Pre-requisites: TOEFL ≥500
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:0:4

COMM 151 COMMUNICATION II

Communication 101 (COMM 101) is designed to introduce students to the language and communication skills that are required for undergraduate study. Critical reading, critical writing and oral presentation skills are developed through a context of humanities and social science research projects which also aim to raise student awareness of quality time management skills and meta-cognition

Pre-requisites: COMM 101
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:0:4

COMM 293/393/493 SPECIAL TOPICS IN COMMUNICATION

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: COMM 293 is open to Sophomore students and above, COMM 393 is open to Junior students and above, COMM 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

COMM 394/494 RESEARCH TOPICS IN COMMUNICATION

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: COMM 394 is open to Junior students and above, COMM 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

COMM 396/496 INDEPENDENT STUDY IN COMMUNICATION

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, COMM 396 is open to Junior students and above, COMM 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Electrical Engineering (ELEG)

ELEG 205 ELECTRIC CIRCUITS I

Physical principles underlying the modeling of circuit elements. Basic circuit elements; resistance; inductance, capacitance, independent and controlled sources and op-amps. Techniques of circuit analysis; complex numbers; sinusoidal analysis.

Pre-requisites: MATH 161
Co-requisites: PHYS 241
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 206 INTRODUCTION TO C++ PROGRAMMING

Overview of computer hardware and software. Programming in "C++" including input/output, data types, variables, pseudocode, algorithms, control statements, operators, functions, arrays, strings, classes, objects, inheritance, polymorphism, pointers, references, file processing, exceptions, templates, operator overloading and more.

Pre-requisites: MATH 111
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:3:3

ELEG 305 ELECTRIC CIRCUITS II

Time-domain transient analysis, Sinusoidal steady-state analysis, alternating current concepts, phasors, frequency domain analysis, Laplace transform, s-domain circuit analysis, state variable circuit analysis, frequency selective circuits, first order passive filters, Bode diagrams, two-port networks, Mutual inductance and transformers.

Pre-requisites: ELEG 205
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 315 SIGNALS AND SYSTEMS

Interpretation, representation and analysis of time-varying phenomena (continuous or discrete) as signals that convey information and noise; a quantitative treatment of the properties of information and noise, and the degradation of signal fidelity. Fourier, Laplace and Z transforms. Introductory applications in the analysis of dynamic data streams emanating from mechanical and electronic systems, data acquisition, control, and communications.

Pre-requisites: ELEG 205, MATH 261
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 325 ELECTRONIC DEVICES AND CIRCUITS

Fundamentals of active semiconductor devices. The course focuses on building an understanding of junction diode, bipolar junction transistors, field-effect transistors devices, operational amplifiers, and special purposes ICs. A laboratory is integrated into the course; the focus of the laboratory is the study of semiconductor devices and circuits characteristics through simulation and experimental procedures.

Pre-requisites: ELEG 205
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 330 FUNDAMENTALS OF ELECTRIC MACHINES

Magnetic circuit concepts and materials, transformer analysis and operation, steady state and dynamic analysis of rotating machines. Study of the basic machine types: dc, induction, synchronous. A laboratory is integrated into the course; the focus of the laboratory is the study of external characteristics of machines and transformers

Pre-requisites: ELEG 205
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 350 POWER SYSTEMS ANALYSIS

Phasor diagrams; Real and Reactive power concepts; Elements of Power systems; Single line diagrams; Modeling of power system components; Per unit quantities; Load flow studies; Symmetrical components.

Pre-requisites: ELEG 330
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 360 FEEDBACK CONTROL SYSTEMS

System modeling through an energy flow approach is presented, modeling of electrical, and mechanical systems are discussed. Feedback control design techniques using pole-placement, root locus, lead-lag, and PID compensators are presented and analyzed.

Pre-requisites: ELEG 305
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 380 LOGIC AND DIGITAL DESIGN

Logic devices and circuits, Boolean algebra, analysis and synthesis of combinational and sequential logic systems, number representation. Introduction to VHDL.

Pre-requisites: ELEG 205
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 385 MICROPROCESSORS AND MICROCONTROLLERS

This course provides a comprehensive understanding of the fundamentals of microprocessor / microcontroller systems. Topics include architecture, data and instruction formats, addressing, linking, interrupt processing and interfacing using assembly language programming. The microcontroller with its built-in processor along with its on-chip memory and its input/output capabilities are covered in detail. Design applications involving the interface and control of external devices by the PIC microcontroller are implemented using interrupt driven software.

Pre-requisites: ELEG 380
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 397 ELECTRICAL ENGINEERING INTERNSHIP

The course requires students to complete a program of full time training to gain practical experience and apply their academic learning in an off-campus work or research environment.

Pre-requisites: Junior year in Electrical Engineering or permission of Program Chair
Co-requisites: None
Restrictions: Students enrolled in ELEG 397 cannot register for additional courses
Lecture/Lab/Credit: 0:0:3

ELEG 410 FUNDAMENTALS OF POWER ELECTRONICS

Introduction to power semiconductor devices such as Bipolar Junction Transistors, MOSFETs, and Thyristors, Design and analysis of circuits utilizing power electronics including conversion of AC and DC in their many configurations.

Pre-requisites: ELEG 325, ELEG 330
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 420 MODERN CONTROL SYSTEMS

Design of modern control systems using matrix approach and the linear systems tools in MATLAB; examples from electrical and mechanical engineering; realization techniques; discretization of continuous systems; controllability, observability and their Gramians, other dynamical system properties; pole-placement; disturbance rejection; Lyapunov stability; state estimation; introduction to multivariable systems; introduction to intelligent control systems.

Pre-requisites: ELEG 360
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 430 ELECTRIC MACHINES

Steady-state analysis of DC machines, synchronous machines, and induction machines, Investigation for equivalent circuits and efficiency of rotating machines. This course has laboratory experiments in DC, single and three-phase AC machines, tests to find the parameters and performance of DC and AC machines.

Pre-requisites: ELEG 330
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 440 INSTRUMENTATION AND MEASUREMENT

Introduction to measurement systems, sensors and transducers, data acquisition and analysis, signal conditioning, instrumentation methods, system specifications, computer interfacing, noise concerns and ergonomic aspects.

Pre-requisites: ELEG 360
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 450 ELECTRIC POWER DISTRIBUTION SYSTEMS

The course covers electric power distribution network architecture and composition including Load curves, Substations, Industrial networks, Distribution voltage and power control, Distribution system planning and design, Distribution system losses, Distribution transformer applications, Pole-top and pad-mounted distribution transformers, Unbalance voltage and unsymmetrical loading.

Pre-requisites: ELEG 350
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 460 DIGITAL SIGNAL PROCESSING

This combined theory and practical course introduces the principles of digital signal processing (DSP). The course begins with an introduction to discrete-time signals and systems followed by such topics as sampling, A/D conversion, aliasing, the z-transform, discrete & fast Fourier transform and digital filter design.

Pre-requisites: ELEG 315, ELEG 360
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 465 INDUSTRIAL AUTOMATION

Principles of systems control and automation. Emphasis on manufacturing industries; Hardware and software associated with system modeling; sensors; signal processing and control. Application of microcontrollers to various systems; PLC's.

Pre-requisites: ELEG 440
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

ELEG 470 ADVANCED POWER ELECTRONICS

A study of high-frequency switching circuits which convert and condition electrical power. Topics covered are linear & switching DC power supplies, inverters, dc-dc converters and power-factor correction converters. This course provides the fundamental knowledge of pulse-width modulated converter circuits, modelling and design of their feedback systems, current-mode control, simulation, input EMI filter design, modelling and design of high-frequency power magnetic elements and low-harmonic rectifiers. Design-oriented analysis is always emphasized.

Pre-requisites: ELEG 410
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 475 POWER SYSTEMS PROTECTION AND RELAYS

The course is about the principles behind the protection of electric systems and covers the role of relaying theory, Relaying Fundamentals, Transducers, Transient Phenomena, DC offset in fault currents, Distribution System Protection, Sub-transmission System Protection, Response of Distance Relays, Pilot Line Protection, Transformer Protection and Rotating Machinery Protection.

Pre-requisites: ELEG 350
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 480 DIGITAL CONTROL SYSTEMS

This course is concerned with the analysis and design of closed-loop systems that contain a digital computer. Distinction is emphasized between a purely digital system and a continuous system that may be sampled to emulate a digital system. Topics covered include sampling, signal conversion and processing (hold devices; z-transform; state variable technique; pole-assignment and state estimation; stability of digital control systems; digital simulation and redesign; time and frequency domain analyses; digital filter structures and microcomputer implementation of digital filters.

Pre-requisites: ELEG360
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ELEG 490 ELECTRICAL ENGINEERING DESIGN PROJECT I

Capstone Design. Project engineering techniques and professional practice issues. Design methods and tools, product life cycle, standards, project management, legal and ethical issues in engineering.

Pre-requisites: Senior year standing or permission of Program Chair
Co-requisites: None
Restrictions: Open to Electrical Engineering students only
Lecture/Lab/Credit: 1:3:2

ELEG 491 ELECTRICAL ENGINEERING DESIGN PROJECT II

Project engineering techniques and professional practice issues. Design methods and tools, product life cycle, standards, project management, legal and ethical issues in engineering, hardware implementation of design project.

Pre-requisites: ELEG 490
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 1:6:3

ELEG 293/393/493 SPECIAL TOPICS IN ELECTRICAL ENGINEERING

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: ELEG 293 is open to Sophomore students and above, ELEG 393 is open to Junior students and above, ELEG 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

ELEG 394/494 RESEARCH TOPICS IN ELECTRICAL ENGINEERING

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: ELEG 394 is open to Junior students and above, ELEG 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

ELEG 396/496 INDEPENDENT STUDY IN ELECTRICAL ENGINEERING

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, ELEG 396 is open to Junior students and above, ELEG 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Engineering (ENGR)

ENGR 103 FRESHMAN SUCCESS SEMINAR

This course provides an opportunity for students to learn and adopt methods and practices to enhance their success both at the PI and later at ADNOC. Emphasis is placed on skill development, attitudes, and practical knowledge that enables students to reach their short and long-term academic goals. Themes include classroom management, time management, learning styles, and teamwork. Exposure to the degree programs through a series of lectures and guest speakers will helps students make a mature and informed decision on their choice of major.

Pre-requisites: Freshman year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:0:1

ENGR 201 STATICS

Forces, moments, couples, equilibrium of bodies in two and three-dimensions, centroids and second moments of areas, volumes and masses, friction and virtual work.

Pre-requisites: PHYS191
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ENGR 469 TECHNOLOGY DEVELOPMENT VENTURES AND ENTREPRENEURSHIP

This course is designed to help students learn the basic business, strategy, and leadership skills needed to launch new technology-oriented ventures. Topics include learning how to assess the feasibility of a technological innovation as well as how to apply best practices for planning, launching, and managing new technology-oriented companies. Students will participate in team projects and case studies which will include feasibility studies, writing and presenting business plans, and presentations for investors.

Pre-requisites: Senior year standing or permission of instructor
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

ENGR 293/393/493 SPECIAL TOPICS IN ENGINEERING

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: ENGR 293 is open to Sophomore students and above, ENGR 393 is open to Junior students and above, ENGR 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

ENGR 394/494 RESEARCH TOPICS IN ENGINEERING

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: ENGR 394 is open to Junior students and above, ENGR 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

ENGR 396/496 INDEPENDENT STUDY IN ENGINEERING

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, ENGR 396 is open to Junior students and above, ENGR 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

ENGR 498 PROFESSIONAL EXAMINATION PREPARATION

The course reviews and reinforces knowledge of engineering and science principles, and assists students with successfully completing the "Fundamentals of Engineering Examination" administered by the National Council of Examiners for Engineering and Surveying (NCEES) or similar professional examinations.

Pre-requisites: Senior year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:2

Health and Fitness (HFIT)

HFIT 101 PERSONAL HEALTH AND FITNESS I

Overview of personal health and fitness, with particular relevance to working in the petroleum and gas industries. Theoretical and practical understanding of personal health and fitness including exercising safely and managing a personal healthy diet and managing a healthy diet and lifestyle regime. The course is enhanced with opportunities for field work, personal survival techniques and the fundamental skills of leadership and teamwork.

Pre-requisites: Freshman year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:0:0.5

HFIT 102 PERSONAL HEALTH AND FITNESS II

Application and critical understanding of personal health and fitness, with particular relevance to working in the petroleum and gas industries. Demonstrable and practical understanding of personal health and fitness including exercising safely and managing a personal healthy diet and managing a healthy diet and lifestyle regime for oneself and others. Advanced leadership, personal development and team building and management skills. The course is enhanced with opportunities for field work, personal and team survival techniques and advanced skills of leadership and teamwork.

Pre-requisites: HFIT 101
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:0:0.5

Humanities and Social Sciences (H&SS)

H&SS 111 ISLAMIC STUDIES

This course explores the meaning of the traditional values and ethics of Islam and their significance in today's modern, scientific, and technological world. It includes a brief survey of Islamic ethics across the history of Islam. The course highlights the application of Islamic ethical values within three major spheres: the social setting, the workplace and the environment. Based on the Sunnah and the historical record of Islam, emphasis is placed on how Islamic ethics can contribute to issues facing modern society in meeting the challenges of the working environment and in raising an ecological consciousness of a modern, global society in its relationship with the natural environment.

Pre-requisites: COMM 101
Co-requisites: COMM 151
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 121 GERMAN LANGUAGE I

German I is designed for students interested in learning the German language. Initial focus is on conversational German to allow the student to function in a German speaking setting. Elementary grammar and written construction are introduced.

Pre-requisites: Permission of instructor
Co-requisites: None
Restrictions: Any previous secondary or post secondary course in German
Lecture/Lab/Credit: 3:0:3

H&SS 171 GERMAN LANGUAGE II

In this course, students understand and make up short simple questions, directions and messages in various situations including public announcements and short conversations at a higher level. Students' skills in writing, reading, speaking and listening are improved so that they can take part in the official examination START 1 of the German Goethe-Institute at the end of this course.

Pre-requisites: H&SS 121
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 4:0:3

H&SS 201 THE WEST IN THE MIDDLE EAST

This course examines the presence of the West in the Middle East over the past thousand years. Its starting point is the Crusades, and it goes on to consider the impact of European commercial activity in the seventeenth and eighteenth century. European colonialism in the region during the nineteenth and twentieth century, and the effects of World War I upon it provide the subsequent stages. The course includes an examination of the discovery and exploitation of the Middle East's oil reserves, and the geopolitics that accompanied the development.

Pre-requisites: COMM 151
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 4:0:3

H&SS 221 INTRODUCTION TO POLITICAL SCIENCE

This course introduces the fundamental principles of comparative government, political theory, international and public policy, and their application in the Islamic societies of the Arabian Gulf and the oil and gas industry.

Pre-requisites: COMM 151
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 222 THE UAE BEFORE AND SINCE THE DISCOVERY OF OIL

This course examines the special relationship between the Gulf sheikhdoms and Britain from 1820 until 1971, and the UAE in the oil era.

Pre-requisites: COMM 151
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 251 PRINCIPLES OF ECONOMICS

This course looks at the basic social and economic institutions of market capitalism. The topics of contemporary economic issues, business organization, price theory and market structure, and economic analysis of public policies are included. Inflation, unemployment, fiscal policies and monetary policy are discussed.

Pre-requisites: COMM 151
Co-requisites: MATH 111
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 301 THE ORIGINS OF THE TWO WORLD WARS

Students examine the political, economic and diplomatic causes behind the two world wars. The differing and sometimes conflicting interpretations of the long and short-term causes of each war are considered. Topics include the 1919 peace settlement and its contribution to inter-war political

instability, an outline survey of the military conduct of each war, and consideration of the reasons behind the respective outcomes of the conflicts.

Pre-requisites: H&SS 201
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 4:0:3

H&SS 311 LEADERSHIP

The course aims to enhance student understanding of what leadership is and how it works, to help students understand the real goal of leadership which is the achievement of mutual objectives which are intended to enhance one's group, organization or society. It also gives students the competencies needed to be effective in the practice of leadership.

Pre-requisites: Junior year standing and COMM 151
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 321 THE POLITICAL ECONOMY OF JAPAN

Provides a broad introduction to Japan including its importance as a major economic partner of the U.A.E. Topics covered include history, politics, economics, society and technology.

Pre-requisites: COMM 151
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 333 THE HISTORY AND POLITICS OF THE MIDDLE EAST

Provides a survey of the oil industry in the region from the early 1900's to the present day. Amongst the aspects studied are relationships between rulers and oil companies, the types of concessions agreed, problems and conflicts associated with oil developments, imperialism and oil, oil and the two world wars, nationalism and oil, the establishment of OPEC and OAPEC and finally the story of oil in the UAE.

Pre-requisites: COMM 151
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 351 WORLD PETROLEUM MARKETS

This course introduces the principles of economics as applied to the oil industry, including the economics of petroleum markets, and the role of petroleum resources in the economic development of owner states. Price theory, petroleum supply components and issues, petroleum market structure, petroleum politics, and case studies on economic development from oil wealth are examined, as well as production contracts, and oil and gas transportation and distribution.

Pre-requisites: H&SS 251
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 373 PERSONAL FINANCIAL MANAGEMENT

Students gain knowledge about financial planning, budgeting and organization including concepts of risk management, insurance, mortgages, financial markets and investment vehicles. Students also interface with the market for personal financial products.

Pre-requisites: Junior year standing and H&SS 251
Co-requisites: None

Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 375 THE ECONOMICS OF MONEY, BANKING AND FINANCIAL MARKETS

This course is an economic analysis of the world financial system, from its central banks to local and regional banks. It explains and examines how money is created and destroyed in an economy, how much money an economy needs for optimal growth, and many other similar subjects.

Pre-requisites: H&SS 251
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

H&SS 293/393/493 SPECIAL TOPICS IN HUMANITIES AND SOCIAL SCIENCES

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: H&SS 293 is open to Sophomore students and above, H&SS 393 is open to Junior students and above, H&SS 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

H&SS 394/494 RESEARCH TOPICS IN HUMANITIES AND SOCIAL SCIENCES

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: H&SS 394 is open to Junior students and above, H&SS 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

H&SS 396/496 INDEPENDENT STUDY IN HUMANITIES AND SOCIAL SCIENCES

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, H&SS 396 is open to Junior students and above, H&SS 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Mathematics (MATH)

MATH 111 CALCULUS I

This is the first course in the three-part Calculus sequence. The course explores the concepts of a limit, continuity and differentiation. The concepts are used to solve problems such as optimization, graphing, related rates, and motion. The concepts of integration are introduced and applied to the calculation of areas, volumes, arc length and work.

Pre-requisites: Freshman year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:0:4

MATH 161 CALCULUS II

A second course in calculus covering some techniques of integration, sequences and series, matrices with eigenvalues and eigenvectors, vectors in both two and three dimensions, planes and surfaces, curves and arc length, and vector-valued functions with their derivatives and integrals. Applications of the material to a number of physical situations relevant to both science and engineering are made.

Pre-requisites: MATH 111
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:0:4

MATH 212 CALCULUS III

A third course in calculus covering differential and integral calculus of functions of several variables, including partial derivatives, maximum/minimum problems, double and triple integrals in various coordinate systems, line integrals, surface integrals, Green's Theorem, Stokes' Theorem, and the Divergence Theorem. Applications of the mathematics to a number of physical situations important to both science and engineering will be made.

Pre-requisites: MATH 161
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 4:0:3

MATH 241 PROBABILITY AND STATISTICS FOR ENGINEERS

This course is an introduction to probability and statistics for engineers. Topics include data analysis, probability, random variables, discrete and continuous probability distributions, estimation, hypothesis testing and correlation. Students will have some experience in analyzing data using Minitab.

Pre-requisites: MATH 212
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MATH 261 DIFFERENTIAL EQUATIONS

This course treats basic theory and standard methods of solution for elementary ordinary differential equations with applications.

Pre-requisites: MATH 212
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MATH 361 ENGINEERING MATHEMATICS

This course treats the classical partial differential equations of mathematical physics. Fourier series, transforms, and integrals are covered, as are topics from complex numbers and special functions.

Pre-requisites: MATH 261
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MATH 365 NUMERICAL METHODS

This is a first course in numerical and approximation techniques designed for undergraduate engineering students. The course covers root finding techniques for solving non-linear equations, numerical solution of systems of linear and non-linear equations, interpolation and approximation of functions or tabulated data, least square approximation, numerical integration using quadrature rules, numerical solution of ordinary differential equations and an introduction to error analysis. The student will also learn to write programs implementing these methods.

Pre-requisites: MATH 212
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MATH 461 LINEAR ALGEBRA

This is an introductory course in linear algebra. Topics covered in this course include systems of linear equations, matrix algebra, determinants, vector spaces, subspaces, linear independence, span, basis, coordinates, linear transformations, matrix representations of linear transformations, eigenvalues and eigenvectors, diagonalization, Gram-Schmidt orthogonalization, orthogonal projection and least squares.
Pre-requisites: MATH 212, ELEG 206 or MEEG 221
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MATH 293/393/493 SPECIAL TOPICS IN MATHEMATICS

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: MATH 293 is open to Sophomore students and above, MATH 393 is open to Junior students and above, MATH 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

MATH 394/494 RESEARCH TOPICS IN MATHEMATICS

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: MATH 394 is open to Junior students and above, MATH 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

MATH 396/496 INDEPENDENT STUDY IN MATHEMATICS

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, MATH 396 is open to Junior students and above, MATH 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Mechanical Engineering (MEEG)

MEEG 205 INTRODUCTION TO MODERN MECHANICAL ENGINEERING

This course introduces the students to modern mechanical engineering as a profession and discipline. The mechanical engineering curriculum is reviewed to highlight "why we teach what we teach". Topics of current interest and emerging areas in modern mechanical engineering are introduced, including topics related to the oil and gas and the broader energy sector. Career paths in mechanical engineering, including the petrochemical industry, are highlighted. The role of codes and standards is introduced. Professional engineering ethics and responsibility are presented. The paths to professional leadership and success are highlighted. Apart from the lectures, knowledge in those areas are also gained through invited lectures, class discussions, interactive library sessions, and field trip(s)/project(s).

Pre-requisites: STPS 201
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:0:2

MEEG 221 ENGINEERING MATLAB

Engineering Matlab (MEEG-221) develops the skills to use MATLAB as a software tool to obtain numerical solutions to a wide range of engineering problems and display the results with annotated graphics. Students will also learn fundamentals of structural programming and numerical analysis techniques as well as how to debug programs.

Pre-requisites: MATH 212
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:2:3

MEEG 275 BASIC MEASUREMENT LABORATORY

The purpose of this course is to provide an introduction to temperature, pressure, fluid flow, viscosity, strain, and rotational speed measurements; data and error analysis; metrology; instrumentation and calibration. The objective of this course is to familiarize the students with the basics of analyzing and presenting experimental data.

Pre-requisites: PHYS 191, ENGR 103, COMM 151
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 1:3:2

MEEG 324 ENGINEERING DYNAMICS

Rectilinear and curvilinear motion of particles and rigid bodies, kinematics and kinetics of particles and rigid bodies, rotational and translational motion of rigid bodies, principle of work and energy in particles and rigid body dynamics, and principle of impulse and momentum in

particle and rigid body dynamics.

Pre-requisites: ENGR 201
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 334 MATERIALS SCIENCE

This course is designed to introduce a study of the properties of engineering materials, the effect of material microstructure on those properties and the development and manipulation of microstructure through processing. Such an understanding is required for the analysis and selection of materials and processes for the design and manufacture of products, systems and structures.

Pre-requisites: CHEM 131
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 335 MATERIALS SCIENCE LABORATORY

This laboratory course is an introduction to basic characterizations techniques for materials. The focus will be on the understanding of the relationship between the composition, the microstructure and the mechanical properties of materials on one hand, and how these are affected by mechanical and thermal processing on the other hand.

Pre-requisites: CHEM 131 or MEEG 334
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 0:3:1

MEEG 344 MECHANICS OF MATERIALS

Introduction to the concepts of stress, strain and constitutive relations. Torsion of circular and thin-walled sections, pure bending, analysis and design of beams for strength and deflection. Shearing stress in beams and thin-walled sections, compound stresses, stress transformation and pressure vessels. Theory and design of columns.

Pre-requisites: ENGR 201
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 345 INTRODUCTION TO MANUFACTURING PROCESSES

Introduction to basic manufacturing processes, including casting, forming, material removal and joining. Interrelations between material properties, manufacturing processes and design. Application of manufacturing processes to metals, polymers and composites. Hands on experience in the use of measuring tools, CAD/CAM, machine tools, and welding equipment

Pre-requisites: STPS 201, MEEG 275
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:3:3

MEEG 354 FLUID MECHANICS

Fluid flow characteristics, dimensions and units. Fluid statics. Fundamentals of one-dimensional fluid flow, conservation of mass, momentum and energy with applications to fluid flow and flow measuring devices. Dimensional analysis and similitude. Viscous laminar and turbulent flow in a pipe, boundary layer concept, flow over immersed bodies.

Pre-requisites: ENGR 201, MEEG 365

Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 365 THERMODYNAMICS

This course is designed to introduce engineering students to the fundamental concepts of thermodynamics and an introduction to their application in energy exchange systems. This course is further designed to improve on problem solving abilities, and to prepare students for more advanced courses in thermal sciences and energy conversion design. This course is the foundation for many other courses in energy conversion.

Pre-requisites: PHYS191, CHEM131
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 5:0:4

MEEG 374 MACHINE DESIGN

This course is designed to introduce fundamentals of machine design and basic operation of various machine elements. Students will apply their knowledge of statics, strength of materials, and materials science to the selection and design of various machine components using state of the art computer software.

Pre-requisites: MEEG 344
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 376 CORE MEASUREMENTS LABORATORY

The course is designed to introduce the fundamental concepts and principles that underlie core measurement techniques in mechanical engineering and offers experiments in the major specialty areas of thermofluids, mechanics, automation and control. In each of these fields, students are directed to study the relevant theory and to conduct experiments with various measurement and calibration techniques for basic parameters such as pressure, temperature, mass and volumetric flow rate. In addition to these experiments, students are assigned a hands-on laboratory experiment. The objective of the hands-on experiments is to prepare students to design and fabricate a simple experiment to permit investigation of a fundamental engineering phenomenon. Report preparation and presentation skills are emphasized throughout course.

Pre-requisites: MEEG 345
Co-requisites: MEEG 385
Restrictions: None
Lecture/Lab/Credit: 1:3:2

MEEG 380 INTRODUCTION TO POLYMER SCIENCE AND ENGINEERING

This course includes definitions, industry overview, nomenclature, basic organic chemistry, polymerization, molecular weight and molecular weight distribution. It also covers basic polymer structure and thermomechanical behavior and structure property relationship as well as mechanical properties, definitions, viscoelasticity, other mechanical properties and composites. Other topics include rheology and introduction to polymer processing techniques and recycling. (cross-listed as CHEG 380, only one of the two courses can be taken for credit)

Pre-requisites: CHEM 131, PHYS 191
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 384 SYSTEM DYNAMICS AND CONTROL

Modeling of mechanical, electrical and electromechanical systems. Laplace Transform techniques. Time response analysis. Block diagram representation. Feedback systems. Root locus method. Frequency response techniques. State-space representation. Controller design.

Pre-requisites: MATH 261, MEEG 221, MEEG 324, ELEG 205
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 385 HEAT TRANSFER

This course introduces the fundamental concepts and principles that underlie heat transfer processes and their application to engineering problems. This overview includes an introduction to steady and unsteady conduction, numerical methods, free and forced convection, heat exchanger design, and radiation.

Pre-requisites: MEEG 354, MATH 261
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 397 MECHANICAL ENGINEERING INTERNSHIP

The course requires students to complete a program of full time training to gain practical experience and apply their academic learning in an off-campus work or research environment.

Pre-requisites: Junior year in Mechanical Engineering or permission of Program Chair
Co-requisites: None
Restrictions: Students enrolled in MEEG 397 cannot register for additional courses
Lecture/Lab/Credit: 0:0:3

MEEG 404 COMPUTER AIDED ENGINEERING

This course is intended to introduce students to the fundamental concepts of finite element modeling. Having a clear understanding of the basic concepts will enable students to use general-purpose finite element software such as ANSYS effectively. The relevant basic theory behind each respective concept is discussed and supplemented by examples that are solved by hand and using ANSYS. Throughout the course, emphasis will be placed on methods by which students may verify their findings from finite element analysis (FEA).

Pre-requisites: MEEG 344, MEEG 221
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:2:3

MEEG 405 INTRODUCTION TO MODERN CONTROL

This is an undergraduate elective course that focuses on the analysis and synthesis of control systems. Topics include a review of Laplace transform techniques and time response analysis; stability and feedback interconnections; basic transfer function analysis and design methods; robustness; state-space analysis, controllability and observability, and state feedback design.

Pre-requisites: MEEG 384
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 410 VISCOUS AND COMPRESSIBLE FLUID FLOWS

Differential analysis of viscous and ideal fluid flow. Ideal compressible gas flow and application to nozzles. Compressible flow with friction and heat transfer in (Fanno and Rayleigh Flows). Normal shock waves.

Pre-requisites: MEEG 354
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 436 FAILURE OF ENGINEERING MATERIALS

This course will introduce students to the principles of fracture mechanics, modes of mechanical failures, and Metallurgical/structural failure analyses. Analytical methods presented include stress analysis, fracture mechanics, fatigue, corrosion, and nondestructive testing. Case studies illustrating the application of basic principles of metallurgy and failure analysis to a wide variety of real-world situations will be covered. Statistical methods will be used to study the fatigue behavior of engineering materials and estimate their reliability under service conditions.

Pre-requisites: MEEG 374, MEEG 334
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 438 INTRODUCTION TO MEASUREMENTS AND INSTRUMENTATION

Measurements and instrumentation is a course in experimental methods where students will learn how to design an accurate measuring system, process and interpret collected data, and report the results. Practice will be given to students, through laboratory exercises, on the measurement of mechanical engineering quantities, such as thermal, stress, vibration and shock.

Pre-requisites: MEEG 376, MEEG 384
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 439 MACHINE DYNAMICS

Knowledge of machine dynamics is vital for the proper design and analysis of engineering systems. This course provides students with the conceptual and analytical skills to analyze the kinematics and dynamics of mechanical mechanisms; synthesize linkages; balance machines; and the design of cams and/or gear trains. Students will have to utilize computer techniques to develop programs for the analysis of machine kinematics and dynamics.

Pre-requisites: MEEG 221, MEEG 324
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 444 ENGINEERING VIBRATION

Time-domain and frequency-domain analysis of vibrating systems; matrix methods, instrumentation, and vibration control; numerical methods, introduction to multi-degree-of-freedom systems, determination of natural frequencies and mode shapes, case studies.

Pre-requisites: MEEG 384
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 454 REFRIGERATION/AIR CONDITIONING AND CRYOGENICS

This course is a senior level offering introducing fundamentals and applications of refrigeration, air conditioning, and cryogenics systems. The course will begin with calculation of moist air properties and psychrometry. The course will next cover fundamentals of heating and cooling load calculations for space heating/cooling load applications, as well as fundamentals of air distribution systems. Principles of ultra low temperature refrigeration and cryogenics will also be briefly

covered in this course.

Pre-requisites: MEEG 385
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 459 TURBO MACHINERY

This course covers the fundamentals of turbo machines analysis. It includes basic thermofluid principles, preliminary design procedures, performance characteristics and application and selection of turbo machines for a variety of engineering situations such as pumping, gas compression and power production.

Pre-requisites: MEEG 354
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 479 ENGINEERING PROJECT MANAGEMENT

The course involves systematic approach to engineering project management with topics in project planning, scheduling, quality/cost control, intellectual/proprietary property management, communication management with the executives, work ethics, and health/safety/environmental aspects of project management.

Pre-requisites: Senior year standing and permission of Program Chair
Co-requisites: None
Restrictions: CGPA≥2.0
Lecture/Lab/Credit: 3:0:3

MEEG 480 RENEWABLE ENERGY TECHNOLOGIES

Wide variety of clean renewable energy sources such as wind, solar, biomass, and OTEC, will be introduced during the class. Thermodynamics and heat transfer analyses of renewable energy sources for heating, power generation, and transportation will be offered. Broad overview of the growing use of the technologies in the world economy will be made with detailed analyses of specific applications.

Pre-requisites: MEEG 365
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

MEEG 490 MECHANICAL ENGINEERING DESIGN PROJECT I

Design I, which represents part I of a senior design project, runs during the first semester of the senior year. The course aims at teaching students how to utilize and integrate the knowledge gained from the various courses taken previously and concurrently within the context of a final year design project. Students learn how to collect information related to their project, organize, and plan an open-ended project using resources from workshops, industry, library, internet and discussions with their supervisors and colleagues. The course gives students the chance to practice and improve their oral and written communication skills by giving oral presentations and submitting written interim reports throughout the semester.

Pre-requisites: Senior year standing or permission of Program Chair
Co-requisites: None
Restrictions: Open to Mechanical Engineering students only
Lecture/Lab/Credit: 1:4:3

MEEG 491 MECHANICAL ENGINEERING DESIGN PROGECT II

Design II is a continuation of part I of the same senior design project and runs during the second semester of the senior year. At this stage, students are able to implement their plans and design

processes outlined in Design I. Students learn how to build/design a mechanical system, an experiment, or conduct simulation work to improve the performance of a certain mechanical system. In this course, students improve their oral and written communication skills by giving oral presentations, preparing posters, and submitting written final reports at the end of the academic year.

Pre-requisites: MEEG 490
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 1:4:3

MEEG 293/393/493 SPECIAL TOPICS IN MECHANICAL ENGINEERING

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: MEEG 293 is open to Sophomore students and above, MEEG 393 is open to Junior students and above, MEEG 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

MEEG 394/494 RESEARCH TOPICS IN MECHANICAL ENGINEERING

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: MEEG 394 is open to Junior students and above, MEEG 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

MEEG 396/496 INDEPENDENT STUDY IN MECHANICAL ENGINEERING

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, MEEG 396 is open to Junior students and above, MEEG 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Petroleum Engineering (PEEG)

PEEG 151 OVERVIEW OF THE PETROLEUM INDUSTRY

This course provides an overview of the formation and trapping of petroleum, geological and geophysical exploration methods, drilling, reservoir management, production and facilities engineering, refining, and petroleum products and transportation. The theme is learning the overall process from exploration through production and utilization of petroleum. Emphasis will be placed on the different types of engineering skills and disciplines required for each phase of the industry.

Pre-requisites: Freshman year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 214 RESERVOIR ROCK PROPERTIES

This course provides theoretical introduction to basic rock properties and their core-based measurements in the laboratory. Reservoir rock properties determined by conventional core analysis and special core analysis will be covered. It will be discussed how to obtain reliable core analysis data and the specific topics addressed include porosity and permeability, Darcy's law and its applications/limitations, fluid saturations, wettability, capillary pressure, relative permeability, resistivity, compressibility and the effect of internal and external forces on rock physical properties.

Pre-requisites: Sophomore year standing and PEEG 151
Co-requisites: PEEG 215
Restrictions: None
Lecture/Lab/Credit: 2:0:2

PEEG 215 RESERVOIR ROCK PROPERTIES LABORATORY

The Reservoir Rock Properties Lab Course complements and builds on the knowledge gained in PEEG 214. Core analysis experiments will be conducted, using state of the art equipment, to determine the properties of Berea sandstone samples and actual carbonate reservoir core plugs. Fundamental lab experiments will be structured to have a short lecture that provides an introduction to the topic, equipment to be used and detailed guidelines for conducting the experiment.

Pre-requisites: Sophomore year standing and PEEG 151
Co-requisites: PEEG 214
Restrictions: None
Lecture/Lab/Credit: 0:3:1

PEEG 216 RESERVOIR FLUID PROPERTIES

This course covers the basic characterization of reservoir fluids, their properties, and their measurement. Topics covered include phase behavior, density, saturation pressures, gas-oil ratios, shrinkage, viscosity and the compositional analysis of oil, gas, and brine. The importance and challenges of obtaining representative fluid samples are discussed in detail. Utilization of the data for reservoir management and reservoir modeling will also be introduced.

Pre-requisites: CHEG 222 or CHEG 322, and PEEG 151
Co-requisites: PEEG 217
Restrictions: None
Lecture/Lab/Credit: 2:0:2

PEEG 217 RESERVOIR FLUID PROPERTIES LABORATORY

The laboratory sessions of this course cover a range of experimental work on fluid samples, known as pressure-volume-temperature study, which give students a basic understanding of how laboratory data are obtained and the factors that influence their reliability. Most of the experiments are performed using real oil and gas samples. Twelve experiments are designed to help students understand the principals and laws governing reservoir fluid behavior that are discussed in theory (PEEG 216).

Pre-requisites: CHEG 222 or CHEG 322, and PEEG 151
Co-requisites: PEEG 216
Restrictions: None
Lecture/Lab/Credit: 0:3:1

PEEG 252 STRENGTH OF MATERIALS

This course covers topics in statics and strength of materials which are related to petroleum engineering applications. Force vectors and couples, force system resultants, free body diagrams, equations of equilibrium and internal/external forces are introduced first and then applied to problems of stress/deformation analysis in various structural members, considering successively axial loading, multiaxial loading, torsion, pure bending, shearing and design of beams. The

relations between stress and strain in brittle and ductile materials are explained and the significance of elastic parameters is highlighted. Topics such as residual stresses, stress concentrations and stress transformations are discussed. Stresses around circular openings, such as wellbores and boreholes, are discussed and the concept of failure criteria is introduced using the Mohr-Coulomb failure criterion as an example. Finally, the concept of plastic deformation is introduced and the limitations of a linear stress-strain analysis are emphasized.

Pre-requisites: MATH 161, PHYS 191
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 314 WELL LOGGING

This course introduces the various well logging methods, tools and their principles of operation with emphasis on the relationship between measurements and reservoir petrophysical properties. Conditions and limitations for applications of various logs are discussed. Graphical and analytical methods used to determine formation composition, contents, and its potential for production are developed and applied. Computer and commercial software packages are used to handle data, create graphs and log traces, and determine reservoir parameters.

Pre-requisites: PHYS 241, PEEG 214
Co-requisites: PEEG 321
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 315 RESERVOIR CHARACTERIZATION

Reservoir model development in physical, mathematical or numerical sense that enables reservoir engineers to understand the principal qualities of the reservoir and analyze its behavior under various production and EOR scenarios is to be discussed. This course introduces various modeling techniques currently implemented in the oil industry for simulating the reservoir before disturbed by drilling and/or production operations (Static Modeling). In the laboratory part of this course, students are given opportunities to use state-of-the-art simulation software developed mainly to construct reservoir models with devoted recognition to matrix/fracture structure and qualities of petrophysical properties. Heterogeneity of the reservoir and fault system layout is a major modeling issue in this modeling practice. Students perform 60 exercises that lead them to walk away with a ready-to-use reservoir structure for theirs dynamic simulation course in the senior level.

Pre-requisites: PEEG 214, PEEG 216, PEEG 314, PGEG 311
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:2:3

PEEG 321 DRILLING ENGINEERING I

This is an introductory level drilling course which introduces rotary drilling process and basic drilling rig components to the students who have no prior knowledge on oil well drilling technology. Hands on practical sessions with the help of drilling simulators will be used to practice basic drilling operations as well as popular well control procedures. At the end of the course the students should be able to assess formation pressures and fracture strengths; design mud programs and casing shoe depths; design basic components of a drilling rig to meet a given objective; select the most suitable operational parameters for some key drilling equipment; and finally, be familiar with popular drilling problems such as well control, stuck pipe, etc.

Pre-requisites: PEEG 252
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 324 DRILLING ENGINEERING II

This is an advanced level drilling course designed for students who have prior knowledge of drilling fundamentals. The course covers a range of topics from drill bits and tubular design, to drilling fluids and cementing. Upon completing this course, the students should be able to know IADC classification of drill bits, identify drill bits to meet given tasks, select bit operating parameters, select casing grades for a given well data, formulate and analyze drilling fluids and finally design cement job to meet a given objective. The class meets two hours per week.

Pre-requisites: PEEG 321
Co-requisites: PEEG 325
Restrictions: None
Lecture/Lab/Credit: 2:0:2

PEEG 325 DRILLING ENGINEERING II LABORATORY

This course is a laboratory component of the PEEG 324 Drilling Engineering II course. It consists basically of practical laboratory sessions during which students prepare drilling fluid samples and conduct a wide range of experimental measurements of properties of drilling. Some of these properties include density, rheologic behavior, fluid loss characteristics, solid content, contamination and chemical analysis. Students are also familiarized with the basic tools and equipment used and their safe operating procedures during the practical sessions. Students work in groups however, each student is expected to submit an independent technical report for each experiment performed.

Pre-requisites: PEEG 321
Co-requisites: PEEG 324
Restrictions: None
Lecture/Lab/Credit: 0:3:1

PEEG 331 RESERVOIR ENGINEERING I

This course introduces the fundamentals of reservoir engineering. Reservoir fluids/rocks properties and their interactions are discussed. Key reservoir parameters required to calculate flow rates, hydrocarbon-in-place, recovery factor and reserves are fully covered. Data quality and quantity is a major issue: What we know about the reservoir, and at what stage? What are the main sources of data and how much uncertainty involved? How much we risk for data estimates? And, how we make plans to compromise lack and quality of data versus cost/risk involved? These and other related questions are the subject of many discussions in the classroom. Volumetric and material balance calculations are used to determine the reservoir worth and fate. Advantages, disadvantages and integration of these techniques are deliberated. Reservoir production profile under single/combination of driving mechanism(s) is discussed in details. Several field examples and case studies are utilized to explain key reservoir issues.

Pre-requisites: PEEG 214 or PGEG 381, PEEG 216
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 334 RESERVOIR ENGINEERING II

This course introduces the reservoir engineering aspects of reservoir displacement mechanisms and recovery processes. The theory and application of liquid-liquid displacement processes are studied through the frontal advance theory. The effect of wettability and heterogeneity on the displacement efficiency is demonstrated along with the practical use of immiscible displacement concepts in estimating field recovery factors. Gas-liquid displacement processes are introduced including factors affecting oil recovery. Furthermore, this course covers the principals of natural water influx into oil and gas reservoirs, and the different methods to determine the water flood front movement in normal and stratified reservoirs. This course touches upon the practice of water and gas injection for reservoir pressure maintenance.

Pre-requisites: PEEG 331, MATH 261
Co-requisites: None

Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 341 COMPLETION AND WORKOVER

The course presents a review of well completion and workover techniques. The objectives and optimum solutions of well completions for different field conditions are discussed including technical and economic considerations. The design of the tubing string, the most important downhole equipment of any hydrocarbon well, is discussed in detail. The ways of opening the formation for production are detailed and the different types of perforating oil and gas wells are analyzed. Workover procedures including remedial cementing, well stimulation methods are studied along with the required design procedures.

Pre-requisites: None
Co-requisites: PEEG 321
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 342 PRODUCTION FACILITIES

This course covers the description, applications, design, analysis and operational problems of surface production facilities. Topics include two-phase & three-phase separation, emulsion treatment, desalting, oil stabilization, water treatment, gas dehydration and sweetening, and storage and transportation.

Pre-requisites: None
Co-requisites: CHEG 302 or CHEG 351 or MEEG 354
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 353 PETROLEUM PROJECT ECONOMICS

The objective of this course is to introduce students to the concept of business economics implemented in modern petroleum industry. The petroleum industry, as a business venture, is articulated and set terminologies are presented and comprehensively discussed. A step by step contemporary economic evaluation of petroleum property is presented. Selected case studies are used during the course to reflect current petroleum industry practice. Both traditional and non-traditional methodologies are discussed in the class.

Pre-requisites: Junior year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 359 HEALTH, SAFETY AND THE ENVIRONMENT

HSE is critically important to all petroleum industry activities, and is integral to the ADNOC Group mission. This course gives students an in-depth understanding of the key issues for the industry and the employee behavior that is required by leading organizations. Subjects include HSE terms and definitions, accident statistics and their use, hazard identification and assessment, changing HSE culture, management of hydrogen sulfide, hazardous waste management, HSE management systems and goals, and basic safety training in selected topics.

Pre-requisites: PEEG 151, STPS 251
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 397 PETROLEUM ENGINEERING INTERNSHIP

The course requires students to complete a program of full time training to gain practical experience and apply their academic learning in an off-campus work or research environment.

Pre-requisites: Junior year in Petroleum Engineering or permission of Program Chair

Co-requisites: None
Restrictions: Students enrolled in PEEG 397 cannot register for additional courses
Lecture/Lab/Credit: 0:0:3

PEEG 423 HORIZONTAL AND MULTILATERAL WELL TECHNOLOGY

This is a comprehensive course designed to familiarize petroleum-engineering students with the benefits and design of horizontal and multilateral wells. The topics covered include key details of drilling and completion of horizontal and multilateral wells, such as planning, drilling, surveying, tubular selection, failure analysis, cutting transport, hole-stability, cementing, centralizer spacing, etc. Students work on design examples and utilize a number of popular industry software packages.

Pre-requisites: PEEG 324
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 424 UNDERBALANCED DRILLING TECHNOLOGY

This course is designed to familiarize students with the five popular UBD techniques. These are Air/Natural Gas Drilling, Mist Drilling, Foam Drilling, Gasified Liquid Drilling and Flow Drilling. Benefits and limitations of each technique along with the design principles and operational procedures are discussed. Common problems pertinent to each technique and recommended procedures are also discussed.

Pre-requisites: PEEG 324
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 425 PRESSURE CONTROL

This course is designed to introduce fundamental well control principles, procedures as well as well control equipment to the students who have completed their basic drilling engineering courses. In this course, students will learn concepts of formation pressure, static and dynamic well bore pressures; primary and secondary well control. They will be introduced well control principles procedures. The topics will cover, shut in procedures; kick circulation procedures; well control equipment will and finally, how to recognize and alleviate kick circulation problems. The course is designed to give students hands on training with the help of PI Drilling Simulators.

Pre-requisites: PEEG 324
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 435 RESERVOIR SIMULATION

This course introduces a comprehensive review of reservoir simulation modelling using Eclipse commercial simulators. The oil, water and gas flow equations are derived by combining the continuity equation with Darcy's flow equation and the equation of state. These flow equations are derived in rectangular and circular coordinates. These flow PDEs for slightly compressible fluids will be solved numerically using finite difference formulation. The numerical dispersion and time truncation error will be derived and explained and their effect on solution is demonstrated. The data needed for model initialization and history matching will be identified, fed and employed in the modelling process. Implicit solution methods are derived and applied on sample problems. Black oil simulation will be explained and compared briefly to compositional simulation. The theoretical presentation of simulation principals will be supported by weekly practical simulation sessions using Eclipse commercial simulator. Using sample example, students will learn and practice how the different sections of an Eclipse model are generated using a 3D geological model. After exploring the different sections of an eclipse model, the students will be required to generate an eclipse model to explore the different options of field development for a test field case. The students will be given the freedom to design a development scenario for the reservoir and

economically evaluate their development options to come with the optimum scenario. A final report summarizing the term project must be submitted at the end of the semester.

Pre-requisites: PEEG 315, PEEG 331
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:3:3

PEEG 436 RESERVOIR EVALUATION AND MONITORING

This course will address theoretical development of flow equations governing well testing in oil and gas wells. A formulation of flow equations in dimensionless form will be introduced. Line Source Analytical solutions of flow equations will be covered concentrating on semilog analysis. The principle of superposition will also be discussed. Deviation form the idealized model will be addressed and type curve solutions of the flow equations will be reviewed. The course will also cover oil and gas well testing techniques. Practical aspects of pressure analysis will be highlighted.

Pre-requisites: PEEG 314, PEEG 331
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 437 NATURAL GAS ENGINEERING

This course starts by reviewing the gas reservoirs rock and fluid properties, including Darcy and non-Darcy flow phenomena near the gas wells. Gas reserves estimation using linearized MBE and Decline Curve Analysis is studied. Various decline curves are reviewed. Gas flow and gas well testing based on gas transient flow equation are studied after performing pressure solution:- p2, solution, Real Gas Pseudo Pressure solutions. Wellbore storage is evaluated along with pressure DD analysis and pressure BU analysis. Deliverability of gas wells are determined using Multi-Rate draw down testing, flow after flow testing, Isochronal Testing, and Modified Isochronal Testing. Finally, Prediction of Future Performance and Ultimate Recovery form gas reservoirs are studied.

Pre-requisites: PEEG 334
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 443 PRODUCTION SYSTEMS DESIGN AND ANALYSIS

This course utilizes Nodal Analysis techniques for the design and performance analysis of the production system starting from the formation up to the production separator. Topics include inflow performance relationships, multiphase flow in horizontal, vertical and inclined pipes, overall well performance evaluation considering various nodes within the production system, and applications to design and analysis situations. In addition to applications to flowing wells, the application of NODAL analysis methods is discussed to the most important two versions of artificial lift techniques: gas lifting and production by electrical submersible pumps.

Pre-requisites: PEEG 331, PEEG 341, PEEG 342
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 444 ARTIFICIAL LIFT

The course gives a review of well performance evaluations and describes the conditions that lead to considerations of artificial lift implementation. The various methods of artificial lift are described and their applications and technical & economic limitations are discussed. Selection of the proper lift method is shown, based on the different parameters of the reservoir fluids and other variables. Detailed description, design and analysis of artificial lift installations is discussed

and applied to several different oilfield scenarios. Detailed design of continuous flow gas lifted, electric submersible pumped, and sucker rod pumped installations is introduced and practiced.

Pre-requisites: None
Co-requisites: PEEG 331, PEEG 341
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 445 PRODUCTION ENHANCEMENT

This course discusses the causes of production impairment and methods of improving well productivity. Topics include loss of productivity due to formation damage, solids deposition, excessive water and gas production, and bottlenecks in the production system; and production enhancement by matrix treatments, remedial cementing and production profile control. De-bottlenecking of the production system through Nodal analysis of the production system is also covered.

Pre-requisites: PEEG 341, PEEG 443
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 446 HYDRAULIC FRACTURING

This course introduces the fundamentals of hydraulic fracturing in petroleum operations. Basic principles of rock and fluid mechanics are integrated with reservoir performance analysis to design and optimize hydraulic fracture treatments. Techniques for analyzing the success of hydraulic fracture treatments are introduced. The use of hydraulic fractures for productivity improvement and for sand control is discussed.

Pre-requisites: PEEG 331, PEEG 341, and PEEG 353
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 454 UNCERTAINTY AND RISK ANALYSIS IN THE PETROLEUM INDUSTRY

The objective of this course is designed to develop the expertise of petroleum engineering students in the area of risk/uncertainty analyses and their relation to decision making process in the petroleum industry. This approach improves their skills to utilize all available information about the reservoir and other related economies in depicting a realistic projection of the reservoir worth and chances of business success. It will also provide an overview of the methodologies, philosophies, data required, interpretations and procedures employed to reach specific goals. Class problems and strategy developments through utilizing traditional and non-traditional techniques will be exercised during the term. Monte Carlo and/or PEEP simulators are used to analyze risk involved.

Pre-requisites: PEEG 353
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 456 PETROLEUM RELATED ROCK MECHANICS

This course covers the basic rock mechanics principles and topics such as nature of rock, rock deformability and rock stress, engineering properties of rocks from laboratory testing, and the effect of factors such as pore pressure, temperature and time on rock behavior. Scale effects, rock strength, brittle and ductile failure and mathematical approaches to stress-strain analysis in rocks, including stress transformations and constitutive representation of rock behavior, will be discussed. Several typical petroleum engineering applications such as calculations of borehole stresses, borehole stability analysis and reservoir compaction, will be given.

Pre-requisites: PEEG 252
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 457 INTRODUCTION TO ARTIFICIAL INTELLIGENCE APPLICATIONS

This course introduces the basics and fundamentals of artificial intelligence methods and their applications in the petroleum industry. Practical examples and case studies are discussed to illustrate the power of these methods. The course is concluded with a term project where students utilize AI methods to solve specific problems in various areas of petroleum engineering.

Pre-requisites: Senior year standing
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

PEEG 490 PETROLEUM ENGINEERING DESIGN PROJECT I

This is the first semester part of the two-semester Senior Design Project. This is multidisciplinary system design course integrating the fundamentals, design concepts, economic analysis, project management, and risk assessment from petroleum and geosciences engineering. Students work, in integrated teams, on open-ended design problems in oil and gas exploration and field development with emphasis on optimum economics and maximum recovery. The first semester is dedicated to establishing detailed definition of the project and individual tasks, preparing the implementation schedule, acquiring data and information, and establishing the reservoir description.

Pre-requisites: Senior year standing or permission of Program Chair

Co-requisites: None
Restrictions: Open to Petroleum Engineering students only
Lecture/Lab/Credit: 0:3:1

PEEG 491 PETROLEUM ENGINEERING DESIGN PROJECT II

This is the second semester part of the two-semester Senior Design Project. This is multidisciplinary system design course integrating the fundamentals, design concepts, economic analysis, project management, and risk assessment from petroleum and geosciences engineering. Students work, in integrated teams, on open-ended design problems in oil and gas exploration and field development with emphasis on optimum economics and maximum recovery. In the second semester, students prepare the reservoir simulation model, conduct simulation studies for different development scenarios, determine the optimum development case, and design the subsurface and surface facilities. Discussions, short reports, and presentations are held throughout the two semesters to monitor and evaluate work progress. A final report and presentations are made by all team members in addition to an oral examination.

Pre-requisites: PEEG 490
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 0:9:3

PEEG 293/393/493 SPECIAL TOPICS IN PETROLEUM ENGINEERING

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: PEEG 293 is open to Sophomore students and above, PEEG 393 is open to Junior students and above, PEEG 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

PEEG 394/494 RESEARCH TOPICS IN PETROLEUM ENGINEERING

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: PEEG 394 is open to Junior students and above, PEEG 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

PEEG 396/496 INDEPENDENT STUDY IN PETROLEUM ENGINEERING

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the Program
Co-requisites: To be determined by the Program
Restrictions: CGPA≥3.0, PEEG 396 is open to Junior students and above, PEEG 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Petroleum Geosciences (PGEG)

PGEG 210 EARTH MATERIALS

This course introduces the fundamentals of mineralogy, including systematic chemistry and crystallography and physical and optical properties of minerals, emphasizing the carbonate group and silicate minerals. Students learn to use the petrographic microscope and to describe and identify a variety of rock-forming minerals in hand samples and petrographic thin-sections.

Pre-requisites: PGEG 221
Co-requisites:
Restrictions: None
Lecture/Lab/Credit: 3:3:3

PGEG 220 GEOLOGY OF THE MIDDLE EAST

This course covers application of the principles of stratigraphy and age-dating methods, first introduced in Overview of Petroleum Industry and introduces biologic evolutionary theory to interpret and understand evolution of Earth's lithosphere, atmosphere, hydrosphere, and biosphere. Emphasis of the course is on tectonic, stratigraphic, geographic, and biologic evolution of the Middle East, and particularly on paleo-environments, facies, paleontology, and the tectonic setting of UAE reservoirs intervals. The course includes at least one all-day field trip.

Pre-requisites: PGEG 221
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:3

PGEG 221 INTRODUCTION TO GEOLOGY AND GEOPHYSICS

This course provides an introduction to geology and geophysics, emphasizing the process that form and shape Earth, petroleum geology, and geophysics, and the geology of the UAE and the Middle East. Course topics include: origin of minerals and rocks; seismology; Earth's gravity; geomagnetism; geologic time; plate tectonics; structural geology; sedimentary transport and the depositional environments of reservoirs; geohazards; hydrology; economic geology. The course

includes at least one all-day field trip.

Pre-requisites: PEEG 151
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:3

PGEG 311 SEDIMENTARY PETROLOGY

Sedimentary Petrology is concerned with the origin of sediment and sedimentary rock. The course covers sedimentary processes, facies, and diagenesis. Emphasis is on petrographic analysis of microfacies and diagenesis and on carbonate reservoirs and source rocks. Students learn how to characterize reservoirs using limited subsurface information from petrographic thin sections and cores. The course includes a five-day field trip.

Pre-requisites: PGEG 220
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

PGEG 321 STRUCTURAL INTERPRETATION

Structural geology is the study of deformed rock. The course deals with the range of structures produced in rock by deformation; with the role of structures in trapping petroleum and their effect on production with application of structural methods in exploration and production. Course topics include stress and strain; rheological behavior of rock; effects of time, temperature, and pressure on deformation; kinematic and dynamic analysis of deformed rock; the origin of fractures, faults, and folds; structural interpretation from seismic reflection, well, and other exploration and production data; mapping of subsurface structures from industry data; regional structural geology of the UAE. The course includes one three-day field trip.

Pre-requisites: PGEG 221, PHYS 191
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

PGEG 323 REMOTE SENSING FOR EARTH SCIENCES APPLICATIONS & GIS

The course covers the basic principles and essential skills of remote sensing using image visualization, processing and GIS (Geographical Information System) for geological and/or environmental mapping. After completing the course, students should understand the physical principles of remote sensing and be familiar with the major remote sensing satellites and datasets. The students will learn the basic skills of image visualization, processing, interpretation and data manipulation for mapping. The course emphasizes the use of satellite images as essential information source for fieldwork.

Pre-requisites: PEEG 151, MATH 212, PHYS 241
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 1:3:2

PGEG 331 IGNEOUS AND METAMORPHIC PETROLOGY

This course provides an overview of igneous and metamorphic rocks as a background for discussing their origin and distribution in relation to plate tectonics. Course topics include rocks and Earth structure, structures, textures, chemistry, and mineralogy of igneous rocks; phase rule and phase diagrams; origin and movement of magmas; metamorphism and metamorphic rock texture, structures and mineralogy, metamorphic facies and metamorphic phase diagrams.

Pre-requisites: PGEG 210
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 1:3:2

PGEG 341 PALEONTOLOGY

Paleontology is the study of past life. The course covers the application of taxonomic procedures to the identification of fossils and the application of paleontology in paleoenvironmental and biostratigraphic analysis. Students learn about the fundamental morphology, modes of life, evolutionary trends, and time ranges of major macrofossil and microfossil groups. Emphasis is on fossil types that are important in the analysis and interpretation of petroleum reservoirs of the Middle East. The course includes one all-day field trip.

Pre-requisites: PGEG 220
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:3:3

PGEG 351 PETROLEUM GEOPHYSICS

The course introduces the principles and methods involved in modern geophysical petroleum exploration. The course concentrates on physical principles and interpretation of seismic surveying and its application to petroleum exploration. Gravity, magnetics, electrical, and electromagnetic principles and survey techniques are covered, but in less detail. Students will learn about the equipment used, typical fieldwork design, numerical data corrections, and data processing for each survey method. The course includes at least three all-day field trips.

Pre-requisites: PGEG 221, PHYS 241
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

PGEG 361 SEDIMENTOLOGY AND STRATIGRAPHY

Stratigraphy instructs in the sedimentological and stratigraphic methods used to analyze and interpret sedimentary sequences. Students will learn to interpret physical processes and depositional environments from sedimentary structures and textures, and to apply sequence stratigraphic methods to interpret and model facies and sedimentary basin evolution. The course incorporates modern and ancient examples from the Middle East, particularly from the UAE. The course includes five days of fieldwork.

Pre-requisites: PGEG 311
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:3:3

PGEG 371 DATA ANALYSIS AND GEOSTATISTICS

This course introduces the conceptual basics of statistical analysis of geoscience data, and instructs students in how to apply statistical methods including geostatistics to interpret geoscience data and solve petroleum geoscience problems. Course topics include graphical representations, univariate statistics, probability, normal distributions, statistical inference, analysis of variance, bivariate correlation and regression analysis, directional data, circular statistics, Markov analysis, event series and time series analysis, analysis of spatially distributed data, trend surface analysis, kriging, and multivariate methods.

Pre-requisites: PGEG 221
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

PGEG 381 ROCK MECHANICS AND RESERVOIRS

This course builds on material introduced in PGEG 321 and is concerned with the prediction and identification of structures produced during deformation, particularly faults and fractures, and the effect of structures on subsurface flow and reservoir behavior. Course topics include stress, strain, and rock failure; rock anisotropy; testing methods; fractures, faults, and fluid flow; detection, mapping, and modeling of faults and fractures. The course includes a one-day field trip.

Pre-requisites: PGEG 321
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:3:3

PGEG 397 FIELD PETROLEUM GEOLOGY

Field Petroleum Geology is concerned with the study of lithologies and structures in the field. The course addresses vertical and horizontal variability in depositional facies and physical characteristics in reservoirs in three dimensions, and shows how physical variability affects petroleum capacity, flow, and production. Attention is paid to post-depositional diagenetic processes and their effect on reservoir evolution. Students make geological and petrophysical measurement of time- and facies-equivalents to UAE carbonate reservoirs. The course includes four weeks of fieldwork followed by one week of data integration and report writing at the Petroleum Institute.

Pre-requisites: PGEG 361
Co-requisites: None
Restrictions: Students enrolled in PGEG 397 cannot register for additional courses
Lecture/Lab/Credit: 0:0:4

PGEG 401 PETROPHYSICS AND LOGGING

This course presents the physical principles of well logging. PGEG 401 introduces students to geophysical measurements made under borehole and lab conditions. The course also demonstrates methods to correlate geophysical measurements and rock properties and prepares students to perform basic well log and core data interpretation. The course covers concepts of rock properties and their application in the oil industry; lab measurements of rock properties (porosity, permeability, density, resistivity, fluid saturation lithology logs, porosity logs, fluid saturation and permeability estimation from well logs; full well log interpretation. The course refers to rock mechanics from core and well log data.

Pre-requisite: PEEG 216, PGEG 351, PGEG 361
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:3:4

PGEG 411 REFLECTION SEISMOLOGY

The most important method for finding and investigating reservoirs on a large scale is reflection seismology. This course covers the fundamental wave theory that is the basis for the method, and the seismic data acquisition, processing, and display techniques in such a way that one can map the underground and describe its characteristics. The course has a significant theoretical component, and includes class exercises using seismic software and display systems on real-world seismic data. A major component of the course is to design, acquire data, and interpret a seismic reflection survey. The course requires fieldwork.

Pre-requisite: PGEG 351
Co-requisites: PGEG 421
Restrictions: None
Lecture/Lab/Credit: 3:3:4

PGEG 421 PETROLEUM GEOSCIENCE ENGINEERING COMPUTING PROJECT

Petroleum Geoscience Engineering Computing introduces the concepts, methods, workflow, and computer software applications used to analyze petroleum exploration and production data. The course consists of a number of problems that are best solved using modern industry software. Problems include reservoir mapping and characterization integrating 2D and 3D seismic and well data, upscaling of reservoir models, processing and analysis of regional magnetic and gravity data, and use of remote imagery and Geographical Information Systems (GIS) to support environmental studies.

Pre-requisite: STPS 251, PGEG 351, PGEG 371, PGEG 397
Co-requisite: PGEG 411
Restrictions: None
Lecture/Lab/Credit: 2:6:4

PGEG 451 ENVIRONMENTAL GEOLOGY

This course deals with how people interact with Earth's natural systems. Environment profoundly controls social and economic systems but, simultaneously, humans are major agents of geologic change. The course covers natural hazards, landscape and soil characteristics, groundwater, surface water, and climate change, emphasizing the environment and environmental issues of the UAE.

Pre-requisites: PGEG 221, CHEM 181
Co-requisites: None
Restrictions: Junior year standing
Lecture/Lab/Credit: 3:0:3

PGEG 461 RESERVOIR CHARACTERIZATION PROJECT

The course introduces and applies the principals and practices used to characterize petroleum reservoirs using core, structural, seismic, petrographic, and petrophysical data. Emphasis is on depositional geometries, petrophysical properties, and compartmentalization of carbonate reservoirs. Much of the coursework involves characterizing and designing a model of a UAE reservoir integrating multiple datasets.

Pre-requisites: PGEG 361, PGEG 421
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 2:6:4

PGEG 471 PETROLEUM SYSTEMS PROJECT

This course involves completion of a project in the student's area of interest in some area of petroleum geology or geophysics. Students must arrange for supervision from an instructor and the project must be approved by the Petroleum Geosciences Program. The course consists mostly of independent project work.

Pre-requisites: PGEG 401, PGEG 411, PGEG 421
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 0:6:3

PGEG 293/393/493 SPECIAL TOPICS IN PETROLEUM GEOSCIENCES

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the program
Co-requisites: To be determined by the program
Restrictions: PGEG 293 is open to Sophomore students and above, PGEG 393 is open to Junior students and above, PGEG 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

PGEG 394/494 RESEARCH TOPICS IN PETROLEUM GEOSCIENCES

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the program
Co-requisites: To be determined by the program
Restrictions: PGEG 394 is open to Junior students and above, PGEG 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

PGEG 396/496 INDEPENDENT STUDY IN PETROLEUM GEOSCIENCES

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the program
Co-requisites: To be determined by the program
Restrictions: CGPA≥3.0, PGEG 396 is open to Junior students and above, PGEG 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Physics (PHYS)

PHYS 191 PHYSICS I – MECHANICS

This is a first course in physics covering the basic principles of mechanics using vectors and calculus. The course consists of a fundamental treatment of the concepts and applications of kinematics and dynamics of particles and systems of particles, including Newton's Laws, energy and momentum, rotation, oscillation and waves.

Pre-requisites: MATH 111
Co-requisites: MATH 161
Restrictions: None
Lecture/Lab/Credit: 5:3:4

PHYS 241 PHYSICS II - ELECTROMAGNETISM AND OPTICS

This is a continuation of PHYS 191 (Physics I – Mechanics). The course introduces students to the fundamental laws of electricity and magnetism, electromagnetic devices, the electromagnetic behavior of materials, applications to simple circuits, electromagnetic radiation, and an introduction to optical phenomena.

Pre-requisites: MATH 161, PHYS 191
Co-requisites: MATH 211 or MATH 212
Restrictions: None
Lecture/Lab/Credit: 5:3:4

PHYS 341 MODERN PHYSICS WITH APPLICATIONS

The major goal of this course is to instill an appreciation of the concepts and methods of twentieth-century physics. Experimental tests of phenomena are discussed throughout. Topics include the radiation and propagation of electromagnetic waves, ideas behind the special theory of relativity, introductory quantum mechanics and elements of solid-state physics. Emphasis is placed on the application of these ideas and concepts to modern optics, semiconductor and other modern devices. The laboratory part consists of experiments selected to illustrate the principles, laws and concepts discussed in the course.

Pre-requisites: PHYS 241
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:Variable:3

PHYS 293/393/493 SPECIAL TOPICS IN PHYSICS

The course offers content not included in existing courses. A student can take multiple Special Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the program
Co-requisites: To be determined by the program
Restrictions: PHYS 293 is open to Sophomore students and above, PHYS 393 is open to Junior students and above, PHYS 493 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

PHYS 394/494 RESEARCH TOPICS IN PHYSICS

The course focuses on research-driven topics. A student can take multiple Research Topics courses with different content for credit subject to program approval.

Pre-requisites: To be determined by the program
Co-requisites: To be determined by the program
Restrictions: PHYS 394 is open to Junior students and above, PHYS 494 is open to Senior students only
Lecture/Lab/Credit: 1-4 credits

PHYS 396/496 INDEPENDENT STUDY IN PHYSICS

The course may offer content not included in existing courses in an independent study format based on a formal arrangement between the student and instructor. A student can take one or more Independent Study course (up to 6 credits). Independent Study courses require prior approval of the Program Chair and Provost (or designee).

Pre-requisites: To be determined by the program
Co-requisites: To be determined by the program
Restrictions: CGPA≥3.0, PHYS 396 is open to Junior students and above, PHYS 496 is open to Senior students only
Lecture/Lab/Credit: 1-6 credits

Strategies for Team-Based Engineering Problem Solving (STPS)

STPS 201 Strategies for Team Based Engineering Problem Solving I

In STPS I, students are introduced to the engineering design and project management process. Multidisciplinary teams respond to a client specification that requires the design and building of an engineering system or device. Professional technical writing including engineering reports and documents, and effective presentations are developed in this context. Engineering drawing and sketching, and the application of

computer-aided drawing using SolidWorks (3D Mechanical Design and 3D CAD Software) are introduced and integrated.
Pre-requisite: COMM 151, ENGR 103
Co-requisite: PHYS 191
Restrictions: None
Lecture/Lab/Credit: 2:3:3

STPS 251 Strategies for Team-Based Engineering Problem Solving II

This is a continuation of STPS I. Team-based multidisciplinary engineering project work is undertaken. Oral and written professional technical communications as well as teamwork are further developed. There is an increased focus on the application of engineering practices and principles to solve open-ended problems.

Pre-requisite: STPS 201
Co-requisites: None
Restrictions: None
Lecture/Lab/Credit: 3:0:3

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Abdurahim El-Keib, Ph.D.	Chair, Electrical Engineering
John Chai, Ph.D.	Chair, Mechanical Engineering
Hemanta Sarma, Ph.D.	Chair, Petroleum Engineering
Thomas Steuber, Ph.D.	Chair, Petroleum Geosciences
Roy Simmons	Registrar
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LaJuana Mooney, Ph.D.	Head, Institutional Research and Assessment
Isoroku Kubo, Ph.D.	Head, Continuing Education and Alumni Affairs (Acting)
Clarence Rodrigues, Ph.D.	Manager, Health Safety and Environment
Helal Al Busaeedi	Manager, Finance (Acting)

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A

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Ainane, Sami, Ph.D., M.S., University of Maryland, 1989, 1983, B.S., University of Grenoble, 1980, Adjunct Associate Professor in Mechanical Engineering

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Al Mansoori, Ali, Ph.D., Imperial College London, 2006, B.S., Florida Institute of Technology, 2002, Assistant Professor in Chemical Engineering.

Al Shami, Abdullah, Ph.D., University of Manchester 1992, I.L.M., Islamic University of Muhammad Bin Saud, 1986, I.L.B. Islamic University of Muhammad Bin Saud, 1983, Professor in Islamic Studies

Al Shoaibi, Ahmed, Ph.D., M.S., Colorado School of Mines, 2008, 2006, B.S., Florida State University, 2001, Assistant Professor in Chemical Engineering

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Barkat, Braham, Ph.D., Queensland of Technology, 2000, M.S., University of Colorado, 1988, State Engineer, Ecole National Polytechnique d'Alger, 1985, Associate Professor in Electrical Engineering

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Floyd, Jean, M.A.T., New Mexico State University, 1990, B.A., University of Minnesota, 1984, Lecturer in English
Fok, Sai-Cheong, Ph.D., Monash University, 1990, B.A., University of Ottawa, 1985, Professor in Mechanical Engineering
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G

Garis, Dalton, Ph.D., University of Florida, 1996, M.S., Texas A&M University, 1989, B.S., University of Massachusetts, 1984, Associate Professor in Economics
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Ghedan, Shawket, Ph.D., M.S., Colorado School of Mines, 1989, 1984, B.S., University of Baghdad, 1978, Associate Professor in Petroleum Engineering
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Harwood, Steve, M.S., City University 1980, B.Sc., London School of Economics, 1977, Cataloging Librarian
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Hayman, Mark, Ph.D., University of Warwick, 2000, M.A., B.A., University of Birmingham, 1990, 1975, Assistant Professor in History
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Lim, Hwee Ling, Ph.D., Murdoch University 2007, M.A., B.A., National University of Singapore, 1993, 1986, Assistant Professor in Communication

Lokier, Stephen, Ph.D., University of London, 2000, B.S., Oxford Brookes University, 1996, Assistant Professor in Petroleum Geosciences

M

MacEachern, Diane, M.S., B.S., Melbourne University, 2001, 1996, Lecturer in Computing

Martin, Neville, M.S., B.S., Newcastle Upon Tyne Polytechnic, 1984, 1983, Lecturer in Mathematics

McDermott, Mary, M.S., University College Galway, Higher Dip., 1981, 1983, Lecturer in Science

Mahmoud, Haytham, Ph.D., M.S., University of Central Florida, 1998, 1993, B.S., University of Alexandria 1989, Assistant Professor in STPS

McNaught, Ian, Ph.D., B.S., Monash University, 1972, 1968, Associate Professor in Chemistry

Meribout, Mahmoud, Ph.D., M.S., University of Technology of Compiegne, 1995, 1991, B.S., University of Constantine, 1990, Associate Professor in Electrical Engineering

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Morad, Sadoon, Ph.D., Uppsala University, Sweden, 1983, M.S., University of Baghdad, 1977, B.S., University of Baghdad, 1974, Professor in Petroleum Geosciences

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Najaf-Zadeh, Reza, Ph.D., M.S., Lehigh University, 1987, 1980, B.S., Tehran University, 1977, Associate Professor in Physics

Nawrocki, Pawel, Ph.D., Institute of Fundamental Technological Research, 1988, M.S., Technical University of Lodz, 1980, Associate Professor in Petroleum Engineering

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O

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Okur, Muge, M.S., Framingham State College, 2002, B.S., Bogazici University, 1998, Lecturer in Physics

Olearski, Janet, M.A., University of London, 1986, M.A., University of Edinburgh, 1980, Senior Lecturer and Coordinator of Learning Enhancement

Owino, Henry, M.A., Loughborough University of Technology, 1986, M.B.I.T., RMIT University, 1997, B.S., RMIT University, 1983, Acquisitions Librarian

P

Peters, Cornelis, Ph.D., M.S., B.S., Delft University of Technology, 1986, 1978, 1975, Distinguished Professor in Chemical Engineering and Chair of Chemical Engineering

Pheasant, Richard, B.A., University of Gloucestershire, 1986, Senior Lecturer in Computing and Coordinator of Computing

Pillay, Avinash, Ph.D., University of London, 1982, M.S., B.S., University of Durban, 1979, 1977, Professor in Chemistry

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Rao, Mohan, Ph.D., Auburn University, 1988, M.S., Indian Institute of Science, 1983, B.S., Bangalore University, 1981 Visiting Professor in Mechanical Engineering

Rasmussen, Paul, Ph.D., McMaster University, 1969, M.S., B.S., Acadia University, 1966, 1964, Associate Professor in Chemistry

Rindfleisch, William, M.A., San Francisco State University, 1984, B.A., University of Wisconsin, 1971, Lecturer in English

Robinson, Lynne, M.A., Nottingham Trent University, 2005, B.A., South Bank University, 1993, Lecturer in English

Rodgers, Peter, Ph.D., B.S., University of Limerick, 2000, 1990, Associate Professor in Mechanical Engineering

Rodrigues, **Clarence,** Ph.D., M.S., Texas A&M University, 1988, 1985, B.S., University of Bombay, 1980, Associate Professor in Mechanical Engineering and HSE Manager

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S

Sarma, Hemanta, Ph.D., University of Alberta, 1988, University of Calgary, 1984, B.S., Indian School of Mines, 1978, Professor in Petroleum Engineering and Chair of Petroleum Engineering

Seela, Jeffrey, Ph.D., Indiana University, 1989, B.S., Iowa State University, 1983, Professor in Chemistry and Coordinator of Chemistry

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Stewart, Sean, Ph.D., University of Wollongong, 1999, M.S., University of New England, 2002, B.S., University of Wollongong, 1995, Associate Professor in Mathematics

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Su, Charles Qi, Ph.D., University of New South Wales, 1990, M.S., Wuhan University, 1981; B.S., Huazhong University of Science and Technology, 1969, Professor in Electrical Engineering

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Takacs, Gabor, Ph.D., Hungarian Academy of Sciences, 1985, M.S. University of Miskolc, 1970, Professor in Petroleum Engineering

Tapper, Richard, M.S., B.S., University of Otago, 1972, 1967, Lecturer in Physical Science

Thomas, Eurof, M.A., University of Essex, 1984, B.S., Cardiff University, 1974, Lecturer in English

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Vega, Sandra, Ph.D., M.S., Stanford University, 2004, 2000, B.S., Universidad Central de Venezuela, 1990, Assistant Professor in Petroleum Geosciences

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Wang, Xun, Ph.D., University of Manchester, 2003, M.S., B.S., Shandong University, 1997, 1998, Senior Lecturer in Mathematics

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Westley, Neil, M.Ed., B.S., McGill University, 1979, 1969, Lecturer in Computing

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Location Map

Directions to The Petroleum Institute

The Petroleum Institute is located on the mainland near Al Maqta Bridge about 23 km from downtown Abu Dhabi and 17 km from Abu Dhabi International Airport. The campus is in an area called Sas Al Nakhl and/or Umm Al Nar (both names are used on road signs). Exits from Airport Road (also called Highway 2) are clearly marked near Al Maqta Bridge.


Campus Map
Takreer
Umm Al Nar Roundabout
Dubai
Masdar
Entrance Gate
26 Delma
25 Jarneen
24 Abalbokhoush
32 Budana
23Al Bundouq
31Heil
21 Umaldalkh
Entrance Gate
Under Construction
Entrance Gate
0
200meter
Abu Dhabi
Student Housing
Clinic
Mosque
Parking
Restaurant
Arzanah (Women in Engineering)
PIRC (Research Center)
Satah (Student Dining Hall)
Asab (Sports Complex)
Building
Zarkuh (Classes, Cafeteria)
Bu'Hasa (Classes, Labs, Student Council Center, ILC)
Ruwais (Classes, Labs)
Umm Shaif (Classes)
Habshan (Management, SAD, Counseling, Housing & Recreation, Library, Registrar, Admissions, Finance and IT)

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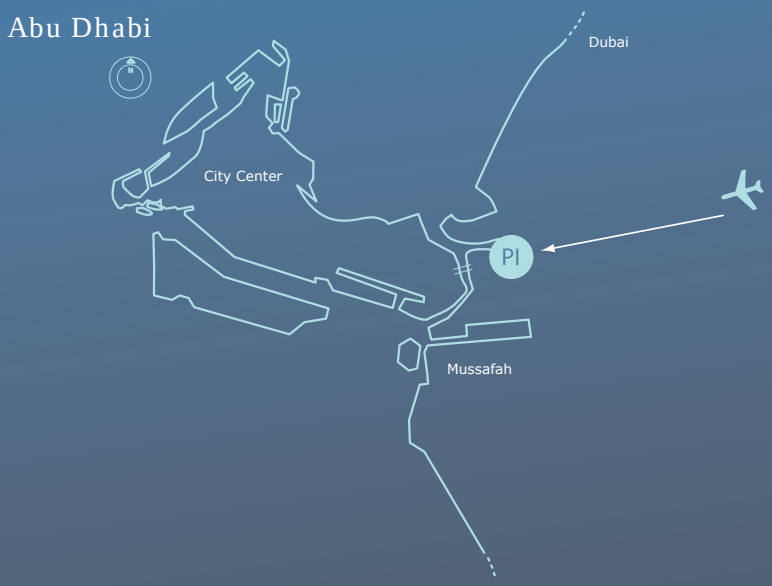

The Petroleum Institute is located on Airport Road midway between Abu Dhabi center and the Abu Dhabi airport.