

The Petroleum Institute

Abu Dhabi

Post-Graduate Catalog



DRAFT 3.0

2006 – 2007 Academic Year

Academic Calendar 2006 – 2007

Fall 2006

| | | |
|--------------------------------|-----------------------|--------------------------|
| New Student Orientation | Saturday – Sunday | August 19 – 20 |
| Al Esraa wa Al Mi'raj | Monday | August 21 |
| Classes begin | Tuesday | August 22 |
| Ramadan begins | Saturday | September 23 |
| Eid Al Fitr Holiday | Sunday – Wednesday | October 22 – 25 |
| National Day Holiday | Saturday – Sunday | December 2 – 3 |
| Boat Race | Monday | December 11 |
| Classes end | Monday | December 18 |
| Study Day | Tuesday | December 19 |
| Final Exams | Wednesday – Wednesday | December 20 – 27 |
| Study Day | Monday | December 25 |
| Mid Year Break | Thursday – Thursday | December 28 – January 18 |
| Arafat and Eid Al Adha Holiday | Saturday – Tuesday | December 30 – January 2 |

Spring 2007

| | | |
|--------------------------|-------------------|--------------------|
| Classes begin | Sunday | January 21 |
| Mawlid Al Nabawi Holiday | Saturday – Sunday | March 31 – April 1 |
| Spring Break | Sunday – Saturday | April 8 – 14 |
| Classes end | Sunday | May 20 |
| Study Day | Monday | May 21 |
| Final Exams | Tuesday – Monday | May 22 – 28 |
| Commencement | Thursday | May 31 |

Summer 2007

| | | |
|-----------------------------------|-----------|---------|
| Classes begin / Internships begin | Sunday | June 3 |
| Classes end / Internships end | Tuesday | July 24 |
| Study Day | Wednesday | July 25 |
| Final Exams | Thursday | July 26 |

Telephone Directory

| Department | Telephone | Fax | E-mail |
|-------------------------------------|----------------------|----------|--|
| Petroleum Institute Information | 508 5100 558 5100 | 508 5200 | |
| Academic Affairs | 508 5713 | 5085 210 | aosman@pi.ac.ae |
| Admissions | 508 5923 | 5085 136 | aalmarzoqi@pi.ac.ae |
| ADNOC Clinic at PI | 602 2804 | | |
| Chemical Engineering | 508 5276 | 508 5200 | asunil@pi.ac.ae |
| Core Program | 508 5380 | 508 5200 | saltamimi@pi.ac.ae |
| Electrical Engineering | 508 5375 | 508 5200 | amohammad@pi.ac.ae |
| Executive Director | 508 5704 | 508 5220 | mkassim@pi.ac.ae |
| Finance and Administration | 508 5723 | 508 5200 | ssameh@pi.ac.ae |
| Foundation Program | 508 5157 | 508 5200 | rmorada@pi.ac.ae |
| Graduates Studies | 508 5880 | 508 5136 | ggilmore@pi.ac.ae |
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| Information Technology | 508 5793 | 508 5200 | malamerei@pi.ac.ae |
| Institutional Research and Analysis | 508 5733 | 508 5220 | IRA@pi.ac.ae |
| Internship and Counseling | 508 5943 | 508 5136 | ujano@pi.ac.ae |
| Library | 508 5961 | 508 5200 | librarian@pi.ac.ae |
| Mechanical Engineering | 508 5362 | 508 5200 | mabedejos@pi.ac.ae |
| Petroleum Engineering | 508 5363 | 508 5200 | mbesterwitch@pi.ac.ae |
| Petroleum Geosciences Engineering | 508 5271 | 508 5200 | japolinar@pi.ac.ae |
| Public Relations | 508 5613 | 508 5240 | atayeb@pi.ac.ae |
| Recreation | 508 5979 | 508 5136 | hallan@pi.ac.ae |
| Registrar | 508 5833 | 508 5136 | Registrar'sOffice@pi.ac.ae |
| Hostels | 508 5900 | 508 5136 | malzaabi@pi.ac.ae |
| Student Affairs | 508 5873 | 508 5136 | aelhaji@pi.ac.ae |
| Emergency Numbers | | | |
| Civil maintenance | 050 5918654 | 558 8613 | |
| A/C maintenance | 050 4451963 | 558 2563 | |
| Electrical maintenance | 050 6994059 | 558 8253 | |
| Medical Hotline | 02 6023265 | | |
| (El Wathig Omer) | 050 6629664 | | |
| Security | 050 6726052 | 508 5200 | amegahed@pi.ac.ae |

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Overview of the Petroleum Institute

The Petroleum Institute was founded by Emiri decree in 2000 under the direction of H.H. Sheikh Khalifa bin Zayed Al-Nahyan. It admitted its first class in fall 2001.

The Petroleum Institute (PI) is financed and governed by Abu Dhabi National Oil Company (ADNOC) and its international partners (Shell, British Petroleum, Total, and Japan Oil Development Company). The objective in founding the PI was to provide the UAE and its oil and gas industry with engineers educated and trained to the highest standards. To this end, an agreement was signed by which the Colorado School of Mines would provide academic guidance and support, and assist in the process of achieving international accreditation.

The campus is situated in the Sas al Nakhl 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 accommodation. The teaching facilities contain the best and most modern equipment available. A separate facility for women has been constructed nearby and the first group of female students will enroll in fall 2006.

Currently there are about 800 male undergraduate students studying at The Petroleum Institute, divided between the Foundation Program and the engineering programs. By the year 2010-2011, it is projected that the PI will have around 2,500 students, of whom some 750 will be female. June 2006 was a major milestone, with PI's first 44 graduates emerging from the engineering programs and going on to start their careers within the ADNOC group of companies.

The 2006-2007 academic year sees the launch of the first post-graduate programs with the offering of a limited suite of post-graduate programs aimed at students wishing to pursue the Master of Science and Master of Engineering degrees. The Petroleum Institute plans to offer a complete suite of Master of Science, Master of Engineering, and Doctor of Philosophy (PhD) degrees in the near future. As the post-graduate program grows, 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 being leveraged by close cooperation with industry through the ADNOC-group operating companies, the international partners, and with participation from selected foreign universities.

Research

The creation and dissemination of new knowledge are primary responsibilities of all members of the university community. Higher education institutions have the responsibility to use that knowledge to contribute to the economic growth and public welfare of the society from which they receive their charter and support. The Petroleum Institute endeavors to provide an environment which enables contribution to the public good by encouraging creative research and ensuring the free exchange of ideas, information, and results. To that end, the Institute acknowledges the following responsibilities:

- To insure that these activities are conducted in an environment of minimum influence and bias, it is essential that the PI protect the academic freedom of all members of its community.
- To provide the mechanisms for creation and dissemination of knowledge, the Institute recognizes that access to information and information technology (e.g. library, computing and internet resources) are part of the basic infrastructure support to which every member of the community is entitled.
- To promote the utilization and application of knowledge, it is incumbent upon the PI to define and protect the intellectual-property rights and responsibilities of faculty members, students, as well as the institution.

The following principles derive from these values and responsibilities:

- The Institute exists to bring faculty and students together to form a community of scholars.
- Faculty members have unique relationship with the PI because of their special responsibility to create and disseminate knowledge independent of oversight or direction from the Institute. Students have a dual role as creators and recipients of knowledge.

- The PI and the faculty share responsibility for facilitating the advancement of students in their chosen discipline.
- The PI and the faculty are mutually dependent upon each other, and share the responsibility for the reputation of both the university and the individual.
- Although research objectives should be informed by the institution's responsibility to its sponsors, to contribute to economic growth and societal wellbeing research priorities must be driven by academic needs relating to the creation, development and dissemination of knowledge.
- Both the creator and the Institute have interest in, and a responsibility to promote, the dissemination and utilization of new knowledge for public good through publication and commercialization.
- Although commercialization is not a primary responsibility of the university community, it is a common result of technology transfer. The sponsor, creator and the Institute may each have an interest in the commercialization of intellectual property and should share in the potential benefits and risks based on their contributions.

Accreditation and Licensure

The Petroleum Institute is licensed by the Ministry of Higher Education, Commission for Academic Accreditation, UAE. All degree-granting programs have been granted initial accreditation by the same organization. The Petroleum Institute is currently seeking international recognition with institutional accreditation from Southern Association of Colleges and Schools, Commission on Colleges (SACS) and program substantial equivalency with ABET, Inc. In addition, the Foundation English program has received conditional accreditation from Commission for English Language Program Accreditation (CEA) with the expectation of full accreditation in the near future.

Institutional Mission Statement

The Petroleum Institute will provide a world-class education in engineering and applied sciences in a 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;
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 post-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.

Student Services

Counseling Program

The Student Affairs Directorate 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 problems
- Communicating with students' guardians concerning problems
- Assisting students as they plan their work placements and internships
- Working with the student advisors to assist the students on academic issues such as course scheduling and career counseling

The office is currently staffed with four full-time counselors. The women's campus will be staffed by its own group of counselors.

Career Services Program

The PI does not have a career services department *per se*, as all undergraduate students are guaranteed positions within the ADNOC group of companies upon graduation. Assistance to post-graduate students in finding employment after graduation is the responsibility of the individual engineering programs, who maintain an extensive network of contacts with potential employers within the ADNOC-group operating companies, with the international partners, and with major oil and gas companies worldwide. Information on employment opportunities is also available in the Office of Graduate Studies.

Health Services

The ADNOC Clinic on the PI campus provides primary health care to all PI students, faculty, and staff members and their dependents. The Clinic is open Sunday – Thursday 7:00 a.m. to 5:00 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 Reception.

Housing

Students who do not live within commuting distance of the PI may be housed in one of the seven on-campus hostels. Availability is not guaranteed for post-graduate students and will be assigned on a space-available basis. Assistance in finding off-campus housing is the responsibility of the Housing and Recreation Department. In some cases, commuting students are also allowed to stay in the hostels depending on availability. Most of the hostels have been refurbished and are configured as double furnished rooms. The Um Al Nar Club, located in hostel 32, has a fitness room with free weights, Nautilus machines, and aerobic machines, and a computer lab with wireless access. This Club is available for students, faculty and staff.

Dining Services

Satah Building, a new dining facility that has a capacity for 750, opens in fall 2006. It will serve three meals a day for the PI community. In addition, cafes open during the day for breakfast, lunch and snacks are located in Zarkuh, Bu Hasa, Habshan, and Arzanah buildings. Delivery service to faculty

and staff offices is available from each of the cafes. In addition, snack machines are located in Bu Hasa and in most of the hostels.

Mail Service

The PI provides mail service on campus. Mail is distributed daily to all Institute offices by staff from General Services. The Reception handles all outgoing mail including courier services. 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 Office

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 students, 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. It also provides official letters that might be required by various government and/or private organizations.

Information Technology

The Information Technology (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, and wireless and local area networks. The Institute uses fiber-optic cables that interconnect the entire campus.

Library

The library is dedicated to providing information services to support academic programs and research activities. It will also house the archives for the PI. The print collection focuses on scientific, engineering, and humanities titles but also has general interest reading books, as well as maps and videos.

The library occupies part of the ground floor and first floor of one wing of Habshan Building and contains stacks, journal collection, an information commons area, quiet reading areas, group study rooms, and staff offices. Seating is available for over 320 users with a shelving capacity of more than 120,000 volumes. Library holdings are available through an online catalog system. Using the library catalog, users can access book titles, full-text journals, and electronic databases. An inter-library loan service is available for the PI community where materials can be obtained from commercial document delivery centers. The library maintains ample operating hours daily and has recently expanded to nights and weekends.

Registry and Records

A permanent record reflecting the academic achievements of each student who enrolls at the PI is maintained by the Registrar's 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.

Students' privacy rights: 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's 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 transcripts of their academic records at the PI from the Registrar's 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 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 college or university-level programs; (2) grades earned in those courses; (3) English language proficiency; (4) results from standardized tests. 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 Post-Graduate program at The Petroleum Institute is available to highly qualified UAE Nationals and non-Nationals.

Admission Process

Admissions policies and procedures for the post-graduate programs of the Petroleum Institute are advertised on the PI website. An electronic application form is provided for the use of prospective students. In order to be considered for admission to the post-graduate program, 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 requested to report to the Petroleum Institute for orientation prior to the start of classes.

Admission Requirements

Admissions Criteria: The following general admissions policy, procedures, and criteria apply to all programs:

- 1) Application Procedures: Students interested in pursuing graduate studies will apply to the Petroleum Institute. Application materials are posted on the PI website, and students can apply electronically following the procedures outlined below. Once received, the application will be sent directly to the cognizant engineering program for a recommendation on admission.
- 2) Admissions: Admission to the post-graduate program is open to all; however preference for admission is given to UAE Nationals. Employees of ADNOC and its group companies will also receive preference for admission. The following general criteria apply to all applicants:
 - a. minimum GPA of 3.00 from a reputable B.Sc. Program; applicants must submit a certified academic transcript from their baccalaureate institution. Degrees will be submitted by the PI to the Ministry of Higher Education and Scientific Research for authentication and attestation.
 - b. recently certified TOEFL score of 550 or better
 - c. GRE scores, general test only (verbal and quantitative)

After recommendation by the Engineering Program, final approval for admission to the Post-Graduate program is required by the Director of Graduate Studies and Research.

Admissions Procedures: Apply electronically for admission on the World Wide Web by following the procedure outlined below.

1. Application: Go to the online application form at:

www.pi.ac.ae/Admiss/grad/graduate_admissions.html.

You may download a paper copy of the application from our website or contact 9712-5085142 or grad-school@pi.ac.ae to have one sent by mail. Students wishing to apply for graduate school should submit completed applications by the following dates:

for Fall admission

April 1 – International student deadline

July 1 – Domestic student deadline

for Spring Admission

September 1 – International student deadline

November 1 – Domestic student deadline

Students wishing to submit applications beyond the final deadline should make a request to the individual academic department.

2. Transcripts: Send to the Post-Graduate Admissions Office two official transcripts from each school previously attended. The transcripts may accompany the application or may be sent directly by the institution attended. International students' transcripts must be in English or have an official English translation attached. All application materials should be mailed to:

The Petroleum Institute
Post-Graduate Admissions
P.O. Box 2533
Abu Dhabi, UAE

3. Graduate Record Examination: The General test of the Graduate Record Examination is required for applicants seeking admission. For information about the test, write to Graduate Record Examinations, Educational Testing Service, PO Box 6000, Princeton, NJ 08541-6000 (Telephone 609-771-7670), or visit online at www.gre.org.

4. English Language Requirement: Students whose native language is not English must score at least 550 on the paper TOEFL examination (Test of English as a Foreign Language) or 213 on the computer-based examination and have the results sent to the Office of Graduate Studies. Contact local American embassies or write to TOEFL Services, Educational Testing Service, P.O. Box 6151, Princeton, NJ 08541-6151, USA, (Telephone 609-771-7100) for information about the TOEFL examination. You may also visit online at www.toefl.org.

Probationary or Provisional Admission: Admission to a post-graduate degree program is under the control of the individual engineering programs who may set higher admission standards than those noted above. For strong applicants, students not meeting the minimum requirements may be admitted by a Program on a provisional basis; applicants with significant relevant industrial experience will be given special consideration for admission. Provisional students are required to maintain a minimum GPA of 3.00 for nine graduate credit hours in order to be removed from provisional status. Each program will examine the applicant's academic background in order to assess the student's needs in terms of deficiency courses which normally will need to be fulfilled before starting the post-graduate program. Admission for students from other technical disciplines or who have non-technical undergraduate degrees will be considered on a case-by-case basis by the cognizant engineering program. Deficiency courses will be identified, and a program of study will be customized for these students. Students taking deficiency courses will have provisional status, and will be required to maintain a cumulative GPA of 3.00 or greater.

Transfer Students

Transfer Credit: Credit for academic work at other institutions will be considered; academic credit for work experience or other experiential situations will not be granted. A maximum of six (6) credit hours can be transferred to the PI to satisfy post-graduate degree requirements. Courses considered for transfer credit must have a minimum of 3.0 on a 4.0 scale. Transfer credit will be granted only after receipt of an official transcript and only for courses with content and level of instruction equivalent to the post-graduate program at the PI. Transfer students must be in good standing at the institution from which they are transferring.

Former Students

A former student who has been voluntarily absent for at least one semester, or who withdrew voluntarily from a semester may seek re-admission by completing a "Request to Resume Studies"

form available from the Registrar's Office. When completed, the form should be submitted to the Registrar's Office.

Former students who were suspended or dismissed should refer to section *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 PI 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 Prerequisites or have the permission of the instructor. Official transcripts or officially certified copies of transcripts or other evidence of the prerequisites are 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.

Tuition

Tuition will be charged to all post-graduate students at a rate of AED1500 per credit hour for ADNOC and ADNOC-group employees and AED2000 per credit hour for non-ADNOC students.

Faculty Advisor Appointment

Each Master's student must select a faculty advisor to provide advice regarding the student's thesis direction and research (MS students) and selection of courses (both MS and ME students) by the middle of their second semester at the PI. The faculty advisor will serve as a voting member of the student's Thesis Committee. The student's program director and the Director for Graduate Studies and Research must approve all faculty advisor appointments. Advisors must be full-time members of the PI Post-Graduate faculty and must hold the rank of professor, associate professor, assistant professor, research professor, associate research professor or assistant research professor. Upon approval by the Director for Graduate Studies and Research, adjunct professors and off-campus representatives may be designated as co-advisors. When appropriate and upon approval by the Director for Graduate Studies and Research, faculty members outside the student's home program may serve as the student's faculty co-advisor. In either of these cases, a co-advisor must be selected from the student's home program.

Thesis Committee

The Director for Graduate Studies and Research appoints a Thesis Committee for Master of Science students whose members have been recommended by the student, the student's faculty advisor, and the student's program director. Students should have a thesis committee appointed by the end of their second semester. This Committee will have a minimum of three voting members, including the student's advisor, who are familiar with the student's area of study. Of these Committee members, two must be from the home program or, in the case of interdisciplinary degree programs, an allied program. Off-campus members can be assigned to the Committee to serve either with full voting status or in a non-voting capacity. Off-campus members with voting status assume all of the responsibilities of on-campus Committee members with respect to attendance of Committee meetings, review of thesis drafts and participation in oral examinations and thesis defense sessions. If a thesis co-advisor is assigned, an additional faculty member from the home or allied program must be added to the committee. Students who choose to have a minor program at the Master's level must select a representative from their minor area of study to serve on the Thesis Committee. Minor representatives must be full-time members of the PI faculty. A Thesis Committee Chairperson is designated by the student at the time he/she requests the formation of his/her thesis committee. The chairperson is responsible for leading all meetings of the thesis committee and for directing the student's thesis defense. In selecting a Thesis Committee chairperson, the following guidelines must be met: 1) the chairperson cannot be the student's advisor or co-advisor and 2) the chairperson must be a full-time PI Post-Graduate faculty member. Shortly after its appointment, the Committee will

meet with the student to hear a presentation of the proposed course of study and thesis topic. The Committee and the student must agree on a satisfactory program and the student must obtain the Committee approval of the written thesis proposal at least one semester prior to the thesis defense. The student's faculty advisor assumes the primary responsibility for monitoring the program and directing the thesis work. The award of the thesis-based Master's degree is contingent upon the student's researching and writing a thesis acceptable to the student's faculty advisor and Thesis Committee.

Thesis Defense

The student submits an initial draft of his or her thesis to the faculty advisor, who will work with the student on necessary revisions. Upon approval of the student's advisor, the revised thesis is circulated to the Thesis Committee members at least one week prior to the oral defense of the thesis. The oral defense of the thesis is scheduled during the student's final semester of study. Students must be registered to defend. This defense session, which may include an examination of material covered in the student's course work, will be open to the public. Following the defense, the Thesis Committee will meet privately to vote on whether the student has successfully defended the thesis. Three outcomes are possible: the student may pass the oral defense; the student may fail the defense; or the Committee may vote to adjourn the defense to allow the student more time to address and remove weaknesses or inadequacies in the thesis or underlying research. Two negative votes will constitute a failure regardless of the number of Committee members present at the thesis defense. In the event of either failure or adjournment, the Chair of the Thesis Committee will prepare a written statement indicating the reasons for this action and will distribute copies to the student, the Thesis Committee members, the student's program director and the Director for Graduate Studies and Research. In the case of failure or adjournment, the student may request a re-examination, which must be scheduled no less than one week after the original defense. A second failure to defend the thesis satisfactorily will result in the termination of the student's graduate program. Upon passing the oral defense of thesis or report, the student must make any corrections in the thesis required by the Thesis Committee. The final, corrected copy and an executed signature page indicating approval by the student's advisor and department head must be submitted to the Office of Graduate Studies for format approval. Format instructions are available in the Office of Graduate Studies and should be obtained before beginning work on the thesis.

Admission to Candidacy

Full-time Master of Science students must complete the following requirements within the first calendar year after enrolling into the Master's degree program.

- have a thesis committee appointment form on file in the Office of Graduate Studies;
- complete all prerequisite and core curriculum course requirements of their department, division or program; and
- be admitted into full candidacy for the degree.

Each degree program publishes a list of prerequisite and core curriculum requirements for that degree. If students are admitted with deficiencies, the appropriate program directors will provide the students written lists of courses required to remove the deficiencies. These lists will be given to the students no later than one week after the start of classes of their first semester in order to allow them to add/drop courses as necessary. Upon completion of the above defined requirements, students must submit an Admission to Candidacy form documenting satisfactory completion of the prerequisite and core curriculum requirements and granting permission to begin Master's level research. The form must have the written approval of all members of the advisor and thesis committee, if appropriate.

Grades and Graduation Requirements

Evaluation of Students and Grading

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.

| Grade | Description |
|-------|--|
| A | Excellent |
| B | Good |
| C | Satisfactory |
| D | Poor (Lowest pass for degree courses) |
| F | Failed |
| XF | Failed due to academic dishonesty |
| W | Voluntarily Withdrawn or F Forgiveness |
| WI | Withdrawn Involuntarily (Dismissed) |
| INC | Incomplete |
| NC | Not for Credit |
| Z | Grade not yet submitted |

Resolution of INC (Incomplete)

If a student, because of illness or other reasonable excuse, fails to complete a course, a grade of INC (Incomplete) is given. The grade INC is temporary and indicates that some work is missing. A grade of INC must be changed by the instructor no later than the end of the fourth week of the first regular semester following the semester in which it was received. If the INC is not changed by the instructor within four weeks, the INC will be changed to an F (Failed). Grade changes submitted after four weeks must be signed by the instructor's Program Director and the Chief Academic Officer.

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 points and quality hours. The grade A represents four quality points, B three, C two, D one, F none. For purposes of quality point calculation, a grade of XF is equivalent to a grade of F. 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, B, C, D, or 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, INC, NC or Z are not counted in determining quality hours.

Transfer Credit not included 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. 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 5 years, post-graduate students should enroll in 15 credit hours each semester. Students wishing to enroll for more credit hours in a given semester must obtain written approval from their faculty advisor.

Grade-Point Averages

Grade point averages are calculated to two figures following the decimal point.

Graduation Requirements

Catalog of Record

For purposes of academic standing and verification that all graduation requirements have been met, the Catalog currently in force is the Catalog of Record.

Graduation Requirements

The individual engineering programs have established the credit hour and graduation requirements for thesis and non-thesis post-graduate degree programs. These requirements are not necessarily uniform across the five engineering programs; prospective students should consult the program-specific information in the following sections of this Catalog for details. The following general guidelines apply.

Master of Engineering (or Master of Science without thesis)

The Master of Engineering degree consists of a minimum of 30 credit hours of approved graduate-level coursework. Students must have an overall cumulative grade point average of 3.00 or better in order to qualify for graduation with a Master of Engineering degree.

Master of Science

The Master of Science degree consists of a minimum of 24 credit hours of approved graduate-level coursework. In addition, students must complete and successfully defend a Master of Science thesis (six credit hours). Students must have an overall cumulative grade point average of 3.00 or better in order to qualify for graduation with a Master of Science.

Academic Rules and Regulations

Full-time Enrollment

Post-graduate students are expected 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 their Program Director. Full-time registration in fall and spring semesters is necessary to maintain progress towards graduation.

Academic Standing

At the end of every semester and summer session, a degree student's academic standing will be assessed based on the student's accumulated total quality hours, cumulative grade point average and semester grade point average. Post-graduate students who maintain an overall cumulative grade point average of 3.00 or better are considered to be in good standing.

A student's progress toward successful completion of a graduate degree shall be deemed unsatisfactory if any of the following conditions occur:

- _ Failure to maintain a cumulative grade point average of 3.00 or greater ;
- _ Receipt of an "Unsatisfactory Progress" recommendation from: (1) the director of the student's home program, (2) the student's thesis committee, or (3) a departmental committee charged with the responsibility of monitoring the student's progress.

Unsatisfactory academic progress on the part of a post-graduate student shall be reported to the Director for Graduate Studies and Research in a timely manner. Students making unsatisfactory progress by any of the measures listed above shall be placed on academic probation upon the first occurrence of such indication. Upon the second occurrence of an unsatisfactory progress indication, the Director for Graduate Studies and Research shall notify the student that he or she is subject to discretionary dismissal according to the procedure outlined below.

Probation and Discretionary Dismissal Procedures

If a student is subject to academic probation as a result of an initial indication of unsatisfactory academic progress, the Director for Graduate Studies and Research shall notify the student of his or her probationary status in a timely manner.

If a student is subject to discretionary dismissal by one of the mechanisms defined above, the Director for Graduate Studies and Research shall notify the student and invite him or her to submit a written remedial plan, including performance milestones and deadlines, to correct the deficiencies that caused or contributed to the student's unsatisfactory academic progress. The remedial plan, which must be approved by the student's faculty advisor and the program director shall be submitted to the Director for Graduate Studies and Research no later than 15 business days from the date of official notification. If the Director for Graduate Studies and Research concludes that the remedial plan is likely to lead to successful completion of all degree requirements within an acceptable time frame, the Director for Graduate Studies and Research may halt the discretionary dismissal process and allow the student to continue working toward his or her degree. If the Director for Graduate Studies and Research concludes that the remedial plan is inadequate, or that it is unlikely to lead to successful completion of all degree requirements within an acceptable time frame, the Director for Graduate Studies and Research shall notify the student of his or her discretionary dismissal and inform the student of his or her right to appeal the dismissal as outlined below.

Unsatisfactory Academic Performance Resulting in Mandatory Dismissal

Unsatisfactory performance as gauged by any of the following measures shall result in immediate, mandatory dismissal of a graduate student: (1) failure to successfully defend the thesis after two attempts; (2) failure to be admitted to candidacy; or (3) failure by a student subject to discretionary

dismissal to achieve a performance milestone or meet a deadline contained in his or her remedial plan. The Director for Graduate Studies and Research shall be notified promptly of any situation that may subject a student to mandatory dismissal. In this event, the Director for Graduate Studies and Research shall notify the student of his or her dismissal and inform the student of his or her right to appeal the dismissal as outlined below.

Students who have been notified of mandatory dismissal will be placed in non-degree status. They may request readmission to either the same or a different degree program by submitting a full application for admission to the Graduate Office. The application will be reviewed through the normal admission process.

If a student who has been reinstated or readmitted to their former degree program subsequently is found to be making unsatisfactory progress, they immediately will be subject to mandatory dismissal.

A student, having been suspended and readmitted twice, who is suspended again, will be dismissed and ineligible to enroll in further courses.

Suspension and dismissal may be appealed to the Appeals Committee. Probation may not be appealed.

Period of Suspension

Suspension is for one regular semester (fall or spring). A suspended student may not take courses in the summer session.

Suspension for Repeated Failure: A student who twice fails the same course counting towards a degree will automatically be placed on suspension regardless of the student's cumulative or semester GPA.

Withdrawal from a course

Students may withdraw from a degree course during the first 10 class days of a regular semester without any record of enrollment in the course appearing on their transcript. Students may withdraw from any degree course after the tenth day of classes through the twelfth week of the semester for any reason with a grade of W. After the twelfth week, no withdrawals are permitted except by appeal.

Students considering withdrawing from any course should discuss the decision with their instructor or program advisor or with an academic counselor. Withdrawing from a course may have an impact on a student's stipend.

Course Add/Drop forms are available from the Registrar's Office.

Return after a missed semester, full withdrawal form 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, or voluntary withdrawal from all courses or a period of suspension or any appeal of a dismissal must be submitted to the Registrar's Office on a *Request to Resume Studies at the Petroleum Institute* form. These are available from the Registrar's Office.

A student who have has dismissed must also submit a letter which states clearly the reason(s) why the s/he should be re-admitted. Appeals for re-admission after dismissal will be considered by the 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, any 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 Appeals Committee that s/he has both the motivation and the ability to succeed at the Petroleum Institute.

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 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

Class attendance is an important component of the learning process. Accordingly, unexcused absences from class will not be tolerated. Work missed due to unexcused absences, including homework, projects, quizzes, and exams, cannot easily be made up and may be assigned a score of zero.

Excused absences from class are allowed under special circumstances such as, medical reasons, or personal or family emergencies. In the case of absence due to a medical condition, the student is required to submit a physician's report to a counselor in order to obtain permission to make up any assignments that have been missed.

Classroom Deportment

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 are subject to permanent removal from the course following consultation with the Chief Academic Officer.

Mobile Phones and Pagers

Mobile phones and pagers should be turned off when entering the PI campus premises. They are not to be used during class.

Free Day

No classes will be held during the last weekday preceding final exams ("free day"). Faculty are prohibited from giving examinations, or planning any class-related activities that require students to attend on a "free day".

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 go directly to the Student Affairs Directorate where they will be referred to a Student Counselor for assistance. The 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 director. Some issues where there is no immediate resolution may require the student to implement a formal appeals process.

PI Appeals Committee

Students who feel that a rule or regulation was applied unfairly may submit an appeal in writing. Appeals will be considered by the PI Appeals Committee. The appeal should be accompanied by relevant evidence, such as a letter from a medical doctor. When considering an appeal, the 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 Appeals Committee consists of five members drawn from the teaching and student affairs staff. Members, appointed by the Executive Director each August, 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 Appeals Committee are final.

Results of the appeal will be given to the student in writing and a copy of all documents will be placed in the student's file.

Academic Integrity Policy

Introduction

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 be committed to the principles of truth and academic honesty. To maintain the highest standards of academic integrity, this policy defines the standards to which The Institute expects its students to adhere.

Definitions

Academic dishonesty includes the following acts committed knowingly or intentionally by the student:

- Cheating** Using or attempting to use unauthorized materials and assistance, such as notes, study aids, electronic communication devices of any sort, or any other forms of unauthorized information or consulting any unauthorized sources, in any academic assignment, exercise, or examination.
- Fabrication** Falsifying or inventing research, citations, or any information on any academic assignment, exercise, or examination.
- Plagiarism** Representing another's words or ideas as one's own or failing to give proper credit to outside sources of information in any academic assignment, exercise, or examination.

Facilitating academic dishonesty: Aiding or assisting another in any of the above three acts.

Responsibility to Deter Academic Dishonesty

Academic dishonesty jeopardizes the quality of education that The Institute is committed to provide its students, the reputation of The Institute, and the principles it has pledged to uphold. Passive acceptance or consent to acts of academic dishonesty can foster deceptive practices that once firmly established will quickly develop into an environment of dishonesty. It is therefore the responsibility of all members of this academic community – students, faculty, and staff alike – to deter actively all instances of academic dishonesty in order to safeguard the high academic standards of The Institute.

Academic Integrity Statement

It is vital that the Academic Integrity Policy be fully understood by the entire academic community. The Policy represents a code of honor that will be upheld by The Petroleum Institute. The full text of this Policy can be found in the Undergraduate Bulletin, and a synopsis can be found online at www.pi.ac.ae/academic. When it appears that the Policy has been violated, the measures outlined in this document will be followed.

Honor Pledge

The Honor Pledge is a reminder to the students that The Institute is committed to academic integrity. The Honor Pledge is a short statement attesting that each paper or examination is the student's own work. The faculty use the pledge as a symbol of The Institute's commitment to these values. The pledge should be typed or handwritten and signed on each major assignment submitted in the form of a hard copy; it should be included on electronically submitted assignments as well, where its inclusion will count as a signature. The pledge is as follows:

"I pledge that I have neither given nor received any unauthorized assistance on this academic assignment, exercise, or examination."

Student Signature

Academic Honor Council (AHC)

1. The AHC is formed every September and is appointed by the Chief Academic Officer (CAO). Members of AHC will serve for at least 12 months, with no special limits on the length of service.
2. The AHC will consist of five (5) members:
 - i. the Director of Student Affairs or his designee and
 - ii. three faculty and one staff member appointed by the CAO
3. The AHC will elect its own Chair from among these five members.
4. The AHC will be charged with maintaining the highest level of academic integrity at The Institute.
5. The Investigating Officer (IO) will be appointed each year by the Director of Student Affairs and will not be a member of the AHC.

Procedure to Report Academic Dishonesty

Informal Resolution

1. If an instructor suspects that a student has committed an academic offence in a particular course or academic activity,
2. s/he should meet with the student to discuss the allegation.
3. If the instructor determines that no academic offence has occurred, the matter is dropped.
4. If the student admits to committing the offence, the instructor, after consulting with the Student Counseling office to review the student's history, may impose any or all of sanctions 1, 2, or 3 from section VII of this document,
5. Or s/he may refer the case to the AHC. If the instructor imposes a sanction, s/he is required to submit a report to the Student Counseling Office, with a copy to the Academic Unit Director.
6. If the student disputes the charge or if the instructor chooses to send the case to the AHC, then the case is referred to the IO.
7. Upon receiving the case, the IO will interview the student and instructor and review the facts.
8. If the IO determines there is not sufficient evidence to proceed, the matter is dropped.
9. If the IO determines there is sufficient evidence to proceed and/or if the student admits the offence at this stage, the case is then referred to the AHC.

The Investigation

1. A student charged with or under investigation for an allegation of an academic offence may not withdraw from the course in question.
2. A student may not graduate as long as any allegation of an academic offence remains unresolved.
3. If a student fails to attend any meeting called in connection with an allegation of an academic offence, the procedure may continue without the student.
4. Students may seek advice about the Policy and the associated procedures from the Counseling office.

Procedure to Resolve Cases Reported to the AHC

1. The IO will present the Charge of Academic Dishonesty to the AHC in writing.
2. The student will be presented with the Charge and must respond to it in writing to the IO within seven days.
3. The AHC will hold a meeting with the IO and the student 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 offence, it will meet separately to determine an appropriate sanction. Decisions of the AHC are reached by majority vote.

The Chair votes only when it is necessary to break a tied vote.

Sanctions and Punishments

When considering possible sanctions, the AHC can take into account the student's records, any history of academic offences, and other relevant circumstances. Possible sanctions include the following:

1. A written warning
2. A reduction in grade for the assignment
3. A zero grade for the assignment
4. A reduction of grade for the course, including an F grade for the course
5. An XF grade for the course
 - a) On the student's transcript an "XF" will be recorded with the notation "failure due to academic dishonesty." An "XF" shall be calculated as an "F" in grade point average calculations, and will have the same repercussions as an "F" in terms of determination of academic standing.
 - b) Students with an "XF" on their transcripts may not run for or hold office in any student organization that is allowed to use Institute funds or Institute facilities.
 - c) The student may file a written petition to the AHC to have the grade of "XF" removed from his/her transcript and replaced permanently with an "F", subject to the conditions listed below. In such cases, the "failure forgiveness" policy will apply.
 - i. A majority of the entire AHC will determine whether the "XF" should be replaced, assuming the following requirements have been met:
 - a) At the time the petition is received, at least twelve months have passed since the grade was imposed; and
 - b) The student has not been found responsible for any other acts of academic dishonesty or other disciplinary offences.
 - ii. Generally, a grade of "XF" should not be removed if imposed for an act of academic dishonesty that required significant premeditation. Decisions of the AHC regarding the removal of an "XF" grade may be appealed to the CAO. If the CAO removes the grade of "XF," he/she shall provide written reasons to the AHC.
6. Suspension from the Institute for one or more semesters
 - a) A student found guilty of Academic Dishonesty may be suspended for one or more semesters. The AHC will determine the length of suspension.
 - b) Once imposed, the AHC will recommend the effective date for suspension, which could be immediate.
 - c) If suspended during an academic semester, the student will receive WI (involuntary withdrawal) for all courses. If the suspension is imposed at the end of

an academic semester, the student will receive a grade of "F" in the course(s) in which the academic dishonesty occurred.

- d) The Institute will report the case to the sponsor(s) of the student's scholarship if applicable.
7. Expulsion from the Institute
- e) A student found guilty of Academic Dishonesty may be expelled from The Institute. This sanction is only to be used in extreme cases.
 - f) The CAO will recommend the expulsion to the Executive Director who shall in turn review the entire case before the student is expelled. He/she may impose a lesser sanction in lieu of expulsion, including suspension.
 - g) An expelled student may not petition to be reinstated to the Institute.

Appeals

1. All appeals must be in writing and must establish grounds for an appeal.
2. All appeals must be submitted within 15 business days from the decision date of the AHC.
3. All appeals must be submitted to the CAO.

Records of Sanctions

1. All records of sanction for all cases will be kept in the Counseling and Internship Office.
2. A record of any sanction requiring action of the Registrar will be placed in the student's file at the Registrar's office.
3. In every case, The Institute will provide a record of the sanction to the student's guardian.
4. The AHC may also choose to provide a record of the sanction to the student's scholarship sponsor.

Committee Annual Report

The AHC will report a summary of its activities to the CAO at the end of every spring semester. The report will include the number of investigations conducted during the previous twelve months and a brief summary of the nature of the cases and the disposition of the cases. Its report may include recommendations for changes in its policies as needed.

Academic Programs 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 excellent facilities using state-of-the-art instructional materials. Students also meet other students who will become lifetime 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.

Students in the engineering post-graduate programs apply the fundamentals of engineering and science in large part by solving advanced engineering problems and in petroleum-related thesis and engineering projects, working either individually or in groups. Subjects are interrelated and students integrate knowledge gained in one course with that gained in others. Grades are based on mid-term and final examinations, periodic in-class tests, homework, and performance on projects, laboratory exercises, class participation, and attendance.

Chemical Engineering Program

Master of Science and Master of Engineering in Chemical Engineering

Program 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.

Post-Graduate program goals (educational objectives)

Master of Science Program

Program Educational Objectives:

1. Provide graduates with an outstanding education and the research skills and knowledge required to further their career aspirations;
2. Prepare graduates to go on for further education in PhD programs;
3. Raise the professional visibility of the PI through publication of scholarly works;
4. Provide ADNOC with a pool of highly educated personnel who can utilize their detailed knowledge of technology to better develop business opportunities;
5. Advance the technological profile of ADNOC, the UAE, and the regional and global oil and gas industry.

Master of Engineering Program

Program Educational Objectives:

1. Provide graduates with an outstanding education and the advanced skills and knowledge in technical and business-related areas required to further their career aspirations;
2. Provide ADNOC with employees who have the knowledge, skills, and educational background required to synthesize technical issues and economic/business management issues in the solution of chemical engineering problems;
3. Provide graduates who move into and perform well in management positions;
4. Provide ADNOC and the UAE with pool of highly educated technical personnel;
5. Advance the technological profile of ADNOC, the UAE, and the regional oil and gas industry.

Post-Graduate program objectives (outcomes)

Master of Science Program

- Outcome 1: Upon completion of the chemical engineering Master of Science post-graduate program, graduates will be able to successfully apply advanced concepts of basic science to formulation and solution of complex chemical engineering problems
- Outcome 2: Upon completion of the chemical engineering Master of Science post-graduate program, graduates will be able to successfully apply advanced concepts of chemical engineering science to formulation and solution of complex chemical engineering problems
- Outcome 3: Upon completion of the chemical engineering Master of Science post-graduate program, graduates will find employment in technologically-relevant areas and will advance rapidly through their chosen career path

Outcome 4: Upon completion of the chemical engineering Master of Science program, graduates will have results of Master of Science research thesis projects published in peer-reviewed journals

Outcome 5: Upon completion of the chemical engineering Master of Science program, graduates will be accepted into well-recognized PhD programs

Master of Engineering Program

Outcome 1: Upon completion of the chemical engineering Master of Engineering post-graduate program, graduates will be able to successfully apply advanced concepts of basic science to formulation and solution of complex chemical engineering problems

Outcome 2: Upon completion of the chemical engineering Master of Engineering post-graduate program, graduates will be able to successfully apply advanced concepts of chemical engineering science and economic analysis to solution of chemical engineering problems

Outcome 3: Upon completion of the chemical engineering Master of Engineering post-graduate program, graduates will perform well in management positions in ADNOC and other major international oil and gas companies

Degree requirements and program of study

POST-GRADUATE DEGREES OFFERED

Master of Science

Master of Engineering

DEGREE PROGRAM REQUIREMENTS

Master of Science

- Minimum of 24 Hours Coursework including
 - 12 Credit Hours for Core Courses
 - 12 Credit Hours for Elective Courses
- Successful completion and defense of thesis (6 Credit Hours)

Master of Engineering

- Minimum of 31 Credit Hours Coursework including
 - 13 Credit Hours Core Courses
 - 18 Credit Hours Elective Courses

Master of Science Program:

Students entering the Master of Science (with thesis) program with an acceptable undergraduate degree in chemical engineering are required to take a minimum of 24 semester hours of course work. All students must complete the four chemical engineering Master of Science core graduate courses (Advanced Thermodynamics, Numerical Methods and Optimization, Reaction Kinetics and Mechanism, Transport Phenomena) and an additional twelve hours of approved electives. In addition, students must complete and defend an acceptable Masters dissertation. Fulltime Masters students must enroll in graduate seminar each semester that they are in residence. Coursework requirements are outlined in the following table.

| Master of Science in Chemical Engineering | | |
|--|--|--------------|
| Core (Required) Courses | | credit hours |
| CHEG 511 | Reaction Kinetics and Mechanism | 3 |

| | | |
|----------|---|-----|
| CHEG 571 | Transport Phenomena | 3 |
| CHEG 522 | Advanced Thermodynamics | 3 |
| CHEG 533 | Numerical Methods and Optimization | 3 |
| CHEG 595 | Graduate Seminar | N/C |
| | Electives | 12 |

Technical elective courses should be selected from the following list:

- CHEG 551: Separations Science and Engineering
- CHEG 511: Reactor Engineering
- CHEG 531: Simulation Science
- CHEG 541: Environmental Engineering
- CHEG 555: Interfacial Science
- CHEG 521: Alternate Energy
- CHEG 575: Materials Engineering and Corrosion
- CHEG 501: Advanced Fluid Mechanics
- CHEG 561: Advanced Heat Transfer
- CHEG 503: Multiphase Flow
- CHEG 524: Statistical Thermodynamics
- CHEG 505: Flow in Porous Media
- CHEG 500: Economic Analysis of Engineering Projects

Program of Study

The program of study for a Master of Science degree in chemical engineering is selected by the student in consultation with his/her advisor and with the approval of the thesis committee.

The program of study has been designed for students who are entering the program at the start of the fall semester. The program assumes that a full-time graduate student will take 15 credit hours per semester, and provides for completion of coursework in two semesters, followed by either thesis or project work as necessary according to the degree requirements.

| Term | Courses |
|-------------------|--|
| Fall Semester 1 | CHEG 522 Advanced Thermodynamics CHEG 511 Reaction Kinetics and Mechanism Electives (2) CHEG 595 Graduate Seminar CHEG 599 MS Thesis |
| Spring Semester 1 | CHEG 533 Numerical Methods and Optimization CHEG 571 Transport Phenomena Electives (2) CHEG 595 Graduate Seminar CHEG 599 MS Thesis |
| Fall Semester 2 | CHEG 599 MS Thesis |
| Spring Semester 2 | CHEG 599 MS Thesis |

Master of Engineering Program

Students entering the Master of Engineering (non-thesis) program with an acceptable undergraduate degree in chemical engineering are required to take a minimum of 30 semester hours of course work. All students must complete the four chemical engineering Master of Engineering core graduate courses (Thermodynamics, Process Simulation & Optimization, Economic Analysis of Engineering Projects, Designed Experimentation) and at least an additional 18 hours of approved electives. Students may complete an acceptable engineering project report for up to six hours of academic credit. Full-time Master's students must enroll in graduate seminar each semester they are in residence. Coursework requirements are outlined in the following table:

| Master of Engineering in Chemical Engineering | | |
|--|--|--------------|
| Core (Required) Courses | | credit hours |
| CHEG 522 | Advanced Thermodynamics | 3 |
| CHEG 535 | Process Simulation and Optimization | 3 |
| CHEG 500 | Economic Analysis of Engineering Projects | 3 |
| CHEG 539 | Designed Experimentation | 4 |
| CHEG 595 | Graduate Seminar | N/C |
| | Electives | 18 |

Technical elective courses should be selected from the following list:

- CHEG 551: Separations Science and Engineering
- CHEG 511: Reactor Engineering
- CHEG 531: Simulation Science
- CHEG 541: Environmental Engineering
- CHEG 555: Interfacial Science
- CHEG 521: Alternate Energy
- CHEG 537: Measurement and Analysis
- CHEG 575: Materials Engineering and Corrosion
- CHEG 501: Advanced Fluid Mechanics
- CHEG 561: Advanced Heat Transfer
- CHEG 503: Multiphase Flow
- CHEG 524: Statistical Thermodynamics
- CHEG 505: Flow in Porous Media
- CHEG 500: Economic Analysis of Engineering Projects

Program of Study

The program of study for a Master of Engineering in chemical engineering is selected by the student in consultation with his/her advisor. All full-time graduate students are required to enroll for seminar for each semester that they are in residence at the PI.

| Term | Courses |
|-------------------|---|
| Fall Semester 1 | CHEG 522 Advanced Thermodynamics CHEG 539 Designed Experimentation Electives (2) CHEG 595 Graduate Seminar |
| Spring Semester 1 | CHEG 535 Process Simulation and Optimization CHEG 500 Economic Analysis of Engineering Projects |

| | |
|-------------------|---|
| | Electives (2) CHEG 595 Graduate Seminar |
| Fall Semester 2 | Electives (2) |
| Spring Semester 2 | Additional coursework or project work (as required) |

Electrical Engineering Program

Master of Science and Master Engineering in Electrical Engineering

Program 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 engineering that prepares graduates for successful professional careers in ADNOC, with other sponsors, and in the regional gas and oil industry. In addition, graduates will engage in life-long learning that will enable them to continue their education throughout their career.

Post-Graduate program goals (educational objectives)

Master of Science Program

Program Educational Objectives:

1. Provide graduates with an outstanding education, and research skills and knowledge to further their career aspirations;
2. Prepare graduates for PhD programs;
3. Raise the professional visibility of the PI through publication of scholarly works;
4. Provide ADNOC with a pool of highly educated personnel who can utilize their acquired knowledge to enhance the competitive edge of their employer;
5. Advance the technological profile of ADNOC, the UAE, and the regional and global oil and gas industry.

Master of Electrical Engineering Program

Program Educational Objectives:

1. Provide graduates with an outstanding education and the advanced skills and background in technical-related areas to further their career aspirations;
2. Provide ADNOC with employees who have the knowledge, skills, and educational background required to synthesize technical issues and economic/business management issues in the solution of electrical engineering problems;
3. Provide graduates who will be able to move into and perform well in management and/or senior engineering positions;
4. Provide ADNOC and the UAE with pool of highly educated technical personnel;
5. Advance the technological profile of ADNOC, the UAE, and the regional oil and gas industry.

Post-Graduate program objectives (outcomes)

Master of Science Program

- Outcome 1: Upon completion of the electrical engineering Master of Science post-graduate program, graduates will be able to successfully apply advanced concepts of basic science to formulation and solution of complex electrical engineering problems
- Outcome 2: Upon completion of the electrical engineering Master of Science post-graduate program, graduates will be able to successfully apply advanced concepts of electrical engineering science to formulation and solution of complex electrical engineering problems
- Outcome 3: Upon completion of the electrical engineering Master of Science post-graduate program, graduates will find employment in technologically-relevant areas and will advance rapidly through their chosen career path
- Outcome 4: Upon completion of the electrical engineering Master of Science program, graduates will have results of Master of Science research thesis projects published in conferences and/or peer-reviewed journals
- Outcome 5: Upon completion of the electrical engineering Master of Science program, graduates will be accepted into well-recognized PhD programs

Master of Engineering Program

- Outcome 1: Upon completion of the Master of Engineering in electrical engineering post-graduate program, graduates will be able to successfully apply advanced concepts of basic science to formulation and solution of complex electrical engineering problems
- Outcome 2: Upon completion of the Master of Engineering in electrical engineering post-graduate program, graduates will be able to successfully apply advanced concepts of electrical engineering science to solution of electrical engineering problems
- Outcome 3: Upon completion of the Master of Engineering in electrical engineering post-graduate program, graduates will perform well in management and/or senior engineering positions in ADNOC and other major international oil and gas companies.

Degree requirements and program of study

POST-GRADUATE DEGREES OFFERED

Master of Science
Master of Engineering

DEGREE PROGRAM REQUIREMENTS

General Program Requirements

Information provided in the following sections includes Graduate Advisory Committee (GAC), the Master of Engineering in electrical engineering (MEEE) and the Master of Science in Electrical Engineering (MSEE) degree programs, requests for deviation from the requirements, and graduate courses.

Graduate Advisory Committee

The student must form a Graduate Advisory Committee (GAC) and register a preliminary plan of study in the Program by the end of the second semester. The Graduate Advisory Committee's membership reflects the specialized professional requirements of the area of concentration. The advisory committee for Master's degree students consists of three (3) faculty members with one of them serving as the student's advisor. One member of the committee may be from outside the program. The student's advisor serves as the chair of the GAC. A final plan of study must be submitted when a student completes her/his coursework. The decision of the Graduate Advisory Committee is based on a majority vote.

Master of Science

The Master of Science in Electrical Engineering (MSEE) degree requires a minimum of thirty-two (32) credit hours including twenty-four (24) credit hours of closely related coursework in an area of concentration, two (2) credit hours of graduate seminar, and six (6) credit hours of thesis research. The 24-credit hours include:

- Six (6) credit hours of core courses;
- At least nine (9) credit hours in an area of concentration;
- Six (6) credit hours of mathematics courses;
- Three (3) credit hours in an approved elective area.

A student's plan of study and thesis must be approved by the student's Graduate Advisory Committee. The student must defend her/his thesis before the graduate advisory committee. The thesis defence will be open to the public. In addition, the student must satisfy all the PI requirements defined in the current edition of *The Petroleum Institute Post-Graduate Catalog*.

Master of Engineering

The Master of Engineering in electrical engineering (MEEE) requires thirty-five (35) credit hours of coursework. The required 35-credit hours include:

- Six (6) credit hours of core courses;
- Fifteen (15) credit hours of EE courses;
- Six (6) credit hours of mathematics courses;
- Six (6) credit hours of additional approved elective courses, which may be either in an electrical engineering area outside that of the student's area of concentration or in a relevant subject area outside the Electrical Engineering Program;
- Two (2) credit hours of graduate seminar; and
- An electrical engineering project in lieu of the thesis that is required under Master of Science.

Note: The student is expected to give a public presentation on her/his project. In addition, the student must satisfy all the Petroleum Institute requirements defined in the current edition of *The Petroleum Institute Post-Graduate Catalog*.

Deviation from Requirements

The forum for any deviations from the requirements described in *The Petroleum Institute Post-Graduate Catalog* will be a formal petition by the Chair of the student's Graduate Advisory Committee to the Electrical Engineering Graduate Committee. Deviations from the requirements may be considered for significant reasons only.

Program of Study

The program of study for a Master of Engineering in electrical engineering is selected by the student in consultation with his/her advisor.

Master of Science Program:

Students entering the Master of Science (with thesis) program with an acceptable undergraduate degree in electrical engineering are required to take a minimum of 24 semester hours of course work. All students must complete the two electrical engineering graduate core courses (ELEG 510 Advanced Linear Systems and ELEG 530 Power System Steady State Analysis), at least nine credit hours in an area of concentration, six hours of mathematics, and three hours of approved elective. In addition, students must complete and defend an acceptable Masters thesis. Students must also enroll in two hours of graduate seminars. Core course requirements and courses that can be taken for graduate credit follow.

| Master of Science in Electrical Engineering | | |
|---|--------------------------------------|--------------|
| Core (Required) Courses | | credit hours |
| ELEG 510 | Advanced Linear Systems | 3 |
| ELEG 530 | Power Systems in Steady State | 3 |
| ELEG 595 | Graduate Seminar I | 1 |
| ELEG 596 | Graduate Seminar II | 1 |

Courses that can be taken for graduate credit in the Control Systems area

ELEG 501 Modern Control Engineering
 ELEG 510 Advanced Linear Systems
 ELEG 511 Modeling and System Identification
 ELEG 512 Advanced Digital Control Systems
 ELEG 513 Optimal Control
 ELEG 514 Adaptive Control
 ELEG 515 Intelligent Control
 ELEG 516 Nonlinear Control
 ELEG 517 Signal Processing
 ELEG 518 Stochastic Processes
 ELEG 517 Signal Processing

ELEG 519 Kalman Filtering and Stochastic Control
 ELEG 520 Robotics
 ELEG 521 Mechatronics
 ELEG 522 Advanced Instrumentation and Measurements

Courses that can be taken for graduate credit in the Power Systems area

ELEG 531 Power System Planning
 ELEG 532 Power System Dynamics and Stability
 ELEG 533 Power System Operation and Control
 ELEG 534 Power Quality and Harmonics
 ELEG 535 Power system Reliability
 ELEG 536 Industrial Power Systems
 ELEG 537 Protective Relaying Theory, Application and Design
 ELEG 538 Digital Power System Protection
 ELEG 539 Power Electronics: Modeling and Design
 ELEG 540 Electric Drives
 ELEG 541 Embedded Controllers
 ELEG 542 High Power Switching Electronics
 ELEG 590 Computation Methods for Engineering
 ELEG 591 Advanced Analog Electronics
 ELEG 592 Non-destructive Testing
 ELEG 593 Special Topics
 ELEG 594 Optimization Methods for Engineers
 ELEG 598 Non-Thesis Research

Program of Study

The program of study for a Master of Science degree in electrical engineering is selected by the student in consultation with his/her advisor and with the approval of the student's graduate advisory committee (GAC).

The program of study has been designed for students who are entering the program at the start of the fall semester. The program assumes that a full-time graduate student will take up to 12 credit hours of course work per semester.

| Term | Courses |
|--------------------------|--|
| Fall Semester 1 | ELEG 510 Advanced Linear Systems ELEG 530 Power Systems in Steady State Mathematics (1) Courses in Concentration area (1) |
| Spring Semester 1 | Courses in Concentration area (2) Mathematics (1) ELEG 595 Graduate Seminar ELEG 599 MS Thesis |
| Fall Semester 2 | Courses in an approved elective area (1) ELEG 595 Graduate Seminar ELEG 599 MS Thesis |
| Spring Semester 2 | ELEG 599 MS Thesis |

Master of Engineering Program

Students entering the Master of Engineering (non-thesis) program with an acceptable undergraduate degree in electrical engineering are required to take a minimum of 33 semester hours of course work. All students must complete the two electrical engineering graduate core courses (ELEG 510

Advanced Linear Systems and ELEG 530 Power System Steady State Analysis), at least fifteen credit hours in an area of concentration, six hours of mathematics, and six hours of approved elective. In addition, students must complete a project and give a public presentation on the project. Students must also enroll in two credit hours of graduate seminars. Core course requirements and courses that can be taken for graduate credit follow.

| Master of Engineering in Electrical Engineering | | |
|--|--------------------------------------|--------------|
| Core (Required) Courses | | credit hours |
| ELEG 510 | Advanced Linear Systems | 3 |
| ELEG 530 | Power Systems in Steady State | 3 |
| ELEG 595 | Graduate Seminar I | 1 |
| ELEG 596 | Graduate Seminar II | 1 |

Courses that can be taken for graduate credit in the Control Systems area

- ELEG 501 Modern Control Engineering
- ELEG 510 Advanced Linear Systems
- ELEG 511 Modeling and System Identification
- ELEG 512 Advanced Digital Control Systems
- ELEG 513 Optimal Control
- ELEG 514 Adaptive Control
- ELEG 515 Intelligent Control
- ELEG 516 Nonlinear Control
- ELEG 517 Signal Processing
- ELEG 518 Stochastic Processes
- ELEG 517 Signal Processing
- ELEG 519 Kalman Filtering and Stochastic Control
- ELEG 520 Robotics
- ELEG 521 Mechatronics
- ELEG 522 Advanced Instrumentation and Measurements

Courses that can be taken for graduate credit in the Power Systems area

- ELEG 531 Power System Planning
- ELEG 532 Power System Dynamics and Stability
- ELEG 533 Power System Operation and Control
- ELEG 534 Power Quality and Harmonics
- ELEG 535 Power system Reliability
- ELEG 536 Industrial Power Systems
- ELEG 537 Protection Relaying Theory, Application and Design
- ELEG 538 Digital Power System Protection
- ELEG 539 Power Electronics: Modeling and Design
- ELEG 540 Electric Drives
- ELEG 541 Embedded Controllers
- ELEG 542 High Power Switching Electronics
- ELEG 590 Computation Methods for Engineering
- ELEG 591 Advanced Analog Electronics
- ELEG 592 Non-destructive Testing
- ELEG 593 Special Topics
- ELEG 594 Optimization Methods for Engineers
- ELEG 598 Non-Thesis Research

Program of Study

The program of study for a Master of Engineering degree in electrical engineering is selected by the student in consultation with his/her advisor and with the approval of the student's graduate advisory committee (GAC).

The program of study has been designed for students who are entering the program at the start of the fall semester. The program assumes that a full-time graduate student will take up to 12 credit hours of course work per semester.

| Term | Courses |
|-------------------|--|
| Fall Semester 1 | ELEG 510 Advanced Linear Systems ELEG 530 Power Systems in Steady State Mathematics (1) Courses in Concentration area (1) |
| Spring Semester 1 | Courses in Concentration area (2) Courses in an approved elective area (1) Mathematics (1) |
| Fall Semester 2 | Courses in Concentration area (1) Courses in an approved elective area (1) ELEG 595 Graduate Seminar |
| Spring Semester 2 | Courses in Concentration area (1) ELEG 595 Graduate Seminar Project work. |

Mechanical Engineering Program

Master of Science and Master of Engineering in Mechanical Engineering

Undergraduate program 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. Our 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 our students with the expectation that they will develop as leading experts in their respective fields of expertise and long-term contributors to our industrial sponsors, the UAE, and beyond.

Post-Graduate program mission and description

The mission of the graduate program in mechanical engineering at the Petroleum Institute is to provide graduate students with learning opportunities for acquiring a broad base of mechanical engineering knowledge necessary for advanced work in Mechanical engineering, an in-depth research experience in thermo-fluids and/or mechanics and materials and/or controls and automation, and the necessary skills for life-long learning and professional development.

Post-Graduate program goals (educational objectives)

1. Prepare ME graduate students to build on their acquired knowledge to generate and analyze original research results and to communicate those results through oral presentations and/or written publications in both independent and team environments.
2. Enhance graduate students' intellectual, analytical and experimental skills.
3. Provide graduate students with opportunities to gain awareness of advances in mechanical engineering.
4. Strengthen students' commitments to professional development and life-long learning skills.

Post-Graduate program objectives (outcomes)

Upon completion of the Master's program, Graduates will be able to:

1. Demonstrate an ability to perform research and/or perform advanced engineering analysis in their area of specialty.
2. Formulate and analyze engineering problems, and synthesize and develop appropriate solutions, based on fundamental and advanced principles.
3. Design mechanical systems to meet desired specifications using advanced engineering tools and techniques.

Degree requirements and program of study

POST-GRADUATE DEGREES OFFERED

Master of Science
Master of Engineering

DEGREE PROGRAM REQUIREMENTS

Master of Science

- Minimum of 30 credit hours, of which coursework must constitute at least 24 credit hours
- 6 credit hours (of the 30) must be for thesis research
- Cumulative grade-point average (GPA) of 3.0
- Successful completion of a research thesis

Master of Engineering

- Minimum of 33 credit hours, of which coursework must constitute at least 30 credit hours
- 3 credit hours (of the 33) must be for a research project
- Cumulative grade-point average (GPA) of 3.0

Master of Science Program

The M.S. program requires a total of 24 credits of approved course work (out of which a minimum of 18 credits must be taken at the Petroleum Institute) plus 6 credits of M.S. thesis based on an approved research topic that must be successfully completed and presented/defended to a designated advising committee. Typically, the M.S. degree is recommended for those individuals who wish to pursue research training on their way towards a Ph.D. degree. Students can select any of the sub-disciplines after consulting with his/her advisor. Courses required towards an M.S. degree are listed in Tables A, B, C, and D.

Table A: Sub-Discipline of Industrial Automation and Control Courses for M.S. and M.Eng.

| Courses: | | credit hours |
|-----------------|--|---------------------|
| MEEG 522 | Feedback Control Systems | 3 |
| MEEG 523 | Discrete-time Control Systems | 3 |
| MEEG 525 | Robot Dynamics and Control | 3 |
| MEEG 526 | Mechatronic Design | 3 |
| MEEG 536 | Measurement & Instrumentation | 3 |
| MEEG 528 | Advanced Vibrations | 3 |
| MEEG 529 | Dynamic Behavior of Materials and Structures | 3 |
| MEEG 530 | Fundamentals of Acoustics | 3 |
| MEEG 534 | Advanced Dynamics | 3 |

Table B: Sub-Discipline of Applied Mechanics, Materials, and Design Courses for M.S. and M.Eng.

| Courses: | | credit hours |
|-----------------|---------------------------------------|---------------------|
| MEEG 542 | Engineering Design Methods | 3 |
| MEEG 543 | Applied Finite Element Analysis | 3 |
| MEEG 544 | Advanced Mechanics of Materials | 3 |
| MEEG 545 | Fracture Mechanics and Fatigue | 3 |
| MEEG 546 | Pressure Vessels & Piping Design | 3 |
| MEEG 547 | Composite Materials | 3 |
| MEEG 548 | Theory of Elasticity and Applications | 3 |
| MEEG 549 | Experimental Mechanics | 3 |
| MEEG 550 | Modeling of Materials Behavior | 3 |
| MEEG 553 | Theory of Plasticity and Applications | 3 |

Table C: Sub-Discipline of Energy and Environmental Engineering Courses for M.S. and M.Eng.

| Courses: | | credit hours |
|-----------------|--|---------------------|
| MEEG 561 | Viscous Flow | 3 |
| MEEG 562 | Advanced Engineering Thermodynamics | 3 |
| MEEG 563 | Advanced Convection Heat Transfer | 3 |
| MEEG 564 | Non-Newtonian Fluid Dynamics | 3 |
| MEEG 565 | Computational Fluid Dynamics | 3 |
| MEEG 566 | Multi-phase Flow and Heat Transfer | 3 |
| MEEG 567 | Advanced Combustion and Air Pollution Control | 3 |
| MEEG 570 | Modern Power Generation Systems | 3 |
| MEEG 573 | Impact of Energy Conversion on the Environment | 3 |
| MEEG 574 | Advanced Conduction and Radiation Heat Transfer | 3 |
| MEEG 575 | Heat Transfer for Modern Industrial Applications | 3 |
| MEEG 576 | Energy Systems Management | 3 |
| MEEG 579 | Environmental and Water Resources Systems | 3 |

Table D: Common Core and Technical Electives courses *

| Course # | Course Title |
|----------|---|
| MEEG 501 | Adv. Mechanical Engineering Analysis I |
| MEEG 502 | Advanced Mechanical Engineering Analysis II |
| MEEG 503 | Applied Numerical Methods |
| MEEG 504 | Continuum Mechanics |
| MEEG 505 | Engineering Optimization |
| MEEG 535 | Advanced Mechanical Engineering Fundamentals |
| MEEG 555 | Life Cycle Cost Analysis |
| MEEG 556 | Legal Aspects of Engineering Design & Construction |
| MEEG 557 | Mathematical Techniques of Reliability Engineering |
| MEEG 558 | Advanced Reliability and Maintainability engineering |
| MEEG 591 | Advanced Special Topics in Mechanical Engineering (1-3 credits) |
| MEEG 595 | Advanced Special Topics in Mechanical Engineering (3 credits) |
| MEEG 597 | Graduate Seminar (0 credits) |
| MEEG 599 | Master's Thesis Research (6 credits) |

*** Important Note: Common Core and Technical Electives**

For the M.S. program, up to (18) credits, including (6) credits of thesis research, can be taken towards corresponding minimum course work requirements. For M. Eng. Program, up to (18) credits, including a 3-credit research project, can be taken towards the required course for the program.

Program of Study

The programs of study shown below are typical; however, some courses from the same specialty can be substituted in subject to program approval.

Program of Study for Industrial Automation and Control (IAC) Option

| Course # | Course Title |
|-------------------|---|
| Semester 1 | |
| <i>MEEG501</i> | <i>Advanced Mechanical Engineering Analysis</i> |
| <i>MEEG505</i> | <i>Engineering Optimization</i> |
| <i>MEEG522</i> | <i>Feedback Control Systems</i> |
| Semester 2 | |
| <i>MEEG523</i> | <i>Discrete-time Control Systems</i> |
| <i>MEEG525</i> | <i>Robot Dynamics and Control</i> |
| <i>MEEG526</i> | <i>Mechatronic Design</i> |
| Semester 3 | |
| <i>MEEG536</i> | <i>Measurement and Instrumentation</i> |
| <i>MEEG528</i> | <i>Advanced Vibrations</i> |
| <i>MEEG530</i> | <i>Fundamentals of Acoustics</i> |
| Semester 4 | |
| <i>MEEG597</i> | <i>Graduate seminar</i> |
| <i>MEEG599</i> | <i>Thesis</i> |

Program of Study for Applied Mechanics, Materials, and Design (AMMD) Option

| Course # | Course Name |
|-------------------|---|
| Semester 1 | |
| <i>MEEG501</i> | <i>Advanced Mechanical Engineering Analysis</i> |
| <i>MEEG505</i> | <i>Engineering Optimization</i> |
| <i>MEEG 543</i> | <i>Applied Finite Element Analysis</i> |
| Semester 2 | |
| <i>MEEG 544</i> | <i>Advanced Mechanics of Materials</i> |
| <i>MEEG 545</i> | <i>Fracture Mechanics and Fatigue</i> |
| <i>MEEG 546</i> | <i>Pressure Vessels & Piping Design</i> |
| Semester 3 | |
| <i>MEEG 547</i> | <i>Composite Materials</i> |
| <i>MEEG 548</i> | <i>Theory of Elasticity and Applications</i> |
| <i>MEEG 549</i> | <i>Experimental Mechanics</i> |
| Semester 4 | |

| | |
|---------|------------------|
| MEEG597 | Graduate seminar |
| MEEG599 | Thesis |

Program of Study for Energy and Environment Engineering (EEE) Option

| Course # | Course Name |
|-------------------|---|
| Semester 1 | |
| MEEG501 | Advanced Mechanical Engineering Analysis |
| MEEG505 | Engineering Optimization |
| MEEG561 | Viscous Flow |
| Semester 2 | |
| MEEG562 | Advanced Engineering Thermodynamics |
| MEEG563 | Advanced Convection Heat Transfer |
| MEEG565 | Computational Fluid Dynamics |
| Semester 3 | |
| MEEG566 | Multi-phase Flow and Heat Transfer |
| MEEG570 | Modern Power Generation Systems |
| MEEG574 | Advanced Conduction and Radiation Heat Transfer |
| Semester 4 | |
| MEEG597 | Graduate seminar |
| MEEG599 | Thesis |

Master of Engineering

The Master of Engineering is designed for practicing engineers and technical professionals who seek an opportunity to enroll in graduate studies to further enhance their technical skills and career development opportunities. When possible, late afternoon and early evening classes are offered to accommodate the work schedule of the majority of the applicants. The M. Eng. degree requires a minimum of 30 credits of approved course work plus 3 credits of an approved research project that must be completed in order to graduate. Students can select any of the sub-disciplines after consulting with his/her advisor. Courses required towards an M. Eng. degree are listed in Tables A, B, C, and D.

Program of Study

The programs of study shown below are typical; however, some courses from the same specialty can be substituted in subject to program approval.

Program of Study for Industrial Automation and Control (IAC) Option

| Course # | Course Title |
|-------------------|--|
| Semester 1 | |
| MEEG501 | Advanced Mechanical Engineering Analysis |
| MEEG505 | Engineering Optimization |
| MEEG522 | Feedback Control Systems |
| Semester 2 | |
| MEEG523 | Discrete-time Control Systems |
| MEEG525 | Robot Dynamics and Control |
| MEEG526 | Mechatronic Design |
| Semester 3 | |
| MEEG536 | Measurement and Instrumentation |
| MEEG528 | Advanced Vibrations |
| MEEG530 | Fundamentals of Acoustics |
| Semester 4 | |
| MEEG534 | Advanced Dynamics |
| MEEG597 | Graduate seminar |
| MEEG595 | Project |

Program of Study for Applied Mechanics, Materials, and Design (AMMD) Option

| Course # | Course Name |
|-------------------|--|
| Semester 1 | |
| MEEG501 | Advanced Mechanical Engineering Analysis |
| MEEG505 | Engineering Optimization |
| MEEG 543 | Applied Finite Element Analysis |

| Semester 2 | |
|-------------------|---------------------------------------|
| MEEG 544 | Advanced Mechanics of Materials |
| MEEG 545 | Fracture Mechanics and Fatigue |
| MEEG 546 | Pressure Vessels & Piping Design |
| Semester 3 | |
| MEEG 547 | Composite Materials |
| MEEG 548 | Theory of Elasticity and Applications |
| MEEG 549 | Experimental Mechanics |
| Semester 4 | |
| MEEG 550 | Modeling of Materials Behavior |
| MEEG597 | Graduate seminar |
| MEEG595 | Project |

Program of Study for Energy and Environment Engineering (EEE) Option

| Course # | Course Name |
|-------------------|---|
| Semester 1 | |
| MEEG501 | Advanced Mechanical Engineering Analysis |
| MEEG505 | Engineering Optimization |
| MEEG561 | Viscous Flow |
| Semester 2 | |
| MEEG562 | Advanced Engineering Thermodynamics |
| MEEG563 | Advanced Convection Heat Transfer |
| MEEG565 | Computational Fluid Dynamics |
| Semester 3 | |
| MEEG566 | Multi-phase Flow and Heat Transfer |
| MEEG570 | Modern Power Generation Systems |
| MEEG574 | Advanced Conduction and Radiation Heat Transfer |
| Semester 4 | |
| MEEG576 | Energy Systems Management |
| MEEG597 | Graduate seminar |
| MEEG595 | Project |

Petroleum Engineering Program

Master of Science and Master of Engineering in Petroleum Engineering

Program 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 petroleum engineers of the ADNOC Group of Companies. The program will emphasize the importance of ethical conduct; health, safety and environmental issues and will provide platforms for life-long learning.

Program goals (educational objectives)

Master of Science Program

Program Educational Objectives:

1. Provide graduates with an outstanding education and the research skills and knowledge required to further their career aspirations;
2. Prepare graduates to go on for further education in PhD programs;
3. Raise the professional visibility of the PI through publication of scholarly works;
4. Provide ADNOC and the regional and global oil and gas industry with a pool of highly educated personnel who can utilize their in-depth knowledge of petroleum engineering to better develop business opportunities;
5. Advance the technological profile of ADNOC, the UAE, and the regional and global oil and gas industry.

Master of Engineering Program

Program Educational Objectives:

1. Provide graduates with an outstanding education and the advanced skills and knowledge in technical and business-related areas required to further their career aspirations;
2. Provide ADNOC and the regional and global oil and gas industry with employees who have the knowledge, skills, and educational background required to synthesize technical issues and economic/business management issues in the solution of petroleum engineering problems;
3. Provide graduates who are prepared to move into and perform well in decision-making/management positions;
4. Provide ADNOC and the UAE with pool of highly educated technical personnel;
5. Advance the technological profile of ADNOC, the UAE, and the regional oil and gas industry.

Program objectives (outcomes)

Master of Science Program

Upon completion of the Petroleum Engineering Master of Science post-graduate program:

- Outcome 1: Graduates will be able to successfully apply advanced concepts of petroleum engineering science to formulation and solution of complex petroleum engineering problems
- Outcome 2: Graduates will find employment in technologically-relevant areas and will advance rapidly through their chosen career path
- Outcome 3: Graduates will publish and present results of their research in international conferences and peer reviewed journals and will participate in professional organizations.
- Outcome 4: Graduates will have sufficient technical knowledge, skills, and experience to successfully begin a Ph.D. program in a well-recognized PhD program

Master of Engineering Program

Upon completion of the Petroleum Engineering Master of Engineering post-graduate program:

- Outcome 1: Graduates will be able to successfully apply advanced concepts of petroleum engineering science to formulation and solution of complex petroleum engineering problems

Outcome 2: Graduates will find employment in technologically-relevant areas and will advance rapidly through their chosen career path

Outcome 3: Graduates will perform well in decision-making/management positions

Degree requirements and program of study

POST-GRADUATE DEGREES OFFERED

Master of Science

Master of Engineering

DEGREE PROGRAM REQUIREMENTS

Master of Science- 30 credit hours

- 24 hours of coursework
 - 12 hours of core courses
 - 12 hours of elective courses (A maximum of 6 hours of elective courses may be taken outside the petroleum engineering curriculum)
- 6 credit-hours of thesis/research credit
- Cumulative grade-point average (GPA) of 3.0
- Successful completion of a research thesis

Master of Engineering- 36 credit hours

- 30 hours of coursework
 - 12 hours of core courses
 - 18 hours of elective courses (A maximum of 6 hours of elective courses may taken be outside the petroleum engineering curriculum)
- 6 credit- hours of project and a final report.
- Cumulative grade-point average (GPA) of 3.0.
- Successful completion of M.E. project and report.

General Requirements

The program of study for a Master of Science degree or Master of Engineering degree in Petroleum Engineering is selected by the student in consultation with his/her advisor and with the approval of the graduate committee. Students whose previous education and training exclude coverage of basic undergraduate petroleum engineering courses will be required to take remedial coursework in the deficient areas before enrolling for graduate core courses in these areas. Deficiencies will be determined through consultation with the student's advisor and program graduate committee. Graduate degree students may be enrolled as part time or full time students. All full time graduate students are required to participate in a non-credit seminar during each semester they are in residence at the PI. Part time graduate degree students are required to participate in a minimum of one graduate seminar.

Master of Science Program

Students entering the Master of Science (with thesis) program with an acceptable undergraduate degree in petroleum engineering or a closely related field are required to take 24 hours of coursework, six hours of thesis research and must participate in the graduate seminar. All students must complete the four petroleum engineering graduate program core courses (Advanced Drilling Engineering; Advanced Reservoir Engineering; Advanced Well Performance Evaluation; Advanced Well Test Analysis). An additional twelve hours of elective courses are chosen based on the student's preferred area of specialty. Where appropriate, a maximum of six hours may be technical elective courses taken outside the petroleum engineering program. The student, in consultation with his/her advisor and with the approval of the graduate committee, will choose, conduct, write up and defend an acceptable Masters thesis. Coursework requirements are outlined in the following table.

| Master of Science Degree Example Curriculum | | Credit Hours |
|---|--------------------------------|--------------|
| Core (required) Courses | | |
| PEEG 510 | Advanced Well Test Analysis | 3 |
| PEEG 520 | Advanced Drilling Engineering | 3 |
| PEEG 530 | Advanced Reservoir Engineering | 3 |

| | | |
|---------------------|--------------------------------------|----|
| PEEG 540 | Advanced Well Performance Evaluation | 3 |
| Technical electives | | 12 |
| PEEG 598 | Master of Science Thesis Research | 6 |
| PEEG 599 | Graduate Seminar | -- |

Program of Study

The program of study for a Master of Science degree in petroleum engineering is selected by the student in consultation with his/her advisor and with the approval of the thesis committee.

The program of study has been designed for students who are entering the program at the start of the fall semester. The program assumes that entering students have fulfilled all of the prerequisites to enroll in initial graduate course of the petroleum engineering sequence. Full-time graduate student will take up to 12-14 credit hours per semester following the program of study. Most course work will be completed in the first year and thesis research will be done primarily in the second year of the program.

Master of Science in Petroleum Engineering

| Term | Courses |
|-------------------|--|
| Fall Semester 1 | PEEG 510: Advanced Well Test Analysis PEEG520: Advanced Drilling Engineering Electives (2) PEEG 599: Graduate Seminar |
| Spring Semester 1 | PEEG 530: Advanced Reservoir Engineering PEEG540: Advanced Well Performance Evaluation Electives (2) PEEG 599: Graduate Seminar |
| Fall Semester 2 | PEEG 598 Master's Thesis Research PEEG 599: Graduate Seminar |
| Spring Semester 2 | PEEG 598 Master's Thesis Research PEEG 599: Graduate Seminar |

Technical elective courses should be selected from the following list:

- PEEG 511 Advanced Well Logging (3-0-3)
- PEEG 522 Conventional & Special Core Analysis (CCAL&SCAL)–Theory and Application (3-0-3)
- PEEG 521 Drilling Fluids and Solids control (3-0-3)
- PEEG 522 Materials Selection (3-0-3)
- PEEG 523 Advanced Well Control
- PEEG 621 Underbalanced Drilling (3-0-3)
- PEEG 622 Wellbore Stability Analysis (3-0-3)
- PEEG 623 Measurement While Drilling (3-0-3)
- PEEG 624 Special Topics in Drilling Engineering (3-0-3)
- PEEG 531 Applied Reservoir Simulation (3-0-3)
- PEEG 532 Enhanced Oil Recovery (3-0-3)
- PEEG 533 Integrated Reservoir Modeling (3-0-3)
- PEEG 631 Compositional Reservoir Simulation (3-0-3)
- PEEG 632 Integrated Reservoir Management (3-0-3)
- PEEG 633 Management of Gas Reservoirs (3-0-3)
- PEEG 541 Well Completions and Workover (3-0-3)
- PEEG 542 Surface Production Facilities (3-0-3)
- PEEG 543 Well Stimulation (3-0-3)
- PEEG 641 Advanced Hydraulic Fracturing (3-0-3)
- PEEG 642 Horizontal Well Technology (3-0-3)
- PEEG 643 Artificial Lift (3-0-3)
- PEEG 644 Produced Water Control and Management (3-0-3)
- PEEG 645 Carbonate Formation Damage and Stimulation (3-0-3)
- PEEG 550 Advanced Petroleum Economics (3-0-3)
- PEEG 551 Uncertainty and Risk Analysis in the Petroleum Industry (3-0-3)
- PEEG 597 Master of Engineering Graduate Project
- PEEG 598 Master of Science Thesis Research

PEEG 599 Graduate Seminar
 PEEG 651 Artificial Intelligence in Petroleum Engineering (3-0-3)
 PEEG 652 Petroleum Related Rock Mechanics (3-0-3)

Master of Engineering Program

This program is designed to update and advance students' knowledge in specific areas of petroleum engineering, to further develop the technical competence of the practicing engineer and to improve his/her performance on the job. Students entering the Master of Engineering (without thesis) program with an acceptable undergraduate degree in petroleum engineering or a closely related field are required to take 36 hours of coursework and must participate in the graduate seminar. All students must complete the four petroleum engineering graduate program core courses (Advanced Drilling Engineering; Advanced Reservoir Engineering; Advanced Well Performance Evaluation; Advanced Well Test Analysis). An additional 18 hours of elective courses are chosen based on the student's preferred area of specialty. Where appropriate, up to six of these hours may be technical electives taken outside the petroleum engineering curriculum. Students, in consultation with his/her advisor and with the approval of the graduate committee need to conduct 3 credit hours equivalent of an engineering project and a final report. Normally the project will be a topic of interest to the student and his/her employer.

| Master of Engineering Degree Example Curriculum | | |
|--|--|--------------|
| Courses | | Credit Hours |
| PEEG 510 | Advanced Well Test Analysis | 3 |
| PEEG 520 | Advanced Drilling Engineering | 3 |
| PEEG 530 | Advanced Reservoir Engineering | 3 |
| PEEG 540 | Advanced Well Performance Evaluation | 3 |
| Technical electives | | 18 |
| PEEG 597 | Master of Engineering Graduate Project | 6 |
| PEEG 599 | Graduate Seminar | -- |

Program of Study

The program of study for a Master of Engineering degree in petroleum engineering is selected by the student in consultation with his/her advisor and with the approval of the graduate committee. The program of study has been designed for students who are entering the program at the start of the fall semester. The program assumes that entering students have fulfilled all of the prerequisites to enroll in initial graduate course of the petroleum engineering sequence. Full-time graduate student will take up to 12-14 credit hours per semester following the program of study. Most course work will be completed in the first three semesters and project work will be done primarily in the second year of the program.

Master of Engineering in Petroleum Engineering

| Term | Courses |
|-------------------|--|
| Fall Semester 1 | PEEG 510: Advanced Well Test Analysis PEEG520: Advanced Drilling Engineering Electives (2) PEEG 599: Graduate Seminar |
| Spring Semester 1 | PEEG 530: Advanced Reservoir Engineering PEEG540: Advanced Well Performance Evaluation Electives (2) PEEG 599: Graduate Seminar |
| Fall Semester 2 | Electives (2) PEEG 597 Master's Project PEEG 599: Graduate Seminar |
| Spring Semester 2 | PEEG 597 Master's Project PEEG 599: Graduate Seminar |

Technical elective courses should be selected from the following list:

PEEG 511 Advanced Well Logging (3-0-3)

PEEG 522 Conventional & Special Core Analysis (CCAL&SCAL)–Theory and Application (3-0-3)
PEEG 521 Drilling Fluids and Solids control (3-0-3)
PEEG 522 Materials Selection (3-0-3)
PEEG 523 Advanced Well Control
PEEG 621 Underbalanced Drilling (3-0-3)
PEEG 622 Wellbore Stability Analysis (3-0-3)
PEEG 623 Measurement While Drilling (3-0-3)
PEEG 624 Special Topics in Drilling Engineering (3-0-3)
PEEG 531 Applied Reservoir Simulation (3-0-3)
PEEG 532 Enhanced Oil Recovery (3-0-3)
PEEG 533 Integrated Reservoir Modeling (3-0-3)
PEEG 631 Compositional Reservoir Simulation (3-0-3)
PEEG 632 Integrated Reservoir Management (3-0-3)
PEEG 633 Management of Gas Reservoirs (3-0-3)
PEEG 541 Well Completions and Workover (3-0-3)
PEEG 542 Surface Production Facilities (3-0-3)
PEEG 543 Well Stimulation (3-0-3)
PEEG 641 Advanced Hydraulic Fracturing (3-0-3)
PEEG 642 Horizontal Well Technology (3-0-3)
PEEG 643 Artificial Lift (3-0-3)
PEEG 644 Produced Water Control and Management (3-0-3)
PEEG 645 Carbonate Formation Damage and Stimulation (3-0-3)
PEEG 550 Advanced Petroleum Economics (3-0-3)
PEEG 551 Uncertainty and Risk Analysis in the Petroleum Industry (3-0-3)
PEEG 597 Master of Engineering Graduate Project
PEEG 598 Master of Science Thesis Research
PEEG 599 Graduate Seminar
PEEG 651 Artificial Intelligence in Petroleum Engineering (3-0-3)
PEEG 652 Petroleum Related Rock Mechanics (3-0-3)

Petroleum Geosciences Engineering Program

Master of Science in Geology

Program mission and description

The educational mission of the Petroleum Geosciences Engineering 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.

Post-Graduate program goals (educational objectives)

Master of Science in Geology Program:

1. Provide graduates with an outstanding education and the research skills required to further their careers;
2. Prepare graduates for further education in Ph.D. programs;
3. Provide the ADNOC Group with highly educated personnel who can utilize their technical knowledge and skills to increase value of petroleum assets and to develop petroleum industry business opportunities;
4. Advance the technological skill base of ADNOC E&P Group of companies, the UAE, and the regional oil and gas industry;
5. Raise the overall educational environment of the PI through publication of scholarly work.

Post-Graduate program objectives (outcomes)

Master of Science in Geology Program

Objective 1: Upon completion of the Petroleum Geosciences Engineering Master of Science in Geology post-graduate program, graduates will be able to apply advanced geological concepts and methods to formulate and solve complex petroleum geosciences engineering problems.

Objective 2: Upon completion of the Petroleum Geosciences Engineering Master of Science in Geology post-graduate program, graduates will find employment in technologically relevant areas and will advance rapidly in their careers.

Objective 3: Upon completion of the Petroleum Geosciences Engineering Master of Science in Geology program, graduates will publish and present results of their research and will participate in professional organizations.

Objective 4: Upon completion of the Petroleum Geosciences Engineering M.Sc. program, graduates will have sufficient technical knowledge, skills, and experience to successfully begin a Ph.D. program in geology in a recognized university.

Degree requirements and program of study

POST-GRADUATE DEGREES OFFERED

Master of Science in Geology

DEGREE PROGRAM REQUIREMENTS

Master of Science in Geology

- Minimum of 30 credit hours, of which coursework must constitute at least 18 credit hours
- 12 credit hours (of the 30) must be for thesis research
- Cumulative grade-point average (GPA) of 3.0
- Successful completion of a research thesis

Master of Science Program

Students entering the Master of Science in Geology (with thesis) program with an acceptable undergraduate degree in geology or geophysics are required to take a minimum of 18 semester hours of coursework and 12 semester hours of thesis research. The Master of Science in Geology includes a sequence of courses focused on Reservoir Characterization. Courses are listed in the following table. The program of study is selected by the student in consultation with his/her advisor

and with the approval of the Institute's Director of Graduate Programs. In addition, students must complete and successfully defend a Master of Science thesis.

| Master of Science in Geology (Reservoir Characterization) | | |
|--|---|--------------|
| Required courses: | | credit hours |
| PGEG 511 | Carbonate Reservoir Petrology | 4 |
| PGEG 512 | Sequence Stratigraphy of Carbonate Systems | 4 |
| PGEG 513 | Advanced Reservoir Characterization | 4 |
| Technical electives: | | |
| PGEG 501 | Reservoir Characterization and Modeling | 4 |
| PGEG 502 | Introduction to Well Log and Rock Physics Analysis | 4 |
| PGEG 503 | Applications of Reflection Seismology | 4 |
| PGEG 531 | Fractured Carbonate Reservoirs | 4 |
| PGEG 532 | Advanced Well Logging and Petrophysics | 4 |

Program of Study

The program of study for a Master of Science degree in petroleum geosciences engineering is selected by the student in consultation with his or her advisor and with the approval of the thesis committee.

The following program of study have been designed for students entering the programs at the start of fall semester. The program assumes that entering students have fulfilled all of the prerequisites to enroll in initial graduate course of the geology reflection seismology course sequence. Full-time graduate student will take up to 12-14 credit hours per semester following the program of study. Most course work will be completed in the first year and thesis research will be done primarily in the second year of the program.

Master of Science in Geology

| Term | Courses |
|-------------------|--|
| Fall Semester 1 | PGEG 511 Carbonate Reservoir Petrology Electives (2) |
| Spring Semester 1 | PGEG 512 Sequence Stratigraphy of Carbonate Systems Elective(s) |
| Fall Semester 2 | PGEG 513 Advanced Reservoir Characterization Elective (optional) PGEG 599 Master's Thesis Research |
| Spring Semester 2 | Elective (optional) PGEG 599 Master's Thesis Research |

Students may only take one course from PGEG 501, PGEG 502, and PGEG 503 for credit.

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, prerequisites, corequisites 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 (3-3-4)

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

Prerequisite CHEM 131
Corequisite MATH 111
Restrictions None

Key

| | |
|----------------------|--|
| Subject code | The area of study or discipline <i>e.g. CHEG = Chemical Engineering</i> |
| Course code | |
| 400 - 499 | Senior (4th year) |
| 500 – 599 | <i>Master's level</i> |
| 600 - 699 | Advanced master's and Ph.D. level |
| Title / level | Name of the course <i>e.g. General Chemistry II</i> |
| Description | Course content |
| Prerequisite | Courses students must have passed before enrollment <i>e.g. CHEM 131</i> |
| Corequisite | Courses students must have passed or be currently enrolled <i>e.g. MATH 111</i> |
| Restrictions | Limitations on who may and may not take the course |
| Hours | <i>e.g. 3-3-4 = 3 class hours per week: 3 lab hours per week: 4 credit/weight* hours</i> |

Subject Codes

| | |
|------|------------------------|
| CHEG | Chemical Engineering |
| ELEG | Electrical Engineering |
| MEEG | Mechanical Engineering |
| PEEG | Petroleum Engineering |
| PGEG | Petroleum Geosciences |

Post-Graduate Courses

POST-GRADUATE COURSES IN CHEMICAL ENGINEERING

CHEG 500 Economic Analysis of Engineering Projects (3-0-3)

Advanced engineering economic principles applied to original and alternate investments. Analysis of chemical and petroleum processes relative to marketing and return on investments.

Prerequisite: CHEG 401 or equivalent

CHEG 501 Advanced Fluid Mechanics (3-0-3)

Development of basic conservation equations for momentum transfer. Constitutive equations for Newtonian and elementary non-Newtonian fluids. Exact solutions of the Navier-Stokes equations. Ordering and approximations. Applications to low and high Reynolds number flows.

Prerequisite: CHEG 301 or equivalent

CHEG 503 Multiphase Flow (3-0-3)

Principles of two- and three-phase flow in pipelines and conduits. Slurry transport, pneumatic transport of solids, entrained flow, flow of hydrocarbon fluids in petroleum production systems. Applications in petroleum and hydrocarbon industry are stressed.

Prerequisite: CHEG 501 or equivalent

CHEG 505 Flow in Porous Media (3-0-3)

Fundamental applications of fluid flow in porous media. Applications in modeling petroleum and gas reservoirs and other oilfield production aspects are included.

Prerequisite: CHEG 501 or equivalent

CHEG 511 Kinetics and Mechanism (3-0-3)

Homogeneous and heterogeneous rate expressions. Fundamental theories of reaction rates. Analysis of rate data and complex reaction networks. Properties of solid catalysts. Mass and heat transfer with chemical reaction. Heterogeneous non-catalytic reactions.

Prerequisite: CHEG 411 or equivalent.

CHEG 512 Reactor Engineering (3-0-3)

Non-ideal flow effects on reactor design. Stability of stirred tank and tubular flow reactors. Mass and heat transfer effects. Modeling of heterogeneous chemical reactors. Fluidized bed reactors.

Prerequisite: CHEG 411 or equivalent.

CHEG 521 Alternate Energy (3-0-3)

Unconventional energy sources, including solar, wind and other non-petroleum energy supplies. Advanced hydrocarbon and non-hydrocarbon energy sources including fuel cells.

Prerequisite: CHEG 411 or equivalent

CHEG 522 Advanced Chemical Engineering Thermodynamics (3-0-3)

Extension and amplification of undergraduate chemical engineering thermodynamics. Topics will include the laws of thermodynamics, thermodynamic properties of pure fluids and fluid mixtures, phase equilibria, and chemical reaction equilibria.

Prerequisite: CHEG 322 or equivalent

CHEG 524 Statistical Thermodynamics (3-0-3)

Principles of relating behavior to microscopic properties. Topics include element of probability, ensemble theory, application to gases and solids, distribution theories of fluids, and transport properties.

Prerequisite: Consent of instructor.

CHEG 531 Simulation Science (3-0-3)

Application of basic principles of physics, chemistry, transport phenomena and reaction kinetics to the computer-aided design of processing systems. The philosophy of process modeling at different levels of

complexity is developed and numerous examples based on the chemical process industry and naturally occurring processes are used.

Prerequisite: CHEG 431 or equivalent

CHEG 533 Numerical Methods and Optimization (3-0-3)

Engineering applications of numerical methods. Numerical integration, solution of algebraic equations, matrix algebra, ordinary differential equations, and special emphasis on partial differential equations. Emphasis on application of numerical methods to chemical engineering problems which cannot be solved by analytical methods.

Prerequisite: consent of instructor

CHEG 535 Process Simulation and Optimization (3-0-3)

Advanced applications of the principles and theory of process design to synthesis of chemical processes and systems. Optimization theory, with applications in process design. Computer-aided process simulation and design.

Prerequisite: CHEG 431 or equivalent

CHEG 537 Measurement and Instrumentation (3-3-4)

Chemical Engineering process instrumentation and measurement principles including measurement of flow, pressure, temperature, position, and other parameters of importance in chemical processes. Variation and uncertainty in measurement instruments. Course includes lab/practicum illustrating aspects of experimental measurement.

Prerequisites: CHEG 311, CHEG 371 or equivalent

CHEG 539 Designed Experimentation (3-0-3)

Solution of engineering problems by applying statistical tools. Description of random variables and probability distributions and the use of statistical decision-making tools. Application of empirical models to optimize engineering systems and application of designed experimentation. Statistical process control in process control, management of operating costs, and optimization in the transactional environment.

Prerequisite: CHEG 331 or equivalent

CHEG 541 Environmental Engineering (3-0-3)

Discussion of the many engineering problems that arise when man interacts with his environment. Comprehensive treatment of topics such as pollution, thermal pollution, treatment of industrial and municipal wastes, solid waste treatment, and the disposal of radioactive wastes. Economic and legislative aspects of these problems will also be considered.

Prerequisite: Consent of instructor.

CHEG 551 Separations Science and Engineering (3-0-3)

Fundamental principles of mass transfer with application to design of mass transfer processes. Theory of diffusion in gases and liquids for single and multicomponent species. Mass transfer in laminar and turbulent flows. Transport analogies, simultaneous heat and mass transfer, with examples of drying and humidification processes. Mass transfer with chemical reaction; examples of slow, intermediate, and fast reactions with application to design of mass contactors. Interfacial mass transfer and mass transfer in two-phase flows. Design of packed beds and columns, gas-sparged reactors.

Prerequisite: CHEG 351 or equivalent or consent of instructor

CHEG 555 Interfacial Science (3-0-3)

Principles and fundamental aspects of gas/solid and liquid/solid interfaces as applied to chemical engineering processes. Chemistry and engineering principles governing adsorption at interfaces. Applications in chemical engineering and petroleum systems including enhanced oil recovery.

Prerequisite: CHEG 301 or equivalent

CHEG 561 Advanced Heat Transfer (3-0-3)

Formulation of the laws governing the transport of energy. Transient and steady-state analysis for heat conduction. The transport of thermal energy in fluids in motion; free and forced convection in laminar and turbulent flow over surfaces and within conduits.

Prerequisite: CHEG 361 or equivalent or consent of instructor.

CHEG 571 Transport Phenomena (3-0-3)

Principles of momentum, heat, and mass transfer with application to chemical processes. Flow in ducts and around submerged objects. Heat conduction and molecular diffusion. Convective heat and mass transfer. Heat- and mass-transfer coefficients. Transport analogies and correlations.

Prerequisites: CHEG 351 and CHEG 361

CHEG 575 Materials Engineering and Corrosion (3-0-3)

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. Methods of corrosion control are then described, and the course concludes with a description of important corrosion and oxidation monitoring techniques.

Prerequisite: consent of instructor

CHEG 581 Polymer Chemistry and Reaction Engineering (3-0-3)

Chemistry and thermodynamics of polymers and polymer solutions. Reaction engineering of polymerization. Catalytic chemistry of polymerization processes. Polymerization reactor design.

Prerequisite: CHEG 411 or equivalent or consent of instructor

CHEG 582 Polymer Properties, Characteristics, and Characterization (3-0-3)

Polymer fluid mechanics, polymer rheological response, and polymer shape forming. Definition and measurement of material properties. Interrelationships between response functions and correlation of data and material response. Theoretical approaches for prediction of polymer properties. Processing operations for polymeric materials; melt and flow instabilities. Fundamental principles of polymer physical, chemical, and mechanical properties. Structure – property relationships; materials science of polymers.

Prerequisite: CHEG 301 or equivalent or consent of instructor

CHEG 583 Polymer Processing (3-0-3)

Characterization techniques based on solution properties. Materials science of polymers in varying physical states. Processing operations for polymeric materials and use in separations. Principles of polymer properties as applied to manufacture of engineered materials from polymers. Product manufacturing methods.

Prerequisite: CHEG 351 or equivalent or consent of instructor

CHEG 591 Advanced Special Topics in Chemical Engineering (1 to 3-0-1 to 3)

Prerequisite: Graduate level standing and permission of the program

CHEG 595 Graduate Seminar (1-0-0)

Weekly seminar by outside speakers; required each semester (no credit)

CHEG 599 Master's Thesis Research

Prerequisite: Graduate level standing and permission of the program

POST-GRADUATE COURSES IN ELECTRICAL ENGINEERING**ELEG501 Modern Control Engineering (3-0-3)**

Linear feedback control systems; block diagram and signal flow graph representation; mathematical modeling of physical systems; stability of linear control systems; time-domain and frequency-domain analysis tools. Lead and lag compensators; PID controllers. Nonlinear control systems: the describing

function and phase plane analysis; stability analysis. Discrete systems; digital control systems: analysis, stability and design. Case studies
Prerequisite: ELEG 360 or equivalent

ELEG 510 Advanced Linear Systems (3-0-3)

State space methods, Theory of multivariable systems, Jordan canonical forms, Transformation matrices, Realization theory, Controllability, Observability, Stability, Robust stability, State feedback controllers, Full and reduced order observers, Output feedback controllers, Compensation, Decoupling and model matching, Introduction to optimal control.
Prerequisite: ELEG 360 or equivalent

ELEG 511 Modeling and System Identification (3-0-3)

Fundamentals of dynamic systems, models, and identification processes, Frequency response identification, Models of linear time-invariant and time-variant systems, Models of time- nonlinear systems, Parametric estimation methods, Convergence and consistency of solutions, Asymptotic distribution, Recursive and non-recursive identification methods, Model selection and validation, Application and case studies.
Prerequisite: ELEG 360 or equivalent

ELEG 512 Advanced Digital Control Systems (3-0-3)

Digital controller design, Pole-assignment design and state-estimation, Linear quadratic optimal control, Sampled-data transformation of analog filters, Digital filter structures, Microcomputer implementation of digital filters.
Prerequisite: ELEG 480 or equivalent

ELEG 513 Optimal Control (3-0-3)

Performance measures for optimal control problems. Variational approach, the Pontryagin's maximum principle and necessary conditions for optimality with applications, Dynamic programming and Hamilton–Jacobi equation, Singular control, Optimal feedback control systems: minimum time, linear quadratic regulator, Optimal output feedback, Linear Quadratic Gaussian Design, Case Studies.
Prerequisite: ELEG 510 or equivalent

ELEG 514 Adaptive Control (3-0-3)

Introduction to the various approaches of adaptive controller design, Real-time parameter estimation, Model reference adaptive control systems, Parametric optimization, Liapunov function method, Self-tuning controllers, minimum variance self-tuner, Variable structure systems, sliding motion, Gain Scheduling. Robustness issues, Practical aspects and implementation, Typical Industrial applications.
Prerequisite: ELEG 510 or equivalent

ELEG 515 Intelligent Control (3-0-3)

Examples of combinatorial optimization problems in engineering, Intelligent control strategies: Expert systems, Fuzzy logic control, Neural networks. Optimization control techniques: Genetic algorithms, Simulated annealing, Tabu search, Evolutionary methods Hybrid systems, Applications in engineering optimization problems.
Prerequisite: Graduate Standing

ELEG 516 Non-Linear Control (3-0-3)

Introduction to nonlinear systems, Linearization of non-linear systems, Phase plane analysis and classification of linear systems, Non-linear system stability: Liapunov method. Absolute stability: Popov and circle criteria, Describing function analysis, Input/Output feedback theory, Passivity and positivity of nonlinear operators. Multipliers and the small gain theorem, Feedback linearization, Sliding-mode control, Robustness of feedback systems, Unbounded operators, Applications.
Prerequisite: ELEG 360 or equivalent

ELEG 517 Signal Processing (3-0-3)

A review of fundamentals of signal theory, digital filtering, FFT processing, advanced concepts such as multirate DSP, wavelets, time-frequency and detection theory.

ELEG 518 Stochastic Processes (3-0-3)

Review of fundamentals of probability, Introduction to stochastic process, Stationarity, Ergodicity, Gaussian random processes, Poisson and renewal processes, Markov processes, Semi-Markov processes, Queuing Theory, Applications to control and power areas.

Prerequisite: MATH 241 or equivalent

ELEG 519 Stochastic Control (3-0-3)

Introduction to stochastic systems, Stochastic state models, Analysis of systems with random inputs, Analysis and design of stochastic quadratic control systems, Analysis of prediction and filtering systems using stochastic system theory.

Prerequisite: ELEG 517

ELEG 520 Robotics (3-0-3)

Basic concepts of robotics, Mathematical description of industrial manipulator, Homogeneous transformation and the Denavit-Hartenberg notation, Transformation between frames, Forward, and inverse manipulator kinematics, Manipulator dynamics, Newton - Euler and Lagrange formulations, Joint space, and Cartesian space trajectories and dynamic control, Trajectory planning, Linear and non-linear control of manipulator.

Prerequisite: ELEG 510 or equivalent

ELEG 521 Mechatronics (3-0-3)

Analysis of mechatronic and measurement systems, Basics of analog signal processing, design and analysis of operational amplifier circuits, Basics of digital devices and the use of integrated circuits, Microcontroller programming and interfacing, PIC microcontroller and PicBasic Pro programming, Data acquisition and how to couple computers to measurement systems, overview of the many sensors common in mechatronic systems, introduction to devices used for actuating mechatronic systems, Overview of mechatronic system control architectures, case studies.

Prerequisite: ELEG 510 or equivalent

ELEG 522 Instrumentation and Measurements (3-0-3)

Measurement principles and design of sensor and measurement systems; Topics include computer-based measurement systems, sensor design, signal conditioning, data acquisition, smart sensors, and mechatronics. Techniques for measuring quantities encountered in robotics and automation, manufacturing, biomedical, and other applications.

Prerequisite: ELEG 440 or equivalent

ELEG 530 Power System Steady State Analysis (3-0-3)

Modelling and computer solutions of large-scale power systems, Advanced power flow computations including three-phase power flow analysis, Contingency analysis, Sparsity techniques, Network equivalents, Compensation schemes, Principle modelling and control of static var systems for network and load compensation. STATCOM, SVC, FACTS, Reactive power management.

Prerequisite: ELEG 350 or equivalent

ELEG 531 Power System Planning (3-0-3)

Mathematical methods and modern approaches to power system planning, Demand forecasting. Generation system planning: deterministic and probabilistic methods. Transmission system planning: heuristic and stochastic methods, Optimization methods for transmission planning. Route selection: environmental and other considerations. Distribution system planning: system layout, and choice of components.

Prerequisite: ELEG 350 or equivalent

ELEG 532 Power System Dynamic Stability (3-0-3)

Dynamic model of synchronous machines, Excitation and governor systems, Nonlinear and linear modelling of single machine infinite bus systems, Stability analysis and control design, Direct method of stability determination, Multi-machine system modelling, Power systems dynamic equivalents, ALFC and voltage stability.

Prerequisites: ELEG 350 and ELEG 360, or equivalent

ELEG 533 Power System Operation and Control (3-0-3)

Power plant characteristics, Economic dispatch, Transmission losses, Automatic generation control, Voltage and frequency control, Power pools, Power system security, State estimation in power systems, Unit commitment, and optimal economic operation of hydro-thermal systems; System operation in a deregulated environment; Optimum coordination of active and reactive power and reserve in a deregulated system.

Prerequisite: ELEG 350 or equivalent

ELEG 534 Power Quality and Harmonics (3-0-3)

Causes of and solutions to electric power quality problems, Study of the harmonics and calculation of harmonic voltages and currents, Grounding, Voltage disturbances, Measurement techniques, Mitigation techniques, PQ definitions, IEEE standards, IEC standards, waveform descriptions Load response to PQ problems (drop-out curves, CBEMA curve, and voltage withstand.)

Prerequisite: ELEG 470 or equivalent

ELEG 535 Power System Reliability (3-0-3)

Reliability evaluation of static and spinning generating capacity requirements, Interconnected system reliability concepts, Transmission system reliability evaluation, Determination of composite system reliability, Distribution system reliability evaluation, Incorporation of customer interruption costs in the evaluation of power system reliability worth.

Prerequisite: ELEG 450 or equivalent

ELEG 536 Industrial Power Systems (3-0-3)

Industrial power system design considerations: planning (safety, reliability, simplicity, maintenance, flexibility, cost); voltages (control, selection, effects of variation); protection (devices, limitations, requirements, coordination, testing); grounding (static and lightning protection, earth connections); power factor control and effects; switching and voltage transformation; instruments and meters; cable construction and installation; bus configuration and substation planning; design, construction, automation, operation.

Prerequisite: ELEG 350 or equivalent

ELEG 537 Protective Relaying Theory, Application, and Design (3-0-3)

The course is focused on the role of protective devices during abnormal conditions of power systems and fault. It addresses the knowledge and skills to design protective systems for the major elements in power systems. The effect of transient behaviour of the fault on protection systems, stability, and synchronization of the relays will be covered in the course.

Prerequisite: ELEG 350

ELEG 538 Digital Power System Protection (3-0-3)

New application of electronic devices in power systems protection, Electronic transducers, Auxiliary transformers, Anti-aliasing filters, Analog to digital converters, Sample and hold devices and computing devices, Numerical techniques for converting quantized data to phasors and using the phasors for derived measurements, such as power flow, apparent impedance, and frequency.

Prerequisites: ELEG 380 or ELEG 490, or equivalent

ELEG 538 Power Electronics: Modelling and Design (3-0-3)

Overview of power semiconductor switches, Switching characteristics and simplified model of Diode, SCR, MOSFET, IGBT, GTO and IGCT. Design of power circuits, magnetic circuit and gate circuits. Review of ac to dc converters, ac to dc conversion at medium voltage high power levels, dc to dc

converters, dc to ac converters, modeling and design, multilevel inverters: topologies, applications. DC motor control: modeling and design of controllers. PWM techniques: SVPWM, SHEPWM and Space vector PWM: theory and features. Introduction to resonant converters. Mini projects with focus on modeling, simulation and experimental implementation.

Prerequisite: ELEG 325, ELEG 330

ELEG 539 Electric Drives (3-0-3)

Study of load characteristics, study of electrical machine characteristics, dynamics of drives. Space phasor modeling of ac motors, speed control of dc motor, speed control of induction motor, speed control of synchronous motor, speed control of permanent magnet motors. CSI fed drives. Laboratory demonstrations on drive control algorithms. The course is heavy content of assignments on simulation using MATLAB-SIMULINK.

Prerequisite: ELEG 410 or equivalent

ELEG 540 Embedded Controllers (3-0-3)

Study on microcontrollers/DSP / FPGAs, Data acquisition, interfacing TTL logic signals with CMOS logic signals, Design of controllers, software development, debuggers, programming of the controllers. PLCs, interfacing PLC and system signals with the controllers, Case study on embedded controllers. Mini projects on embedded controller design or programming.

Prerequisite: ELEG 380, ELEG 385

ELEG 541 High Power Switching Electronics (3-0-3)

Power processing at high power applications, gate drive design, power circuit layout design, PWM requirements, switching frequency requirements, synchronized PWM techniques, Multi pulse rectifiers, Multi level inverters, Medium voltage high power drives, Power electronics applications to power systems.

Prerequisite: ELEG 410 or equivalent

ELEG 590 Computation Methods for Engineers (3-0-3)

Introduction to general engineering problem, solution using computers, real vector-spaces and matrix problems, solutions of partial differential equations in engineering, nonlinear equations and approximations: interpolations and least squares; numerical differentiation and integration, error analysis, optimization techniques: Variational approaches, search methods.

Prerequisite: Math 261 or equivalent

ELEG 592 Non-destructive Testing (3-0-3)

Basic non-destructive materials testing methods, Ultrasonic material characterization, Ultrasonic flaw detection, Acoustic emission, Eddy-current inspection, Radiographic testing, and Magnetic techniques.

Prerequisite: Graduate Standing

ELEG 593 Special Topics (One to five hours)

The content of this course will include advanced topics of a specialized nature in the area of interest.

Prerequisite: Consent of the instructor

ELEG 594 Optimization Methods for Engineers (3-0-3)

Model construction, Linear and nonlinear programming, Network models, Dynamic models, Stochastic models, Queuing theory and decision theory, Problems include case studies in engineering.

Prerequisite: Graduate standing

ELEG 595 Seminar I (0-1-1)

Presentation of a paper with emphasis placed on techniques of oral communication, to include use of audiovisual aids. The course is usually taken in the first semester of residence in the MSEE or MEE program.

Prerequisite: Graduate standing

ELEG 596 Seminar II (0-1-1)

Presentation of papers with emphasis placed on techniques of oral communication, to include use of audiovisual aids. The course is usually taken in the first semester of residence in the MSEE or MEE program.

Prerequisite: ELEG 595

ELEG 598 Non-Thesis research (One to 6 hours)

An individual research project to be approved by the Graduate Advisory Committee.

Prerequisite: Graduate Standing

ELEG 599 Masters of Science Thesis (One to 12 hours)

Thesis research resulting in an approved thesis

Prerequisite: ELEG 596.

POST-GRADUATE COURSES IN MECHANICAL ENGINEERING**1. Industrial Automation and Control (IAC)****MEEG 522 Feedback Control Systems (3-0-3)**

State space methods, Theory of multivariable systems, Jordan canonical forms, Controllability, observability, Stability, Pole placement, State feedback controllers, Observer design, Output feedback controllers, Compensation, Decoupling and model matching.

Prerequisite: MEEG 384

MEEG 523 Discrete-time Control Systems (3-0-3)

Discrete time control systems, The z-transform, z-domain analysis, Design of control systems via the z-transform, State space analysis, Controllability and Observability, Observer design, Control design in state space, Optimal control systems, Quadratic optimal control.

Prerequisite: MEEG 384 or equivalent

MEEG 524 Advanced Control Topics (3-0-3)

Intelligent control: Fuzzy logic control, Neural networks. Optimal feedback control systems: minimum time, linear quadratic regulator, optimal output feedback, Linear Quadratic Gaussian Design. Robust control techniques: H-infinity and μ -synthesis.

Prerequisite: MEEG 584 or equivalent

MEEG 525 Robot Dynamics and Control (3-0-3)

Mathematical representation of industrial manipulator, Forward, and inverse manipulator kinematics, Dynamic modeling techniques: Newton - Euler and Lagrange formulations, Joint space, and Cartesian space trajectories, Trajectory planning, computed torque control of manipulators.

Prerequisite: MEEG 384 or equivalent

MEEG 526 Mechatronic Design (3-0-3)

Measurements and control systems, signal processing, sensors and actuators, digital and electronic circuits, microprocessor architecture, microcontroller programming and interfacing, and real-time programming. Applications to control of mechanical systems.

Prerequisite: MEEG 384

MEEG 527 Real-Time Monitoring and Control (3-0-3)

Tasks and states control structure, timing techniques, operator's console control, feedback control implementation, multitasking, intertask communication, distributed control, and programmable logic controllers.

Prerequisite: MEEG 384

MEEG 528 Advanced Vibrations (3-0-3)

Response of discrete and continuous dynamical systems, damped and undamped, to harmonic and general time-dependent loading. Convolution integrals, Fourier and Laplace Transform solution methods. Lagrange's equations; Solution of the Eigenvalue problem, Rayleigh's Method, Vibration measurement and applications.

Prerequisite: MEEG 444

MEEG 529 Dynamic Behavior of Materials and Structures (3-0-3)

Response of materials and structures to dynamic loading events. Topics include: theory of wave propagation; plane waves, wave guides, dispersion relations; shock waves, equations of state; dynamic deformation mechanisms adiabatic shear banding, dynamic fracture. Computational methods for modeling the dynamic responses of structures will also be addressed.

Prerequisites: MEEG 324 and MEEG 344

MEEG 530 Fundamentals of Acoustics (3-0-3)

This course will cover the fundamental principles of acoustics allowing the students to go on to more advanced course in acoustics, such as Underwater Sound Propagation, Active Noise Control, or Radiation and Scattering from Elastic Structures.

Prerequisite: MEEG 444

MEEG 534 Advanced Dynamics (3-0-3)

Kinematics in plane and space; Dynamics of particle, system of particles, and rigid bodies. Holonomic and non-holonomic constraints. Newton's equations, D'Alembert's principle, Hamilton's principle, and equations of Lagrange. Impact and collisions. Stability of equilibria.

Prerequisite: MEEG 324 or equivalent

MEEG 536 Measurements and Instrumentation (3-0-3)

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.

Prerequisite: MEEG 384 (System Dynamics and Control) or equivalent

2. Applied Mechanics, Materials, and Design (AMMD)**MEEG 538 Failure of Engineering Materials: Design, Analysis, Prediction and Prevention (3-0-3)**

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.

Prerequisites: MEEG 334 (Material Science) and MEEG 344 (Mechanics of Materials)

MEEG 542 Engineering Design Methods (3-0-3)

An introductory graduate level course in critical thinking about formal methods for design in Mechanical Engineering. Course participants gain background on these methods and the creative potential each offers to designers. Participants will formulate, present, and discuss their own opinions on the value and appropriate use of design materials for mechanical engineering.

Prerequisites: MEEG 374, MEEG 334 or Equivalent

MEEG 543 Applied Finite Element Analysis (3-0-3)

Computer modeling and fundamental analysis of solid, fluid and heat flow problems using existing computer codes.

Prerequisites: MEEG 221, MEEG 344 and computer programming

MEEG 544 Advanced Mechanics of Materials (3-0-3)

Strain energy methods; thick/thin-walled cylinders; shrink-fit assemblies; rotating disks; thermal stresses; shells and plates; beams on elastic foundations.

Prerequisite: MEEG 344

MEEG 545 Fracture Mechanics and Fatigue (3-0-3)

Stress analysis of cracks; stable and unstable crack growth in structures and materials; materials fracture resistance; fatigue; fatigue life estimation, fatigue crack growth.

Prerequisite: MEEG 544

MEEG 546 Pressure Vessels and Piping Design (3-0-3)

This course is designed to introduce students to piping and pressure vessel design drafting practices as they relate to the oil, gas, and petrochemical industries. The course will be divided into two major topics consisting of basic design of pressure vessels and applications and basic design of piping system and applications. The basic design of pressure vessels will consider the following items: codes, internal & external pressures on cylinders and heads, design pressure and temperature, calculation of vessel wall and nozzle reinforcements, maximum allowable working pressure, criteria for choice of materials of construction, nozzles, closures, supports, and foundations. The basic design of piping systems will consist of codes, standards and regulatory requirements, design considerations, loads on piping systems, calculations-guidelines and rules of thumb, external loads on piping, and piping systems configuration and sizing will be covered.

Prerequisites: MEEG 544 and MEEG 354

MEEG 547 Composite Materials (3-0-3)

Micromechanics of advanced composites with passive and active reinforcements, mathematical models and engineering implications, effective properties and damage mechanics, recent advances in "adaptive" or "smart" composites.

Prerequisite: MEEG 344

MEEG 548 Theory of Elasticity and Applications (3-0-3)

Equations of equilibrium and compatibility; stresses and strains in beams, curved members, rotating disks, thick cylinders, torsion and structural members.

MEEG 549 Experimental Mechanics (3-0-3)

Advanced methods of measurement in solid and fluid mechanics. Scientific photography, Moire, photo-elasticity, strain gages, interferometry, holography, speckle, NDT techniques, shock and vibration, and laser anemometry.

Prerequisite: MEEG 376 or Equivalent

MEEG 550 Modeling of Material Behavior (3-0-3)

Constitutive equations for the response of solids to loads, heat, etc. based on the balance laws, frame invariance, and the application of thermodynamics to solids. Nonlinear elasticity with heat conduction and dissipation. Linear and non-linear non-isothermal viscoelasticity with the elastic-viscoelastic correspondence principle. Classical plasticity and current viscoplasticity using internal state variables.

Prerequisites: MEEG 334 and MEEG 344

MEEG 553 Theory of Plasticity and Applications (3-0-3)

Yield condition; plastic stress-strain relations; theory of slip-line fields; applications to bending, torsion, axially symmetric bodies, metal forming.

Prerequisite: MEEG 548

3. Energy and Thermo-Fluids Systems (ETFS)**MEEG 561 Viscous Flow (3-0-3)**

Fluid flows where viscous effects play a significant role. Examples of steady and unsteady flows with

exact solutions to the Navier-Stokes equations. Boundary layer theory. Stability of laminar flows and their transition to turbulence.

Prerequisite: MEEG 354

MEEG 562 Advanced Engineering Thermodynamics (3-0-3)

This course is a modern review of classical thermodynamics with emphasis on current applications and computer tools. The laws of thermodynamics are the limiting constraints on many engineering processes of interest including various energy conversion phenomena, manufacturing processes, refrigeration, power generation, and the green house effect. Transformation of energy from one form to another are the bread-and-butter of mechanical engineering. The course is designed to provide a basis for the analysis of such transformations. An introduction to statistical view of engineering thermodynamics will also be given in this course.

Prerequisites: MEEG 365 and MEEG 354

MEEG 563 Advanced Convection Heat Transfer (3-0-3)

Statement of conservation of mass, momentum and energy. Laminar and turbulent heat transfer in ducts, separated flows, and natural convection. Heat and mass transfer in laminar boundary layers. Nucleate boiling, film boiling, Leidenfrost transition and critical heat flux. Interfacial phase change processes; evaporation, condensation, industrial applications such as cooling towers, condensers. Heat exchangers design.

Prerequisites: MEEG 394 and MEEG 354

MEEG 564 Non-Newtonian Fluid Dynamics (3-0-3)

This course offers the specific techniques and understanding necessary for being able to compute and understand issues associated with non-Newtonian fluid dynamics. Issues of rheology and analytic techniques are covered.

Prerequisite: MEEG 354

MEEG 565 Computational Fluid Dynamics (3-0-3)

Fundamentals of numerical analysis of engineers. Inversion of large, sparse matrices. Numerical solution of the incompressible Navier-Stokes equations in Cartesian and curvilinear grids. Application to turbulent flows and micro-fluidics.

Prerequisites: MEEG 562 and MEEG 563, or permission of program

MEEG 566 Multiphase Flow and Heat Transfer (3-0-3)

Boiling and condensation in stationary systems, phase change heat transfer phenomenology, analysis and correlations. Fundamentals of two-phase flow natural circulation in thermal hydraulic multi-loop systems with applications to nuclear reactors safety. Multiphase flow fundamentals. Critical flow rates. Convective boiling and condensation. Multiphase flow and heat transfer applications in power and process industries.

Prerequisites: MEEG 354 and MEEG 394

MEEG 567 Advanced Combustion and Air Pollution Control (3-0-3)

This course covers thermo-chemistry and chemical kinetics of reacting flows in depth. In particular, we focus on the combustion of hydrocarbon fuels in both a phenomenological and mechanistic approach. The course covers the specifics of premixed and non-premixed flame systems, as well as ignition and extinction. Combustion modeling with equilibrium and chemical kinetic methods will be addressed. Environmental impact and emissions minimization will be covered in detail. Finally, the course will cover available combustion diagnostic methods and their application in laboratory and real-world systems.

Prerequisites: MEEG 365, MEEG 354 and MEEG 394

MEEG 570 Modern Power Generation Systems (3-0-3)

Thermal engineering of modern power generation systems. Thermodynamics and heat transfer. Cycle analysis of various modern power generation technologies including gas turbine, combined cycle, waste burning, cogeneration, nuclear and hydroelectric technologies. Energy storage and energy transport.

Prerequisites: MEEG 365 and MEEG 394

MEEG 573 Impact of Energy Conversion on the Environment (3-0-3)

Energy conversion impacts the environment in several aspects, ozone depletion, global warming through the production of CO₂, waste heat rejection and the release of pollutants. This course assesses the energy flow for the nation and studies the various sources for global warming, waste rejection and ozone depletion in particular. Based on this assessment, certain energy conversion processes are studied in detail. Alternative methods and options, including renewable energy will be developed in class and analyzed in detailed design projects.

Prerequisites: MEEG 365 and MEEG 394

MEEG 574 Advanced Conduction and Radiation Heat Transfer (3-0-3)

Theory of conduction and radiation. Diffused and directional, poly- and mono-chromatic sources. Quantitative optics. Radiation in enclosures. Participating media. Integro-differential equations. Multidimensional, transient and steady-state conduction. Phase change. Coordinate system transformations.

Prerequisites: MEEG 394 or equivalent

MEEG 575 Heat Transfer for Modern Industrial Applications (3-0-3)

Most heat transfer texts to be used in introductory courses contain far more material than is possible to cover in one semester. The intention of this advanced course is to extend the student's understanding of the subject by utilizing the fundamental relationships that have been derived from first principles to solve problems of practical significance, including applications in power, process, and energy fields.

Prerequisite: MEEG 365 and MEEG 394

MEEG 576 Energy Systems Management (3-0-3)

Covers the application of energy efficient technologies, analysis procedures and implementation techniques, including lighting, motors, energy conservation and demand side management. The course will cover the latest innovation in energy efficient equipment and applications, primarily in the buildings and industrial areas. Topics will include both new installations and retrofit activities, with an emphasis on methods for evaluating the energy and cost savings potential of different design options or equipment alternatives.

Prerequisite: MEEG 354, MEEG 365 and MEEG 394.

MEEG 579 Environmental and Water Resources Systems (3-0-3)

Applications of statistical and systems engineering techniques in the analysis of information necessary for the design or characterization of environment or hydrologic processes; emphasis on the fundamental considerations that control the design or information collection programs, data interpretation, and the evolution of simulation models used to support the decision-making process.

Prerequisites: MEEG 354 and MEEG 365, or equivalent

COMMON MECHANICAL ENGINEERING GRADUATE CORE AND TECHNICAL ELECTIVE COURSES**MEEG 501 Advanced Mechanical Engineering Analysis I (3-0-3)**

An advanced, unified approach to the solution of mechanical engineering problems, with emphasis on the formulation and solution of equilibrium, eigen value and eigen functions, propagation problems, and solutions of systems of differential equations. Review and extension of undergraduate material in applied mathematics with emphasis on problems in heat transfer, vibrations, fluid flow and stress analysis which may be formulated and solved by classical procedures.

MEEG 502 Engineering Mechanical Engineering Analysis II (3-0-3)

Sturm-Liouville problem. Partial differential equations: Characteristic curves, separation of variables and integral transforms (Laplace and Fourier), method of characteristics. Wave, heat and diffusion equations. Calculus of variations.

MEEG 503 Applied Numerical Methods (3-0-3)

Methods of transformation of partial differential equations into discrete systems of equations. Presentation of the finite difference method, the finite element method, and the finite volume method, along with the direct and iterative methods for solving the discrete equations. Particular attention is paid to the construction of the discretisation, to the study of the properties of the discrete problem (consistency, convergence, stability), and to the actual computation.

MEEG 504 Continuum Mechanics (3-0-3)

Cartesian tensors. Basic principles of continuum mechanics: deformation, displacement, strain, stress, conservation of mass, continuum thermodynamics and constitutive equations. Illustrative applications in elasticity, fluid dynamics, visco-elasticity and plasticity.

Prerequisite: Graduate Standing or permission of instructor.

MEEG 505 Engineering Optimization (3-0-3)

Overview of applied single- and multi- objective optimization and decision making concepts and techniques with applications in engineering design and/or manufacturing problems. Topics include formulation examples, concepts, optimality conditions, unconstrained/constrained methods, and post-optimality sensitivity analysis. Students are expected to work on a semester-long real-world multi-objective engineering project.

Prerequisite: Graduate Standing or permission of instructor.

MEEG 535 Advanced Mechanical Engineering Fundamentals

This course will provide the students with review of advanced fundamentals in mechanical engineering. The course should serve very useful to the students who begin/return to graduate studies after some time away from the school, as well as practicing engineers and scientists in the field. The course will consist of four modules as follows:

- Engineering Mathematics (16 hours: advanced algebra, differential equations, partial Diff. Eqs, computational methods in Engr. Mathematics, selected examples)
- Applied Mechanics and Controls (16 hours: statics and dynamics; strength of materials; materials science; vibration and feedback control)
- Thermo fluids (20 hours: Classical Thermodynamics, Applied Thermodynamics, fluid mechanics, single phase heat transfer, multi-phase heat transfer)

Prerequisite: Admission to graduate program at PI.

MEEG 555 Life Cycle Cost Analysis (3-0-3)

This course melds elements of traditional engineering economics with manufacturing process modeling and life cycle cost management concepts to form a practical foundation for predicting the cost of commercial products. Methodologies for calculating the cost of systems will be presented. Product life cycle costs associated with scheduling, design, reliability, design for environment (life cycle assessment), and end-of-life scenarios will be discussed. In addition, various manufacturing cost analysis methods will be presented, including: process-flow, parametric, cost of ownership, and activity based costing. The effects of learning curves, data uncertainty, test and rework processes, and defects will be considered. This course will use real life design scenarios from integrated circuit fabrication, electronic systems assembly, and substrate fabrication, as examples of the application of the methods mentioned course will use real life design scenarios from integrated circuit fabrication, electronic systems assembly, and substrate fabrication, as examples of the application of the methods mentioned above.

Prerequisite: Engineering economics.

MEEG 556 Legal Aspects of Engineering Design and Construction (3-0-3)

Examines ways in which the legal system affects the design and construction process. Focuses on contract types and the relationships between the parties in different delivery systems. Topics include contract law, the relationships between the parties, tort and negligence law, and the statutory principles affecting construction.

Prerequisite: Senior standing or admitted to graduate program.

MEEG 557 Mathematical Techniques of Reliability Engineering (3-0-3)

Basic probability and statistics application of selected mathematical techniques in analyzing and solving reliability engineering problems. Applications of matrices, vectors, tensors, differential equations, integral transforms, and probabilistic methods to a wide range of reliability related problems.

Prerequisites: Statistics, Linear Algebra

MEEG 558 Advanced Reliability and Maintainability engineering (3-0-3)

Reliability and maintainability concepts in conceptual, development, production, and deployment phases of industrial products. Costing of reliability, methods of obtaining approximate reliability estimates and confidence limits. Methods of reliability testing-current research and developments in the area of reliability engineering. Modern CAD techniques in reliability design, thermal analysis of circuit boards, vibration analysis, maintainability analysis and preventive maintenance methods.

Prerequisite: Admitted to graduate program at PI

MEEG 591 Advanced Special Topics in Mechanical Engineering (1-3 credits)

Prerequisite: Graduate level standing and permission of the program

MEEG 595 Advanced Special Topics in Mechanical Engineering (3-0-3)

Prerequisite: Graduate level standing and permission of the program

MEEG 599 Master's Thesis Research (6 credits)

Prerequisite: Graduate level standing and permission of the program

POST-GRADUATE COURSES IN PETROLEUM ENGINEERING**1. Deficiency-Removal Courses (3 contact hours each; no graduate credit)****PEEG 500 Rock and Fluids Properties-Formation (3-0-3)**

Students will receive comprehensive coverage of reservoir rock and fluids properties and their applications to reservoir engineering calculations, with an overview of well logging and well log analysis.

PEEG 501 Oil and Gas Reservoir Engineering (3-0-3)

The course covers fundamentals of fluid flow in porous media with applications to oil and gas reservoirs, along with basics of oil and gas well test analysis.

PEEG 502 Basics of Well Drilling, Completion and Production (3-0-3)

The course is an overview of drilling engineering, well completion & workover, and production methods including artificial lift.

2. Formation Evaluation Courses**PEEG 510 Advanced Well Test Analysis (3-0-3)**

This course is designed to give an advanced-level perspective in the area of pressure transient test interpretation. After a brief review of well testing fundamentals, interpretation techniques in complex systems are discussed. This includes topics such as varying wellbore storage, fractured wells, dual porosity systems, composite systems, layered reservoirs and horizontal wells. The course includes numerous example problems specifically designed to supplement the theoretical discussions. The use of well test analysis in reservoir characterization will be emphasized.

PEEG 511 Advanced Well Logging (3-0-3)

This course introduces students to advances and latest technological developments of modern well-logging. Various in-depth analysis and interpretation methods for well logs needed for interpretation of petrophysical and mechanical properties of the porous media and fluid saturations for different lithological environments will be explored and practiced. Emphasis will be on application of results to formation and reservoir evaluation.

PEEG 512 Conventional and Special Core Analysis (CCAL&SCAL)–Theory and Application (3-0-3)

This course is designed to give the best practice in conventional and special core analysis in terms of measurement, interpretation, and application in reservoir management and simulation. An overview of the various well coring techniques will be given, in addition to an introduction to reservoir engineering data that can be extracted from core measurements. Best practice in laboratory conventional and special core analysis will be delivered. Any possible integration of conventional core data with log and test data to help reservoir models building will be covered. The use of special core analysis data in dynamic reservoir modeling will be emphasized.

3. Drilling Engineering Courses

PEEG 520 Advanced Drilling Engineering (3-0-3)

This is a comprehensive course on drilling with topics covering from the planning stages of a drilling well, to selecting optimum operating conditions to achieve 'cost effective' as well as, safe drilling practices. The instructor will list the stages of planning, explain each one of them, show example cases, and finally, will let the students work on sample cases. A number of popular industry software packages will also be used to demonstrate the concepts explained during lectures. The students will have hands-on experience with these software packages. However, dangerous assumptions inherent in these software packages will also be explained.

PEEG 521 Drilling Fluids and Solids control (3-0-3)

Students will learn the latest developments in drilling fluids technology and selection of appropriate mud systems for particular applications, to improve drilling operations. Additional topics include control and disposal of solids and liquids in drilling, workover and completion operations, and impacts on environmentally sensitive areas.

PEEG 522 Materials Selection (3-0-3)

This course is designed to give students a full understanding of mechanisms behind drill bit, drill pipe, drill collar and casing designs. Students will master their ability to make appropriate designs and assess any tubular failure conditions by using a popular drilling software in numerous practical sessions. Types of bits to be used and conditions at which they are going to be operated can have significant effect on drilling time, consequently on total drilling cost. The largest manufacturer of drill bits makes 34 types and 33 sizes and many more on request. Upon completing this course students will be able to systematically select the most suitable bit for a particular case by employing modern techniques and analyzing previous bit records from existing fields.

PEEG 523 Advanced Well Control

This course is designed to bring graduate students to a high level of theoretical knowledge and practical competence with the most advanced technologies for safe handling of high subsurface pressures of gas and oil formations during drilling operations. The course encompasses topics such as dynamic killing and unloading procedures, underground blowouts, formation of craters under drilling structures, motion of gas kicks in inclined wellbores, sensing and transmitting bottom-hole data, and the automation of well control.

PEEG 621 Underbalanced Drilling (3-0-3)

The course is designed to help graduate students understand different methods of underbalanced drilling (UBD), including advantages and disadvantages of each method. Operational conditions and constraints, which play important role in selecting the most suitable UBD technique will be discussed. Upon completing this course, the students are expected to be able to design, plan and run UBD operations.

PEEG 622 Wellbore Stability Analysis (3-0-3)

With more complex wells being drilled in existing environments, costs related to borehole instabilities continues to rise with drilling horizontal, multilateral and extended reach wells. This course provides a

concise overview of rock mechanics principles applicable to wellbore stability analysis and highlights related topics. It is divided into several modules dealing with rock stresses, borehole stresses and failure modes, drilling in unusual pressure regimes, mud weight design and casing shoe programs. Focusing on models used in wellbore stability analysis, fundamentals, causes and effects of instabilities are discussed. Case histories will be presented and reasons for mechanical and chemical formation failures in a drilled hole will be explained. Students will be involved in calculations of well fracturing and break down conditions using advanced geomechanics software; they will gain a good understanding of the processes and physics involved including prevention.

PEEG 623 Measurement While Drilling (3-0-3)

The course teaches students to utilize drilling data to determine formation properties and how mud logger's data can be used to estimate formation fluid content.

PEEG 624 Special Topics in Drilling Engineering (3-0-3)

This course addresses recent advances and technological developments in specific areas such as Underbalanced Drilling, Directional Drilling, Bit Selection, and Measurement While Drilling.

4. Reservoir Engineering Courses

PEEG 530 Advanced Reservoir Engineering (3-0-3)

This course covers many reservoir engineering practices in a multidisciplinary approach. The reservoir engineering topics covered range from basic reservoir rock and fluid characteristics to reservoir management, modeling and field development planning and implementation. Basic reservoir engineering equations are introduced with emphasis directed to parameter significance and its employment in reservoir engineering calculations. The course will give students a comprehensive understanding of the reservoir dynamics, which results in advanced skills to utilize all available reservoir data and their application for the sake of better managing the reservoir to maximize recovery and profit. Pertinent industrial reservoir computer models will be explained as needed.

PEEG 531 Applied Reservoir Simulation (3-0-3)

This course introduces a comprehensive review of the theory and practices of reservoir models building and application in reservoir management and development. The required data for model building and their sources will be described. The importance of data screening and quality checking will be demonstrated. The course also covers the ways by which wells are modeled in reservoir simulators. It also covers the various phases of model building from data preparation and grid design, to initialization and history matching of the reservoir model using observed open-hole S_w data and reservoir performance. The different types of simulation models such as single-well model, sector model, and full-field model will be presented and their purposes identified. Forecasting of a reservoir's future performance under primary and secondary recovery schemes will be taught along with the interpretation of simulation results. Additional advanced topics include pseudo-relative permeability, capillary pressure, and the role of simulation in reservoir management. ECLIPSE 100 will be utilized during the tutorials but prior experience with ECLIPSE is not required.

PEEG 532 Enhanced Oil Recovery (3-0-3)

This course covers reservoir recovery life cycles and recovery processes. The limitations of depletion and pressure maintenance projects will be demonstrated and possible enhancement in oil production rates and recovery will be explored through the application of EOR methods. This course takes a comprehensive look at several aspects of improved oil recovery. Various techniques are described and case studies presented. The latest technological improvements in Enhanced Oil Recovery (EOR) will be presented. This course will also present the mechanisms and limitations of the different EOR methods. The help of reservoir modeling in the process will be demonstrated. Finally reservoir screening criteria, design and implementation of EOR methods will be given.

PEEG 533 Integrated Reservoir Modeling (3-0-3)

This course will deliver the concepts and methodologies required to develop and build complex reservoir models. It will cover the application techniques used to build reservoir models through the integration of

core, well log and seismic data to produce a consistent reservoir description. The course introduces reservoir modeling workflow from construction of the 3D static reservoir model through upscaling for dynamic reservoir simulation. The course aims to develop a shared understanding of concepts among the various disciplines. The course will increase the awareness of the importance of geostatistics and the situations where the application of geostatistical techniques could add value.

PEEG 631 Compositional Reservoir Simulation (3-0-3)

This course will deliver to the students the theory and application of compositional reservoir simulation. Phase behavior of different reservoir fluids will be reviewed, along with the fluids' Pressure-Volume-Temperature relationships. The students will be introduced to the characterization of reservoir fluids using industry standard software. Simulation of gas injection and WAG displacement in oil reservoirs will be modeled using the industry standard compositional model of ECLIPSE 300.

PEEG 632 Integrated Reservoir Management (3-0-3)

This course presents the pertinent and most vital knowledge and tools of integrated reservoir management supported by case studies. The course emphasizes the importance of using an interdisciplinary approach to the management of oil and gas reservoirs for the purpose of maximizing hydrocarbon recovery and investment profitability. Significance of the technology and activities of each discipline of the asset team is explained in relation with the other disciplines' technologies and activities to produce one integrated technology which allows the asset team to better understand the reservoir and in turn provide the most suitable solution for sound reservoir management. Analytical and numerical models of reservoir management will be explained to help design and study the optimum short, medium and long term plans for field development. The course also highlights the importance of timing and cost /benefits analysis.

PEEG 633 Management of Gas Reservoirs (3-0-3)

This course recognize the growing importance of natural gas production. It will help the students understand the engineering drivers for gas reservoir management and how a gas reservoir's value can be maximized through sound engineering practices. A full spectrum of gas reservoir engineering techniques is addressed and their application to a large variety of gas resource management options is discussed.

5. Production Engineering Courses

PEEG 540 Advanced Well Performance Evaluation (3-0-3)

The course provides detailed coverage of inflow performance relationships, multiphase flow in pipes and well performance evaluation. The emphasis is on the analysis, design and optimization of the production system using nodal analysis. Commercial software packages will be used to apply learned methods to flowing and artificially lifted wells, injection wells and field-scale production optimization.

PEEG 541 Well Completions and Workover (3-0-3)

The course provides comprehensive coverage of the various types of well completions and their applications and selection criteria. Design and selection of tubing and subsurface production control equipment. Review of the types and applications of completion and workover fluids. Detailed study of perforating and sand control operations. Review of production logging .methods and their applications for well diagnosis. Remedial cementing and stimulation operations. Design and planning of basic workover operations.

PEEG 542 Surface Production Facilities (3-0-3)

This course provides a comprehensive coverage of the theory, design, operation, evaluation, and trouble-shooting of oil, water, and gas surface handling facilities.

PEEG 543 Well Stimulation (3-0-3)

Formation damage assessment and determining loss of productivity from drilling and workover operations, asphaltene and wax deposition, emulsion blocking and scaling will be covered. This will be followed by methodology of candidate selection and design and analysis of well stimulation methods for

sandstone and carbonate formations, including acid fracturing. The latest advances in well stimulation technologies will be studied.

PEEG 641 Advanced Hydraulic Fracturing (3-0-3)

Students will learn about physical principles and engineering methods involved in hydraulic fracturing; an advanced treatise integrating the necessary fundamentals from elasticity theory, fracture mechanics and fluid mechanics to understand designs, optimization and evaluate hydraulic fracturing treatments including special topics such as high permeability fracturing and deviated well fracturing.

PEEG 642 Horizontal Well Technology (3-0-3)

Students will learn about production engineering aspects of horizontal well technology; applications and limitations of horizontal wells; types and applications of horizontal well completion; production performance of horizontal wells; and production forecasting and productivity enhancement.

PEEG 643 Artificial Lift (3-0-3)

This course covers evaluation and analysis of well production performance; screening and selection of artificial lifting methods; comprehensive study of artificial lift technology including artificial lift system design and optimization; and economic optimization of artificial lift systems.

PEEG 644 Produced Water Control and Management (3-0-3)

Emphasis of the course is dealing with the critical economic impact of produced water on maturing reservoirs, whether the source of produced water is waterflood injection or natural water drive. Topics will be chosen to meet needs and may include corrosion, scaling, emulsions, hydrates, produced water management and water shutoff.

PEEG 645 Carbonate Formation Damage and Stimulation (3-0-3)

The course covers the mechanisms and diagnosis of damage particular to carbonate reservoirs, and choice of appropriate technologies for damage removal and/or well stimulation. Students will learn appropriate applications and critical design components for matrix and fracture acidizing, with additional discussion of propped hydraulic fractures in carbonates.

6. Other Courses

PEEG 550 Advanced Petroleum Economics (3-0-3)

Topics include engineering justification for capital outlay in the petroleum industry; appraisal of development and remedial work on oil and gas wells; appraisal of producing properties; estimation of productive capacity, reserves; operating costs, depletion, and depreciation; value of future profits, taxation, fair market value.

PEEG 551 Uncertainty and Risk Analysis in the Petroleum Industry (3-0-3)

Understanding the nature of uncertainty and risk in petroleum operations, and how to account for these issues using deterministic and probabilistic methods are the theme of the course. Applications employ a systematic approach to analyze decisions in the presence of risk and uncertainty.

PEEG 597 Master of Engineering Graduate Project

PEEG 598 Master of Science Thesis Research

PEEG 599 Graduate Seminar

PEEG 651 Artificial Intelligence in Petroleum Engineering (3-0-3)

The course is a comprehensive review of the various artificial intelligence (AI) techniques, with applications of AI in drilling, production and reservoir engineering.

PEEG 652 Petroleum Related Rock Mechanics (3-0-3)

This advanced course will introduce students to mechanical and engineering properties of rocks and rock masses and application of soil and rock mechanics principles to petroleum engineering problems such as borehole stability analysis, rock fracturing, sand production and acoustic wave propagation in rocks. Topics such as origins and measurement of rock stress, behavior of discontinuities, poroelastic behavior and effective stress, rock strength and failure criteria and time-dependent behavior of geomaterials, will be covered.

POST-GRADUATE COURSES IN PETROLEUM GEOSCIENCES ENGINEERING

PGEG 501 Reservoir Characterization and Modeling (2-6-4)

The course integrates standard petroleum reservoir data (rock facies, seismic, petrophysics and structural geology) with up-to-date industry modeling software. Reservoir models are used to characterize complexity and heterogeneity of large fields, especially of carbonate reservoirs. Emphasis is on reservoir architecture and petrophysics in Mesozoic oilfields of the UAE.

Prerequisites: PGEG361, PGEG401, PGEG421 or equivalents.

PGEG 502 Introduction to Well Log and Rock Physics Analysis (3-3-4)

The course applies principles of well logging and rock physics analysis to carbonate reservoir interpretation. It includes methods and limitations of geophysical measurements of rocks under lab and borehole conditions. PGEG502 discusses methodologies to correlate geophysical measurements and rock properties, and prepares students to perform well log analysis and core data interpretation of carbonate reservoirs. The course covers: (a) concepts of rock properties and their application in the oil industry; (b) lab measurements of rock properties (porosity, permeability, density, resistivity, fluid saturation); (c) lithology logs, porosity logs, fluid saturation and permeability estimation from well logs; and (d) full well log interpretation.

Prerequisites: PEEG213, PGEG351, PGEG361 or equivalents.

PGEG 503 Applications of Reflection Seismology (3-3-4)

The course covers principles of seismic reflection acquisition, processing and interpretation and their application in the petroleum industry. Course topics include principles governing the behavior of seismic waves, surveying techniques used to acquire seismic reflection data on land and at sea, principles that control the choice of acquisition parameters, methods used to process seismic reflection data from raw data to final seismic sections, and principles and practice of interpreting industry seismic reflection data in mapping structures and stratigraphy. Students will learn how to design, acquire, process and interpret seismic reflection data using industry software. Course requires fieldwork.

Prerequisites: PGEG351, MATH212.

PGEG 511 Carbonate Reservoir Petrology (3-3-4)

Carbonate Reservoir Petrology covers carbonate depositional textures, microfacies, diagenesis, permeability, and porosity. Students will learn how to unravel the complex geologic history of carbonate reservoirs from deposition through diagenesis to emplacement of hydrocarbons to develop 3D predictive reservoir models.

Prerequisite: PGEG 311.

PGEG 512 Sequence Stratigraphy of Carbonate Systems (3-3-4)

This course instructs in the sedimentological, petrographic, and stratigraphic methods used to analyze and interpret carbonate sediment and sedimentary sequences. Students will learn to interpret physical processes and depositional environments from sedimentary structures, facies, 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. Course includes a five-day field trip.

Prerequisite: PGEG 511 Carbonate Reservoir Petrology

PGEG 513 Advanced Reservoir Characterization (1-9-4)

Students integrate well log, core, thin section, seismic reflection, and other datasets to characterize and develop geologically realistic, predictive computer model of a carbonate reservoir. Focus is given to depositional geometries, diagenetic processes, and reservoir compartmentalization.

Prerequisite: PGEG 512 Sequence Stratigraphy of Carbonate Systems

PGEG 531 Fractured Carbonate Reservoirs (3-3-4)

Course topics include: fracture characterization; fracture data acquisition from cores; well logs, and well testing; fracture classification; fracture inter-relation parameters; frequency distribution of fractures with respect to lithology and depth; radius of curvature; mapping of fracture trend; fracture geometry and conductivity with respect to paleo-stresses; in-situ stresses and mechanical behavior of rocks; migration and accumulation of hydrocarbon in fractured reservoirs; primary and secondary recovery of fractured reservoirs. Case studies from the Middle East and the UAE are included. Course includes a five-day field trip.

Prerequisites: PGEG 321, PGEG 381 and PGEG 421.

PGEG 532 Advanced Well Logging and Petrophysics (3-3-4)

Course covers physical principles of well logging and modern well logging technologies. Course topics include elastodynamics of fractured porous media; connectivity tensors of porous media; rock diagnosis and rock typing from logs and cores; sonic and seismic wave velocities and pore structure; velocity-porosity-diagenesis models; classification of seismic facies from well logs; use of well logs and AVO to predict carbonate pore type; fluid substitution to predict seismic velocities of saturated rocks; up-scaling and high-resolution reservoir characterization; and production monitoring using well logs.

Prerequisites: PGEG401, PGEG411, MATH212 and PHYS241.

PGEG 599 Master's Thesis Research (6)

Thesis research leading to a research thesis.

Prerequisite: Graduate level standing.

Directory of the Institute

Governing Board

| | |
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| H. E. Dr. Yousef Omair Bin Yousef, Ph.D. | Chairman (ADNOC) |
| Mohamed B. Al Qubaisi | Deputy Chairman (ADNOC) |
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| David Dalton | Member (BP) |
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| Ryotaro Oguro | Member (JODCO) |
| Yousif Al Hashemi | Member, non-voting (PI) |

Industry Advisory Board

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| Ali Khalifa Al Shamsi | ADNOC |
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| Waddah Al Hanai, Ph.D. | ADNOC |
| John Poate, Ph.D. | Colorado School of Mines |
| David Dalton | BP |
| Loic Laurandel | TOTAL |
| David Westerman | Shell |
| Taksahi Hiraoka | JODCO |
| Robert M. Baldwin, Ph.D. | Petroleum Institute |

Institute Administrators

| | |
|--------------------------|---|
| Michael Ohadi, Ph.D. | Executive Director (Acting) |
| Michael Ohadi, Ph.D. | Chief Academic Officer (Acting) |
| John Rogan, Grad. Dip. | Head Librarian |
| Yousef Al Hashami | Director of Finance and Administration |
| Juma Al Ali | Head of Human Resources |
| Mohamad Al Mubarak | Head of Information Technology |
| Mahmood Hassan Shehada | Supervisor of General Services |
| Jerome V. Ward, Ph.D. | Director of Institutional Research and Analysis |
| Yousef Al-Neaimi | Director of Student Affairs |
| Mohammad A. Ismail | Head of Admissions |
| Butti Al Falahi | Head of Internship and Counseling |
| George T. Gilmore, M.Ed. | Registrar |
| Mohammed Al Zaabi | Housing Supervisor |
| Haydon Allan | Recreation Supervisor |

Full-Time Faculty

A

Abdala, Ahmed, Ph.D., M.S., North Carolina State University, 2002, 2001, B.S., Suez Canal University, 1990, Assistant Professor, Chemical Engineering

Abdel Magid, Youssef, Ph.D., M.S., University of Manitoba, 1976, 1972, B.S., Cairo University, 1969, Professor, Electrical Engineering

Aggour, Mohamed, Ph.D., University of Manitoba, 1978, B.S., Alexandria University, 1967, Professor, Petroleum Engineering

Aggour, Tamir, Ph.D., B.S., Texas A & M University, 1999, 1994, Assistant Professor, Petroleum Engineering

Agyeman, Kofi, Ph.D., Massachusetts Institute of Technology, 1976, B.S., University of Ghana, 1970, Professor and Coordinator, Physics

Ahmad, Jamal, Ph.D., M.S., North Carolina State University, 1993, 1986, B.S., Birzeit University, 1986, Associate Professor, Mechanical Engineering

Akgun, Ferda, Ph.D., Colorado School of Mines, 1989, M.S., University of Louisiana, 1985, B.S., Middle East Technical University, 1982, Associate Professor, Petroleum Engineering

Al Ameri, Tareq, Ph.D., Imperial College, 2005, B.S., Washington University, 2001, Lecturer, Chemical Engineering

Al Hashimi, Saleh, Ph.D., M.S., B.S., Tufts University, 2000, 1998, 1995, Assistant Professor, Chemical Engineering

Ali, Mohammed, Ph.D., Oxford University, 2003, M.S., University of Birmingham, 1998, B.S., University of Wales, 1997, Assistant Professor, Petroleum Geosciences Engineering

Ali, Sayel, Ph.D., The Ohio State University, 1987, M.S., University of Dundee, 1980, B.S., University of Jordon, 1976, Assistant Professor, Mathematics

Allison, David, Ph.D., Teesside Polytechnic, 1986, M.S., University of Kent, 1981, B.S., University of London, 1981, Assistant Professor, Mathematics

B

Baldwin, Robert, Ph.D., Colorado School of Mines, 1975, M.S., B.S., Iowa State University, 1972, 1969, Professor and Director, Chemical Engineering

Barkat, Braham, Ph.D., Queensland of Technology, 2000, M.S., University of Colorado, 1988, Assistant Professor, Electrical Engineering

Beig, Abdul Rahiman, Ph.D., M.E., Indian Institute of Science, 2004, 1998, B.E., Karnataka Regional Engineering College, 1989, Assistant Professor, Electrical Engineering

Benbow, Rachel, M.L.S., B.A., University of Pittsburgh, 2001, 1999, Librarian

Berteussen, Karl, Ph.D., University of Oslo, 1976, M.S., Bergen University, 1972, Professor, Petroleum Geosciences Engineering

Bolt, Philip, Ph.D., University of Exeter, 1997, M.S., Plymouth Polytechnic, 1988, B.A., University of Liverpool, 1987, Assistant Professor, English

Bouchalkha, Abdel Latif, Ph.D., M.S., Oklahoma State University, 1993, 1989, B.S., Central State University, 1986, Associate Professor, Physics

Boukadi, Fathi, Ph.D., M.S., Pennsylvania State University, 1991, 1987, B.S., University of Louisiana, 1985, Associate Professor, Petroleum Engineering

Bradley, Curtis, Ph.D., M.A., Rice University, 1997, 1992, B.S., Oregon State University, 1985, Assistant Professor, Physics

Brandt, Caroline, Ph.D., University of East Anglia, 2004, M.A., University of Surrey, 1996, Assistant Professor, Communications

C

Caulfield-Browne, Mark, Ph.D., B.S., University of Nottingham, 1994, 1988, Assistant Professor, Mechanical Engineering

Craig, Robert, M.A., University of Essex, 1987, Senior Lecturer and Coordinator, Communications

D

Dalton, David, M.A., University of Sheffield, 1995, B.S., Birmingham University, 1978, Senior Lecturer, Communications

Darwish, Naif, Ph.D., Oklahoma State University, 1991, M.S., Yarmouk University, 1984, B.S., Kuwait University, 1981, Associate Professor, Chemical Engineering

Dean, Kevin, Ph.D., King's College, 1981, M.Eng., University of Liverpool, 1978, B.S., University of Hull, 1977, Associate Professor, Physics

Dib, Khalid, Ph.D., North Dakota State University, 1999, M.S., Eastern New Mexico University, 1992, B.S., Iowa State University, 1988, Assistant Professor, Mathematics

Didenko, Andriy, Ph.D., M.S., Odessa National University, 1986, 1978, Assistant Professor, Mathematics

Dirks, Marinus, Drs., State University of Leiden, 1973, Assistant Professor, Physics

Duthler, Kirk, Ph.D., M.A., University of Kentucky, 2001, 1994, B.A., Hope College, 1991, Assistant Professor, Communications

E

Edwards, Gerald, Ph.D., University of Texas, 1984, M.S., Northeast Louisiana University, 1975, B.S., University of Nevada, 1973, Associate Professor, Petroleum Geosciences

El Kadi, Mirella, Ph.D., University of Lausanne, 1993, Assistant Professor, Chemistry

El-Keib, Abdurrahim, Ph.D., North Carolina State University, 1984, M.S., University of Southern California, 1976, B.S., University of Tripoli, 1973, Professor and Director, Electrical Engineering

Emamizadeh, Behrouz, Ph.D., University of Bath, 1998, M.S., Purdue University, 1986, B.S., University of Massachusetts, 1983, Assistant Professor, Mathematics

Eriksen, Jens, Ph.D., M.S., New York University, 1976, 1974, B.S., Aarhus University, 1972, Associate Professor, Chemistry

Eveloy, Valerie, Ph.D., Dublin City University, 2003, M.S., National Institute of Applied Science, 1994, Research Assistant Professor, Mechanical Engineering

F

Farinwata, Shehu, Ph.D., Georgia Institute of Technology, 1993, M.S., B.S., University of Detroit, 1985, 1983, Associate Professor, Electrical Engineering

Fernandes, Ryan, Ph.D., University of Kentucky, 1991, M.S., B.S., University of Bombay, 1981, 1979, Associate Professor, Mathematics

Fok, Sai Cheong, Ph.D., Monash University, 1990, B.A., University of Ottawa, 1985, Associate Professor, Mechanical Engineering

Francis, Colin, Ph.D., B.S., University of Bristol, 1979, 1975, Professor and Coordinator, Chemistry

G

Garis, Dalton, Ph.D., University of Florida, 1996, M.S., Texas A&M University, 1989, B.S., University of Massachusetts, 1984, Associate Professor, Economics

Geluk, Jaap, Ph.D., M.S., University of Leiden, 1983, 1971, Professor, Mathematics

Ghedan, Shawket, Ph.D., M.S., Colorado School of Mines, 1989, 1984, B.S., University of Baghdad, 1978, Associate Professor, Petroleum Engineering

Giblin, Michael, B.S., National University of Ireland, 1983, Lecturer and Coordinator, Mathematics

Goharzadeh, Afshin, Ph.D., University of Le Havre, 2001, M.S., University of Rouen, 1998, B.S., University of Le Havre, 1997, Assistant Professor, Mechanical Engineering

Gupta, Anuj, Ph.D., M.S., The University of Texas, 1991, 1987, B.Eng. The University of Delhi, 1983, Associate Professor, Petroleum Engineering

H

Hamid, Nihad, Ph.D., Leeds University, 1976, M.S., Bristol University, 1971, B.S., Imperial College, 1970, Lecturer, English

Harb, Gabriele, Diploma, University of Rostock, 1987, Lecturer, German

Hatakka, Mary, M.A., B.A., University of Helsinki, 1991, 1983, Lecturer, Communications

Hayman, Mark, Ph.D., University of Warwick, 2000, M.A., B.A., University of Birmingham, 1990, 1975, Assistant Professor, History

Hogan, Gordon, B.Eng., McMaster University, 1967, Lecturer, Electrical Engineering

K

Karkoub, Mansour, Ph.D., M.S., B.S., University of Minnesota, 1994, 1990, 1988, Professor and Acting Director, Mechanical Engineering

Khezzar, Lyes, Ph.D., Imperial College, 1987, MS, University of Manchester, 1983, B.S., University of Bradford, 1982.

Kubo, Isoroku, Ph.D., Cornell University, 1974, M.B.A., Indiana University, Associate Professor, Mechanical Engineering

L

Lamont, Lisa, Ph.D., University of Ulster, 2005, B. Eng., University of Ulster, 2001, Assistant Professor, Electrical Engineering

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

Lane, Robert, Ph.D., University of Florida, 1971, B.S., University of North Carolina, 1966, Professor and Director, Petroleum Engineering

Lim, Hwee Ling, M.A., B.A., National University of Singapore, 1993, 1986, Lecturer, Communications

M

McNaught, Ian, Ph.D., B.Ed., B.S., Monash University, 1972, 1975, 1968, Associate Professor, Chemistry

Merrifield, Michael, M.A., Inter American University of Puerto Rico, 2001, B.A., University of West England, 1989, Lecturer

Miller, Gary, Ph.D., University of New Brunswick, 1994, M.S., Queen's University, 1990, Assistant Professor, Mathematics

Moore, David, M.A., B.A., University of Dublin, 2001, 1998, Lecturer, STEPS

Munster, Dominic, M.S., Cranfield University, 1999, B.S., University of Salford, 1998, Lecturer, Mathematics

Murphy, Hugh, Ph.D., University of Arizona, 1979, M.S., Lehigh University B.S., Manhattan College, Professor and Director, Core Program

N

Najaf-Zadeh, Reza, Ph.D., M.S., Lehigh University, 1987, 1980, B.S., Tehran University, 1977, Associate Professor, Physics

Nawrocki, Pawel, Ph.D., Institute of Fundamental Technological Research, 1988, M.S., Technical University of Lodz, 1980, Associate Professor, Petroleum Engineering

Neilson, Jane, M.S., Simon Fraser University, 2000, B.S., University of British Columbia, 1974, Lecturer, Mathematics

Nunn, Roger, Ph.D., M.A., University of Reading, 1996, 1989, Associate Professor, English

O

Ohadi, Michael, Ph.D., University of Minnesota, 1986, M.E., Northeastern University, 1982, M.S., B.S., Southern Illinois University, 1980, Professor, Mechanical Engineering, Acting CAO, Acting Executive Director

Olearski, Janet, M.A., University of Edinburgh, 1980, M.A., University of London, 1986, Learning Enhancement Coordinator

P

Palmer, Bruce, Ph.D., University of Utah, 1972, B.S., Colorado School of Mines, 1968, Professor, Chemical Engineering

Pillay, Avin, Ph.D., University of London, 1982, M.S., B.S., University of Durban, 1979, 1977, Associate Professor, Chemistry

Poshtan, Majid, Ph.D., Tulane University, 2000, M.S., University of New Brunswick, 1992, B.S., Tehran University, 1988, Assistant Professor, Electrical Engineering

Posner, Barry, M.S., B.S., University of Alberta, 1998, 1994, Lecturer, Economics

R

Rasmussen, Paul, Ph.D., McMaster University, 1969, M.S., B.S., Acadia University, 1966, 1964, Associate Professor, Chemistry

Rodgers, Peter, Ph.D., B.S., University of Limerick, 2000, 1990, Associate Professor, Mechanical Engineering

Rogan, John, B.A., Monash University, 1969, Grad. Dip., Royal Melbourne Institute of Technology, 1971, Head Librarian

Roos, Gregory, Ph.D., B.S., University of Cape Town, 1976, 1972, Associate Professor, Chemistry

Rostron, Paul, Ph.D., University of Northumbria, 1993, B.S., Newcastle Polytechnic, 1990, Assistant Professor, Chemistry

S

Sassi, Mohamed, Ph.D., M.S., University of California, 1990, 1987, B.S., University of Rochester, 1985, Associate Professor, Chemical Engineering/Mechanical Engineering

Scott, Suzanne, Ph.D., University of Denver, 1997, M.A., Washington University, 1976, B.A., Drury College, 1972, Assistant Professor, STEPS

Seela, Jeffrey, Ph.D., Indiana University, 1989, B.S., Iowa State University, 1983, Professor, Chemistry

Seibi, Abdennour, Ph.D., M.S., B.S., Pennsylvania State University, 1993, 1988, 1985, Associate Professor, Mechanical Engineering

Shires, Michael, M.L.S., B.A., University of Alberta, 2000, 1991, Librarian

Sirat, Manhal, Ph.D., Uppsala University, 1999, M.S., Baghdad University, 1982, B.S., Mosul University, 1977, Assistant Professor, Petroleum Geosciences Engineering

Steiner, Rex, M.A., M.L.S., B.A., Emporia State University, 1991, 1990, 1988, Librarian

Steuber, Thomas, Ph.D., University of Cologne, 1989, Associate Professor, Petroleum Geosciences Engineering

Stewart, Sean, Ph.D., B.S., University of Wollongong, 1999, 1995, Associate Professor, Mathematics

Stokes, Michael, Ph.D., B.S. Imperial College, 1972, 1968, M.Ed., Manchester University, 1984, Professor, Physics

Sun, Yuefeng, Ph.D., M.S., Columbia University, 1994, 1989, B.S., Petroleum University of China, 1982, Associate Professor, Petroleum Geosciences Engineering

T

Tarfa, Tahar, Ph.D., University of Le Havre, 1994, Assistant Professor, Mechanical Engineering

V

Vega, Sandra, Ph.D., M.S., Stanford University, 2004, 2000, Assistant Professor, Petroleum Geosciences Engineering

Vukusic, Sulafudin, Ph.D., University of Leeds, 1999, M.S., University of Manchester, 1996, B.S., University of Sussex, 1991, Assistant Professor, Chemistry

W

Webb, Matthew, Ph.D., Australian National University, 2001, M.A., B.A., Victoria University of Wellington, 1996, 1991, Assistant Professor, Communications

Williams, John, Ph.D., University of Exeter, 1979, M.B.A., Open University, 1993, B.S., University of Exeter, 1974, Professor, Petroleum Engineering

Winn, Robert, Ph.D., University of Wisconsin - Madison, 1975, M.S., Lehigh University, 1971, B.S., Oregon State University, 1969, Professor and Director, Petroleum Geosciences Engineering

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.

Site Map



- | | |
|--|---|
| 1- Zarkuh – Foundation Program | 11- B 11 – Student Hostel |
| 2- Bu Hasa – Core Program and ChE Program | 12- B 21 – Student Hostel |
| 3- Ruwais – EE, ME, PE and PGE Programs | 13- Heil – Student Hostel |
| 4- Umm Shaif – H&SS Faculty, Offices and Classrooms | 14- B 22 - Student Hostel |
| 5- Habshan – Library and Administration | 15- Bu Danah - Student Hostel and Umm Al Nar Club |
| 6- Arzanah – Women's Campus | 16- Bunduq - Student Hostel |
| 7- Mosque | 17- Abu Albokhoosh - Student Hostel |
| 8- Asab.- Sports Halls, Recreation Center & Fitness Center | 18- Jarnin - Student Hostel & ADNOC Health Clinic |
| 9- Football Fields | 19- Delma - Student Hostel |
| 10- Satah – Dining Hall | 20- ADNOC Technical Institute |