Jubail Industrial College

JIC

2016

BULLETIN
Preferred Choice for Technology Education and Training in Saudi Arabia

Proudly Serving the Nation Since 1978
An aerial view of the Jubail Industrial College

His Majesty King Salman Bin Abdulaziz Al-Saud
His Eminence Prince Saud bin Naif bin Abdul-Aziz Al-Saud, Prince of Eastern Region
His Highness Prince Saud Bin Abdullah Bin Thunayan Al-Saud, Chairman of the Royal Commission
His Excellency Dr. Ali Bin Hassan Al-Asiri, General Manager of the Colleges and Institutes Sector of RC-Jubail

During the RC-Jubail Colleges and Institutes Sector Graduation Ceremony 2016
Jubail Industrial College embodies an ethos of mutual respect whilst providing a caring environment that enable students to achieve personal success and to progress confidently into a world of endless possibilities, both within the Kingdom of Saudi Arabia and abroad.

We, at Jubail Industrial College, believe that education includes the whole person and we aim to nurture both academic and non-academic lives of our students to ensure that young people get the opportunities to fully develop before joining the qualified workforce of the country.

Established in 1989, the history of the College goes back to late ‘80s when the Royal Charter of the Kingdom transformed the Jubail Human Resources Development Institute into an Industrial College. The institutional development of education and training for successful industrialization of the industrial city has been the cornerstone of manpower development by the city planner.

By its presence at the heart of the largest petrochemical complex of the world, the college has been able to forge strong industry-education links, and continuously harness its expertise and resources to manpower development according to the national plans. With unwavering support of its parent organization, the Royal Commission for Jubail & Yanbu, the college enviably rose to the premier position of the Kingdom for technology education and training.

In our mission to provide quality education, emphasis was laid on preparing graduates for life and work; systematic monitoring, management reviews and quality audits ensured the programs remained current and relevant to the job market. We took strides in ensuring that our programs are benchmarked to international standards, our business processes carry quality hallmarks. To that end, the college worked for and successfully obtained accreditation of its educational programs by ETAC of ABET, CTAB, and ACBSP, while our business processes won ISO:9000 Quality Management System certification.

Our efforts to continuously improve via
program evaluation, revision, implementation and stakeholders’ feedback provided the impetus to remaining close to the job markets.

Some of the current efforts of the college include a focus on renewable energy which is in light of the country’s pursuit for sustainable energy. Together with our overseas partners, we are working to build a solar power generation unit in the college, and bring solar education at the forefront of our development plan.

Also, the college is focused on providing certified professional training to its students and trainees. Partnerships with the American Welding Society (AWS) and International Society of Automation (ISA) and being the approved training centers of these institutions are examples of JIC’s recent achievements in this area.

JIC continues to focus efforts in supporting the national Saudization objectives. In fact, our strategic aim to support the national Saudization program has paid huge dividends in bringing affluence and prosperity to the community. JIC’s competency-based education and the industrial training programs have made it one of the country’s frontrunners for providing quality manpower in support of national development plans.

The college fosters an environment which promotes initiatives, teamwork, creativity, professionalism and continuous improvement. The quality of its faculty remains one of the strengths of its success as it recruits well qualified professionals throughout the year which has been the constant trademark of its operations.

Our world class facilities well-equipped to provide job-oriented practical experiences, computer labs with internet access, digital library, in-campus accommodation, business complexes, and recreational facilities make Jubail Industrial College one of the enviable places to live, study and work in the Kingdom of Saudi Arabia.

As the Managing Director, I am proud to be a part of this community, the staff that brings it all together, I greatly value the role that other stakeholders play in the life of Jubail Industrial College.
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Jubail Industrial City (Madinat Al-Jubail Al-Sinaiyah) is located approximately 100 kilometers north of the busy conglomerate of Dammam, Dhahran and Al-Khobar and is joined to them by an excellent highway. Jubail Industrial City itself is a new city. It was conceived as a model development project to bring industrial diversification to an oil-rich area.

Jubail Industrial City now plays a leading role in the industrialization process, with its wide range of primary industries as well as support and service industries. There is easy access to King Fahd International Airport, to Bahrain over the King Fahd Causeway and to the rest of the Kingdom and the other Gulf countries through an efficient road network. The city continues to enjoy carefully planned growth, sustaining and improving upon the quality of life it has already established.
The Royal Commission for Jubail and Yanbu (RCJY) was set up in the mid-seventies to plan, construct and subsequently manage the two new industrial cities of Jubail and Yanbu, one on the east coast and the other on the west coast of Saudi Arabia. The monumental task of RCJY was not only to develop industries, housing, education, health services, and recreational facilities, but also involved in community and social welfare development. Not only has it attracted a range of industries to the area, but it has created a pleasant landscaped living environment out of what was formerly arid desert. The local architecture combines the best of Arabian community tradition with modern principles of design and construction. Strict environmental regulations govern the activities of industries to ensure a safe and clean area. It is under the auspices of the Royal Commission that Jubail Industrial College operates as a training institute.
Jubail Industrial College has its roots in 1978 when the Royal Commission for Jubail and Yanbu established a skills training center, to develop skilled manpower required by the Kingdom. In 1982, the skills training center was upgraded into an institute named the Royal Commission Jubail Human Resources Development Institute.

The Manpower Council of the Government of Saudi Arabia issued a Royal decree in 1989 to transform the institute into a full-fledged engineering and business college, named the Jubail Industrial College. This was established to serve the educational and training needs of the newly created Jubail Industrial City and the local and regional community of the Eastern Province of the Kingdom of Saudi Arabia.

Jubail Industrial College, the Kingdom’s largest and most sophisticated, is a 'semi autonomous' technical institute governed by the Board of Directors of the Royal Commission. At the college level, the activities concerning academic, administrative and student services are administered by the Managing Director along with the College Deputy for Education and Training Affairs, College Deputy for Curriculum and Quality Assurance, and College Deputy of Student Affairs according to by-laws and College Council decisions.

Jubail Industrial College is an outstanding example of how relevant modern education, in support of technology, transforms a rural society into a modern, vibrant one. It is a successful example of how, within a couple of decades, planned industrial and educational developments can work hand in hand.
Jubail Industrial College occupies a spacious campus in the heart of Jubail Industrial City (Madinat Al-Jubail Al-Sinaiyah) on the Arabian Gulf coast. The 1,370,000 square meter area amounts to a self-contained site, containing several educational and administrative buildings, an ample residential area for students, cafeterias, a mosque, a snack bar, coffee shops, laundry shop, commissary, a library, workshops and laboratories, as well as a vast recreation area. Particular care has been taken to provide a congenial working and living environment. There are acres of green space, shaded walks, fountains and gardens. The existing infrastructure facilities have now been expanded to accommodate a sharp increase in the student population of the College.

JIC is primarily a residential college that creates an atmosphere of collegiality and camaraderie among students. Over 90 percent of students stay in the campus while some students commute from nearby towns and cities.

The College environment is very friendly and informal, and reflects warm relationships between staff and students. Over the years student enrollment has increased to over 7,000. With the increase in enrollment, the College facilities have also been developed and expanded.

The Arabian Gulf is directly adjacent to the College campus, affording a relaxing escape from the industrial landscape of the city; the long stretches of quiet shoreline are enjoyed by staff and students alike.
To be recognized as an institution of academic and training excellence and the preferred choice for technology education and training in the Kingdom.

To provide the Kingdom with well-educated and highly-trained manpower in technical and business related fields by offering quality technology education and training programs that are career-focused and market-driven, through partnership with business, industry, community and other stakeholders.

The following is a summation of the College’s objectives to achieve its mission:

- To support the National Saudisation Program and contribute to the affluence and prosperity of the nation.

- To support the tenets of the National Development Plan; by preparing technically-trained quality manpower to international standards, by meeting specific job descriptions, and, in so doing, to promote the various developmental projects of the nation, particularly those of Jubail Industrial City.

- To provide short, tailor-made courses to industry and commerce in addressing their needs for technical manpower training.

- To promote collaborative applied research with industry and commerce and to provide consultancy services to them.

- To assist the stability and growth of the Jubail Industrial City community by providing further education options that will help attract Saudi nationals to settle and to work in the region.

- To provide community service programs that generate cultural, professional and recreational benefits for society.
Underpinning all the educational and training activities at the College, there are certain principles which make JIC unique among the other colleges/universities in the Kingdom:

- Active Teaching and learning
- Course integration
- Balance knowledge and skills
- Linking curricula with job requirements
- Preparing ready-to-work graduates
- Dynamic and responsive curriculum revision
- Link with outside accrediting and professional bodies
- Quality assurance in curriculum revision, implementation, and evaluation
- Computer-aided teaching and learning
- Societal context

The College has the following degree programs:

Associate of Science (AS) in:
- Manufacturing Engineering Technology
- Mechanical Maintenance Engineering Technology
- Electrical Power Engineering Technology
- Instrumentation and Control Engineering Technology
- Chemical Engineering Technology
- Industrial Chemistry Technology
- Polymer Engineering Technology
- Accounting

Bachelor of Science (BS) in:
- Mechanical Engineering Technology
- Chemical Engineering Technology
- Electrical Engineering Technology
- Instrumentation and Control Engineering Technology

Through ongoing curriculum re-structuring and updating, all programs and courses place a strong emphasis on technology, as they do on cutting edge innovations and changes across the wide spectrum of industry. Change is the only constant.

All degree programs include a cooperative training module (OJT on-the-job training) for a full semester. Such pre-graduation work placement equips our students with real exposure to the realities of industry while familiarizing them with the kinds of working lives they are likely to experience after graduation.
The College, in setting up four specialized departments, shows that it has identified major areas of industrial and commercial activity to which it can make a distinct contribution.

- **Department of Mechanical & Manufacturing Engineering Technology**
- **Department of Electrical and Electronic Engineering Technology**
- **Department of Chemical & Process Engineering Technology**
- **Department of Management & Information Technology**

Students follow a one-year Preparatory Year program of intensive study before they enter one of the specialization departments. The College Preparatory Year programs are offered mainly by the two support departments:

- **English Language Center**
- **Department of General Studies**

They also offer additional courses to support students during their specialization years.

College entrants consist of the following:

- Fresh high school graduates who enroll in the College’s associate programs.
- Associates degree holders who want to enroll in a Bachelor’s Program which leads to a BS degree.
- Privately employed individuals with associates degree who wish to pursue an affordable ‘Bachelor’s Program’ on a part-time basis.
- Industry sponsored trainees with high school certificate who pursue long tailored courses / NDT courses training and of up to one year.
- Practicing engineers and other professionals working in the industry and commerce who seek to upgrade their knowledge with highly-specialized and intensive short courses of 1-2 weeks duration.
- Business community leaders and managers who seek to upgrade their credentials with highly specialized global programs.
- Public service attendees who want to participate in the College’s evening courses.
The College’s academic programs are based on the American model and style of post-secondary education that utilizes the credit hour system as a measure of the course weight. All the engineering majors, except Industrial Chemistry Technology (INCT), are based on the criteria of the Engineering Technology Accreditation Commission (ETAC) under the Accreditation Board of Engineering and Technology, Inc. (ABET) - (ETAC-ABET) - system of the USA. INCT is a chemistry-based program which closely shadows the Canadian Technology Accreditation Board (CTAB). The business majors follow the Association of Collegiate Business Schools and Programs (ACBSP) guidelines and standards. English is the language of instruction in all degree programs and courses, except those devoted to the study of Arabic and Islamic studies.

The College provides a non-credit prep year, consisting of intensive courses in English language, science, mathematics, computer studies, study skills, and physical education. These courses are designed to assist the students in developing the necessary competence and skills to engage in analytical critical thinking and expression for their successive years in the specialization majors. Additionally, the courses in specialization areas are designed to augment the core curricula and help prepare students to become creative and productive member of their professions and the society at large.

One of the principal objectives of the College is to prepare the students to face the current global challenges and enable them to utilize all sources of knowledge made available today by modern communications and information technology. Therefore, JIC is inspired to impart world class education, knowledge and foresight to its students adopting English language as the medium of instruction in the College.

The College is open minded in its hiring preferences though preference is given to people with developed English language abilities. Our faculty are distinguished by their willingness to embrace new technologies and developments, and great emphasis is placed on the swift introduction of these new and improved methods to the curriculum. In this regard, teaching methodologies, multi-media and information technology advances are key areas.
JIC graduates have long been recognized by business and industry as disciplined, thoughtful individuals who have undergone a rigorous, knowledge based yet practical education and training. All JIC graduates possess a range of IT skills and are encouraged to manage their own time efficiently. The special emphasis the College places on problem-solving, technical aptitudes, leadership, creative expression and logical thinking, is evidenced by all our graduates who successfully make the shift to full time employment. Graduation is deferred until students show real aptitude and real improvement.

JIC believes in working in close collaboration with industry and other well-established national and international institutions in order to forge strategic partnerships which are mutually beneficial. Two of the country’s premium organizations, i.e. Saudi Aramco and Saudi Basic Industries Corporation (SABIC) are engaged in frequent dialogue with the College to assess the development of curricula and facilities.

All College programs have active industrial advisory committees to guide them. Such guidance oversees a process of constant improvement and refinement.

These partnerships and connections are of great importance to College programs as they directly influence student outcomes. Such ongoing collaboration and dialogue will keep JIC responsive to industry while remaining at the cutting edge of new technologies.

The College's educational activities are divided into five main areas:
- Associate and Bachelor Degree Programs
- Short and Tailor-Made Special Programs for Local Industries
- English Language Services
- Community Education Programs
- Applied Research and Consultancy Services

**Associate of Science Degree Programs** are open to High School graduates and these involve three years of full-time study. The programs are also offered part-time for company employees. The programs cover specific areas of technology and business.

**Bachelor of Science Degree Programs** are open to high achievers of associate programs.

**Short and Tailor-Made Programs** called Special Programs are designed to cater to the specific needs of industry. These are available to large numbers of industrial trainees if required.

**NDT Basic and Advanced Training Programs** to meet the industry demands.
The English Language Unit offers intensive industry standard English courses for the trainees. The College conducts tests and examinations in keeping with internationally accredited standards and procedures.

Community Education Programs are offered as part of the community service of the College in the evening hours.

JIC’s Applied Research and Consultancy Services are primarily directed at solving specific problems of industry.

The College campus provides a scholastic atmosphere which encourages the student to pursue intellectual, social, athletic and cultural activities in a well-organized academic environment. It comprises:

- An educational building, with well over 133 classrooms, workshops and laboratories.
- A dormitory complex of 28 buildings with accommodation for 4,192 students.
- Three cafeterias that seat 1,200.
- A 624-seat auditorium.
- An ample Information Technology Center to provide all JIC departments, staff and students with all necessary information and technical support that help to manage the College operations and decision-making. It also provides each department of the College with the Student Information System (SIS), in addition to several other services.
- A media and learning resources center, including a print shop.
- A College Clinic, including Medical facilities provided in nearby polyclinics and also at the main Royal Commission hospital.
- A 1,700 square meter multi purpose recreation and exhibition center, a 1,200 square meter indoor sports complex augment the wide range of facilities at the College. The College also has 4 indoor playing fields where sports and other recreational activities are held.
- An English Language Center, complete with 42 classrooms on three floors, a number of language labs/CALL labs, as well as faculty and administrative offices and lounges.
- An Ultra Modern NDT Training Center, the first of its kind in Saudi Arabia, to offer NDT basic and advanced courses for industrial and other trainees.
- A modern purpose-built building for the Electrical and Electronic Engineering Technology Department, that houses more than 45 class rooms, labs, workshops, conference room, resource room, in addition to a sufficient number of offices for staff.
- A spacious building for the Management and Information Technology Department, with well over 29 classrooms, computer labs, conference room and offices.
- A two storey building for the Library and Learning Resources Center. It also has an e-library and ebrary.
**STORIED TRAINING CENTER**

- Capacity: 1,500 Trainees
- 56 workshops and labs
- 40 classrooms

**STORIED AUDITORIUM**

- Capacity: 1,500 students
- VIP Lounge and Buffet Facilities

**STORIED ENGLISH LANGUAGE CTR.**

- Capacity: 5,700 Students
- 36 language labs
- 90 classrooms

**STORIED BUILDING FOR CHE DEPT.**

- Capacity: 4,500 Students
- 60 workshops and labs
- 36 classrooms
database which include around 20,000 books, in addition to multi-media, network and internet facilities.

- Twelve new additional student accommodation buildings (dorms) with additional accommodation for 4,192 students.

- An additional 100 faculty housing units built inside the campus.

The College facilities also include self-contained faculty housing units within easy reach of the main campus.

The College provides a wide range of benefits and services to foster students' well-being. These include:

Financial benefits to ensure that every student can afford a reasonable standard of living while pursuing his studies.

Student care and on-campus facilities to ensure that students can enjoy a physical, mental and social sense of well-being and a good quality of life.

Academic and career support to ensure that each student can cope efficiently with the academic demands and administrative requirements of the College, while developing clear career goals.

The Monthly Stipend

Each regular full-time student of the College is entitled to receive One Thousand Saudi Riyals (SR 1000) to help him with his day-to-day living expenses. The student shall be entitled to receive his stipend only if he registers the minimum work load of 12 credit hours. (Graduating students are exempted).

Books and Course Materials

The College supplies all text books produced in-house to the students at 25% of the actual cost. Uniforms and training materials are also provided.

Academic Awards

At the end of each regular semester, a financial award is paid to full time outstanding students, as follows:

- The first award for students who attain exceptional grades (i.e. who earn a cumulative GPA 4.00 on graduation) is One Thousand Saudi Riyals (SR 1000).

- The second award for students who attain excellent grades (i.e. who earn a cumulative GPA of 3.75 or more, but less than 4.00) is Seven Hundred Fifty Saudi Riyals (SR 750).
Safety and Security

The College provides safety, security and first aid equipment in all areas of student use and access.

Dormitory

The on-campus dormitory provides a comfortable and secure environment. Students may live with sufficient privacy while having the opportunity to develop good relations with their fellow students.

Food Services

Students are provided with wholesome nutritious meals, free of charge. Great care is taken by specialized staff to ensure that students benefit from a well-balanced and varied diet. There are spacious self-service cafeterias and, in addition, a number of small coffee shops, snack bars and restaurants within the campus.

Medical Care

The on-campus clinic provides medical treatment on weekdays from 07:00 to 15:00. Outside of these hours and during weekends, students may report to the Emergency Room of the Royal Commission Hospital, which is close by. Students may also be referred from the on-campus clinic to one of the local clinics or to the local hospital.

Social Counseling

Counselors help students to identify and cope with a range of personal problems and discuss suitable solutions with them.

Mail and Telephone Services

The Student Affairs Department provides mail and telephone services to College students to enable them to remain in easy contact with their families.

Internet and Intranet Services

The College provides both services within walking distance from the student dorms to enable students to do their homework and to use the world-wide web.
Student Clubs and Indoor/Outdoor Games Facilities

Students are encouraged to take part in club activities and indoor/outdoor games to refresh their minds and spend their leisure time in the campus:

- Orientation Year Club
- Science and Talented Students Club
- Cultural, Religious and Social Activity Club
- Theater and Artistic Activity Club
- Boy Scouts Club
- Sports Club

Recreational Facilities

A swimming pool, gymnasium, weight-training room, as well as a variety of ball courts and playing fields, encourage students to use their leisure time in a healthy and productive manner. Great emphasis is again placed on the development of individual abilities but always working within the context of a team.

The Commissary

While there are numerous large shopping centers nearby, the College has its own commissary and mini-commercial center to meet students’ needs.

Student Affairs Committee

This committee organizes and supervises students’ on-campus activities. Sub-committees have also been established to look after the welfare of all students:

- Social committee
- Religious and cultural committee
- Vocational competition committee
- Sports committee
- Boys Scouts committee
- Arts and drama committee

The aim of these committees is to ensure that all students are offered the opportunity to avail themselves of whatever guidance they feel they may need which may help them to develop their character by preparing them for their working lives.
A candidate for this degree must:

- Be a Saudi national or his mother Saudi national.
- Not exceed 23 years of age and satisfies the degree requirements in a period not exceeding 5 years.
- Possess the General Secondary School Certificate (scientific literary branch) with a minimum grade of “Good”.
- Possess the results of the General Capabilities Test (Qudurat) and the Achievement Test (Tahsili) for the scientific literary branch.
- Present stamped and approved Letter of “Identification” from his employer, indicating that he is still on duty, in order to be admitted as a part-time student at the College (if he is a government or private sector employee).
- Be declared medically fit.
- Meets any other requirements as decided by the College Council.

A candidate for this degree must:

- Be a Saudi national or his mother Saudi national.
- Be a graduate of Jubail Industrial College with a GPA of 2.45 out of 4.00 as minimum.
- Possess the Associate Degree in Science in specialization areas decided by the College Council.
- Have possessed the Associate Degree in a period not exceeding 5 years.
- Be declared medically fit.
- Present stamped and approved Letter of “Identification” from his employer, indicating that he is still on duty, in order to be admitted as a part-time student at the College (if he is a government or private sector employee).
- Successfully completed any qualifying or complementary courses decided by the College Council as requirements of admission to the Bachelor Program.
- Meets any other requirements as decided by the College Council.

- Each student has to register personally at the prescribed date and in accordance with the College regulations. Registration by proxy is not permitted. Registration will not be made without the student’s course registration card duly approved by the academic advisor.
- For regular semesters, the student should register within three days prior to the commencement of the semester.
- Early registration for any semester can be made during the 9th week of the preceding semester.
- For the Summer Session, students can register a day prior to commencement. Early registration can be made during the ninth week of the second semester.
- Registration priority will be given to students holding early registration. Others can register if places are still available.
Transfer of Students to the College

The College may admit students who wish to transfer from another college, provided that the following conditions are met:

- Be a Saudi national or his mother Saudi national.
- Possesses scientific general secondary school certificate.
- Should have a cumulative GPA of 2.00 out of 4.00 or 2.5 out of 5.00.
- The medium of study at the student’s previous institution should be English.
- Students should submit his transfer request four weeks before beginning of the study.
- Student should not suspend his study more than two main semesters at his previous university.
- Transfer students should not be discontinued or suspended for disciplinary or moral reasons and when it is find out this was the caused, his acceptance will be cancelled.
- The student should attend any exam requested by JIC.
- The student should present a letter of identification from his previous certificate.
- The student should present an original approved document from his previous institution showing the academic courses he studied and the grades obtained.
- Student whose major cum GPA is less than 2.00 and passed the preparatory year at his previous college, his transfer request will be studies and if his request is accepted, only is preparatory year will be equalized.
- The student should present the syllabus of the courses that he passed with a (C) grade as a minimum.
• The Chairmen of the departments concerned have the right to compute the relevant courses the student studied and passed with a (C) grade as a minimum provided that the specialty hours transferred for the student should not exceed 10 hours. General or Preparatory Year courses may be counted provided that the student obtained a (C) grade as a minimum in any of these courses.

• The transferred course grades and their credited hours shall not be computer as part of the cumulative GPA for a graduate of JIC.

Transfer of Students within the College

A student is allowed, when it is possible, to change his major within the College once only and after one semester. A change of major is not allowed for students studying for Bachelor degree.

• A student must complete a Change of Major form during the period specified in the academic calendar.

• The Chairmen of the departments concerned will specify the courses that a student passed which are relevant to the new major and write to the Registration Department to count these courses for the student if the transfer is approved.

• Courses studied by the student and not accepted by the new department will be registered in the student’s record and added to the hours earned but not counted in a student’s cumulative GPA.

Part-time Students

Students who have employment or other commitments may take their courses on a part-time basis. Further details about this scheme are available from the Registrar's Office.
Each student is assigned a faculty member as an academic advisor when he starts studying in the Preparatory Year or in the specialization department.

A student may seek assistance in the following areas:

- Selecting programs.
- Interpreting academic rules and regulations.
- Assistance in confirming the pre-registration proposed by the Students Information System (SIS) during the specified periods.
- Assistance in the final registration of courses in the SIS and according to the plan of study.
- Assistance in solving problems related to the student’s academic life.
- Information on graduation requirements, department and College regulations pertaining to academic matters.
- Supervision and integration of the student’s course of study.

The Guidance and Counseling Center is responsible for providing advice and observing the students’ behavioral and social problems and for contributing to the resolution and orientation programs aimed at spreading awareness among students and developing their skills and enhancing their positive aspects.

It performs the following services:

- Prepare lists of students receiving and academic warning and call for help in solving the problems that led to their poor academic performance.
- Implement new programs for students at the beginning of each semester.
- Prepare lists of students receiving first and second honors and call to encourage them and to award them prizes.
- Conduct individual interviews with students wanting advice or seeking assistance in solving a problem.
- Arrange meetings with students in the College Auditorium to offer advice and listen to their suggestions and problems.
- Establish lectures and publish articles and brochures to develop the students’ skills and level of sophistication in thinking, and to overcome their weaknesses.
- Visit the student accommodation, according to the schedule prepared by the Center in cooperation with the student housing unit.
• Communicate with the guidance and counseling centers at other universities to benefit from their experiences and share our experience with them.
• Hold periodic meetings of staff of the Center and the rest of the members of the Advisory Board and the candidates for the Student Council of the Center to evaluate the achievements and discuss new developments.
• When a student graduates, issue him with an official record listing all extra-curricula activities in which he participated.
• Visit secondary schools in various regions of the Kingdom to provide them with information about the college and its departments.

The Library and Learning Resources Centre (LLRC) is the prime source of information for the faculty, staff and students. The aim of the Library is to provide materials and latest information in all the discipline related to JIC courses and to ensure that all the students and users of the library have an opportunity to use the library resources.

The electronic databases and internet access are very useful for the faculty and students. The network of the College allows the access of these electronic resources beyond the four physical walls of the library.

The Library is organizing Library Orientation program from time to time to create awareness of the resources available and the methods of their usage. This has shown increase in the usage of library and its resources.

Recently, the Library is equipped with around 170 latest computers to provide fast and better services and internet access.

Jubail Industrial College has started bachelor courses in addition to diploma courses. Many short courses are also organized for industries. The library acts as a central point and provides the necessary information and learning resources to support these courses. The library database has around eighty six (86,000) ebooks and includes information on all the subjects taught by the College.
The Library offers a range of services and facilities, as follows:

- **USER GUIDANCE SERVICE (Symphony Library Software)**

  The Symphony library software has been used to computerize its services. It is a very useful and user-friendly software and supports both English and Arabic languages. The software consists of different applications called **modules**. Each module performs one set of library tasks. It helps to search the library materials. The library staff helps the user in using the library services. The user guidance and help services are organized from time to time.

- **EBRARY DATABASE SERVICE**

  It is highly interactive eBook database from ebrary designed for academic institutions. It has multi-disciplinary content. The access of this database is available within JIC campus.

  The collection currently includes around 70,000 titles from more than 220 leading and professional publishers. The database includes the titles in the following main subject areas.

- **CATALOGING SERVICE**

  The online catalogue services are provided on the JIC network. From any computer within the College, the catalogue can be searched. It has both English and Arabic catalogues. It includes catalogue for both print and non-print materials and also the catalogue of 187 eBooks from Netlibrary.

- **CIRCULATION SERVICE**

  The library operates with flexible circulation policies in order to increase the usage of library materials. Staff of the college and students with valid JIC ID card are eligible to borrow the library materials. CDs, multimedia and magazines are issued only to the staff. The facility is also provided to the outside users.
and users of other Royal Commission in Jubail Colleges and Institutes, if they become the member of the library.

**Lending limitations and durations:**

The following are the maximum number of books issued to the library members.

<table>
<thead>
<tr>
<th>Type of Borrower</th>
<th>No. of Books</th>
<th>Duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Student</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Staff/Employee</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>15</td>
</tr>
</tbody>
</table>

**REFERENCE AND REFERRAL SERVICE**

On JIC Intranet and on the college website, the library has provided links to many useful encyclopaedias, dictionaries, almanacs and atlases. The user can search these web sites from the library link. In addition to this, many reference materials are also available in the library.

**WEB-BASED AND ELECTRONIC INFORMATION SERVICE**

Internet search facility is also available in the new library for all users to search the required information in their respective educational and academic fields. The new library has 170 computers with internet facility.
• MULTIMEDIA SERVICE

There are about 470 multimedia lessons available in the digital library. They are related to mechanical engineering, safety, chemical engineering, electrical engineering and computer subjects. Each one is one hour lesson with sound, picture and text. The subject is clearly explained in these lessons. Users can utilize these lessons in the library with the help of library staff. They can use some lessons directly from the library website.

• COLLECTION DEVELOPMENT SERVICE

Collection development is an important part of the library. The library materials are requested by the JIC departments. It is evaluated and checked for availability in the library. Only relevant and useful materials are acquired by the library. During the year 2009/2010 the library has acquired many good books, CDs and multimedia lessons.

• STUDY ROOM FACILITY

There are 8 study rooms. The students can reserve and use the study rooms. They can study alone or group study facilities also available in some rooms. This is a very useful facility for the students particularly during exams.

• JOURNALS AND MAGAZINE SERVICE

The library is subscribing around 72 journals. These journals are organized and are available in the library. Some journals are also available in electronic format. Two English newspapers and ten Arabic newspapers are available in the library. The current paper is made available and the back issues for one month are also available in the library.

• ONLINE PRINTING & PHOTOCOPYING SERVICES

Photocopying self-service facility is available in the library. The photocopying machine is connected to the JIC network. Students are provided with password to utilize the printing and photocopying services.

The photocopying and printing is controlled by equitrac software. The software is controlling the accounting of photocopying and printing charges incurred by the users.
ESDI SERVICE

Electronic Selective Dissemination of Information (ESDI) service is highly personalized service that alerts users about the new publications in their specified field(s) of interest by email. Through this service the Library aims to save the precious time of users in searching relevant information needed for academic and research purposes.

<table>
<thead>
<tr>
<th>DAYS</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUNDAY to WEDNESDAY</td>
<td>7:00 AM - 10:00 PM</td>
</tr>
<tr>
<td>THURSDAY</td>
<td>7:00 AM - 8:00 PM</td>
</tr>
<tr>
<td>FRIDAY</td>
<td>CLOSED</td>
</tr>
<tr>
<td>SATURDAY</td>
<td>3.30 PM - 9.30 PM</td>
</tr>
</tbody>
</table>

Till October 2014, the library has 13,795 books, around 86,187 ebooks, subscribed 72 journals, 12 newspapers, around 470 multimedia and CDs, 170 computers for users, 8 study rooms, one multimedia room, one class room and one internet lab. Around 128,040 users visited the library to utilize different library services and resources till October 2014.
The Information Technology Center (ITC) is responsible for developing the information systems and information gateway for the College. The mission of the ITC is as follows:

*To create a unique IT environment that adds value, create image and increase the competitive advantages of JIC. Most importantly, JIC must be known as one of the best institutions in the country for adopting IT solutions and techniques in both academic and administrative areas.*

ITC plays a pivotal role in supporting JIC to achieve its business strategic plan from international point of view. As a result, all JIC buildings are connected with latest network technology including the wireless system. E-services including on-line admission already in place and the plan to transform the College into e-College is underway now.

JIC IT infrastructure is rapidly growing since the establishment of MISC at JIC in 1999. Currently thirteen main JIC buildings are embedded with state of the art IT technologies for hardware, software, and network within the JIC campus. Server hardware technologies ranging from Compaq, HP, to Dell is deployed to serve user authentication, database, Internet, Intranet, email and various ranges of software application services. World pronounced network technologies ranging from ATM, Gigabit, fiber optic to wireless is vitally used throughout the campus. MS Windows operating system is a supporting platform for overall JIC IT infrastructure, which supports all application software technologies.

JIC critical server software, which includes and not limited to Microsoft Windows 2003 Enterprise Edition, Microsoft Exchange Server 2003 Enterprise Edition, Oracle Database Standard Edition, and Symantec Antivirus Cooperate Enterprise Edition. Several software products belonging to various manufacturers such as oracle, Dynix (Library Automation System – Horizon Ver 7.3.1), Episuite (ID card Episuite Software Ver-5.0), NCS (OPSCAN Ver 8.0 NCS 1 user Admission Test Paper Scanning System), Quest (TOAD Ver 7.6), Dameware (Remote Control Software DameWare Ver 4.8). JIC MISC has in-house development unit (SDU) dedicated to design, develop, and maintain wide range of software application products based on client/server as well as web-based architecture. Currently JIC MISC deploys, maintains and uses 15 in-house/customized developed applications in addition to JIC Intranet and Internet web sites.

- **Physical Connectivity**

Thirteen (13) main JIC buildings are networked using three (3) ATM Marconi and two (2) Cisco backbone switches, three (3) Cisco distribution switches, twenty five (25) Marconi and twenty four (24) Cisco edge switches, and twenty (20) D-Link switches. 3800 network nodes are distributed among the JIC networked buildings. All Academic computer labs are networked in separate domains and workgroups. Indoor and outdoor fiber optic LAN is used to connect...
between the backbone, distribution and edge switches. Each node is connected with CAT-5/CAT-6 cable to the network faceplates following AT&T standards.

All JIC new buildings are networked using ATM ASX-1000 Marconi and Cisco 6509 backbone switches through Fiber optic Gigabit Connection at both ends. Existing JIC buildings are networked using ATM ASX-1000 backbone switches with dual connections 622/155 Mbps. New dormitory buildings are networked using wireless Technology.

The Department has two units (1) The Systems Development Unit and (2) The System Operation Unit.

System Development Unit has the responsibility to maintain an effective MIS which will provide the right and timely information to all the departments of JIC. Activities include system study, planning, analysis, design, implement and maintain the end-user requirements. The other activities include providing software support for both bought-in packages and in-house developed applications.

The ITC provides effective information services to students, faculty and management. It also links the College to stakeholders and the external community, locally, nationally and abroad. The information systems networks, which are now being developed, are as follows:

1. Student Information System
2. Personnel Information System
3. Special Program Information System
4. Industrial Relations Information System
5. Stipend Information System
6. Housing Information System
7. Security Information System
8. Inventory Information System
9. Dormitory Information System
10. Media and Bookstore Information System
11. Improvement Program Information System
12. Purchasing Information System

The main objective of this unit is to provide Technical Support to JIC end-users regarding preventive maintenance of software, hardware and network related activities. Providing technical support, end-user's training related to unit's issues. It also ensures effective implementation, accessibility, availability, and security of the JIC computer network systems supporting Intranet, Internet and E-mail systems.

ITC also provides e-services to all faculty and students such as:

- Internet
- Intranet
- E-mails
To empower the College with quality control tools and quality assurance measures in its bid to become the preferred seat of technical education and training in the country.

The primary role of the C&QA department is to reinforce and enhance quality culture in the College on all matters which concern the formal instruction of the college including curriculum, functions that impact the quality of students’ learning outcome and services that support the process of teaching and learning.

The department constitutes of four units namely curriculum, academic accreditation, faculty development, and statistics and information.

**Role of the Unit**

To Provide 3rd-party advisory and consulting services to the academic departments and the College Management for the development, revision, implementation and evaluation of all award-bearing programs of the College.

**Objectives of the Unit**

To oversee the implementation across the College of the organization’s strategy for quality assurance on education programs vis-à-vis curriculum and teaching, including procedures to ensure that:

1. all award bearing programs of study are subject to periodic monitoring and review in accordance with the requirements of the organization;
2. arrangements for external examiners are securely in place, and appropriate action is promptly taken where necessary to address issues raised in external examiner’s reports;
3. a proactive role in promoting quality culture in curriculum design and implementation is pursued.
Role of the Unit

Provide national and international recognition to the college programs by engaging accreditation bodies of repute.

Objectives of the Unit

Its main objectives are to:

1. Draw strategies for Academic Accreditation.
2. Prepare the College programs for national and international accreditation.
3. Promote the culture of accreditation in the College community.
4. Provide the college with the necessary infrastructure and tools that support accreditation activities.
5. Establish expertise in the local and international accreditation.

Role of the Unit

1. Provide JIC staff with a comprehensive range of academic developmental activities and services.
2. Create an environment that facilitates and promotes effective teaching and learning, professional development, applied research, college/community services.
3. Promote faculty development to enable faculty members to reach their highest potential in teaching or applied research activities.
4. Assist faculty members to attain their highest potential in teaching.
5. Enhance a sense of collegiality among faculty as they expand their intellectual, teaching, and scholarly horizons.
6. Contribute in achieving quality performance in the College.

Objectives of the Unit

Its main objectives are to:

1. Develop and implement policies as well as strategies in order to develop the skills of the teaching staff in the College.
2. Provide instructional assistance to faculty on campus.
3. Provide faculty with resources and experiences that enhance teaching and learning.
4. Supports JIC faculty towards the attainment of its professional development objectives.
5. The center contributes in the academic development through its efforts in the faculty members’ performance appraisal survey, conducting training programs, lectures and seminars.
6. Enhance the teaching effectiveness of faculty at JIC.

Faculty Development Activities

1. Workshops on Teaching and Learning Methods
2. Workshops on Curriculum Development and Procedures
3. Training programs on Equipment and Software
4. Seminars on specialized topics
5. Lectures from industrial experts
6. Participating in technical meetings and conferences
### ACCREDITED PROGRAMS

The following Associate and Bachelor degree programs are accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org.

1. Electrical Engineering Technology (BS)
2. Instrumentation and Control Engineering Technology (BS)
3. Chemical Engineering Technology (BS)
4. Mechanical Engineering Technology (BS)
5. Electrical Power Engineering Technology (AS)
6. Instrumentation and Control Engineering Technology (AS)
7. Polymer Engineering Technology (AS)
8. Chemical Engineering Technology (AS)
9. Manufacturing Engineering Technology (AS)
10. Mechanical Maintenance Engineering Technology (AS)

### ACCREDITATION BODY

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>ABET Engineering Technology Accreditation Commission</td>
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<tr>
<th>ACCREDITATION BODY</th>
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</thead>
<tbody>
<tr>
<td>ACBSP Accredited</td>
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</tbody>
</table>

Industrial Chemistry Technology (AS)

<table>
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<tbody>
<tr>
<td>CCTT</td>
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<table>
<thead>
<tr>
<th>ACCREDITATION BODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACBSP Accredited</td>
</tr>
</tbody>
</table>

1. Office Management (AS)
2. Marketing (AS)
3. Accounting (AS)
4. Computer and Information Technology (AS)
Role of the Unit

Support the various decisions of the management, academic departments and other agencies of the college via creation of an information base, and preparing diagnostic statistics and reports.

Objectives of the Unit

Its main objectives are to:

1. Develop and operate a statistical system which provides a comprehensive range of statistical products and services to meet the information needs of the College management.
2. Develop appropriate methods for the collection, processing and dissemination of statistics on students, alumni, faculty, award bearing programs, industrial training services, and the job market, which are timely and relevant.

Statistics and Information Unit Activities

1. Developing electronic assessment and reporting systems
2. Providing External and Internal Statistical Reports
3. Providing survey tools and analysis
4. Maintaining JIC website
5. Providing decision making statistical studies
The mission of the center is to accomplish excellence by enabling students to attain their full potential in their command of the English language, thus enabling them to pursue their studies in the technical and business specializations of the College, and subsequently play an integral role in the workplace.

In order to accomplish this mission, the department has established a learning environment where basic and specialization English courses are offered using state-of-the-art teaching facilities. This is to strengthen the students’ background to support them throughout their study at JIC where English is the medium of instruction.

The English Language Center has set the following objectives:

1. To bridge the gap between students’ secondary school English education and JIC specialization programs during the preparatory year
2. To raise the level of students’ writing to meet the standards of the specialization departments
3. To enable students to communicate effectively in a business or technical context
4. To advance students’ productive English skills to the level of the modern Saudi workplace
5. To strengthen students’ command of English to meet the demands of post AS studies

The Center’s facilities include:

- Over 60 classrooms and 20 Computer-Assisted Language Learning (CALL) Labs
- 3 Exam Halls
- Meeting Room
- Conference Room
- 50 Staff Offices, plus 2 Director Suites and a Resources Room
- Teachers’ Lounge
- Refreshment Areas for Staff and Students
A major portion of the teaching time in the two 15-week semesters in the Preparatory Year is assigned to English Language courses. These intensive courses, to which all new students are initially admitted, are designed to equip them with a solid foundation in English and are common to both engineering technology and business students. The PYP courses are listed below:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Weekly Contact</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>ELC 001</td>
<td>English I</td>
<td>LT 10, LB/LT 12</td>
<td>13</td>
</tr>
<tr>
<td>Second</td>
<td>ELC 002/003</td>
<td>English II</td>
<td>LT 10, LB/LT 12</td>
<td>13</td>
</tr>
</tbody>
</table>

As part of their degree requirements, all students are required to take a certain number of courses in the ELC which are designed to enable them to cope better with the demands of their specialization areas. These courses develop their language skills to a higher level to handle technical and communicational proficiencies they need in their majors. The SEP courses are given below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Weekly Contact</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELC 103</td>
<td>English III</td>
<td>LEC 2, LB/LT 3</td>
<td>3</td>
</tr>
<tr>
<td>ELC 104</td>
<td>English IV</td>
<td>LEC 2, LB/LT 3</td>
<td>3</td>
</tr>
<tr>
<td>ELC 205</td>
<td>Technical Writing</td>
<td>LEC 2, LB/LT 3</td>
<td>3</td>
</tr>
<tr>
<td>ELC 407</td>
<td>Advanced English</td>
<td>LEC 1, LB/LT 3</td>
<td>2</td>
</tr>
</tbody>
</table>
Course Objectives of English I and English II

Both English 1 and English 2 courses in the Preparatory Year Program are designed to provide a sound basis in the fundamentals of the English language, and to enable students to understand and respond appropriately in a range of academic and work-related situations. The course aims to bridge the gap between the students’ previous English language educational experience and the requirements of the specialized programs to be undertaken in JIC in the following semesters. Further aims of the course are to instill in students effective study skills and a disciplined approach to work whilst at the same time giving them confidence to express themselves effectively in both written and spoken English.

Special emphasis in this course is placed on:

- Introducing a wide range of specialized work and study-related vocabulary.
- Improving oral and written communication skills.
- Building confidence in everyday and situation-specific interactive situations.
- Emphasizing the need for correctness through consolidation and repetition of forms and structures.

Course Objectives of English III

- To consolidate and extend the students’ writing skills, in order to write clear and accurate English.
- To encourage students to think independently, observe and interpret data, express and justify opinions.
- To widen students’ vocabulary.
- To expand and practice students’ use of grammar and syntax in order to enable them to express themselves with precision.

Course Objectives of English IV

- To give students confidence in expressing themselves through the oral use of English in a variety of functional situations, both formal and informal.
- To listen to and reproduce intonational patterns and language rhythms.
- To use correct language register in conversation and meetings.
- To consolidate and expand their use of syntactical structures in order to express themselves clearly with precision and concision.
- To widen their passive and active vocabulary (both formal and idiomatic).
- To organize material for presentation.

Course Objectives of Technical Writing

- For students to gain the practical skills needed to function effectively in the real world of further education and employment.
- To write and format a report to ensure that it is clear and easy to follow.
- To use and interpret graphic aids to supplement text.
- To write and reply to formal letters, using appropriate language and layout.
- To compose and format an effective personal resume (CV) and cover letter.
- To understand and fill in forms correctly.
Course Objectives of Advanced English

- To improve their written work so that they may write English without error and convey information with the utmost clarity.
- To give them the necessary skills to sit for an internationally recognized examination (Cambridge First Certificate).
- To increase their vocabulary.
- To improve the students’ command of spoken English and develop their ability to express themselves clearly.
- To improve their listening skills so that they will be able to understand whatever topics may arise in their degree courses.
ELC 001 English I [10-12-13]

Pre-requisite: None

ELC001 is a 13-credit-hour course designed for first-semester Preparatory-Year Program (PYP) students. At the successful conclusion of this course, students will have attained sufficient English skills to fulfill the criteria for the Common European Framework of Reference for languages (CEFR) Level A2.

Using an integrated approach, students are exposed to all four language skills: reading, writing, listening and speaking, as well as correct form during the grammar activity. Students spend 15 hours each week in the Skills class, using Language Leader, five hour weekly in the Writing class, and two hours in the CALL lab.

ELC 002 English II (Technical) [10-12-13]

Pre-requisite: ELC 001

ELC002 is a 13-credit-hour course designed for second-semester Preparatory-Year Program (PYP) students who will be studying technical stream courses at JIC. At the successful conclusion of this course students will have attained sufficient English skills to fulfill the criteria for the Common European Framework of Reference for languages (CEFR) Level B1.

Using an integrated approach, students are exposed to all four language skills: reading, writing, listening and speaking, with a tendency towards technical as well as general topics. Students receive 10 hours per week of general English (Skills), 5 hours of technical English (Tech), 5 hours of Writing and 2 hours of CALL.

ELC 003 English II (Business) [10-12-13]

Pre-requisite: ELC 001

ELC003 is a 13-credit-hour course designed for second-semester Preparatory-Year Program (PYP) students who will be studying business stream courses at JIC. At the successful conclusion of this course students will have attained sufficient English skills to fulfill the criteria for the Common European Framework of Reference for languages (CEFR) Level B1.

Using an integrated approach, students are exposed to all four language skills: reading, writing, listening and speaking, with a tendency towards business as well as general topics. Students receive 10 hours per week of general English (Skills), 5 hours of business
ELC 103 English III (Composition) [2-3-3]
*Pre-requisite: ELC 002/ELC 003*

The course consolidates and extends writing skills through the performance of a variety of functional tasks. It ranges from guided to free writing, and there is extensive practice in a variety of areas. It encourages students to think for themselves, to observe and interpret, to express their opinions, to justify their ideas and to increase their vocabulary and use of structures. It also gives them the opportunity to practice different verb tenses, moods and voices. They are expected to write independently about a wide range of topics. They are also encouraged to participate in class discussion and to ask freely on any aspect of the language with which they require help. The overall aim of the course is to help students say with confidence whatever they need to convey in a precise and concise manner, by developing clarity of expression achieved through accuracy of structure and syntax and a widening of vocabulary, and through correct pronunciation and the appropriate use of intonation, sentence rhythm and register.

ELC 205 English V (Technical Writing) [2-3-3]
*Pre-requisite: ELC 104*

This course enables students to produce organized reports, formal letters, CVs that conform to technical format/style, audience, suitable mechanics, vocabulary, grammar and the use of graphics where appropriate. They will also learn the language and conventions of forms used in the industrial and business environment.

ELC 407 Advanced English [1-3-2]
*Pre-requisite: ELC 205*

This course in Advanced English is for students studying for the Bachelor’s degree at JIC and aims to hone some of the skills learnt in previous English courses. It focuses particularly on the listening, speaking and writing components of the language. The listening and speaking provide motivating communicative practice, where students are encouraged and expected to be actively involved in the learning process. The writing develops skills by involving students in the stages of planning, writing and improving their work, stimulating their motivation through the use of interesting tasks. The course also provides effective exam training.
The mission of the department is to provide students with knowledge and skills in Mathematics and applied physical sciences that will enable them to cope with the challenges in their specialization courses.

The Department of General Studies is one of the first educational departments to be in contact with the newly enrolled students in the College. To fulfill its mission, the Department has set a supportive learning environment where a wide variety of courses are offered using state-of-the-art teaching facilities to strengthen the students’ background to support them throughout their study at JIC.

The Department of General Studies has set the following objectives:

- To bridge the gap between students’ secondary school education and JIC specialization programs during the preparatory year.
- To offer specialization courses in Mathematics, Physics, Chemistry and Islamic Culture for Management and Information Technology and Engineering Technology Departments.
- To provide courses tailored to the needs of the local industry and community.

The Preparatory Year operates on two fifteen-week semesters throughout the academic year. Courses are designed to:

- Provide a major portion of the teaching in English Language courses, offered by the English Language Center.
- Provide groundwork for the specialization program by offering courses in a designated range of academic subjects.
- Develop the students’ physical fitness through a diverse program of Physical Activity.

The department is well equipped to perform its various functions through the following:

- Excellent computer facilities, photocopying and support services that provide the necessary tools for the faculty members to perform their duties smoothly and efficiently.
- The Physics and Chemistry laboratories meet all the demands for their subject area in terms of apparatus, materials, and instrumentation including computerized experiments.
- The Physical Activity section makes full use of the wide range of pitches and courts, games rooms and sports halls, multi-gym work stations and a swimming pool.
# PREPARATORY YEAR REQUIREMENTS: ENGINEERING STREAM

## PREP YEAR LEVEL I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lec</th>
<th>Lab</th>
<th>Credit</th>
<th>Pre-req</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ELC 001</td>
<td>English I</td>
<td>10</td>
<td>12</td>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td>GES 002</td>
<td>Physical Activity</td>
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</tr>
<tr>
<td>GES 006</td>
<td>Study Skills</td>
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<td>0</td>
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<tr>
<td>*MIT 012</td>
<td>Introduction to Computer</td>
<td>0</td>
<td>1</td>
<td>1</td>
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<td>11</td>
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*Courses offered by concerned department.*

## PREP YEAR LEVEL II

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lec</th>
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<th>Credit</th>
<th>Pre-req</th>
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<tbody>
<tr>
<td>*ELC 002</td>
<td>English II</td>
<td>10</td>
<td>12</td>
<td>13</td>
<td>ELC 001</td>
</tr>
<tr>
<td>GES 011</td>
<td>College Algebra and Trigonometry</td>
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<td>4</td>
<td>-</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>13</td>
<td>15</td>
<td>17</td>
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</tbody>
</table>

*Courses offered by concerned department.*
### PREPARATORY YEAR REQUIREMENTS: BUSINESS STREAM

#### PREP YEAR LEVEL I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lec</th>
<th>Lab</th>
<th>Credit</th>
<th>Pre-req</th>
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</thead>
<tbody>
<tr>
<td>*ELC 001</td>
<td>English I</td>
<td>10</td>
<td>12</td>
<td>13</td>
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</tr>
<tr>
<td>GES 002</td>
<td>Physical Activity</td>
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<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>GES 006</td>
<td>Study Skills</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>*MIT 012</td>
<td>Introduction to Computer</td>
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**TOTAL** 11 15 16

#### PREP YEAR LEVEL II

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<th>Course Code</th>
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<th>Lab</th>
<th>Credit</th>
<th>Pre-req</th>
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<tbody>
<tr>
<td>*ELC 003</td>
<td>English II</td>
<td>10</td>
<td>12</td>
<td>13</td>
<td>ELC 001</td>
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<tr>
<td>GES 012</td>
<td>Math for Business</td>
<td>3</td>
<td>2</td>
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</table>

**TOTAL** 13 14 17

*Courses offered by concerned department.*
As part of AS (Associate of Science) and BS (Bachelor of Science) degree requirements, the student is required to take a certain number of courses in the Department of General Studies, which are designed to enable him to fully understand the demands of his specialization field.

Courses provided by the Department of General Studies in the specialization years for both AS and BS programs are listed below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lec</th>
<th>Lab</th>
<th>Credit</th>
<th>Pre-req</th>
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GES 002 Physical Activity [0-2-1]

Pre-requisite: None

This is a practical course designed to provide general physical activities for the students and aims to keep them fit and strong whilst increasing their knowledge of sport and its relation to good health. The course also aims to help the students to utilize their spare time effectively and prepare them to cope physically and mentally with their environmental study. The topics include: Football, Volleyball, Basketball, Swimming and Table Tennis.

ges 006 Study Skills [1-0-1]

Pre-requisite: None

This is a theoretical course, the curriculum designed to make the student knows the rules and regulations of Student Affairs at Jubail Industrial College, and teach the students methods of learning skills and how to navigate them successfully. This course is dealing with different aspects of university/college social life, such as setting goals, determining the objectives through organization. It is also motivate students to study and time management, participation in the classroom and taking notes. And also deals with methods of reading textbooks and studying successful skills and how to excel in tests.

GES 011 College Algebra and Trigonometry [3-3-4]

Pre-requisite: None

This is a theoretical course designed to provide knowledge and educational experience to students in basic and fundamental mathematical concepts required for technical courses. The topics include: Factoring of polynomials, Equations and Inequalities in one variable, Two dimensional co-ordinate system and graphs, Introduction to Functions, Linear and Quadratic functions, Synthetic division, Remainder Theorem and the Factor Theorem, Zeros of polynomial functions, Inverse Functions, Exponential and Logarithmic functions with their graphs and their properties, Trigonometric functions, Trigonometric Identities, Inverse Trigonometric functions, Parabolas and Ellipses, System of linear equations in two variables.
GES 012 Math for Business [3-2-4]

*Pre-requisite: None*

This is a theoretical course designed to provide basic mathematical knowledge and educational experience to students in order to solve mathematical problems involved in business courses. The topics include: Basic operations with real numbers, Linear equations and inequalities in one variable and two variables, System of linear equations in two variables and solving it using elimination, substitution and graphical methods, System of linear inequalities in two variables and solving it using the graphical method, Properties of exponents, Operations of Matrices, Sequence and series, Percents, Decimal and their applications, Simple interest, Annuities and Mortgage.

GES 112 Statistics [2-2-3]

*Pre-requisite: GES 011 College Algebra and Trigonometry or GES 012 Math for Business*

This is a Theoretical course. The aim of this course is to develop the students understanding of statistical concepts and ability to apply them in their respective streams.

The topics include: Sampling classification and statistical analysis of data. Describing and presenting a non-tabulated (tabulated) set of data through frequency, relative frequency, cumulative frequency distributions and their graphical presentations; measures of central tendency; measures of dispersion; analysis of ordered pairs data through linear correlation and linear regression; probability; normal distribution, binomial distribution, T- distribution and index numbers.

GES 113 Calculus I [3-3-4]

*Pre-requisite: None*

This is a theoretical course designed to provide knowledge and educational experience to students in order to solve mathematical problems involved in technical specialty courses. The topics include: Limits and continuity, Differentiation, applications of differentiation, Indeterminate form, L’ Hopital rule, Indefinite and Definite integrals with their applications, Numerical integration, Ordinary differential equations of first order and first degree. Modeling with the first order differential equations.

GES 132 Fundamentals of Physics [3-4-4]

*Pre-requisite: None*

This is a theoretical and practical course designed to enable students to acquire sufficient knowledge and skills in Physics relevant to their specializations. The course provides Physics concepts and applications in motion and forces, work and energy theorem,
electrostatic forces, fields, potentials and energy, magnetism, magnetic forces and fields, DC and AC electric circuit components and characteristics, light nature, reflection and refraction of light.

Techniques, skills and modern computerized apparatus necessary to make laboratory measurements possible are adopted. Experiments in mechanics, thermodynamic, electricity and magnetism are made to support the theory and to meet the needs of engineering technology programs as well as to familiarize students with team work.

**GES 151 General Chemistry [2-4-3]**
**Pre-requisite: None**
This course is a theoretical and practical course. It is designed to provide an introductory knowledge for students who have not had a science course taught in English. The course enables students to learn the states of matter and units of measurements, uncertainty of measurements, atoms, molecules and ions, modern view of the atomic structure, the electronic structure of atoms and related hypothesis, periodic table, stoichiometry (calculations with chemical formulas and equations, types of chemical reaction), solutions (definition, properties and concentrations), solubility and precipitation reactions, red-ox reaction and its implication, chemistry of non-metals, basic concepts of chemical bonding, saturated and unsaturated hydrocarbons and organic compounds of different functional groups.

The practical components of the course include teaching students awareness of safety regulations, laboratory techniques, and laboratory experiments to develop the students’ ability in experimentation, observation, measurements and documentation.

**GES 271 Islamic Culture [1-0-1]**
**Pre-requisite: None**
This is a theoretical course designed to provide knowledge and education on the concepts of language and terminology of the world culture and the ability to differentiate between similar terms used in science and civilization. The course also enriches the students believes that Islam is a general and comprehensive for all human being anywhere and at any time. The topics include: General culture, civilization and science; Islamic culture and civilizations; Faith in Islam, concepts, degrees, importance, sources and characteristics; The family in Islam; Sanctions in Islam; Economic in Islam; The political system in Islam.

**GES 313 Calculus II [3-3-4]**
**Pre-requisite: GES 113 Calculus I**
This is a theoretical course designed to provide knowledge and educational experience to students and enables them to acquire sufficient understanding and knowledge in mathematics required in bachelor degree program. The topics include: Functions of two variables, Limits and Continuity, Partial differentiation, Differentiability and Chain Rule, Extrema of Functions of two variables, Beta and Gamma

**GES 314 Engineering Mathematics [3-3-4]**  
*Pre-requisite: GES 313 Calculus II*

This is a theoretical course designed to provide knowledge and educational experience to students and enables them to acquire sufficient understanding and knowledge in Engineering Mathematics required in bachelor degree program. The topics include: Vectors and their properties, Vector functions, differentiation & integration of vector functions, line integral, surface integral, Green’s and Gauss’s theorems, Linear Algebra; Rank of a matrix, Inverse of a matrix, Eigen values & Eigen vectors. LU factorization. Numerical Methods; Finite Difference operators, Difference equations, Newton Raphson iteration Methods, Interpolation and extrapolation, Least square method, Numerical solution of Ordinary Differential equations of first and second order by Runge-Kutta Method. Linear programming, Simplex method.

**GES 332 College Physics [3-3-4]**  
*Pre-requisite: GES 132 Fundamentals of Physics*


**GES 371 Ethics in Islam [1-0-1]**  
*Pre-requisite: GES 271 Islamic Culture*

This is a theoretical course designed to provide knowledge and education on the concepts of ethics in Islam and to provide an overviews of philosophical
schools of thought and its inability to provide ethical approach of the true happiness of human being.

The course shows that Islamic morals correspond to the observance of people and highlighting its characteristics and how it is relating by revelation heavenly. It is also enabling the student to know types of ethics and its stages of formation, the means to build morals, and then shows the impact and role-criminal legislation to protect morality and that it is not opposed to individual freedoms. The course is then ending by display and study of the most important images of ethics: merciful and modesty, chastity and honesty, integrity and justice, patient and persistence.

GES 472 Arabic Language [2-0-2]
Pre-requisite: None

This is a theoretical course designed to provide knowledge and education on the concepts of Arabic language. The course enables students to learn Arabic language and speech, sentence structure and divisions, and expressed knowledge of localized and the edified and both signs and therefore the ability to differentiate between oral and written. Then addresses the curriculum punctuation marks in terms of their importance, and how to apply them in the field of writing, as well as the types of HAMZA, how to plot in the first, central, and the end of words, as well as the difference between the lam solar, lam Lunar, also the difference between the TA’A open, and TA’A. The course sealed by definition on how to pronounce, and write the number, and numbered correctly.
The mission of the department is to prepare graduates equipped with job-oriented knowledge, skills, and problem-solving abilities to work as mechanical engineering technicians and technologists.

The department has established a set of objectives to fulfill its mission. These objectives are achieved through a set of well-defined tasks which focus on creating a conducive and stimulating educational environment. This includes developing and implementing innovative and responsive curriculum, teaching and learning strategies, outcome-based assessment, and continuous improvement process using up-to-date and well equipped laboratories and teaching facilities. In addition to curricular activities, students are continuously encouraged to actively participate in Engineering Project Competitions, Career Day Exhibitions, Science Clubs, ASME JIC-Student’s Section and other extra-curricular activities.

The department maintains close links with the industries, values their experience and incorporates their feedbacks into its curriculum. The department also provides courses tailored to the needs of the local industry and community.

The M&MET department offers Associate of Science and Bachelor degrees in the following areas:

- **Associate of Science in Mechanical Maintenance Engineering Technology (MMET);**
- **Associate of Science in Manufacturing Engineering Technology (MAET);** and
- **Bachelor of Science in Mechanical Engineering Technology (MEET).**

**The MMET Program Educational Objectives (PEOs)**

Graduates of the Mechanical Maintenance Engineering Technology Program will:

1. pursue a successful career in the field of mechanical maintenance engineering technology;
2. work effectively as individuals or in professional teams to solve technical problems;
3. demonstrate effective communication skills;
4. enhance their professional skills by means of continuous education and development; and
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.
The MMET Student Outcomes (SOs)

By the time of graduation, the students will demonstrate:

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

c. an ability to conduct standard tests and measurements, and to conduct, analyze and interpret experiments;

d. an ability to function effectively as a member of a technical team;

e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;

f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

i. a commitment to quality, timeliness, and continuous improvement.

The MAET Program Educational Objectives (PEOs)

Graduates of the Manufacturing Engineering Technology Program will:

1. pursue a successful career in the field of manufacturing engineering technology;

2. work effectively as individuals or in professional teams to solve technical problems;

3. demonstrate effective communication skills;

4. enhance their professional skills by means of continuous education and development; and

5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The MAET Student Outcomes (SOs)

By the time of graduation, the students will demonstrate:

a. an ability to apply the acquired knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;
c. an ability to conduct standard tests and measurements, and to conduct, analyze and interpret experiments;
d. an ability to function effectively as a member of a technical team;
e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;
f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
i. a commitment to quality, timeliness, and continuous improvement.

The MEET Program Educational Objectives (PEOs)

Graduates of the Mechanical Engineering Technology BS Program will:

1. pursue a successful career in mechanical engineering technology or related fields;
2. be effective in the design of mechanical engineering technology solutions and the practical application of mechanical engineering technology principles;
3. effectively lead, work and communicate in cross-functional teams;
4. enhance their professional skills by means of continuous education and professional development; and
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The MEET Student Outcomes (SOs)

By the time of graduation, the students will demonstrate:

a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to
improve processes;
d. an ability to function effectively as a member or leader on a technical team;
e. an ability to identify, analyze, and solve broadly-defined engineering technology problems;
f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
h. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
i. a commitment to quality, timeliness, and continuous improvement
j. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives; and
k. a knowledge of the impact of engineering technology solutions in a societal and global context.

An important element of our technology education is the hands-on experience which the students receive in the laboratory and workshop environment. The laboratories and workshops are equipped with adequate facilities to help students become productive immediately after graduation. Mainly these are:

**Fluid Mechanics Laboratory**
Facilities in the lab reinforce knowledge in such basics as fluid properties, hydrostatics, flow metering, and losses in pipes and fittings, etc.

**Thermodynamics and Heat Transfer Laboratory**
Facilities in the thermo-fluid lab allow hands-on experience in various temperature-measuring devices; studies in thermodynamic properties of gases, air standard cycles, heat transfer by conduction, convection and radiation, and performance characteristics of different types of heat exchangers.

**Mechanics Laboratory**
This laboratory is equipped with bench top facilities to enable experiments in a wide range of basic engine mechanisms such as governors, cams, gears; static and dynamic balancing; static and dynamic friction; forced and free vibrations, etc.

**Fluid Power Laboratory**
A number of oil power hydraulic trainers complete with modern industrial components provide expanding insight into the way in which these components function interactively in industrial oil power systems. Some bench-top equipment allows training in basic and electro-pneumatics.

**Materials Testing Laboratory**
Facilities in the lab allow tensile, compression, shear, bending, creep, impact, beam deflection, and torsion tests. Nondestructive test equipment for fluorescent penetrant and magnetic particle inspections are also available.

**Metallurgy Laboratory**
Facilities in the lab allow sample preparation for microstructure examination by optical microscope on ferrous and non-ferrous metals; carry out various
heat treatment processes.

**Metrology Laboratory**
This lab allows training in mechanical measurement and inspection. It is equipped with a variety of measuring tools, universal measuring microscope, profile projector, gear and thread inspection tools, surface roughness tester, computer controlled surface measurement system, computer controlled roundness measurement system, etc.

**CAD Laboratory**
It hosts a network of computers, printers and plotters, to assist training in technical drawings using AutoCAD software.

**Basic Skill Workshops**
The bench work and sheet metal workshops provide entry level hands-on skills in marking, filing, sawing, drilling and sheet metal work.

**Plant Maintenance Workshop**
Facilities in the workshop allow practical hands-on training in the use of common hands-on and power tools; maintenance of valves, bearings, mechanical transmission systems, packing and seals; training in shaft alignment, etc.

**Pump and Compressor Workshops**
These workshops allow extensive training in operation and maintenance of generic pumps and compressors. A multi-pump test rig and a fully instrumented compressor unit allow performance studies of the generic machines.

**Power Generation Workshop**
Facilities in the workshop allow studies in vapor power cycles using an oil-fired steam power plant which comprises a high pressure boiler, super heater, turbine, condenser, cooling tower and the feed water treatment units. A gas turbine unit comprising compressor-turbine assembly, combustion chamber, power turbine, ignition system and instrumentation enables tests to be carried out on the performance of the machine. A self-contained diesel engine unit fitted with dynamometer, gas analyzer and instrumentation allows studies in diesel power generation.

**Diesel Workshop**
This workshop contains a number of industrial diesel engines of popular makes that allow rigorous practical hands-on training in operation and maintenance of diesel engines.

**Special Program Workshop**
Equipped with multi-skill facilities, this workshop enables hands-on training in the use of hand and measuring tools, pipe and pipe threading machines, and valve testing; demonstration of construction, and
maintenance of basic industrial equipment such as pumps, compressors, valves and gear boxes.

**Lathe Workshop**
This allows extensive hands-on machining experience in turning and shaping.

**Milling and Grinding Workshop**
This allows training in universal milling, surface grinding, tool grinding and high quality surface finish.

**Arc and Gas Welding Workshops**
These provide extensive training facilities in shielded metal arc welding, TIG, MIG, oxyacetylene welding and cutting, brazing, auto-manual flame cutting, pipe profilers, etc.

**CNC Workshop**
It allows training in Computer Numerical Control machines for turning and milling. The machines are linked to the CAD Lab which allows CAD drawings to be sent to the floor mounted machines. Students learn to program simulated machining using standard CNC software.

**Refrigeration and Air Conditioning Workshop**
Facilities include benches for tube fitting and welding, flaring, leak testing, system evacuation and recharging, domestic and commercial refrigeration simulators, commercial refrigeration unit with fault simulations, etc.

It allows training in troubleshooting and maintenance of air conditioning equipment such as room air conditioners, packaged roof top units, mini split units, etc. The workshop is well equipped with domestic and commercial air conditioning simulators, industrial air conditioning controls, etc.

**Senior Project Laboratory**
This laboratory is equipped with workstations where the software installed enable the students to undergo mechanical systems design experience, which integrate the mechanical engineering curriculum. Contemporary engineering design, analysis and programming packages are installed for students to complete design assignments and projects in various mechanical engineering areas.

The job and career opportunities for graduates of the department include the following:

Graduates of the Bachelor of Science program will be able to enter careers in petrochemical, power, manufacturing, process and other industries as mechanical technologists or engineers in the following fields:

- **Maintenance**
- **Operation**
- **Installation**
- **Testing and evaluation**
- **Troubleshooting**
- **Design**
- **Technical sales**

Graduates of the Mechanical Maintenance Engineering Technology (MMET) AS program will be able to enter careers in petrochemical, power, process and other industries as technicians in the following fields:
- Mechanical maintenance
- Operation
- Installation
- Testing
- Troubleshooting
- Technical sales

Graduates of the Manufacturing Engineering Technology (MAET) AS program will be able to enter careers as manufacturing technicians in the following fields:

- Manufacturing processes
- Workshop machining and fabrication
- CNC programming and operation
- Design and drafting
- Inspection and quality control
- Materials planning
- Production planning
## Degree Requirements: Associate of Science in

### 1st YEAR LEVEL I

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**Total credit hours**: 72

*Students are required to take an elective course in the 2nd year level II. See page 108 for the list of electives.*
### Additional Degree Requirements: Bachelor of Science in

#### 3rd Year Level I

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**TOTAL** 10 15 15

#### 3rd Year Level II

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### 4th YEAR LEVEL II

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**Minimum total credit hours** 135/136

*Students are required to take a non-technical elective in the 4th year level II. See page 109 for the list of electives.
### 1st YEAR LEVEL I

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**TOTAL** 11 20 18

### 1st YEAR LEVEL II

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**TOTAL** 10 20 17
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**TOTAL** | 10 | 19 | 17

### 2nd YEAR LEVEL II

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**TOTAL** | 11 | 14 | 17

**Total credit hours** | 72

*Students are required to take an elective course in the 2nd year level II. See page 108 for the list of electives.*
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MME 101 Engineering Drawing [0-2-1]  
**Pre-requisite: None**  
This introductory course in drawing and drafting covers use of instruments, English letter and number construction, geometrical operations, sketching and shape descriptions, orthographic views, orthographic projections and sectional views.

MME 102 Workshop Technology [0-2-1]  
**Pre-requisite: None**  
This course provides students with basic workshop skills which they may require later in their majors. The students carryout exercises in bench work, sheet metal work and basic mechanical measurements.

MME 103 Industrial Safety and Environment [1-0-1]  
**Pre-requisite: None**  
This course introduces the concept of health and safety during on-job training or at work and the sources of environmental pollutions. It aims at forming within the students sound attitudes towards safety and environment. Students recognize general safety, mechanical, electrical and chemical hazards, fire safety, the factors influencing environmental pollutions and the regulatory bodies to control them.

MME 104 Manufacturing Processes I [2-6-4]  
**Pre-requisite: None**  
This course covers theory and practice of common machining and metal-joining operations essential to manufacturing technicians. Topics include conventional lathe operations, gas metal cutting and metal joining using different welding techniques.

MME 105 Introduction to Engineering Materials [1-0-1]  
**Pre-requisite: None**  
This subject deals with the materials commonly used in various engineering applications and manufacturing processes, differences in commonly used metals, non-metals, polymers, ceramics and alloys.

MME 111 Manufacturing Processes II [2-4-3]  
**Pre-requisite: MME 104 Manufacturing Processes I**  
This course is primarily concerned with milling and surface grinding by combining theory and practice of metal cutting operations. Additional topics include casting and some metal forming processes.

MME 112 Strength of Materials [2-3-3]  
**Pre-requisite: MME 134 Applied Mechanics**  
This course covers basic mechanical properties and testing of materials by combining theories with standard tests.

MME 114 Production Technical Drawing [0-3-1]  
**Pre-requisite: MME 101 Engineering Drawing**  
This course concerns symbols and terminology used in machine drawing. Topics include auxiliary views, machining allowance, surface texture, fits and tolerances.

MME 121 Plant Maintenance [2-2-3]  
**Pre-requisite: None**  
This course provides basic knowledge and skills required by a mechanical maintenance technician throughout his career.
MME 131 Applied Thermodynamics [2-2-3]
*Pre-requisite: GES 132 Fundamentals of Physics*
This course deals with the conversion of heat into work, laws of thermodynamics relating to air standard cycles, gas laws and steam tables for calculating properties of liquids and vapor.

MME 132 Fluid Mechanics [2-2-3]
*Pre-requisite: GES 132 Fundamentals of Physics*
This course deals with the laws of fluids at rest and motion. It covers basic fluid properties, energies of flowing fluid, flow measurement in closed and open conduits and basic compressible flow.

MME 133 Computer Aided Drafting [0-3-1]
*Pre-requisite: MME 101 Engineering Drawing*
This course prepares students to draw various engineering drawings using the computer aided drafting package. Students receive hands-on experience in using the CAD package, using two-dimensional construction commands.

MME 134 Applied Mechanics [1-2-2]
*Pre-requisite: GES 113 Calculus I and GES 132 Fundamentals of Physics*
This course is designed to introduce the basic principles of engineering mechanics for study of applied technology. Topics include forces, vectors and resultants, moments and couples, 2-D equilibrium, trusses, friction, centroids and center of gravity, kinematics of rectilinear and angular motion, kinetics, work energy and power, impulse and momentum.

MME 151 Fluid Mechanics & Heat Transfer [2-2-3]
*Pre-requisite: GES 132 Fundamentals of Physics*
This course is designed for Electrical Engineering students

This course covers basics of hydraulic, heat transfer and their laboratory demonstration. Topics in hydraulics include physical and transport properties of fluids, fluid pressure, hydrostatics, Bernoulli’s theorem, measurement of discharge, losses in pipe flow. Topics in heat transfer include various heat transfer modes and some of their applications.

MME 201 Metallurgy [2-2-3]
*Pre-requisite: GES 151 General Chemistry*
This course deals with crystalline structure of metals, equilibrium phase diagram, iron-carbon phase diagram, heat treatment processes, ferrous and non-ferrous metals, extraction of iron from ore and steel making processes.

MME 202 Mechanical CAD Applications [0-3-1]
*Pre-requisite: MME 114 Production Technical Drawing*
This course provides advanced mechanical drawing skills using Computer-Aided Design and Drafting techniques. Standards and codes in drawing machine parts and assembly drawings are also included. Students use software packages to create and develop mechanical designs in a 3-D environment.

MME 203 Manufacturing Processes III [2-3-3]
*Pre-requisite: MME 111 Manufacturing Processes II*
This course covers advanced manufacturing processes which include CNC machining, robotics and non-traditional machining. Students are taught CNC programming for milling and turning operations. Students learn basic robotic configuration and programming.
MME 204 Machine Elements [2-2-3]
_pre-requisite: MME 112 Strength of Materials_
This course deals with machine elements such as shafts, bearings, keys and couplings, gears, belts, chains and the use of empirical rules in selection of machine elements for specific application.

MME 205 Metrology and Quality Control [1-2-2]
_pre-requisite: MME 102 Workshop Technology_
This course deals with techniques and instruments of measurement used in manufacturing activities. Students learn to use various measuring tools and instrument and apply statistical tools for quality control.

MME 211 Metrology and Quality Control [2-2-3]
_pre-requisite: None_
This course is designed for NDT students. This course deals with techniques and instruments of measurement used in manufacturing activities. Students learn to use in various measuring tools & instrument & apply statistical tools for quality control.

MME 212 Production Planning and Control [2-2-3]
_pre-requisite: MME 203 Manufacturing Processes III_
In this course students are taught in establishing, designing, planning, controlling, calculating and running a production system.

MME 213 Welding and Inspection [2-3-3]
_pre-requisites: MME 104 Manufacturing Processes I and MME 201 Metallurgy_
This course concerns various welding processes, welded joints, welding symbols, welding metallurgy, nondestructive testing of weldments and qualification of welders and welding operators.

MME 214 MAET Project [0-4-2]
_pre-requisite: MME 112 Strength of Materials and ELC 205 Technical Writing_
Students learn to work in groups, select suitable engineering ideas, plan activities, transform ideas into product, write and present the project.

MME 221 Pumping Machinery & Installations [2-3-3]
_pre-requisites: MME 132 Fluid Mechanics_
This course is designed to equip students with knowledge and hands-on skills needed to operate and maintain a pump and understand the interaction between the pump and system.

MME 224 Power Plant Operations [1-0-1]
_pre-requisite: None_
This course is designed for Electrical Engineering students. This course introduces steam and gas power generation systems. Topics include combustion in boilers, boiler types, boiler operation and control, superheaters, condensers, cooling towers and feed water treatment. Combined cycle power generation is briefly discussed.

MME 232 Hydraulics and Pneumatics [2-2-3]
_pre-requisite: None_
This course introduces students to the functions of various elements that make hydraulic or pneumatic control circuits. Students learn to build the circuits and troubleshoot them for various fault condition scenarios.

MME 233 MMET Project [0-4-2]
_pre-requisite: MME 112 Strength of Materials and ELC 205 Technical Writing_
Students learn to work in groups, select suitable engineering ideas, plan activities, transform ideas into product, write and present the project.

**MME 235 Industrial Compressors [2-2-3]**  
*Pre-requisite: MME 131 Applied Thermodynamics*  
This course is designed to equip students with knowledge and hands-on skills needed to operate and maintain compressors.

**MME 237 Power Generation Systems [3-4-4]**  
*Pre-requisite: MME 131 Applied Thermodynamics*  
This course deals with different types of power generation systems, particularly steam power plants, gas power plants, combined cycle power generation and internal combustion engines. It covers combustion, operation and control of boilers, super-heaters, condensers, cooling towers and water treatment. Students learn to analyze steam and gas power plants. It also deals with the operation, maintenance and troubleshooting of internal combustion engines. Students acquire hands-on skills in selected engine types.

**MME 290 Co-operative Work Experience [0-40-3]**  
*Pre-requisite: None*  
This is intensive on-the-job training program where each student spends fifteen weeks of working in industry. It gives students ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. It helps them undergo a process of transition from intense class room training to the working environment. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.

**MME 291 Co-operative Work Experience [0-40-3]**  
*Pre-requisite: None*  
This is intensive on-the-job training program where each student spends fifteen weeks of working in industry. It gives students ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. It helps them undergo a process of transition from intense class room training to the working environment. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.

**MME 321 Machine Drawing [0-3-1]**  
*Pre-requisite: MME 133 Computer Aided Drafting*  
This course covers the drawing conventions, abbreviations and symbols used in drawings; indication of surface texture; limits, fits and tolerances; screw threads and threaded fasteners; welded joints and assembly drawings. Students are required to make extensive use of computer aided design and drafting packages.

**MME 322 Statics [2-3-3]**  
*Pre-requisite: GES 132 Fundamentals of Physics*  
This course covers the forces and couples; free body diagrams; two and three-dimensional static equilibrium of a particle and rigid bodies; friction; centroids; center of gravity; moments of inertia; analysis of forces in trusses.

**MME 323 Materials Science [2-3-3]**  
*Pre-requisite: None*  
This course covers the crystalline and non-crystalline structure of materials, mechanical behavior of materials, phase diagrams, Fe-C diagram and IT
diagram, heat treatment of steels, iron and steel production process and corrosion and degradation of metals. The classifications, properties and applications of: steels, cast iron, nonferrous metals, polymers, ceramics and composite materials will be covered.

MME 331 Dynamics [2-3-3]
*Pre-requisite: MME 322 Statics*
This course covers the kinematics of particles and rigid bodies in rectilinear and curvilinear motion; kinetics of particles, work and energy.

MME 332 Machine Design I [2-3-3]
*Pre-requisite: MME 321 Machine Drawing*
This course deals with designing machine elements subjected to static and dynamic loading. It deals with stresses and deformations in machine elements, and prediction of failures under static, cyclic and impact loading. Machine elements such as threaded fasteners, power screws, riveted joints, welded joints, shafts and associated parts are included. This course makes extensive use of design data book in problem solving exercises.

MME 333 Heat Transfer and Heat Exchangers [2-3-3]
*Pre-requisite: MME 131 Applied Thermodynamics or CHM 223 Transport Processes*
This course presents the analysis of the three heat transfer modes; conduction, convection and radiation and their applications in engineering systems. It presents the steady state and transient conditions, condensation and boiling heat transfer and the design of different types of heat exchangers.

MME 421 Thermal Engineering [2-3-3]
*Pre-requisite: MME 131 Applied Thermodynamics*
This course covers the analysis of combustion, steam cycles, gas turbine cycles, turbines, combined cycles and refrigeration and air conditioning systems. Full thermal analysis is presented to allow the students to design a combined power plant making full advantage of co-generation.

MME 422 Kinematics and Mechanisms [2-3-3]
*Pre-requisite: MME 331 Dynamics*
This course covers the study of mechanisms and machine elements. Aspects of the kinematics, statics, and dynamics of various mechanical elements such as linkages, cams, gears, gear trains are studied. Mechanical balancing is also introduced.

MME 423 Machine Design II [2-3-3]
*Pre-requisite: MME 332 Machine Design I*
This course is continuation of Machine Design I and involves further design of machine elements. It deals with analysis of columns, determination of stresses in cylinders and pressure vessels, design of bearings, gears, springs, clutches and brakes, belt, rope and chain drives.

MME 431 Manufacturing Processes [3-3-4]
*Pre-requisite: MME 323 Materials Science*
This course covers basic and advanced manufacturing processes comprehensively in theory and practical sessions. The manufacturing processes include (but not limited to) casting, conventional machining: turning and milling, metal forming and joining methods as welding, powder metallurgy, advanced processes that include CNC machining, robotics and non-traditional methods.
MME 432 Senior Project [0-6-2]
Pre-requisite: MME 423 Machine Design II
The senior design project is the capstone design experience. The objective of the course is to provide the student an exposure to the design of a specific project and get experience from participating in the project development. It is also to integrate and strengthen students’ knowledge acquired throughout the curriculum. An extensive individual or group design or analytical project is performed in consultation with one or more faculty advisors. Students use contemporary engineering computer software in completing the design assignments and, write and present the project.

MME 433 Maintenance Planning and Management [2-0-2]
Pre-requisite: None
This course presents maintenance as an integrated system that needs to be planned, designed, engineered and controlled using statistical and optimization techniques. Emphasis is on the use of quantitative techniques for operating, controlling and improving maintenance systems.

MME 492 Co-operative Work Experience [0-40-3]
Pre-requisite: None
The cooperative training program involves placement of students in industries relevant to their academic and technical interests. During this training the students spend a period of 15 weeks in companies or industries and receive training in one or more of the following areas; product design and development, system upgrading or design modifications, project planning, reliability assessment, environment and safety, and total quality management. It gives them ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.
The mission of the department is to prepare graduates equipped with job-oriented knowledge, skills, and problem-solving abilities to work as electrical engineering technicians and technologists.

The department has established a set of objectives to fulfill its mission. These objectives are achieved through a set of well-defined tasks which focus on creating a conducive and stimulating educational environment. This includes developing and implementing innovative and responsive curriculum, teaching and learning strategies, outcome-based assessment, and continuous improvement process using state-of-the-art teaching facilities.

The department maintains close links with the industries, values their experience and incorporate their feedbacks into its curriculum. The department also provides courses tailored to the needs of the local industry and community.

In addition to curricular activities, students are continuously encouraged to actively participate in Engineering Project Competitions, Career Day Exhibitions, Science Clubs, IEEE, ISA JIC-Student’s Section and other extracurricular activities.

The E&EET Department currently offers the following programs:

- **Associate of Science in Electrical Power Engineering Technology (ELET),**
- **Associate of Science in Instrumentation and Control Engineering Technology (ICET),**
- **Bachelor of Science in Electrical Engineering Technology (ELET), and**
- **Bachelor of Science in Instrumentation and Control Engineering Technology (ICET).**

**The ELET AS Program Educational Objectives (PEOs)**

Graduates of the Electrical Power Engineering Technology Program will:

1. pursue a successful career in the field of electrical power engineering technology;
2. work effectively as individuals or in professional teams to solve technical problems;
3. demonstrate effective communication skills;
4. enhance their professional skills by means of continuous education and development; and
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.
The ELET AS Student Outcomes (SOs)

By the time of graduation, the students will demonstrate:

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

d. an ability to function effectively as a member of a technical team;

e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;

f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

i. a commitment to quality, timeliness, and continuous improvement.

The ICET Program Educational Objectives (PEOs)

Graduates of the Instrumentation and Control Engineering Technology Program will:

1. pursue a successful career in the field of instrumentation and control engineering technology;

2. work effectively as individuals or in professional teams to solve technical problems;

3. demonstrate effective communication skills;

4. enhance their professional skills by means of continuous education and development; and

5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The ICET Student Outcomes (SOs)

By the end of the program, the students should be able to:

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;
c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

d. an ability to function effectively as a member of a technical team;

e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;

f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

The Bachelor of Science program in Electrical Engineering Technology prepares graduates with strong knowledge, necessary skills, and problem-solving abilities to work and become electrical technologists/engineers. It will enable graduates to enter careers which require designing, developing, assembling, operating, testing, maintaining, documenting, and improving the performance of electrical equipment and power systems.

**The ELET BS Program Educational Objectives (PEOs)**

Graduates of the Electrical Engineering Technology BS Program will:

1. pursue a successful career in electrical engineering technology or related fields;
2. be effective in the design of electrical engineering technology solutions and the practical application of electrical engineering technology principles;
3. effectively lead, work and communicate in cross functional teams;
4. enhance their professional skills by means of continuous education and professional development; and
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

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g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

i. a commitment to quality, timeliness, and continuous improvement.
The ELET BS Student Outcomes (SOs)
By the end of the program, the students should be able to:

a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;

b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

d. an ability to function effectively as a member or leader on a technical team;

e. an ability to identify, analyze, and solve broadly-defined engineering technology problems;

f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;

i. a commitment to quality, timeliness, and continuous improvement

j. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives; and

k. a knowledge of the impact of engineering technology solutions in a societal and global context.

The Bachelor of Science program in Instrumentation and Control Engineering Technology will prepare graduates with strong knowledge, necessary skills, and problem-solving abilities to work and become instrumentation and control engineering technologists/engineers of excellence. It will enable graduates to enter careers which require specifying, installing, testing, calibrating, operating, and upgrading process control systems, DCS & SCADA Systems.

The ICET BS Program Educational Objectives (PEOs)
Graduates of the Instrumentation and Control Engineering Technology BS Program will:

1. pursue a successful career in instrumentation and control engineering technology or related fields;

2. be effective in the design of instrumentation and control engineering technology solutions and the practical application of instrumentation and control engineering technology principles;

3. effectively lead, work and communicate in cross functional teams;

4. enhance their professional skills by means of continuous education and professional development; and
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The ICET BS Student Outcomes (SOs)

By the end of the program, the students should be able to:

a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;

b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

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i. a commitment to quality, timeliness, and continuous improvement

j. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives; and

k. a knowledge of the impact of engineering technology solutions in a societal and global context.

The Department occupies a modern two-storied purpose-built building which consists of 7 large-sized workshops, 13 medium-sized laboratories, 2 terminal rooms, 20 classrooms, a conference room, a resource room/teaching aid center, and prayer room, faculty common room in addition to a sufficient number of individual and shared offices for faculty members. All facilities are very well furnished with modern versatile benches and equipped with the necessary teaching aids, training and testing instruments, modules and systems in addition to software and computers. The building is also well connected and networked to JIC internet and intranet services.

The Department has the following specialized labs and workshops:

**Two Electrical Circuits Laboratories (E073, E074)**
Equipped with multi-meters, oscilloscopes function generators and dc power supplies, decade boxes-resistance, capacitance and combined.

**Electrical Machines Workshop (E019)**
Equipped with 6 complete training stations with relevant LabVolt modules on electrical machines and transformer system and control of industrial
motors system.

**Electrical Wiring & Installation Workshop (E055)**
Equipped with 7 KNX trainer panel station, 6-bench mounted wiring boards and testing devices.

**Electrical Power Systems Workshop (E032)**
Equipped with 6 complete training systems with relevant LabVolt modules on electrical transmission and control of industrial motors.

**Power Electronics & Drives Workshop (E035)**
Equipped with 6 complete training stations with relevant modules of devices and systems of power electronics and drives.

**ELET Diploma Project Laboratory (E021)**
Equipped with Elbag industrial systems, electrical maintenance tool kits, well-mounted wiring boards and testing devices.

**Instrumentation and Measurements Laboratory (E011)**
Equipped with 10 complete BEAMEX MCS100 calibration laboratory benches with full sets of relevant modules, many different types of: gauges, transducers, (P,T,F) transmitters, SMART transmitters, 8 Beckman industrial FG2A function generators, oscilloscopes and testing devices.

**Two Analogue & Digital Electronics Laboratories (E056, E057)**
Equipped with 10 complete sets of: power supplies, oscilloscopes, function generators, testing devices, digital tester chip-master compact, Analog & Digital breadboard training system, TTL families of IC chips to be used for digital labs, electronics components with needed electronics tools.

**PLC Laboratory (E077)**
Equipped with 12 complete sets of: Siemens LD (S7-313C) training stations with Wuekro application units, LD Profi-Cassy units, power supplies, testing devices, in addition to 12 Allen-Bradley (SLC-100) training stations. It is also equipped with six new sets of Siemens SCADA winCC modules for trainers and 40 for trainees.

**Microprocessor / Microcomputer Laboratory (E045)**
Equipped with 9 sets of: ITE-EB2000 training equipment, parallel-port interface cards, CMCS application boardswith serial port interface and data acquisition software, power supplies, IBM PCs and 1
TC++ programming set.

**Process / Industrial Control Laboratory (E008)**
Equipped with 25 Armfield & 4 LabVolt level, temperature, pressure & flow process control stations in addition to testing devices & Pentium IV PCs.

It is also equipped with 8 sets of DCS systems donated from Emerson Process Automation Company consists of field bus transmitters, wireless transmitters, Differential pressure transmitter, temperature transmitter and customized DCS simulation software. It also contains one cruiser station which simulates all plant measuring equipment including Vibration, Analytical Instrumentation and Micro motion flow meters.

**Instrumentation Engineering Laboratory (E061)**
Equipped with 9 sets of: Feedback M.P. trainers customized interfacing PCB, Meggers, project boards, K&H IDL analogue lab, oscilloscopes, and IBM PCs with MultiSim software V9.

It is also equipped with 8 complete sets of: K&H MTS-51microcomputer trainers, digital boards, K&H MTS-86C, Pentium IV PCs, oscilloscopes, power supplies, function generators & DMM Meggers M8037.

**Digital System Design & ECAD Laboratory (E063)**
Equipped with 9 complete sets of: power supplies, oscilloscopes, function generators, testing devices, electronics components and electronics tools.

It will be soon equipped with six complete BEAMEX MCS100 calibration laboratory benches with full sets of relevant modules, many different types of: gauges, transducers, (P,T,F) transmitters.

**Plant Automation System Laboratory (E042)**
Equipped with 6 complete sets of: SMAR multi-loop digital controllers CD600 Plus, SMAR interface converters ICS2.0P, foundation Fieldbus valve positioners FY302, foundation Fieldbus to pneumatic signal converters FP302, current to foundation fieldbus converters IF302, 10 way flush mounting programmable alarms RTK 725S and digital panel meters.

**Yokogawa DCS (Digital Control System) Laboratory (E079)**
Equipped with a Yokogawa DCS training system (Centum 3000) with 12 sets of HP Pentium IV PCs. Additional hardware and software will be added soon to serve 6 groups of students at a time.

**EE Computer Terminal Room (E047)**
Equipped with 50 computer work stations, printer and teaching aid facilities.

**ICET Project Laboratory (E072)**
Equipped with 10 sets of: oscilloscopes, universal interface bread boards, ac/dc power supplies, meggers, soldering stations, testing devices, electronics tool boxes, Universal device programmers and electronics components.

**Control Systems Laboratory (E074)**
Equipped with 10 complete sets of PCs with Lab View software & associated hardware including 8 NI Elvis workstations and 24Quanser prototype board module work stations.
Two Computer Simulation Terminal Rooms (E039, E041)
With an overall capacity of 60 students and well equipped with modern PCs for MultiSim, MATLAB, ETAP & other multi-user software.

Industrial Programs Workshop (E004)
Equipped with all necessary electrical modules, discrete instruments, testing & measurement equipment for basic hands-on skills & vocational training of industrial trainees.

Employability and career opportunities for graduates of the department include the following:

Graduates of the Associate of Science in Electrical Power Engineering Technology program will be able to work as:

- Electrical Power Systems Technician
- Electrical Installation and Maintenance Technician
- Electrical Power Troubleshooting Technician
- Electrical Machines Technician
- Electrical Control & Protection Technician

Graduates of the Bachelor of Science in Electrical Engineering Technology program will be able to work as:

- Electrical Control & Protection Technologist/Engineer
- Electrical/Electrical Power Division/Section Supervisor

Graduates of the Associate of Science in Instrumentation and Control Engineering Technology program will be able to work as:

- Control Engineering Technician
- Instrumentation Installation and Maintenance Technician
- Process Instrumentation and Analytical Instrumentation Technician
- Testing and Calibration Technician
- Measurement and Control Technician
- Operations Technician
- Sales Support Technician

Graduates of the Bachelor of Science in Instrumentation and Control Engineering Technology program will be able to work as:

- Control Engineering Technologist/Engineer
- Instrumentation Installation and Maintenance Technologist/Engineer
- Process Instrumentation and Analytical Instrumentation Technologist/Engineer
- Testing and Calibration Technologist/Engineer
- Instrumentation, Measurement and Control Division/Section Supervisor
- Operations Technologist/Engineer
- Sales Technologist/Engineer
### Degree Requirements: Associate of Science in

#### 1st YEAR LEVEL I

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### 2<sup>nd</sup> YEAR LEVEL I

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### 2<sup>nd</sup> YEAR LEVEL II

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*Students are required to take an elective course in the 2<sup>nd</sup> year level II. See page 137 for the list of electives.
### Additional Degree Requirements: Bachelor of Science in

#### 3rd Year Level I

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<th>Course Code</th>
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<td>Fluid Mechanics and Heat Transfer</td>
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**TOTAL** | 11  | 15  | 16    |

#### 3rd Year Level II

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**TOTAL** | 11  | 13  | 15    |
### 4th YEAR LEVEL I

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<th>Pre-req</th>
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### 4th YEAR LEVEL II

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**Total credit hours** 132/133

* Students are required to take a non-technical elective in the 4th year level II. See page 138 for the list of electives.
# Degree Requirements: Associate of Science in

## 1st Year Level I

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**TOTAL** | 12 | 18 | 18 |

## 1st Year Level II

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**TOTAL** | 11 | 17 | 17 |
### 2nd YEAR LEVEL I

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**TOTAL** | 12 | 17 | 18

### 2nd YEAR LEVEL II

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<td>EEE 223 &amp; EEE 224</td>
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**TOTAL** | 9/10 | 18/13 | 16

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**Total credit hours** | 72

* Students are required to take an elective course in the 2nd year level II.
See page 137 for the list of electives.
### 3\(^{rd}\) YEAR LEVEL I

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**TOTAL** | 12   | 14   | 17   |

### 3\(^{rd}\) YEAR LEVEL II

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**TOTAL** | 12   | 15   | 17   |
### 4th YEAR LEVEL I

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**TOTAL**  
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### 4th YEAR LEVEL II

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<td>Process Control Applications</td>
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<td>Senior Project</td>
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**TOTAL**  
|        |        | 8/9  | 12/15 | 13/14 |               |

|        |        | 0    | 40    | 3     |               |

**Total credit hours**  
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EEE 101 Electrical Circuits I [2-3-3]
*Pre-requisite: None*
This level 1 foundation course introduces students to the fundamental concepts, terminologies and practices used in Electrical Engineering. It explains the laws and theorems related to series and parallel DC circuits. Students are also introduced to basic AC concepts and, the response of reactive elements such as L and C to sinusoidal waveform.

EEE 111 Electrical Machines I [2-3-3]
*Pre-requisite: EEE 101 Electrical Circuits I*
This is a fundamental module on electrical machines, introducing students to the concepts, principle of operations, construction and applications of DC machines and single-phase transformers. This module provides close insight into the study of electrical machines and drives. Laboratory part of the course is covered through very well designed experiments and futuristic equipment.

EEE 112 Electrical Circuits II [2-3-3]
*Pre-requisite: EEE 101 Electrical Circuits I*
This is an intermediate level module that extends the subject matter of EEE 101: Electrical Circuits I. It concentrates on AC analysis of resistive, inductive and capacitive circuits. It explains in details the power in single-phase systems, power factor improvement, poly-phase systems and power calculations for three-phase delta and/or Y connected circuits. It also covers RLC resonant circuits and associated effects.

EEE 113 Electronics [3-3-4]
*Pre-requisite: EEE 101 Electrical Circuits I*
This course combines knowledge with hands-on experience, to enable students to learn about and acquire the necessary skills to deal with analogue and digital devices, such as diodes, transistors, op-amps, logic-gates, combinational and sequential circuits.

EEE 121 Instrumentation & Measurements I [2-3-3]
*Pre-requisite: None*
This is a fundamental course introducing students to the concepts, principles of operations and applications of basic instruments used in measurements and control. It also introduces the basic principles of transducers for measurement and control. This course is a stepping stone for the other specialized subjects.

EEE 131 Analogue Electronics [2-3-3]
*Pre-requisite: EEE 101 Electrical Circuits I*
This course combines knowledge with hands-on experience, to enable students to learn about and acquire the necessary skills to deal with discrete analogue devices, such as diodes, transistors, FET’s and op-amps.

EEE 132 Digital Electronics [2-3-3]
*Pre-requisite: EEE 101 Electrical Circuits I*
This course combines knowledge with hands-on experience, to enable students to learn the concept and principles of operation of digital electronic building blocks. This includes logic gates, flip flops, counters, registers and displays.

EEE 201 Electrical Machines II [2-3-3]
*Pre-requisites: EEE 111 Electrical Machines I, and EEE 112 Electrical Circuits II*
This is an advanced course that combines theoretical knowledge of electrical machines with hands-on skills. It extends the subject of EEE 111: Electrical Machines I by introducing students to the concepts, principles of operation, construction, characteristics
and applications of auto-transformers, three-phase transformers, single-phase and three-phase induction motors, and synchronous machines.

EEE 202 Electrical Control and Protection I [2-3-3]
Pre-requisite: EEE 111 Electrical Machines I
This course introduces students to the concepts and structure of electromagnetic controls of electrical motors used in industry in the areas of electrical power system. Different motor control circuits used are designed and practiced. The concepts of relays, circuit breakers and their applications are introduced to students. The module also provides a broad study of switching equipment. A control circuit is introduced as a project to apply certain techniques for improving the comprehension and hands-on skills.

EEE 203 Power Electronics [2-3-3]
Pre-requisite: EEE 113 Electronics
This course is designed to provide students with sufficient knowledge and skills in the area of Power Electronics. The course introduces the topics of Semiconductor Switches; Power Diode, Thyristors, Transistors; Uncontrolled and Controlled rectifiers, MOSFET Choppers and Inverters. Practical part of the course is covered through very well designed experiment and advanced equipment, that further increase the knowledge and hands-on-skill of the students.

EEE 204 Electrical Wiring [2-3-3]
Pre-requisite: EEE 112 Electrical Circuits II
This is a theoretical and practical course designed to enable students to acquire sufficient knowledge and skills in residential, commercial and industrial wiring. The course elaborates on wiring components, wiring tools, over head and underground services, calculations related to sizes of conductors, conduits and boxes, OCPD for transformer and motors using National Electric Code (NEC). Practical part of the course is covered through installing and operating various circuits on wall mounted large wooden boards. Various modular systems like emergency alarm, burglar alarm and heating are used to provide additional hand-on- skill related to modern aspects of wiring.

EEE 211 Electrical Troubleshooting [2-3-3]
Pre-requisite: EEE 202 Electrical Control and Protection I
This course applies the concept and techniques of troubleshooting to different control and power circuits used in industry. The course includes the concepts of Off and On-line Troubleshooting, Ladder Diagrams, methods and techniques of troubleshooting; Five-Step Approach, a Diagram Programmed Operation for Problem Analysis and Testing Devices. The course enables the students to perform troubleshooting on various motors, analyze problems and propose remedies through state of the art equipment.
EEE 212 Transmission and Distribution of Electrical Energy [2-3-3]
Pre-requisite: EEE 112 Electrical Circuits II
This course provides students with the basic concepts of electrical power system e.g, generation, transmission and distribution. It gives detailed information about the types of power plants, transmission system, types and characteristics of transmission lines, power handling capacity of lines, distribution system, substation layouts, sub-station equipments, medium and low voltage distribution, and methods of feeding distributors. Practical part of the course is covered by very well designed experiments using futuristic equipment.

EEE 213 ELET Project [0-4-2]
Pre-requisites: EEE 201 Electrical Machines II, and EEE 202 Electrical Control and Protection I
This mainly, hands-on skill course provides students with the opportunity to apply previously gained knowledge and skills to build a project and carry out all the necessary steps of construction, troubleshooting, and successful operation, and finally present it in the form of a report.

EEE 217 Electrical and Electronic Principles [1-3-2]
Pre-requisite: None
This course introduces, students from other departments, about the basic electrical concepts, DC and AC signals, circuits, electrical measuring instruments, basic semiconductor devices and the basic operation of some IC’s.

EEE 221 Instrumentation & Measurements II [2-3-3]
Pre-requisite: EEE 121 Instrumentation and Measurements I
This course combines knowledge with hands-on experience, to enable students to learn about and acquire the necessary skills (operation and calibration) to deal with differential pressure measurement, transmission and transmitters, control valves and actuators, flow measurement and flow calculations. The study of principles and measurements of physical parameters such as humidity, Density, Viscosity and pH-value is also included.

EEE 222 Electrical Machines and Control [2-3-3]
Pre-requisite: EEE 101 Electrical Circuits I
This course introduces the students to the concepts of electrical machines and control. DC/AC generators and motors are covered. Single and Three-phase transformers are discussed. The course also introduces the students to principles of motor control and motor control circuits.

EEE 223 Industrial Control [2-3-3]
Pre-requisite: EEE 121 Instrumentation and Measurements I & GES 113: Calculus I
This course combines knowledge with hands-on experience to enable students to learn about and acquire the necessary skills to deal with elements of basic feedback control system, characteristics of process dynamics, feedback controllers and their tuning. Cascade control, feed-forward, ratio-control and troubleshooting of Control loop are also included.

EEE 224 Introduction to Microprocessor [2-3-3]
Pre-requisites: EEE 132 Digital Electronics or EEE 113 Electronics
This course introduces the basic architecture of microprocessor based systems to the students. Which includes both hardware and software components. It uses Assembly-language programming to solve the engineering problems.
EEE 231 Instrumentation System Diagram [0-2-1]  
**Pre-requisite: EEE 223 Industrial Control**
This course introduces the students to learn, read and interpret the complex loop and PID-diagrams. It also explains to the students the necessary information/specifications of the instruments for ordering / purchasing purposes. It also includes preparing and reading different types of work-orders and work-permits.

EEE 233 Programmable Logic Controllers [2-3-3]  
**Pre-requisites: EEE 113 Electronics or EEE 132 Digital Electronics**
This course combines knowledge with hands-on experience, to enable students to learn about and acquire the necessary skills to deal with the various components of PLCs and to design real life industrial applications.

EEE 232 Instrumentation Engineering [2-3-3]  
**Pre-requisite: EEE 221 Instrumentation and Measurements II**
This course introduces the students to process instrumentation devices such as sensors and control valves. Operational amplifiers based signal conditioning circuits such as inverting, non-inverting, summing, averaging, differential, V/I, I/V, A/D and D/A converters and filters are included. The principle and characteristics of control valve is also introduced.

EEE 234 Computer Control I [2-3-3]  
**Pre-requisite: EEE 224 Introduction to Microprocessor**
This course combines knowledge with hands-on experience, to enable students to learn about and acquire the necessary skills to deal with personal computers in monitoring and controlling different sensors, transducers and actuators.

EEE 235 ICET Project [0-4-2]  
**Pre-requisites: EEE 223 Industrial Controls, and EEE 224 Introduction to Microprocessor**
It is a project-based course in which students have the opportunity to utilize their theoretical knowledge & the practical skills learned in program courses, to design, develop and implement Instrumentation and Control based system. The students will be exposed to managing and costing of the project.

EEE 290 Co-operative Work Experience [0-40-3]  
**Pre-requisite: None**
This is intensive on-the-job training program, where each student spends fifteen weeks of working in industry. It gives students ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. It helps them undergo a process of transition from intense class room training to the working
Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.

EEE 291 Co-operative Work Experience [0-40-3]
Pre-requisite: None
This is intensive on-the-job training program, where each student spends fifteen weeks of working in industry. It gives students ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. It helps them undergo a process of transition from intense class room training to the working environment. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.

EEE 311 Network Analysis [2-3-3]
Pre-requisites: GES 313 Calculus II, and EEE 112 Electrical Circuits II
This course covers analysis techniques for electrical circuits containing independent and controlled sources. It covers transient response analysis of 1st and 2nd order circuits, magnetically coupled circuits, frequency response analysis, simple passive filter design, Laplace transform, transfer function, Fourier series and two-ports network parameters. excitation, two-ports network parameters.

EEE 312 Electric Drive Systems [2-4-3]
Pre-requisites: EEE 201 Electrical Machines II, and EEE 203 Power Electronics
This course covers motor drive selection, modeling of DC machines, DC machine steady state characteristics, phase-controlled DC motor drives, chopper-controlled DC motor drive, modeling of three phase induction machine, induction motor steady state characteristics, phase-controlled induction motor drives, frequency-controlled induction motor drives, voltage source and current source inverter fed induction motor, voltage source inverter (VSI) operation, modulation techniques, voltage/frequency controlled induction motor drives, vector controlled induction motor drives and harmonics. The MATLAB/SIMULINK software is extensively used for the electric motor drive simulation.

EEE 321 Industrial Electronics [2-3-3]
Pre-requisite: EEE 131 Analogue Electronics
This course introduces principles of operations, design and applications of some core areas of electronics being used in industry such as SCR, DIAC, TRIAC, regulators, amplifiers, oscillators, filters, choppers, inverters, sensors, I/O-devices and drives.

EEE 331 Digital System Design [2-3-3]
Pre-requisite: EEE 132 Digital Electronics
This course presents the fundamental concepts used in the digital systems design. It covers the design of both advanced combinational and sequential circuits using VHDL and FPGA implementation.

EEE 332 Process Instrumentation [2-3-3]
Pre-requisite: EEE 221 Instrumentation and Measurements II
This course discusses different types of sensors employed in the process industry. It also enables the students to have a better understanding of smart technology such as HART and wireless communication in process control. The course is also giving the hands on experience with designing and implementation of different loops in multi-loop controllers.
EEE 401 Electrical Power System I [2-3-3]
Pre-requisites: EEE 212 Trans. and Dist. of Electrical Energy, and EEE 311 Network Analysis
This course provides an introduction to the classical methods and modern techniques in power system analysis with the aid of a personal computer. Topics include: the concepts of complex power, transmission line parameters, transmission line performance and compensation, system modeling and per-unit analysis, circuit theory as applied to power systems, and load flow analysis.

EEE 402 Digital Control System [2-3-3]
Pre-requisites: EEE 224 Introduction to Microprocessor, and EEE 421 Control Engineering
This course presents the analysis and design of discrete time control systems. It starts with z-transform and its properties, then it covers the open-loop and close-loop discrete systems. The digital controller will be designed at the end of the course with various stability tests. The MATLAB/SIMULINK and LabVIEW will be used with advantage to obtain numerical solutions.

EEE 411 Electrical Control and Protection II [2-3-3]
Pre-requisites: EEE 202 Electrical Control and Protection I, and EEE 401 Electrical Power System I
Topics include control schemes in power systems, modeling of turbines, speed governors, and excitation systems, generator voltage regulation, reactive power compensation, protective relaying, over current, differential, distance and pilot protection, protection of electrical equipment and transmission lines, primary and back-up protection strategies of electric power systems protection schemes.

EEE 412 Electrical Power System II [2-3-3]
Pre-requisite: EEE 401 Electrical Power System I
This course is the continuation of EEE 401 which provides students with a working knowledge of power system problems and computer techniques used to solve some of these problems. Topics include optimal dispatch of generation, symmetrical three-phase faults, symmetrical components, unsymmetrical faults, technical treatment of the general problem of power system stability and its relevance.

EEE 413 Senior Project [0-6-2]
Pre-requisite: EEE 312 Electric Drive Systems
The senior design project is the capstone design experience. The objective of the course is to provide the student an exposure to the design of a specific project and get experience from participating in the project development. It is also to integrate and strengthen students’ knowledge acquired throughout the curriculum. An extensive individual or group design or analytical project is performed in consultation with one or more faculty advisors. Students use contemporary engineering computer software in completing the design assignments and, write and present the project.
EEE 421 Control Engineering [2-3-3]
*Pre-requisite: GES 313 Calculus II*
This course applies control theory to design systems with desired behaviors. It focuses on implementation of control systems derived by mathematical modeling of systems of a diverse range using Laplace transform. It describes State variables; time-domain and frequency-domain design and analysis; design of feedback control systems; root locus analysis; stability analysis; Bode & Nyquist analysis techniques etc.

EEE 422 Advanced PLC [2-3-3]
*Pre-requisite: EEE 233 Programmable Logic Controllers & EEE 331 Digital System Design*
This course presents advanced topics in programmable logic controllers. In addition to the use of advanced Control- instructions, Math-instructions and Logical-instructions in designing, it also discusses the state-diagram based design. Interfacing, configuring, operating and trouble-shooting of PLC with prototype-boards and with real-life application of process industry such as PID-controller etc are also included.

EEE 423 Advanced Microprocessors and Microcontrollers [2-3-3]
*Pre-requisites: EEE 224 Introduction to Microprocessor, & EEE 331 Digital System Design*
This course is intended to familiarize students with Microprocessor and Microcontroller features and difference between them. It provides the student with necessary theoretical and practical skills needed for microcontroller programming, designing and applications. The course also covers interfacing of real world applications like LEDs, Relays, Switches, ADCs and Motors etc. using Microcontroller.

EEE 431 Computer Control II [2-3-3]
*Pre-requisite: EEE 234 Computer Control I*
This course combines knowledge with hands-on experience, to enable students to learn the necessary skills to deal with real time control systems. Provide all aspects of PC interfacing and data acquisition systems from design and specification to programming, installation and configuration. The basics of DCS, SCADA and the field bus technology are also included.

EEE 432 Process Control Applications [2-3-3]
*Pre-requisites: EEE 233 Programmable Logic Controllers, and EEE 423 Advanced Microprocessors and Microcontrollers*
This course introduces the students to some core areas of control application being used in industry such as batch, boiler, SIS, ESD, DCS and advanced controls. It explains the principles and designing of the above systems using international standards.

EEE 433 Senior Project [0-6-2]
*Pre-requisites: EEE 321 Industrial Electronics, and EEE 423 Advanced Microprocessors and Microcontrollers*
The senior design project is the capstone design experience. The objective of the course is to provide the student an exposure to the design of a specific project and get experience from participating in the project development. It is also to integrate and strengthen students’ knowledge acquired throughout the curriculum. An extensive individual or group design or analytical project is performed in consultation with one or more faculty advisors. Students use contemporary engineering computer software in completing the design assignments and, write and present the project.
EEE 490 Co-operative Work Experience [0-40-3]

Pre-requisite: None

The cooperative training program involves placement of students in industries relevant to their academic and technical interests. During this training the students spend a period of 15 weeks in companies or industries and receive training in one or more of the following areas; product design and development, system upgrading or design modifications, project planning, reliability assessment, environment and safety, and total quality management. It gives them ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.

EEE 491 Co-operative Work Experience [0-40-3]

Pre-requisite: None

The cooperative training program involves placement of students in industries relevant to their academic and technical interests. During this training the students spend a period of 15 weeks in companies or industries and receive training in one or more of the following areas; product design and development, system upgrading or design modifications, project planning, reliability assessment, environment and safety, and total quality management. It gives them ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.
The mission of the department is to prepare graduates, equipped with job-oriented knowledge, skills, and problem-solving abilities to work as chemical engineering technicians, polymer engineering technicians, industrial chemistry technicians and technologists.

The department has established a set of objectives to fulfill its mission. These objectives are achieved through a set of well-defined tasks which focus on creating a conducive and stimulating educational environment. This includes developing and implementing innovative and responsive curriculum, teaching and learning strategies, outcome-based assessment, and continuous improvement process using state-of-the-art and well-equipped teaching facilities. In addition to curricular activities, students are continuously encouraged to actively participate in Engineering Project Competitions, Career Day Exhibitions, Chemical Open Day, and other extracurricular activities.

The department also plays an important role in developing the careers of practicing engineers, operators, technicians and other industrial trainees by organizing and delivering programs and courses tailored to the needs of the local industry and the community.

The CHE Department offers the following programs:

- **Associate of Science in Chemical Engineering Technology (CHET)**
- **Associate of Science in Polymer Engineering Technology (POLY)**
- **Associate of Science in Industrial Chemistry Technology (INCT)**
- **Bachelor of Science (BS) in Chemical Engineering Technology (CHET)**

### The CHET Program Educational Objectives (PEOs)

Graduates of the Chemical Engineering Technology Program will:

1. pursue a successful career in the field of chemical engineering technology;
2. work effectively as individuals or in professional teams to solve technical problems;
3. demonstrate effective communication skills;
4. enhance their professional skills by means of continuous education and development; and
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.
The CHET Student Outcomes (SO)

By the time of graduation, the students will demonstrate:

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

d. an ability to function effectively as a member of a technical team;

e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;

f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

i. a commitment to quality, timeliness, and continuous improvement.

The POLY Program Educational Objectives (PEOs)

Graduates of the Polymer Engineering Technology Program will:

1. pursue a successful career in the field of polymer engineering technology;

2. work effectively as individuals or in professional teams to solve technical problems;

3. demonstrate effective communication skills;

4. enhance their professional skills by means of continuous education and development; and

5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The POLY Student Outcomes (SO)

By the time of graduation, the students will demonstrate:

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

d. an ability to function effectively as a member of a technical team;

e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;
defined engineering technology problems;
f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
i. a commitment to quality, timeliness, and continuous improvement.

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Program Outcomes
Graduates of the program will be able to:

1. Apply knowledge of mathematics, science, chemical principles and concepts to solve industrial laboratory problems.
2. Safely and competently use laboratory apparatus and instruments.
3. Design and conduct chemistry experiments.
4. Use quality control techniques to differentiate between products and raw materials.
5. Analyze food and drugs for adulteration.
6. Use modern software for data gathering and analysis.
7. Work and communicate in cross-functional teams providing knowledge in his trade.
8. Work safely and maintain professional, ethical and social responsibilities at work place.

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(This Program Follows CTAB Guidelines)

Program Objective
The Associate of Science program in Industrial Chemistry Technology program will prepare graduates with the knowledge and skills to work as Industrial Chemistry Technicians. Graduates will have extensive training in sampling techniques, qualitative and quantitative analyses, use of analytical instruments, data analysis, and conducting chemistry experiments.

The Bachelor of Science program in Chemical and Engineering Technology program will prepare graduates with knowledge, skills and problems solving abilities to work as chemical engineering technologists and enter careers in chemical, petrochemical process industry and related fields. Graduates will have strengths in their knowledge of process plant operations, production, design, technical services and supervision.
The BS CHET Program Educational Objectives (PEOs)

Graduates of the Chemical Engineering Technology BS Program will:

1. pursue a successful career in chemical engineering technology or related fields;
2. be effective in the design of chemical engineering technology solutions and the practical application of chemical engineering technology principles;
3. effectively lead, work and communicate in cross-functional teams;
4. enhance their professional skills by means of continuous education and professional development; and
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The BS CHET Student Outcomes (SO)

By the time of graduation, the students will demonstrate:
By the end of the program, the students should be able to:

a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
d. an ability to function effectively as a member or leader on a technical team;
e. an ability to identify, analyze, and solve broadly-defined engineering technology problems;
f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
h. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
i. a commitment to quality, timeliness, and continuous improvement
j. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives; and
k. a knowledge of the impact of engineering technology solutions in a societal and global context.
The department is well equipped with modern, sophisticated instruments and equipment which support the hands-on training and skill development. The facilities enable students to acquire skills while making use of similar equipment currently used in the industry.

Facilities in Industrial Chemistry Technology

Laboratory facilities include not only conventional laboratory equipment, but also modern instrumentations such as the ones used in the fields of gas and liquid chromatography; ultraviolet, visible, infrared and atomic absorption spectroscopy and mass spectrometry.

**Analytical Chemistry Laboratory**
This laboratory provides facilities for using analytical procedures based on gravimetric analysis, volumetric titration, wet chemical methods and preparation of laboratory set ups to practice analytical methods.

**Instrumental Analysis Laboratory**
In this laboratory, students are trained in modern instrumental methods for qualitative and quantitative measurements, based on gas chromatography, liquid chromatography (HPLC), ultraviolet, visible and infrared (FTIR) spectroscopy. This laboratory is also equipped with latest instruments such as atomic absorption spectrophotometers (AAS), Gas Chromatography-Mass Spectrometry (GC-MS) to provide hands-on training in these specialized areas. They are also instructed on the preventive maintenance of analytical equipment and their calibration/standardization with reference samples.

**Corrosion Laboratory**
This laboratory provides opportunities for students to learn about Electrochemical Process, Electrolysis, Polymer coatings on metals and chemical cleaning of metals.

**Introduction to Macromolecules Chemistry Laboratory**
In this laboratory students will gain knowledge related to biopolymers such as carbohydrates, proteins, lipids, nucleic acids and industrial polymers.

**Physical Chemistry Laboratory**
In this laboratory students are trained with experiments related to chemical kinetics, chemical equilibrium, thermo chemistry and thermodynamics.
Facilities in Chemical Engineering Technology

The workshops and laboratories are equipped with extensive training facilities that include ultramodern Process Simulation Training System.

Chemical Reaction Engineering Laboratory
This laboratory has various facilities and equipment to serve a number of topics. These facilities include different types of reactors, Batch Reactor, CSTR, CSTR in Series Reactors, Plug Flow Reactor, Fluidized Bed Reactor, Catalytic Reactor, Mixing System and rate determination equipment.

Chemical Engineering Thermodynamics’ Laboratory
This laboratory is used to serve two courses in AS and BS programs. It consists of equipment and facilities that include Joule Thomson effect, thermal loop cycle, gas expansion system, bomb calorimeter, heat capacity of gases, mixing enthalpy, heat of formation, partial molar volumes, boiling point diagrams, miscibility gap in ternary systems, and dissociation equilibrium equipment.

Transport Processes/Unit Operations Laboratory
Facilities in this laboratory demonstrate the basic principles of fluid flow operations and heat transfer approach. These facilities include measurement of flow in closed channel, discharge measurements apparatus, Bernoulli’s theorem apparatus, Reynold’s apparatus and friction/energy losses through various pipe fittings; and heat transfer through composite materials, free and forced convections units, radiation unit and different types of heat exchanger equipment. These equipment/apparatuses may be run stand alone or through computer based mimic diagram and data logging system.

Process Plant Simulation Laboratory
This is a new laboratory with modern simulators where students learn the operation and applications of hands-on training of the units of a chemical plant in totality. There are one instructor station and 16 operator stations of Yokogawa Centum CS R3000 DCS simulators on which students are trained professionally on nine simulation models.

Instrumentation and Measurements Laboratory
In this laboratory, students learn principles of operation and applications of basic instruments used in process measurements and control, become familiar with the terminology used in instrumentation and control, learn the functions of basic measuring tools and finally, carry out simple calibration techniques for measuring and testing process control equipment. Facilities in this laboratory include: flow, level, temperature, pressure, and PH measurement and control along with sensing elements.

Chemical Engineering Computer Laboratory
This laboratory is equipped with a sufficient number of computers and software to serve a number of courses including Computer Applications in CHE, Process Simulation, Process Equipment, Process Control and Separation Processes. The software packages used in the laboratory include: Envision, UniSim, MATLAB, Computer Based Training (CBT), and Williams CDs.

Petroleum Refining Technology Laboratory
In this laboratory, students are introduced and become familiar with various crude oil and petroleum products tests, analysis of crude samples and product specifications. The experiments conducted in this laboratory include: API gravity, boiling range and
volatility, viscosity, aniline point, pour point, BS&W, flash point, centrifuge and neutralization of petroleum products.

**Process Equipment Laboratory**
This laboratory houses different types of equipment necessary to educate students on the basic principles and functions of process equipment used in industrial plants. These equipment items include valves (gate, globe, butterfly, check, ball and safety valves), pumps (centrifugal, gear and piston pumps), CBT software on boilers, and heat exchanger models.

**Environmental Laboratory**
This laboratory aims to teach the students basic techniques for chemical analysis of environmental samples including air and water. It includes wet chemical methods of analysis (e.g., biochemical oxygen demand and suspended solids) and instrumental techniques (e.g., gas analyzers, colorimeters). It also includes modules to demonstrate wind and solar energy.

**Separation Process Laboratory**
This laboratory houses mainly separation processes equipment, which consist of a computer-controlled distillation column and absorption column. It has also apparatuses for determining gas and liquid diffusion coefficients, mixing apparatus and different equipment designed and fabricated by CHET students during their project work.

**Facilities in Polymer Engineering Technology**
The laboratories are equipped with facilities that provide hands-on practice and experience in polymer synthesis, polymer analysis and characterization, polymer rheology, polymer processing, polymer compounding and polymer testing.

**Polymer Chemistry Laboratory**
This laboratory provides basic facilities for the qualitative analysis of organic compounds, identification and separation of polymers, polymer synthesis, and polymer modifications.

**Polymer Characterization and Testing Laboratory**
The laboratory is equipped with the necessary facilities used for characterizing and testing of polymer materials. The facilities in this laboratory include, Universal Testing machine (UTM), pendulum impact tester, Differential Scanning Calorimeter (DSC), Thermogravimetric Analyzer (TGA), FTIR-spectroscopy, glossmeter, color meter, light microscope, Vicat and HDT machine and stiffness tester.

**Polymer Processing Laboratory**
Experiments relating to processing of plastics materials are conducted in this laboratory. The laboratory is equipped with injection molding, single screw extruder, twin screw extruder, blown film unit, capillary
rheometer, compression molding, Melt Flow Index (MFI) and melting point machines.

Graduates of the Bachelor of Science in Chemical Engineering Technology program will be able to work as chemical engineers or technologists in the following fields:

- Chemical and petrochemical industries
- Petroleum refineries
- Water and waste water treatment industries
- Plant construction
- Production and maintenance
- Safety and environment
- Quality control
- Operator training

Graduates of the Associate of Science in Chemical Engineering Technology program will be able to work as process operators in the following fields:

- Chemical and petrochemical industries
- Petroleum refineries
- Water and waste water treatment industries
- Plant maintenance and supervision
- Production
- Product and equipment sales
- Health, Safety and environment

Graduates of the Associate of Science in Industrial Chemistry Technology program will be able to work as Laboratory technicians in the following fields:

- Chemical and petrochemical industries
- Plastics industries
- Food and agrochemical industries
- Pharmaceutical industries
- Water industry
- Health, safety and environment
- Government chemical laboratories
- Cosmetic industries

Graduates of the Associate of Science in Polymer Engineering Technology program will be able to work in the following fields:

- Polymer and Plastic Industries
- Chemical and Petrochemical Industries
- Laboratory and Quality Control
- Research and Development
- Product and Equipment Sales
- Plant and Process Operation
## Degree Requirements: Associate of Science in Chemical and Process Engineering

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*Students are required to take an elective course in the 2nd year level II. See page 167 for the list of electives.*
### ADDITIONAL DEGREE REQUIREMENTS: BACHELOR OF SCIENCE IN

#### 3rd YEAR LEVEL I

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#### 3rd YEAR LEVEL II

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* Students are required to take a non-technical elective in the 4th year level II. See page 168 for the list of electives.
### Degree Requirements: Associate of Science in

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**Total credit hours** 72

*Students are required to take an elective course in the 2\textsuperscript{nd} year level II. See page 167 for the list of electives.*
# Degree Requirements: Associate of Science in

## 1st Year Level I

<table>
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<tr>
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## 1st Year Level II

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### 2nd YEAR LEVEL II

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*Students are required to take an elective course in the 2nd year level II. See page 167 for the list of electives.*
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<th>Course Code</th>
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CHM 101 Laboratory Techniques [1-3-2]

*Pre-requisites: None*

Includes laboratory measurement techniques, separation techniques and laboratory automation techniques. Emphasizes on the safe analysis of industrial samples taking into account laboratory safety awareness and applications. Covers various solvent extraction, distillation, filtration, evaporation, crystallization and similar methods including viscosity, specific gravity, pH, melting and boiling points measurements.

CHM 102 Industrial Chemistry Principles I [2-0-2]

*Pre-requisite: None*

Covers significant figures, conversions/dimensional analysis, scientific notation, conversion factors, stoichiometry, solutions, gas laws and quantum chemistry. Emphasizes chemistry problem-solving, formulae and equations, reactions, bonding, gases, solutions and composition of compounds. Introduces the basic principles of industry chemistry with emphasis on industrial application of chemical principles.

CHM 111 Organic Chemistry I [2-3-3]

*Pre-requisite: GES 151 General Chemistry*

This course provides fundamentals concepts of knowledge essential to a thorough understanding of carbon compounds, its derivatives, both physical and chemical properties, and reactivity.

CHM 112 Inorganic Chemistry I [2-3-3]

*Pre-requisite: GES 151 General Chemistry*

Introduces atomic structure, covalent molecular substances, and main group elements. Covers catalysis and its industrial application.

CHM 121 Chemical Engineering Principles [2-0-2]

*Pre-requisite: None*

This course explains the basic concepts of units and dimensions used in process industries and introduces the concept of process variables, stoichiometry principles and basics of combustion. It prepares the students to formulate and solve material balances on non-reacting chemical process systems and lays the foundation for subsequent courses in thermodynamics, separation process, and kinetics.

CHM 122 Process Equipment [2-2-3]

*Pre-requisite: None*

The course gives an overview of important process
equipment which includes pumps, valves, heat exchangers, steam turbines, boilers, compressors, vessels and storage tanks. It comprises both theoretical and laboratory sessions. The lab session will be based on hands on training & interactive a computer-based training program as well as multimedia programs in the form of videos.

**CHM 131 Instrumentation & Process Control [2-2-3]**  
*Pre-requisite: CHM 122 Process Equipment*  
The course is divided into two parts: theory and practical. The theory aims to set the ground for the student to be familiarized with various instrumentation used in the chemical industry. It also covers the basic fundamentals of process control and control theory. The practical involves laboratory sessions on various control panels such as temperature, pressure, flow and level.

**CHM 141 Introduction to Polymer Technology [2-0-2]**  
*Pre-requisite: None*  
This course provides a general introduction to polymers and covers fields of polymer chemistry, polymer engineering technology, polymer processing and recycling industry. The course provides historical perspective; definitions, classifications and applications of polymers, structure of polymers and introduces polymer processing and recycling. Moreover, this course links polymer industry and production with petrochemical industry which provides the main building blocks of polymers (monomers).

**CHM 153 Polymer Materials [2-3-3]**  
*Pre-requisite: CHM 141 Introduction to Polymer Technology*  
This is a theoretical and practical course designed to enable students to acquire sufficient knowledge and skills in polymer materials. This course starts with an introduction to polymer materials and the polymer industry. The student begins to understand the important properties of polymers compared to other materials. Types of polymeric materials (plastics, elastomers, fibers, adhesives and coatings), major commodity and engineering polymers are covered.

**CHM 154 Polymer Science and Engineering [3-3-4]**  
*Pre-requisite: None*  
This course covers physical and mathematical principles required to solve engineering problems, basic concepts of polymer science and engineering, phenomena of glass transition temperature and crystallization, structure-property relation, and an overview of mechanical, electrical and optical properties.

**CHM 155 Polymer Chemistry [3-3-4]**  
*Pre-requisite: GES 151 General Chemistry*  
This is a theoretical and practical course designed to enable students to acquire sufficient knowledge and skills in polymer chemistry. This course provides an introduction to organic chemistry and the chemistry of polymers which acts as a basis for the understanding of the whole of polymer engineering technology. It begins with basic organic chemistry, basic concepts in polymer chemistry, and reaction types used to produce different polymers. Each major type of polymerization will be covered including addition, condensation, ionic and transition metal catalyzed polymerization.

**CHM 201 Organic Chemistry II [3-3-4]**  
*Pre-requisite: CHM 111 Organic Chemistry I*  
Includes a study of hydrocarbons, oxygen, nitrogen
and sulfur containing compounds. Emphasizes on reaction mechanisms, synthetic methods, their industrial importance and applications.

\textbf{CHM 202 Analytical Chemistry I [2-3-3]}
\textbf{Pre-requisite: GES 151 General Chemistry}
Provides lecture and intensive laboratory treatment of both the theory and practice representative of qualitative chemical measurements. Includes sampling and data handling, volumetric analysis, acid-base equilibria, acid-base titration, titration curves and gravimetric analysis. Emphasizes on the chemistry of analysis, calculations and laboratory techniques of classical and standard methods for the quantitative analysis of industrial samples.

\textbf{CHM 203 Instrumental Analysis I [2-3-3]}
\textbf{Pre-requisite: CHM 101 Laboratory Techniques}
Introduce instrumental methods of analysis involving Polarimetry, Refractometry, Introduction to spectroscopy, UV molecular absorption, Infrared spectroscopy, Photometry. Emphasizes on sample preparation for analysis, the setup and operation of the instrument and the interpretation of results, optimization, troubleshooting and maintenance of all instruments.

\textbf{CHM 204 Introduction to Macromolecule Chemistry [2-3-3]}
\textbf{Pre-requisite: CHM 111 Organic Chemistry I}
Serves as an introduction to the field of Macromolecule Chemistry. Covers natural organic biopolymers (e.g. deoxyribonucleic acid, starch, cellulose and hemoglobin) and synthetic organic polymers (e.g. PVC production as case study).

\textbf{CHM 211 Instrumental Analysis II [2-3-3]}
\textbf{Pre-requisite: CHM 203 Instrumental Analysis I}
Covers instrumental methods of analysis involving Introduction to chromatography, Gas chromatography, Liquid-liquid chromatography, Atomic absorption spectroscopy, Introduction to Mass spectrometry and Thermal Analysis. Emphasizes on sample preparation for analysis, the setup and operation of the instrument and the interpretation of results, optimization, troubleshooting and maintenance of all instruments.

\textbf{CHM 212 Quality Control [2-0-2]}
\textbf{Pre-requisite: None}
The course enables students to gain knowledge of quality control concepts and statistical calculations and serves the instructional needs of technology students as well as technical and industrial training objectives, instruction of manufacturing, quality, inspection, purchasing, and product design personnel. This course is divided into seven sections, which include data distribution, probability models, control chart principles, specification and tolerance limits, quality systems and ISO 9000. Moreover, sufficient theory is presented to ensure that students gain a sound understanding of the basic principles of quality control and substantial use of probability and statistical techniques is reduced to simple mathematics or is developed in different forms like tables and charts.

\textbf{CHM 213 Biochemistry I [2-3-3]}
\textbf{Pre-requisite: CHM 204 Introduction to Macromolecule Chemistry}
Provides the relevance of physical chemistry principles to biochemical processes. Includes the biochemical relevance of pH, application of thermodynamics to biochemistry, chemical and kinetics of enzyme-catalyzed reactions, metabolism and the
regulation of metabolic processes.

**CHM 214 Analytical Chemistry II [2-3-3]**
*Pre-requisite: CHM 202 Analytical Chemistry I*
Covers the complex formation reaction with amino carboxylic acid; effect of acidity on solubility of precipitates; the mass balance approach; effect of complexation on solubility; precipitation titrations; reduction-oxidation titration; titration involving iodine; electrochemical cells and electrode potential.

**CHM 215 INCT Project [0-4-2]**
*Pre-requisite: None*
Involves several steps such as: defining the project, setting objectives, gathering information, performing experiments, analyzing results, writing a report and an oral presentation of the finding. Emphasizes project planning and effective team work.

**CHM 216 Technicians Responsibility [1-0-1]**
*Pre-requisite: None*
Covers production process control, safety and communications. Includes; overview, plant operators, plant production and safety. Guides a technician or an operator to utilize his knowledge of a general plant operator responsibilities and specific responsibilities of outside operators and control room operators.

**CHM 218 Analytical Instrumentation [1-3-2]**
*Pre-requisite: None*
This course is specially designed and developed for electrical engineering students. Introduces instrumental methods of analysis involving pH and conductivity measurements, UV molecular absorption, infrared spectroscopy, gas chromatography. Emphasizes on sample preparation for analysis, the set up and operation of the instrument and the interpretation of results, optimization, troubleshooting and maintenance of all instruments.

**CHM 221 Computer Applications in Chemical Engineering [0-2-1]**
*Pre-requisite: MIT 170 Computer Applications*
The course will enable students to gain a background in using Microsoft Excel and MATLAB to solve simple to complex chemical engineering problems. The material involves only a practical approach using the two software packages to solve systems of algebraic and differential equations; material and energy balance calculations; chemical composition calculations; linear regression; and VLE data computations.

**CHM 222 Industrial Chemical Processes [2-0-2]**
*Pre-requisite: CHM 111 Organic Chemistry I*
The course will enable the student to gain thorough knowledge of several industrial chemical processes and their technology; analyze process flow sheet
alternatives for different industries; assess the inter-connection of equipment in process flow sheets; and recognize the environmental effects of these different industrial processes.

**CHM 223 Transport Processes [3-3-4]**
*Pre-requisite: GES 132 Fundamentals of Physics*
This course covers aspects of fluid mechanics and heat transfer. The fluid mechanics section includes fluid in motion, continuity equation, Bernoulli’s equation flow in pipes, Reynold’s number pipe fittings, pumps, and compressors. Heat transfer includes heat transfer mechanism, heat transfer through composite walls, radiation heat transfer, heat exchangers, flow patterns, LMTD calculation, heat load and fouling in heat exchanger.

**CHM 224 Reaction Kinetics and Reactors [2-3-3]**
*Pre-requisite: GES 113 Calculus I*
This course combines knowledge with hands-on experience, which enables students to learn the following: the reaction mechanism and kinetics, the various industrial reactor types and the design equation that are applicable to these reactors, industrial catalysis and classification. Laboratory experiments and the application of the Excel spreadsheet are used to solve reaction kinetics and reactor design problems.

**CHM 225 Chemical Engineering Thermodynamics I [2-2-3]**
*Pre-requisite: GES 132 Fundamentals of Physics*
The course introduces the basic concepts of thermodynamics in relation to the physical and chemical transformations that accompany many industrial processes. It covers the first and second laws of thermodynamics and their applications to heat engines, heat pumps and refrigeration.

**CHM 230 Process Plant Safety [2-0-2]**
*Pre-requisite: MME 103 Industrial Safety and Environment*
This course consists of basic knowledge of safety associated with chemical plants. It also introduces the various emergency procedures and safety problems in chemical plants. It is a course which will help students to learn safety considerations of different processes to enable the students to acquire skills to deal with various chemicals and related safety equipment.

**CHM 231 Petroleum Refining Technology [2-3-3]**
*Pre-requisite: CHM 111 Organic Chemistry I*
This is a theoretical and practical course designed to enable students to acquire sufficient knowledge to gain thorough knowledge of crude oil and its refining techniques, and some important secondary refining processed such as reforming, cracking, and hydrotreating. This course will also enable the students to perform different lab tests used in the petroleum refining.

**CHM 232 Separation Processes I [3-3-4]**
*Pre-requisite: CHM 223 Transport Processes*
This course introduces fundamentals of equilibrium-based unit operations frequently encountered in industry which include distillation and absorption. Distillation covers fractional, vacuum, steam, extractive, and azeotropic operations. The course also covers mixing processes and dimensionless numbers.

**CHM 233 Process Plant Simulation [1-3-2]**
*Pre-requisite: CHM 131 Instrumentation and Process Control*
The course will enable students to gain thorough knowledge on a process simulator, a user-friendly
computer simulated environment, which mimic real-time chemical plant operations; application of instrumentation and process control background for startup, shut down and troubleshooting operations on different processes using Yokogawa CS3000 Emulated DCS keyboard.

**CHM 234 Environmental Pollution Control Engineering [1-2-2]**

*Pre-requisite: CHM 111 Organic Chemistry I*

This course introduces the global aspects of environmental pollution and its social and economic impacts on the ecology. The course gives students an overall description of various engineering control devices used in petroleum and petrochemical industries to reduce and combat air, water and solid pollution. This will enable the students to evaluate and assess potential environmental hazards posed by industries; select appropriate types of pollution control devices among a host of devices available in the market; and familiarize themselves / or become familiar with legislation and acts issued by government and local authorities regarding pollution limits set for industry to follow.

**CHM 235 CHET Diploma Project [0-4-2]**

*Pre-requisite: CHM 131 Instrumentation and Process Control*

This course prepares the students to formulate and work with hands-on experience for chemical process system and lays the feedback of foundation for courses in unit operation, process equipment and instrumentation. The students are required to design and fabricate a working model of the process setup & use to test their project range ability for accuracy.

**CHM 236 Water and Waste Water Treatment Technology [2-3-3]**

*Pre-requisite: None*

This course covers all the fundamental proficiencies of water treatment, including laboratory testing, hydraulics, mathematics, chemistry, water transmission, disinfection. This course also serves as a highly illustrative reference featuring dozens of handy problem-solving tables that are invaluable for troubleshooting on site, and brief and simplified versions of water fundamental and laboratory tests, supplemented with common problems and possible solutions and mathematical problem-solving tools to help students diagnose problems throughout statistical calculations.

**CHM 237 Fundamentals of Corrosion [2-3-3]**

*Pre-requisite: None*

This course provides an understanding of corrosion fundamentals. It highlights problems arising from corrosion in industries. The course explains the basic corrosion mechanisms, types of corrosion, methods for its control and prevention and the various procedures of corrosion monitoring.

**CHM 238 Fertilizer Technology [3-0-3]**

*Pre-requisite: None*

This course provides the students with the basic knowledge about fertilizer processes; familiarize the students with the pollution control techniques applicable to the fertilizer industry; illustrate fertilizer processes through BFDs and PFDs; expands students’ knowledge on process equipment; enhance research skills and prepare students for a job in the fertilizer industries.
CHM 241 Industrial Polymerization [2-3-3]
Pre-requisite: CHM 155 Polymer Chemistry
This is a practical and theoretical course designed for studying polymerization in the industrial setting. The course discusses the kinetics and thermodynamics of polymerization reactions and their effects on industrial scale polymerization. Different reactor types and methods of polymerization are discussed. In addition, different lab experiments and techniques will be acquired during the laboratory work which is related to the concepts explained in the theoretical part.

CHM 242 Polymer Characterization and Testing [2-3-3]
Pre-requisite: CHM 141 Introduction to Polymer Technology
This course addresses the different techniques of polymer characterization and testing including data handling. The structural, thermal, mechanical, and chemical properties of polymers are described and the different modern techniques to measure these properties and molecular weight of polymers are discussed.

CHM 244 Polymer Processing I [2-3-3]
Pre-requisite: CHM 154 Polymer Science and Engineering
This course provides an introduction to polymer processing and polymer rheology. It covers the concept of polymer rheology on a simple level and gives a basic introduction into the main types of polymer processing techniques and their respective machineries. It deals with mixing and compounding of polymers and polymer additives. Basic equipment for mixing and compounding will be discussed. The practical aspect of the course will familiarize students with how polymers are processed and the major polymer processing methods.

CHM 251 Polymer Processing II [2-3-3]
Pre-requisite: CHM 244 Polymer Processing I
This course is designed to familiarize students with the main plastic processing techniques for converting polymer raw materials into plastic end products. It involves important plastic processing techniques such as injection molding, compression, blow molding, other molding techniques and a brief discussion of fiber reinforced plastics.

CHM 252 Polymer Engineering and Design [2-2-3]
Pre-requisite: CHM 242 Polymer Characterization and Testing
This course integrates the growing knowledge and experience of the student with some principles of polymer engineering, enabling him to understand how to design and develop commercial applications for polymers, with an emphasis on plastics.

CHM 253 Polymer Project [0-4-2]
Pre-requisites: CHM 242 Polymer Characterization and Testing or CHM 244 Polymer Processing I
Diploma Projects are assigned to small groups of students based on their theoretical and practical knowledge acquired during the program. Projects relating to polymer production (from synthesis to process flow diagram, material and equipment design), polymer testing and characterization, polymer processing; polymer blend and composite, etc. are assigned to students. A formal paper will be written and presented at the end of the project.

CHM 290 Co-operative Work Experience [0-40-3]
Pre-requisite: None
This is intensive on-the-job training program where
the student must spend a total of 15 weeks of working in industry. It gives students ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. It helps them undergo a process of transition from intense class room training to the working environment. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.

CHM 291 Co-operative Work Experience [0-40-3]
Pre-requisite: None
This is intensive on-the-job training program where the student must spend a total of 15 weeks of working in industry. It gives students ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. It helps them undergo a process of transition from intense class room training to the working environment. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.

CHM 292 Co-operative Work Experience [0-40-3]
Pre-requisite: None
This is intensive on-the-job training program where the student must spend a total of 15 weeks of working in industry. It gives students ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. It helps them undergo a process of transition from intense class room training to the working environment. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.

CHM 321 Process Heat Transfer [2-3-3]
Pre-requisite: CHM 223 Transport Processes
The course combines knowledge of theoretical as well as practical part of heat transfer that enable students to learn the different heat transfer operations and to acquire experience on various heat flow operations and heat transfer equipment. The course also covers the design of different types of heat exchangers, pinch technology and their integration in overall process plant. Further, the course provides thorough concepts on the operations of various heat exchanger types with proper heat utilization and optimization in process plant.

CHM 322 Mass and Energy Balances [3-3-4]
Pre-requisite: CHM 121 Chemical Engineering Principles
The course covers the principles of chemical engineering calculations. A review of the systematic methods of converting units and consistency and dimensional homogeneity of equations is carried out. The major part of the course deals mainly with systematic methods of formulating and solving mass
and energy balance equations for a batch or continuous process composed of single and multiple units, single and multiple phases, recycle, bypass and purge streams and phase changes. Tutorial sessions involve application of Unisim software to simulate and solve mass and energy balance problems.

CHM 323 Fluid Flow [2-3-3]
Pre-requisite: CHM 223 Transport Processes
The course provides a fundamental understanding in the properties, types (Newtonian and Non Newtonian) and behavior of fluids, the character of fluids at rest (fluid statics), and the nature of fluids in motion (fluid mechanics or dynamics) and types of flows (Laminar and Turbulent). The course enables the student to gain thorough knowledge in fluid mass and energy balances (Bernoulli equation) and friction in pipe flow and pipe flow problems. The course further enables the student to gain understanding of fluid flow through packed and fluidized beds. Further, the course thoroughly focuses on dimensional analysis and scale up concepts connected with fluid flow. Furthermore, the course emphasizes on centrifugal pump characteristics and compressible flow.

CHM 331 Chemical Process Technology [2-0-2]
Pre-requisite: CHM 222 Industrial Chemical Processes
By the end of the course students will be familiar with basic chemical process technology concepts, chemical process structures and various disciplines that are integrated in chemical processes. Process flow diagrams and various symbols used in flow schemes will also be given emphasis. Students will learn various industrial manufacturing processes such as the production of methanol, MBTE, polyethylene, and polypropylene, synthetic fiber, and mixed fertilizers; and about filters, dryers and various plant utilities.

CHM 332 Chemical Engineering Thermodynamics II [2-3-3]
Pre-requisite: CHM 225 Chemical Engineering Thermodynamics I
This course covers the basic concepts of thermodynamics, and the first and second laws of thermodynamics. The course emphasizes the application of thermodynamic laws and principles to non-flow and flow processes. It also covers the equations of state and generalized correlations as a source of generating thermodynamic properties of pure fluids and mixtures. Finally, thermodynamic analysis of the most important flow processes are carried out for the purpose of calculating their efficiencies.

CHM 421 Chemical Reaction Engineering [2-3-3]
Pre-requisite: CHM 224 Reaction Kinetics and Reactors
This course examines chemical reaction kinetics and interpretation of experimental rate data; relationship between kinetics and mechanisms, conversion, selectivity and yield; isothermal and non-isothermal design of reactors; catalysis and catalytic reactors; and determination of residence time distribution for non-ideal flow reactors; and reactor safety.

CHM 422 Process Control [2-3-3]
Pre-requisite: CHM 131 Instrumentation and Process Control
This course covers the following topics in chemical process control: manual and automatic control, components and mechanism of all control systems, incentives of a process control system, comparison
between simple feedback control and advanced control strategies and configurations, block diagram representation of a control system, regulatory and servo control, open loop and closed loop responses, classification of process variables in a control system, developing dynamic models of chemical processes, linearization of dynamic models, Laplace transforms and transfer functions, open loop response of first and second order processes, closed loop response and stability of feedback control systems.

CHM 423 Process Plant Design [3-3-4]
Pre-requisite: CHM 321 Process Heat Transfer and CHM 322 Mass and Energy Balances
This course includes the following topics: BFD, PFD, PID; areas of special concern in process design; materials selection for construction; the use of heuristics in process design; the use of pinch technology; and use of Hysys in process plant simulation, and economics associated with process design.

CHM 424 Process Simulation and Optimization [2-3-3]
Pre-requisite: CHM 322 Mass and Energy Balances
The course will enable the student to gain substantial knowledge and understanding in process modeling and simulation of typical chemical process systems such as single and multistage CSTRs, batch reactors, distillation columns, fluid flow and heating systems. The course will also enable the student to gain thorough knowledge in formulating and solving optimization problems of typical linear and non-linear programming problems with graphical and simplex methods, single variable optimization, and multivariable optimization with equality constraints and least squares curve fitting model to solve over-determined problems. The course will further enable the student to apply MATLAB software package for process simulation and optimization of typical process systems and units.

CHM 431 Process Operation Troubleshooting [3-3-4]
Pre-requisite: CHM 323 Fluid Flow
The course introduces concepts and tools of trouble shooting methodologies to identify and rectify problems and malfunctions in equipment and processes in chemical industries. It covers real examples of trouble shooting problems from industry with special emphasis on distillation column, reactors, pumps, compressors, heat exchangers and furnaces. Part of the course is practical training where students operate a pilot plant in order to identify and solve problems encountered in during operation of the plant.

CHM 432 Senior Project [0-6-2]
Pre-requisite: CHM 421 Chemical Reaction Engineering and CHM 423 Process Plant Design
The course is an application of all basic principles of chemical engineering to the process design of a chosen chemical product. The product may be a valuable intermediate petrochemical that can be processed into finished petrochemicals, an alternative fuel, a thermally stable polymer or a finished product. In the first stages of design, a process concept is developed with the advantages and feasibility of all alternative synthesis routes investigated. Upon deciding on the process description, a flow diagram is developed and material and energy balance calculations are carried out. The results of these calculations are validated by using a process simulation software package. In the following stages
of the design, individual pieces of equipment are sized properly according to known standards or heuristics and equipment special features are pointed out. In many cases, the design is supplemented by a layout of equipment together with a complementary HAZOP study showing the main control loops. Finally, process costs are estimated based on equipment sizes and mass flow rates of the raw materials and the economic feasibility of the process judged by determining the rate of return on investment.

**CHM 433 Separation Processes II [3-3-4]**

*Pre-requisite: CHM 232 Separation Processes I*

This course introduces binary and multicomponent distillation, liquid-liquid extraction with ternary systems, absorption and stripping, design of multi-stage multicomponent distillation systems, diffusion and mass transfer models and their applications to continuous contacting separation processes.

**CHM 491 Co-operative Work Experience [0-40-3]**

*Pre-requisite: None*

This is intensive on-the-job training program where the student must spend a total of 15 weeks of working in industry. It gives students ample opportunities to experience real working environment and enable them to apply some of the skills they had gained in the college. It helps them undergo a process of transition from intense class room training to the working environment. Students are evaluated on their performance and are required to give oral presentation and submit a report based on his training/field experience.
The mission of the department is to deliver quality Business and IT Education and Training Programs for students and individuals from industry and other sectors of the society.

In fulfilling its mission, the MIT Department has established a set of objectives relating to curriculum, students, faculty and resources and aims to achieve these by undertaking different departmental activities. This includes developing and implementing a responsive curriculum, teaching and learning strategies, outcome-based assessment, and continuous improvement process using state-of-the-art teaching facilities. These tasks contribute to creating a conducive and stimulating educational environment. In addition to curricular activities, students are continuously encouraged to actively participate in various extra-curricular activities.

The MIT Department is primarily involved in teaching and training in Marketing, Accounting, Office Management and Computer and Information Technology (COIT) subject areas. The Associate of Science (AS) programs of the MIT department are fully accredited by a leading business education accrediting body, the Association of Collegiate Business Schools and Programs (ACBSP), USA.

The main educational programs of the MIT Department are of three-year duration, offered to mainly full-time students in the college premises. The department's Associate of Science (AS) degree programs are offered in the following specializations:

- **Associate of Science in Accounting (ACTG);**
- **Associate of Science in Marketing (MKTG);**
- **Associate of Science in Office Management (OMNG);** and
- **Associate of Science in Computer and Information Technology (COIT).**

The **ACTG Program Educational Objectives (PEOs)**

Graduates of the Accounting AS Program, within a few years after graduation, will be expected to:

1. Pursue a successful career in the field of business and accounting;
2. Work effectively as individuals or in professional teams to accomplish tasks and solve
organizational problems in the area of accounting and finance;

3. Demonstrate effective communication skills;

4. Have enhanced their professional skills by means of continuous education and professional development; and

5. Demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The ACTG Student Outcomes (SOs)

Upon graduation, the students will demonstrate:

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to adequately defined accounting problems and practices;

b. an ability to apply a knowledge of accounting, quantitative methods and information technology applications in the field of accounting and finance;

c. an ability to conduct standard accounting and auditing tests and measurements for analyzing, examining, recording and interpreting financial statements and reports;

d. an ability to function effectively as a member of an accounting and financial management team;

e. an ability to identify, analyze, and solve adequately defined accounting, business and managerial accounting problems;

f. an ability to apply written, oral, and IT sound communications in both accounting and non-accounting environments; and an ability to identify and use appropriate accounting and financial management tools and techniques;

g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

i. a commitment to quality, timeliness, and continuous improvement.

The MKTG Program Educational Objectives (PEOs)

Graduates of the Marketing Associate of Science (AS) Program, within a few years after graduation, will be expected to:

1. Pursue a successful career in the field of business and marketing;

2. Work effectively as individuals or in professional teams to accomplish tasks and solve organiza-
tional problems in the field of business and marketing;
3. Demonstrate effective communication skills;
4. Have enhanced their professional skills by means of continuous education and professional development; and
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The MKTG Student Outcomes (SOs)

Upon graduation, the students will demonstrate:

a. an ability to apply the acquired knowledge, techniques, skills, and the use of analytical tools of the discipline to adequately defined marketing problems and practices;
b. an ability to apply a knowledge of marketing planning, customer service, marketing analysis and information technology to identify marketing related problems and work for solutions;
c. an ability to conduct marketing, sales and communications related standard tests, measurements and research approach for investigating, recording, analyzing and interpreting market data, reports and outcomes through presentations;
d. an ability to function effectively as a member of marketing team;
e. an ability to identify, analyze, and solve adequately defined marketing problems;
f. an ability to apply written and oral communication in a business work environment; and an ability to identify and use appropriate marketing management knowledge, techniques and skills;
g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
i. a commitment to quality, timeliness, and continuous improvement.

The OMNG Program Educational Objectives (PEOs)

Graduates of the Office Management AS Program, within a few years after graduation, will be expected to:

Department of Management and Information Technology JIC Bulletin 2016
1. Pursue a successful career in the field of office management;
2. Work effectively as individuals or in professional teams to accomplish tasks and solve organizational problems in the area of office management;
3. Demonstrate effective communication skills;
4. Have enhanced their professional skills by means of continuous education and professional development; and
5. Demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

The OMNG Student Outcomes (SOs)

Upon graduation, the students will demonstrate:

a. an ability to apply the acquired knowledge, techniques, skills and the use of modern equipment/devices to adequately defined office management processes and practices;

b. an ability to apply knowledge of organization, management, and information technology to solve basic and practical problems in the field of office management;

c. an ability to conduct standard tests and measurements for examining and analyzing uses of office technology equipment and processes;

d. an ability to function effectively as a member of an administrative and office support team;

e. an ability to identify, analyze, and solve adequately defined office management problems;

f. an ability to apply written, oral, graphical and electronic communication in non-technical or administrative environment; and an ability to identify and use appropriate office software programs and applications;

g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

i. a commitment to quality, timeliness, and continuous improvement.

The COIT Program Educational Objectives (PEOs)

Graduates of the Computer and Information Technology AS Program, within a few years after graduation, will be expected to:
1. Pursue a successful career in the field of computer and information technology;
2. Work effectively as individuals or in professional teams to solve IT and systems support problems;
3. Demonstrate effective communication skills;
4. Have enhanced their professional skills by means of continuous education and professional development; and
5. Demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

**The COIT Student Outcomes (SOs)**

Upon graduation, the students will demonstrate:

a. an ability to apply the acquired knowledge, techniques, skills and the use of modern tools to adequately defined information technology and IT support activities;
b. an ability to apply knowledge of computing, programming, basic electronics, networking, trouble shooting and computer technology to solve basic practical problems in the field of information technology and IT support activities;
c. an ability to conduct standard tests and measurements for configuration and troubleshooting, PC system administration and security, disaster recovery and maintenance;
d. an ability to function effectively as a member of a technical team;
e. an ability to identify, analyze, and solve narrowly defined information technology and IT support problems;

f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
i. a commitment to quality, timeliness, and continuous improvement.

The MIT Department is housed in a new two-storey, state-of-the-art circular-shaped brick and glass building.

The ground floor has accommodated:
- six (6) specialized computer labs
- two (2) IT labs
- one (1) office simulation lab
- one (1) MBA lab
- two (2) MBA classrooms
- one (1) MBA visiting faculty room
- five (5) single faculty office rooms
- three (3) large room for faculty offices
- one (1) store room
- five (5) sitting areas

The first floor has accommodated:
- six (6) classrooms
- five (5) large faculty office rooms
• seven (7) single faculty office rooms
• three (3) conference rooms
• six (6) computer labs
• MIT Chairman and Secretary’s offices
• four (4) sitting areas

Each classroom and conference room has a capacity of at most thirty five (35) students while a computer lab has a capacity of a maximum of twenty five (25) students (except for the specialized computer labs which is limited to fifteen students).

There are also two (2) small coffee shops for students in the ground floor.

The educational technological facilities used at the MIT Department include:
• Fully fitted computer labs with specialized equipment for some IT courses
• Instructional technologies like laptops and projectors
• Information network (Intranet and Internet)
• Internet and intranet connections for all student and faculty members
• SMART boards in classrooms and computer labs
• Student Information System (SIS)
• Wi-Fi hotspots for wireless connection all throughout the building

The faculty offices are equipped with PC’s, printers and supported by photocopiers. The department also has access to college equipment, facilities and services including electronic library and media services for printing and publishing. Textbooks and lecture materials are regularly reviewed for their relevance and appropriateness to the learning needs of students.

**Office Simulation Center**

The characteristics of the office environment has changed considerably in recent years, and with it, the role of the office workers. One of the major influences has been the increased reliance on electronic technology. Today, computers are utilized in telecommunications, Internet, information processing, reprographics, records management, and inventory control. With the existence of computer networks, these business functions have become more interdependent, necessitating the integration of systems and procedures.

These changes in today's office have created a demand for office workers with a broader variety of skills, an awareness of the interrelatedness of office functions, and knowledge of new procedures and terminology. In addition, today's employees are
expected to demonstrate good human relations skills, exercise sound judgment, be cost-conscious and apply time-management principles. The Office Simulation Center modules are designed to prepare students for employment opportunities in today's rapidly changing business environment.

The Simulation Center is designed to simulate the work environment where students can apply what they have studied theoretically to practical assignments and exercises.

**Specialized Computer Labs**

The MIT Department has established six (6) state-of-the-art specialized IT labs, designed to support the delivery of several courses that are part of the COIT Major (including PC Building Workshop, PC Troubleshooting Lab, Network Security Lab, Internetworking Lab, Data Communication lab and Network Operating System lab) and also, host industry courses of similar specialization.

As a dedicated environment, these specialized labs promote best practices and provide students with a rich and comprehensive hands-on experience, enabling them to learn respective subjects practically with training equipment and facilities that are currently unique in Saudi Arabia, including Computer Troubleshooting Trainers, Practical Network Cabling Systems and Practical LAN Trainers that are also supported by respective Instructor Modules.

It is expected that the Management and Information Technology programs will lead to meaningful careers in accounting, marketing, office management and Information Technology. MIT graduates of the AS programs will be able to work in the following fields of specialization.

Graduates of the Associate of Science in Accounting program will be able to work as Accounting technicians in the following fields:

- **Manufacturing Industry**
- **Banks**
- **Insurance and Finance**
- **Government ministries**
- **Accounting and Auditing firms**
- **Non Governmental bodies**
- **Stock exchange**
- **Real estate**
- **Retail and Distribution**

Graduates of the Associate of Science in Marketing program will be able to work as sales and marketing assistants and as sales-persons in the following fields:

- **Retailing and Wholesaling**
• Banking and Insurance
• Hospitality industries
• Manufacturing industries
• Government Ministries
• Travel and Tourism
• Telecommunication
• Marketing Research agencies
• Advertising agencies
• Marketing consultancies

Graduates of the Associate of Science in Office Management program will be able to work as administrative assistants, personal assistants, secretaries, typing and clerical staff in the following fields:

• Government Establishments
• Sales and Marketing
• Manufacturing and Retailing
• Information Technology
• Banking
• Construction
• Insurance
• Health
• Sports and Leisure
• Tourism

Graduates of the Associate of Science in Computer and Information Technology program will be able to work as Technical Support or Administrators of IT systems in the following fields:

• End-user Support
• Help Desk Support
• Personal Computing
• Networking
• System Administration
• IT Security
### Degree Requirements: Associate of Science in

#### 1st Year Level I

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<th>Credit</th>
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| MIT 290     | Cooperative Work Experience               | 0   | 40   | 3      | -       |
| **Total credit hours** |                              |    |      |        | 71      |

*Students are required to take an elective course in the 2\textsuperscript{nd} year level II. See page 201 for the list of electives.*
## Degree Requirements: Associate of Science in Accounting (ACTG)

### 1st Year Level I

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<th>Credit</th>
<th>Pre-req</th>
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**TOTAL** | **13** | **10** | **17** |

### 1st Year Level II

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**TOTAL** | **9**  | **16** | **16** |
### 2nd YEAR LEVEL I

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### 2nd YEAR LEVEL II

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* Students are required to take an elective course in the 2nd year level II. See page 201 for the list of electives.

**Total credit hours** 70
## Degree Requirements: Associate of Science in Marketing (MKTG)

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### 2<sup>nd</sup> YEAR LEVEL I

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### 2<sup>nd</sup> YEAR LEVEL II

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<th>Pre-req</th>
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*Students are required to take an elective course in the 2<sup>nd</sup> year level II. See page 201 for the list of electives.
### Degree Requirements: Associate of Science in

#### 1st Year Level I

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**TOTAL**                                               | **10** | **18** | **16** |

#### 1st Year Level II

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**TOTAL**                                               | **11** | **15** | **16** |
## 2nd YEAR LEVEL I

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## 2nd YEAR LEVEL II

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<tr>
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<tr>
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<td>COIT Project</td>
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<td>IT Safety Practices</td>
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<td>XXX xxx</td>
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*Students are required to take an elective course in the 2nd year level II. See page 201 for the list of electives.*
<table>
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<tr>
<th>Course Code</th>
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<th>Credit</th>
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<td>MIT 281</td>
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</table>
MIT 011 Introduction To Computer [0-1-1]
*Pre-requisite: None*
This course enables prep-year students to become familiar with modern computer hardware and software. It introduces them to basic concepts of computing, including widely used operating system and application package for word processing.

MIT 101 Management Theory and Practice [3-0-3]
*Pre-requisite: None*
This is a first level course and is designed to provide students with an understanding of the managerial functions of planning, organizing, leading, and controlling which the students will require in other advanced courses in their marketing, accounting, and office management majors. It will also provide a basic understanding of the organizational functions like human resource, marketing, accounting and operations management.

MIT 102 Elementary Arabic Typing [0-3-1]
*Pre-requisite: None*
This course is an introductory course for typing. It involves learning to type by the touch method. Practice exercises using “typing tutor program” are done in order to build and develop keyboarding, speed and accuracy and correct typing techniques. Students are introduced to type a minimum speed of (20 cwpm).

MIT 111 Office Management [3-0-3]
*Pre-requisite: MIT 101 Management Theory and Practice*
The course deals with the study of administrative principles, procedures, and technological competencies governing the modern office environment. It provides students with the knowledge, skills and proper attitudes to function effectively within a modern office environment. This is to prepare them for their future employment opportunities by equipping them with the technical and professional skills to perform effectively as clerical and administrative support personnel within an organization.

MIT 112 Elementary English Typing [0-3-1]
*Pre-requisite: None*
This introductory course involves learning to type by the touch method. Students will learn to master the basic keyboard skills and operations. Practice exercises are done in order to develop speed, accuracy and correct typing techniques. The minimum speed is set at 25 words per minute.

MIT 113 Arabic Word Processing I [0-2-1]
*Pre-requisite: MIT 102 Elementary Arabic Typing*
This course introduces the students to the basics of Arabic word processing and its terminologies. MS Word is used to demonstrate the preparation of documents and reports using the basic features of the software.

MIT 114 Arabic Business Correspondence [2-2-3]
*Pre-requisite: MIT 102 Elementary Arabic Typing*
This introductory course is aimed at developing transcription skills from dictated written or typed notes. The course emphasizes spelling, punctuation and sentence structure; in addition the course will cover the conventions of inter-company correspondence in Arabic.
MIT 121 Principles of Marketing [3-0-3]  
*Pre-requisite: None*
The course is designed to provide students with a broad understanding of today’s marketing concepts about creating customer value and building profitable customer relationships. The course starts with an understanding of customer needs and wants, customer groups and segments based on their characteristics, deciding on what target markets and what products and brands the organization can advertise and promote with adequate blending of price, product, place and promotion mixes to reach, win, keep and eventually grow targeted consumers. In order to deliver these broad understandings, the course will cover the fundamental concepts of marketing, marketing mix, actors and forces in marketing, consumer behavior, marketing communications, marketing channels, marketing information systems and direct and online marketing in building better customer relationships.

MIT 131 Marketing Management [3-0-3]  
*Pre-requisite: MIT 121 Principles of Marketing*
The course is designed to enhance students’ understanding of marketing principles, knowledge of marketing management approaches in order to advance their skills in using knowledge of marketing management and marketing strategies practiced by successful marketing companies and organizations. Therefore, the course is organized to provide a theoretical and practical understanding of marketing management. It includes the study of strategic planning and the marketing management process which is vital to satisfying consumer needs and wants in the market place. It will also focus on key aspects of international marketing.

MIT 122 Principles of Selling [2-3-3]  
*Pre-requisite: None*
The course is designed to provide students with the knowledge and understanding of selling processes, techniques and skills. It will focus on understanding buyer behavior, the importance of customer relationship strategy and developing understanding of communicating and negotiating skills, converting features into benefits, and business to business sales presentation skills.

MIT 141 Accounting I [2-2-3]  
*Pre-requisite: None*
This course introduces student’s fundamental principles of accounting. This explains the purpose, uses and users of accounting. Students are exposed to basic steps of accounting cycle that includes the preparation of general journal, ledger accounts and trial balance. It discusses the concept of double entry system through rules for debit and credit. The course provides sound understanding of various financial items to be included in Income Statement and Balance Sheet.

MIT 142 Principles of Economics [3-0-3]  
*Pre-requisite: None*
The course is designed to introduce the student to the basic ideas in the subject of economics. It deals with basic economic principles that help them understand the process of decision making by individuals and societies. The fundamental economic activities of production, distribution, exchange, and consumption at both the micro and macro level are being analyzed to make impressions upon the students the idea that all business activity occurs in an economic environment (macroeconomics) and all business decisions need to be analyzed in terms of their impact on the
profitability as well as the competitive positioning of the firm (microeconomics).

MIT 151 Accounting Practice I [1-2-2]  
**Pre-requisite: MIT 141 Accounting I**  
This is an entirely practice based course which combines knowledge of accounting principles and rules with advanced practices. The course reinforces students’ knowledge and understanding gained in accounting I by focusing on their grasp of double entry accounting system for assets, liabilities and capital, costs and expenses; maintenance of day books and nominal ledger management through practical exercises and assignments.

MIT 152 Cost Accounting [2-2-3]  
**Pre-requisite: MIT 141 Accounting I**  
This course is concerned with the studying of the principles of cost accounting and their applications within manufacturing business organizations. The first part of this course deals with the cost behavior and classifications as well as the accounting of direct materials, direct labor and overhead costs. The second part examines the main approaches in reporting, listing and preparing production costs. This part consists of the classifications and listing of both marginal and total costing besides the methods of absorption of overhead cost. The last part of this course is concerned with different types of costing, such as job costing, contract and service costing and process costing.

MIT 153 Introduction to Finance [2-2-3]  
**Pre-requisite: MIT 141 Accounting I**  
This course serves as a foundation course in the area of finance. The course is designed to familiarize the students with the theoretical underpinnings of modern finance as well as the industry practices in the area of corporate finance. The earlier part of the course provides an overview of finance and focuses on analyzing financial statements while the later part focuses on discounted cash flow analysis and bond financing.

MIT 161 Computer Systems Architecture [2-1-2]  
**Pre-requisite: MIT 012 Introduction to Computer**  
This fundamental course introduces the students to the theoretical concepts of hardware architecture of a computer system. It helps the students to understand how computer hardware works, functions and how the various hardware components are interconnected and integrated together. The modern computer system architecture and technologies are discussed and explained in detail.

MIT 162 End-User Applications [2-3-3]  
**Pre-requisite: MIT 012 Introduction to Computer**  
This course is designed for the students on the IT specialization track. It covers the concepts of IT, Word processing, Spreadsheet, Databases, Presentation, Information and Communication.

MIT 163 Programming Concepts [1-3-2]  
**Pre-requisite: MIT 012 Introduction to Computer**  
The course provides students with an understanding of the main programming concepts using high level computer language. The students will gain practical experience in developing programs. They will be introduced to modern programming concepts such as Object-Oriented programming.

MIT 164 Keyboarding [0-3-1]  
**Pre-requisite: None**  
This introductory course involves learning to touch
type. Students will learn to master the basic keyboarding skills with correct posture. Practical exercises are done in order to develop speed, accuracy and correct typing techniques. The minimum speed is set at 20 words per minute.

**MIT 169 PC Operating Systems [0-3-1]**  
*Pre-requisite: None*  
This course is to enable students to learn the basics of computer, hardware, software, and understand the functions and familiarize the use of operating systems.

**MIT 170 Computer Applications [0-2-1]**  
*Pre-requisite: MIT 011 Introduction to Computer*  
This course is designed for the students of both business and engineering disciplines. It covers basic information technology (IT) concepts, and focuses on developing skills in advanced features of word processing and spreadsheet applications.

**MIT 171 Data Communication and Networks [2-3-3]**  
*Pre-requisite: None*  
To introduce the concepts of Data Communication and Networking. Provide the essential knowledge of different types of Networks and equipment. Familiarize with LAN, MAN and WAN technologies.

**MIT 172 Relational Database Concepts and Design [1-3-2]**  
*Pre-requisite: MIT 162 End-user Applications*  
This course provides an understanding of modern relational database design and modeling techniques. Develop windows-based database applications. Use MS Access to save and manipulate data using SQL Queries.

**MIT 173 PC Building and Maintenance [0-3-1]**  
*Pre-requisite: MIT161 Computer Systems Architecture*  
This course provides hands on training on assembling, disassembling, maintaining and troubleshooting personal computer, associating peripherals, configuration and optimization, upgrading and repairing components from the perspective of a PC technician. It develops critical thinking and troubleshooting skills using special techniques to identify, troubleshoot and maintain the sources of basic hardware problems. This course helps the students to prepare for professional certifications.

**MIT 174 Multimedia and Web Design [1-3-2]**  
*Pre-requisite: MIT 162 End-user Applications*  
To provide students with hands-on-experience of graphics design and animation using Photoshop and Flash program. Create eye-catching animation and graphics. This course also provides students with an understanding of the Web technologies and tools to enhance a Web presence. The use of presentation of information in the design of a professional Web contents.
MIT 175 Soft Skills [3-0-3]
*Pre-requisite: None*
This course focuses on thinking skills, the difference between critical and creative thinking, the decision-making process, problem-solving mechanism, and keys to effective time management.

MIT 180 E-Communication [0-3-1]
*Pre-requisite: MIT 169 PC Operating Systems*
This is an introductory course to the concepts, methodologies and practice of electronic communication which familiarizes the students with the electronic transmission of information using computers and other electronic communication tools. It demonstrates how modern technologies enable them to enhance workplace communication and create professional business presentations.

MIT 201 Office Automation [3-0-3]
*Pre-requisite: MIT 101 Management Theory and Practice*
This course is designed for the students to explore the concepts of office automation and to provide them the knowledge of the basic components of office automation which will enable them to handle an array of office tasks that involves these components. Students will have the opportunity to practice how to plan, identify, organize, coordinate, analyze, and implement office automation systems including the selection of appropriate technology, hardware, software, communication equipment, and training human resources. The course also covers the administrative and technical concepts of the transformation process to office automation and the significance of the human impact during this process.

MIT 202 Intermediate Arabic Typing [0-4-2]
*Pre-requisite: MIT 102 Elementary Arabic Typing*
This course is a continuation of MIT 102 and focuses on developing speed and a greater degree of accuracy. The course brings the students’ basic typing skills up to an intermediate level. It includes practice exercises covering: letters; tables; business and statistical forms; manuscripts and legal forms. Students will have a minimum typing speed of 27 words per minute.

MIT 203 Organizational Behavior and Ethics [2-0-2]
*Pre-requisite: ELC 103 English III (Composition)*
The course is designed to provide students with an understanding and awareness of the various factors that influence individual and group behavior within organizations. It also explores the ethical aspects of decision making and behavior in the workplace.

The field of organizational behavior derives many concepts and methods from the behavioral and social sciences such as psychology, sociology, social psychology, and anthropology. In the workplace
today, a good understanding of the theory of human relations in organizations is essential. Some contemporary organizational issues include individual and group dynamics, motivation, leadership, organizational structure, morale, power, organizational change and development.

**MIT 204 Arabic Word Processing II [0-2-1]**

*Pre-requisite: MIT 113 Arabic Word Processing I*

This course is a practical course for those who are majoring in office management. The student will be introduced to all features of Microsoft Word. This course will provide the student with the skills, which are necessary to write professional documents, business reports, memos, and templates.

**MIT 205 English Word Processing I [0-2-1]**

*Pre-requisite: MIT 112 Elementary English Typing*

This course introduces the students to the basics of English word processing. Areas covered include terminology and preparing documents and reports using the features of word processor software.

**MIT 206 Personnel Administration [3-0-3]**

*Pre-requisite: MIT 101 Management Theory and Practice*

This course is designed to provide students with the knowledge and skills involved in managing people in organizations. It covers the main functions and activities of personnel administration which includes human resource planning, recruitment and selection, training and development, performance appraisal, reward and compensation management and motivation.

**MIT 211 Practical Office Management [2-2-3]**

*Pre-requisite: MIT 111 Office Management*

This is a practical oriented course, which consolidates the skills and competencies learned in previous courses. It further builds upon the skills at intermediate and graduate level required for individual and teamwork, basic office skills, and accountability. The main focus is on-the-job training in a simulated office environment setting focusing more and more on the latest development in modern office environment.

**MIT 212 Intermediate English Typing [0-4-2]**

*Pre-requisite: MIT 112 Elementary English Typing*

This course is a continuation of MIT 112 and focuses on developing speed and a greater degree of accuracy. The course brings the student’s basic typing skills up to an intermediate level. It includes practice exercises covering: letters; tables; business and statistical forms; manuscripts and legal forms. Students will have a minimum typing speed of 27 words per minute.

**MIT 213 Arabic Spreadsheet [0-2-1]**

*Pre-requisite: None*

This course provides students a practical and theoretical knowledge of Arabic electronic spreadsheet. Topics for this course include mastering the worksheets, creating database and producing graphical presentation. Students are also expected to utilize the formula and other features for calculations and numerical data analysis. The user interface language is Arabic.

**MIT 214 English Spreadsheet [0-2-1]**

*Pre-requisite: None*

This course provides a basic understanding of Excel, Microsoft’s powerful spreadsheet application program. Topics include the Excel environment, entering and editing data, using simple and complex
formulas, using functions, formatting text and numbers, working with multiple worksheets, creating charts and graphics, managing databases, and printing spreadsheets. This course will give student hands-on experience in using the MS-Excel program for doing the office related activities like accounting, budgeting, inventory management, book keeping and generating financial reports.

MIT 215 Management Information System [3-0-3]
**Pre-requisite: None**
This course focuses on the fundamental knowledge of IS principles and practices with which every business student should be familiar with. The course is designed to enable students to learn the basic principles and methods of Information Systems with particular emphasis to IS principles that are useful to students as they face career challenges in modern organizations. It is also designed to help the students acquire skills of preparing database and brief reports using the MS Access package. The course also prepares the student to observe and write report on MIS practices of a small or medium size organization.

MIT 216 English Word Processing II [0-2-1]
**Pre-requisite: MIT 205 English Word Processing I**
This course prepares students in creating routine text documents to sophisticated mail merges and desktop published newsletters. Students acquire knowledge in using built-in templates for creating common documents such as memos, letters, resumes, etc. and wizards to create customized new documents.

MIT 217 Business English Correspondence [2-2-3]
**Pre-requisite: ELC 205 Technical Writing**
This course aims to equip learners with the requisite skills and capability so that they are able to transform themselves into competent and effective communicators in Business English. It adopts a holistic yet an applied methodology in order to ensure that learners acquire knowledge in the fundamentals of communication as well as attain specific skills of how to devise appropriate, often, appealing means of communication such as letters, job application letters and resumes.

MIT 221 Marketing Communication [2-3-3]
**Pre-requisite: MIT 121 Principles of Marketing**
The course will introduce students to the critical role played by advertising and promotion in the marketing activities of an organization. All the promotion mix tools are considered and students will be able to develop an integrated marketing and sales communications and promotion plans by using their acquired skills and understanding of these communication tools.

MIT 222 Retail Sales and Marketing [3-0-3]
**Pre-requisite: MIT 132 Principles of Selling**
The course will develop students’ understanding of the role of marketing in retailing and will also cover
all major aspects of retail selling. Topics covered include environment of retailing, retail buyer behavior, the marketing mix for retailing, retail selling, retail marketing planning and online retail marketing, retail location, retailing theories and principles, competitive nature and growth of ‘brick’ (supermarket) vs. ‘click’ (online shopping) based retailing.

**MIT 223 Consumer Behavior [3-0-3]**  
*Pre-requisite: MIT 121 Principles of Marketing*  
The course is designed to provide students with an understanding of theories and applications relating to consumer behavior. It will emphasize that effective marketing strategies require an understanding of consumer needs and wants. Personal, social, cultural, psychological and situational influences will be examined along with their marketing and sales implications in terms of consumer behavior principles and processes.

**MIT 224 Services Marketing [3-0-3]**  
*Pre-requisite: MIT 131 Marketing Management*  
The course recognizes the vital role that Services Marketing play in the Saudi economy and in other economies of the world. The main theme of the course is that service organizations like banks, restaurants, hotels, hospitals, educational institutions, professional and community based service organizations, require a distinct approach to marketing strategy both in their planning, organizing and implementation stages. The course will expand on concepts general marketing theories and tools studied in the Principles of Marketing.

**MIT 225 Public Relations [3-0-3]**  
*Pre-requisite: None*  
Public relations are an integral part of communications and play a vital role in the overall effort to achieve a firm’s objectives. Public relations is a course that stress upon developing better relations with not only the customers but also with the community, government, politicians, and all groups that have some stake in the affairs of business, like the distributors, and employees, among others. The goal of PR is to achieve better relations with all these groups through factual and correct information. Public relation teaches the monetary and economic benefits of coordinating communication activities around all these groups. The most challenging aspect of the course is the teaching of communication skills used in contemporary media channels and to draw publics’ attention to achieve targeted objectives and build organizations’ image. Public relation develops synergies in the overall marketing activities of the firm.

**MIT 231 Industrial Sales and Marketing [3-0-3]**  
*Pre-requisite: MIT 131 Marketing Management*  
This course will focus on marketing and sales related issues in business to business (B to B) environment involving industrial enterprises and organizations. The course covers issues of marketing and sales related challenges faced by industrial and organizational customers. This will include studying marketing practices unique to the marketing of goods and services to industrial customers, by using marketing tools such as segmentation and targeting, relationship strategies, supply chain management, business logistics management and developing organizational customer fit strategies. The nature of industrial marketing and selling also highlights understanding of industrial buyer behavior, industrial services, industrial marketing communications, pricing strategies and building long term relationships with industrial and organizational customers.
MIT 232 Marketing Research [2-3-3]
Pre-requisites: GES 112 Statistics and MIT 214 English Spreadsheet
This course examines the process of collecting and analyzing data to support marketing decisions. It emphasizes the process of designing marketing research which includes marketing and selling related problem definition, questionnaire design, sampling, collection of data, and the analysis, interpretation and presentation of secondary and primary data using Excel and SPSS software.

MIT 241 Accounting II [2-2-3]
Pre-requisite: MIT 141 Accounting I
This course is second of the two accounting courses. The course aims to develop and strength basic accounting concepts and takes students further to advance topics of financial accounting. This explains the importance and purpose of internal control. The students will be exposed to accounting for cash, receivables, fixed assets, and current liabilities including payroll.

It provides sound understanding of accounting for partnership and corporate businesses. The students will learn accounting for partnership and corporate businesses with special emphasis to stockholders’ equity items of corporate balance sheet.

MIT 242 Accounting Information System I [2-2-3]
Pre-requisite: MIT 151 Accounting Practice I
This course is an introduction to management information systems with an emphasis to accounting information system (AIS). The students will have the knowledge required to make informed business decisions about the application of information technology. It explains how accounting activities are implemented and integrated in manual and computer-based accounting information systems. It discusses in detail the transaction processing in AIS, internal control, business process management, systems development life cycle, document techniques including flow charting and data flow diagrams.

MIT 243 Managerial Accounting [2-2-3]
Pre-requisite: MIT 152 Cost Accounting
This course is mainly concerned with the studying of the principles of managerial accounting and their applications within manufacturing and service business organizations. The first part of the course deals with importance and purpose of managerial accounting and helps students use the acquired knowledge to take decisions in a complex business environment. The second part examines the main approaches in system design; mainly job-order costing and process costing. The third part deals with cost-volume-profit relationship and profit planning. The fourth part covers segment reporting, decentralization and capital budgeting. This course provides students with the knowledge of blending accounting and financial issues with managerial decisions.

MIT 244 Business Law [2-0-2]
Pre-requisite: None
This course includes knowledge, process and practices business law and legal environment of business. The course is designed to enable students to learn the basic methods and processes of law applied to business organizations, buyers and sellers. It is also designed to help the students acquire skills reasoning on the basis of legal arguments in small case situations or illustrations. Also this course will help them to learn legal terminology applied in business organizations and individuals as customers and employees.
MIT 251 Accounting Practice II [1-2-2]

*Pre-requisite: MIT 241 Accounting II*

This is an entirely practice based course which combines knowledge of accounting principles and rules with advanced practices. The course reinforces student’s knowledge and understanding gained in accounting I & II and Accounting Practice I by focusing on student’s grasp of the accounting cycle by providing practical exercises and assignments.

MIT 252 Auditing And Financial Control [3-0-3]

*Pre-requisite: MIT 151 Accounting Practice I*

The aim of this course is to familiarize the student with the modern auditing theory and practice. The course will compare UK and Saudi Arabian auditing standards and application and the background legal framework auditing operates. The course is designed to introduce the student to the generally accepted auditing standards and identify Saudi auditing practice or legal requirement that is different from that accepted elsewhere in the world.

MIT 253 Accounting Information System II [2-2-3]

*Pre-requisite: MIT 242 Accounting Information System I*

Accounting Information System II is the continuation of Accounting Information System I (MIT 242) and is designed to introduce computer technology as it relates to design, implementation, and operation of accounting information systems. The objective of this course is to familiarize students with (1) accounting information systems (AIS) and their components; (2) the transformation of raw financial data into financial information by AIS; (3) the use of internal controls to assure the accuracy and reliability of accounting data and information; (4) the systems analysis, design, and implementation cycle; and (5) the utilization of a variety of software packages and integrated systems such as SAP.

MIT 254 Government Accounting [1-2-2]

*Pre-requisite: MIT 151 Accounting Practice I*

The present course is mainly concerned with the studying of the logic behind and nature of all the funds and non-fund accounts associated with the government. It specifically deals with the principles and application of government accounting, budgetary planning and control within the context of accounting for local and government enterprise system and processes, divisions of public and government budgets, government funds and expenditures, capital projects and debt services funds within government systems, assets, liabilities and permanent funds of public enterprises.

This course also deals with the financial reporting and internal control within governmental accounting systems of public enterprises. The conceptual frameworks of governmental accounting will be integrated...
with the application of accounting within Saudi government enterprise in order to enhance student's understanding and skills within the practices of public accounting process and application.

MIT 261 Network Operating Systems [2-3-3]
*Pre-requisite: MIT 171 Data Communication and Networks*
To provide students with hands-on experience, skills, and knowledge to install and configure a network operating system.

MIT 262 PC Configuration and Troubleshooting [1-6-3]
*Pre-requisite: MIT 173 PC Building and Maintenance*
This course prepares the students to support a variety of desktop operating systems used on personal computers. It explains the generic functions of any operating system running on a PC and how the OS is related to the user, applications, and hardware. The course also explains the concepts, tools, methods and techniques that are used to install, maintain and troubleshoot the OS running on a PC. Some basic network configuration is also covered.

MIT 263 Internet Services Management [2-3-3]
*Pre-requisite: MIT 171 Data Communication and Networks*
This course introduces students to the use and application of various network protocols used in Internet. The course covers the Internet services based on the TCP/IP protocol suite.

MIT 264 Enterprise Resource Planning [3-0-3]
*Pre-requisite: None*
This course introduces the concepts of integrated business functions and the fundamentals and principles of ERP. It develops an understanding of how these business functions fit together in an overall framework for enterprise resource planning (ERP). This course introduces the software approach to ERP through SAP. It provides a level of hands on experience in both functional and technical areas of SAP.

MIT 270 Database Applications [0-3-1]
*Pre-requisite: MIT 012 Introduction to Computer*
This course is a practical course for those who are majoring in office management, marketing and accounting. This course provides knowledge and skills on creating and designing database tables, implementing and modifying database management system, data entry, querying databases, creating forms and reports.

MIT 271 Disaster Recovery [2-3-3]
*Pre-requisite: MIT 262 PC Configuration and Troubleshooting*
To provide the students with the knowledge and skills required to identify vulnerabilities and threats, and implement appropriate countermeasures to recover in case of a disaster. It focuses on techniques to measure risks; avoid disasters and design disaster recovery solutions and plans.

MIT 272 End-User Support [2-3-3]
*Pre-requisite: MIT 262 PC Configuration and Troubleshooting*
To provide the students with a comprehensive set of tools and techniques needed to identify and resolve various IT problems end-users face. Learn technologies used in Help Desk and computer support. Students will also acquire skills for troubleshooting computer problems and address the needs of end-
users. They are introduced to the standard practices in End user support.

**MIT 273 System Administration [2-3-3]**
*Pre-requisite: MIT 261 Network Operating Systems*
To provide the students with a comprehensive understanding of Operating Systems hands-on exercises to develop the skills needed to implement Microsoft Windows-based Operating Systems in a client / server environment. The course covers a wide range of concepts and technologies related to Microsoft based client/server network operating systems.

**MIT 274 Computer and Network Security [2-3-3]**
*Pre-requisite: MIT 261 Network Operating Systems and MIT 263 Internet Services Management*
This course provides the knowledge and skills required in the area of IT security. It focuses on how to deploy security countermeasures to protect computers and networks. The course deals with Computer Security principles, ethical hacking and security tools and techniques.

**MIT 276 IT Safety Practices [1-0-1]**
*Pre-requisite: None*
This course provides students with an awareness of the best safety practices applied within an IT environment based on international standards.

**MIT 277 Project Management [2-3-3]**
*Pre-requisite: None*
To provide an overview of the roles, responsibilities, and management methods of the technology project manager. The course assumes no prior knowledge in management techniques. It is intended to teach students how to develop approaches and styles of management for software projects. The course assumes a basic understanding of techniques and analysis.

**MIT 279 Wireless Technology [2-4-3]**
*Pre-requisites: MIT 163 Programming Concepts and MIT 171 Data Communications and Networks*
This course provides students with an understanding of how wireless communication systems function. Also, students are taught how early cellular systems have migrated to digital networks. It provides the basics of building wireless systems in various topologies – WPAN, WLAN, WMAN and WWAN. It focuses more on WLAN implementation.

**MIT 281 Distributed Systems [2-3-3]**
*Pre-requisites: MIT 171 Data Communication and network and MIT 172 Relational Database Concepts and Design*
This course introduces students to the use of data and information in an enterprise-wide operation. Understand the technology at the center of collecting, storing, manipulating and distributing data in an organization. To understand the fundamentals of the collection of separate but linked processors and/or data stores. To familiarize students with the technology used to link sites which have data stored over different geographic location.

**MIT 282 COIT Project [0-4-2]**
*Pre-requisite: None*
This course enables the students to undertake a project applying the knowledge and skills acquired in their specialized field. Also, it enhances the students to develop an ability to define clear project goals and create a work breakdown structure for project activities.
MIT 290 Cooperative Work Experience [0-40-3]
*Pre-requisite: None*
*(Office Management Major)*
Participate in work place duties, tasks and assignments as a co-op trainee and complete weekly reports and prepare & submit a complete written report as per Coop manual and make presentation on workplace/job experience and skills/concepts/methods learned.

MIT 291 Cooperative Work Experience [0-40-3]
*Pre-requisite: None*
*(Marketing Major)*
This is intensive on-the-job training program where each student spends fifteen weeks of working in a company/organization or an industry. It gives students ample opportunities to experience real life working environment and enable them to apply some of the skills they had learned at the college, and acquire workplace operational skills. It helps them undergo a process of transition from intense classroom and lab training to working in organizational/industrial environment. Students are evaluated on their performance at the workplace by their supervisors and also through a written report on acquired knowledge and skills and weekly reports, including an oral presentation (preferably using power points) on workplace knowledge and skills learning experience, evaluated by a faculty committee.

MIT 292 Cooperative Work Experience [0-40-3]
*Pre-requisite: None*
*(Accounting Major)*
Participate in work place duties, tasks and assignments as a co-op trainee and complete weekly reports and prepare & submit a complete written report as per Coop manual and make presentation on workplace/job experience and skills/concepts/methods learned.

MIT 293 Cooperative Work Experience [0-40-3]
*Pre-requisite: None*
*(Computer Information Technology)*
Participate in work place duties, tasks and assignments as a co-op trainee and complete weekly reports and prepare & submit a complete written report as per Coop manual and make presentation on workplace/job experience and skills/concepts/methods learned.

MIT 299 Computer Programming [1-3-2]
*Pre-requisite: None*
This course provides students with an overall background of the concepts that must be present in a typical programming language. The students will have an understanding of the main programming concepts in both structured programming and event-driven programming. The students will gain practical experience using C++ programming languages. They will be provided with the background on the modern programming methods such as object-oriented program construction.

MIT 370 Computer Programming in Visual Basic [1-3-2]
*Pre-requisite: MIT 011*
This course assumes no prior knowledge of programming and provides students with the required foundation to develop application solutions in their specialization. The students will learn how to analyze & decompose a problem and formulate an algorithmic solution using pseudo code. Together with modern programming methods such as object-oriented program construction, students will gain an
understanding of event-driven programming, through practical experience using Visual Basic programming language.

**MIT 410 Organization and Management [2-3-3]**  
*Pre-requisite: MIT 203 Organizational Behavior and Ethics*  
The course presents the fundamentals of management principles to undergraduate students in a straightforward manner. The course develops students’ skills such as: decision-making, planning and organizing, working in diverse groups and teams, staffing, employee motivation, leadership, conflict management, and other essential skills that are needed to become a successful manager.

**MIT 412 Industrial Sociology [1-3-2]**  
*Pre-requisite: MIT 203 Organizational Behavior and Ethics*  
This course introduces to students the sociology discipline, primarily on the interplay of sociological theories and applications. It fosters appreciation of such sociological concerns as sociological analysis of work and industry, work and society, organizations and workplaces, changing organizations and management of work, occupations and society, work experiences, opportunities and meanings, conflict, challenges and resistance in work.

**MIT 413 Environment and Society [1-3-2]**  
*Pre-requisite: None*  
This course focuses attention on human environment relations and connects issues concerning human societies, ecological systems and environment with data and perspectives from different fields of study in the natural and social sciences.

**MIT 430 Engineering Economics [2-0-2]**  
*Pre-requisite: GES 314 Engineering Mathematics*  
This course presents the methods of economic analysis in engineering that systematically evaluate the costs and benefits of technical project proposals. Students will be exposed to the different economic and financial concepts and techniques that include the time value of money, economic equivalence, measures of worth of investment, rate of return of investment, investment risk assessment, and capital budgeting. These will enhance their understanding of the factors that affect the economic success of engineering projects, to the end, will enable them to formulate recommendations that will ensure the best use of capital.
The NDT Testing and Evaluation has been added as an academic discipline to the existing disciplines of the College. NDT Training Center has been providing a focused education that integrates the best of theory and practical applications. Training and certification are in accordance with the recommended practice SNT-TC-1A and CP-105, 2011 edition of the American Society of Non-Destructive Testing (ASNT). The training module includes major conventional NDT methods like Penetrant testing, Magnetic Particle testing, Radiography testing, Ultrasonic testing, Eddy Current Testing and Visual Testing to advanced NDT methods such as Phased Array Ultrasonic Testing (PAUT), as well as Time of Flight Diffraction (TOFD). The training on Electromagnetic Testing and IRIS (ET, MFL, RFT & UT) for Tube Inspection using MS-5800 has also been well received by the industries.

The core mission of NDT Training Center, as has always been the case, is to qualify the workforce needed for the Kingdom industries in NDT inspection. The NDT graduates are very much needed by the industries because they possess the specified certifications and knowledge in maintaining the integrity of their engineering systems and the safety and well-being of the final products.

NDT Center has been offering the short courses especially to the employees from the various industries to upgrade themselves with the new skill and certification. The short courses offered are International certifications like AWS-CWI Seminar & Examination, ASNT Level I & II in Conventional NDT’s and tailors made courses of Advanced NDT to cater the industry need.

All of the teaching staffs are highly qualified and certified in various methods by International Certifying Bodies and according to international standards, like EN ISO 9712, American Society of NDT (ASNT) & American Welding Society (AWS).

The NDT Training Center offers the following:

- **Associate of Science in Non-Destructive Testing and Evaluation Engineering Technology (NDTE)** - under the Department of Mechanical and Manufacturing Engineering Technology
- **NDT Certification Courses**

The main objectives of JIC-NDT is to develop the local workforce to meet the increasing demand for a qualified NDT and engineering personnel in the Kingdom and to exchange the ideas and technical NDT knowledge.

Inspection techniques are required at various industrial applications and fields like steel production, construction, operation and during shut down maintenance of various engineering systems. Technical inspection by Non Destructive Testing (NDT)
has become an important tool in the preventive maintenance & new construction of almost all engineering systems. In some area like aircraft maintenance, NDT is the only technique applied for determining the integrity. NDT has always been under the focus and rapid development both in finding new area of applications and advancement in testing systems. NDT is becoming widely accepted practice driven by the needs of modern industries around the globe.

The principle of examination using NDT is to detect defects (inhomogeneity in metal structures like crack, inclusion, voids, etc. in the surface and underneath) and if necessary to assess defect sizes and corrosion in metals without affecting the serviceability of the component being tested. These defects are inherited during manufacturing stages or introduced in-service in a stationary or mobile engineering systems like oil/gas, petrochemical plants, power plants, aircraft and shipping industries, etc. Some NDT methods are specially used to identify physical properties of metal and degree of electrical conductivity.

Students are exposed to major NDT techniques covering the conventional methods, semi-automated & automated methods foreseeing the future generation inspection requirements. The training provided is well exceeding the basic training period recommended by most of the Industrial & renowned International agencies (ASNT & PCN) NDT training guidelines. Extensive & Intensive coverage of the technique builds in the confidence & insight required for a NDT Personnel. A proactive approach with a structured training of industrial working culture helps the student to practice the tone well in advance to employment.

On 2013, JIC has launched a new major, the Associate of Science Degree Program in Non-Destructive Testing and Evaluation Engineering Technology (NDTE) in Semester 341 (September, 2013). It was prepared in response to the job market demands led by Saudi ARAMCO.

The program is aligned with the classroom training requirements of ASNT - American Society for Non-Destructive Testing.

Graduates of the program will be able to enter a career rich with institutional certifications. The 72 credit-hour program is fully compliant with ABET, the Accreditation Board for Engineering and Technology, for its structure (curricula contents and composition), educational objectives and the students outcomes, that will facilitate program accreditation by ABET when it is sought.

The allocation of the program credit hours is: two-thirds of it owes to technical courses, while the remaining one-third to non-technical courses.

The industry feedback was received during the design of the program. Saudi ARAMCO positively vetted the contents and more than 90% of the industry respondents in a conducted survey favored an NDTE major in the College.

The program was benchmarked with similarly named programs inside and outside of the kingdom with
satisfactory results; the contents were relevant and appropriate to the program educational objectives.

**The NDTE Program Educational Objectives (PEOs):**

Graduates of Non-Destructive Testing and Evaluation Engineering Technology program will:

1. pursue a successful career in the field of non-destructive testing and evaluation
2. work effectively as individuals or in professional teams to solve technical problems;
3. demonstrate effective communication skills;
4. enhance their professional skills by means of continuous education and development;
5. demonstrate professional and ethical responsibilities towards their profession, society and the environment as well as the respect for diversity.

**The NDTE Students Outcome (SOs)**

By the time of graduation, the students will demonstrate:

a. an ability to apply the acquired knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

c. an ability to conduct standard tests and measurements, and to conduct, analyze and interpret experiments;

d. an ability to function effectively as a member of a technical team;

e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;

f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

i. a commitment to quality, timeliness, and continuous improvement.

NDT Training Center also offers certification courses in the following areas:

- **Penetrant Testing**
- **Magnetic Particle Testing**
- **Visual Testing**
- **Radiography Testing**
- **Ultrasonic Testing**
- **Eddy Current Testing**
- **Electromagnetic Testing**
- **Phased Array Ultrasonic Testing (PAUT)**
- **Time of Flight Diffraction (TOFD)**
- **Certified Welding Inspector (AWS-CWI)**
The students undergo extensive hands-on training experience with wide range of equipment and samples which is a distinguished feature of JIC-NDT training. The laboratories and workshops are provided with the latest and modern equipment & samples to impart knowledge and technical skills necessary for fresh graduates to work in Industrial environment immediately after the graduation.

The major facilities of the NDT Training Center include:

**Introduction to NDT**

This is an induction program designed for the newcomers to the field of Non destructive testing. This will guide the students through the various NDT methods. The course will emphasize the basic principles, advantages and limitations of the conventional NDT methods, defects associated with the manufacturing processes, destructive testing and the different personnel certifications available globally that can be chosen in a professional NDT career.

The course will also outline the common NDT practices with practical demonstration in the respective fields.

**Magnetic Particle Testing (MT) Laboratory**

The MT course includes basic principles of magnetic particle testing, understanding of standards and specifications, instrumentation and calibration of tools and equipment, processes and procedures, advantages and limitations of various techniques. Students inspect the flawed samples and interpret the results based on ASTM/ASME standards and specifications.

![Image of a person working with equipment]

The facilities include 10 Electromagnetic yokes, 4 Permanent yokes, 2 Coils and 1 Prod type. The students will be trained on 35 flawed imported welded specimens from UK and 12 imported flawed forged specimens. The students are trained to use the Light meters, residual field indicator, Hall Effect gage meter, Flux indicator, Keto’s ring, Pie gauge, settling test & black light. The training will cover the residual & continuous methods; AC & DC magnetization; Dry & Wet detection medias; Visible & Fluorescent powders.

**Penetrant Testing (PT) Laboratory**

Liquid penetrant testing is one of the most widely used surface NDT methods that reveal surface discontinuities in virtually any non porous ferrous & non-ferrous material. The training provides the knowledge required to understand the method and perform testing. PT facilities include all types of
penetrants like visible dye, fluorescent, water washable, solvent removable etc. and also equipped with ultrasonic cleaning equipment (1800 BT Bench Top unit) which is one of the most efficient post cleaning method of the penetrant-tested samples. Students receive hands-on practical training in different types of penetrant, developer and perform testing on several weld flaw samples. The theory session includes the basic principle, advantages and limitations, familiarization of the equipment / chemicals, pre-cleaning requirements, test methods, interpretation of the test results and preparation of reports.

**Visual Testing (VT) Laboratory**

VT laboratory is equipped with wide range of flawed specimens, tools & equipment to meet the present industrial needs & requirements. Visual inspection is by far the most common non destructive testing and first in the chain. The eye as a tool can perform accurate inspections to detect type, size, shape, color, depth, brightness, contrast and texture etc. Visual testing is essentially limited to detect any discontinuities on the surface, and in many cases, visual testing may lead to further inspection by other NDT methods. The student will be familiar with the application and working principles of basic inspection tools/equipment like Bridge Cam Gage, AWS Weld Gauge, Pipe Pit Gauge, Weld Fillet Gauge, High-Low Gauge, Inspection Mirrors, Digital Vernier Caliper, Micrometers lenses, kits, Video-scopes and Boroscopes. As an accompanying method to other NDT methods, VT will be carried out on diverse specimens to identify and characterize the discontinuity by its technical expressions. A total of 55 flawed specimens with assorted defects are available for inspection & evaluation. The evaluated discontinuities against the respective acceptance standards will be reported & documented.

**Electromagnetic Testing (ET) Laboratory**

Well equipped with multi technology system, MS 5800, capable of performing Eddy Current, Magnetic Flux Leakage, Remote Field & IRIS Ultrasound, in addition to 4 sets of Nortec 500D Dual frequency Eddy Current Flaw Detectors. Applicable for the inspection of tubes in Condensers, Feed water heaters, Heat
exchangers, Air conditioners, Boilers, Carbon steel heat exchangers and Air coolers. The eddy current technique (ET) is commonly used to inspect conductive non-ferromagnetic materials. Remote field testing (RFT) and magnetic flux leakage (MFL) techniques are used for the inspection of ferritic materials and carbon steel tubes. The internal rotary inspection system (IRIS) ultrasound technique is used for tube profilometry and corrosion mapping, and is a reliable validation technique for eddy current, remote field, and magnetic flux leakage inspections of any material. Equipped with wide range of probes (sensors) suitable for all inspection methods (ET, RFT, MFL and IRIS), Students receive hands on experience, on testing & evaluation of ferrous & non-ferrous tubes with incorporated artificial defects in Mock-up Heat Exchanger tubing's. The training is also given on Using Multi-view Software for the Analysis & Evaluation of different inherent, service induced & misleading discontinuity signals significant for correct Interpretation. Reporting the data through CARTO Software provides a complete integrated heat exchanger inspection report.

**Ultrasonic Testing (UT) Laboratory**

This course covers the Basic principles, Advantages & limitations of the method, Waves and Wave Properties, Equipment Familiarization, Probe Construction and type of probes, Methods in UT Inspection and Machine Calibration, Straight Beam & Angle Beam Examination Procedures, Principles of Shear Wave Generation & Shear Wave system Calibration, Ultrasonic Testing Variables & Ultrasonic Testing Procedures, Inspection and evaluation of samples, Technique Development & Indication Classification, Industrial Problems and Solutions.

The lab is equipped with 18 ultrasonic flaw detectors and 05 ultrasonic thickness gauging equipment from the Olympus, USA, in addition to one Epoch 1000i Ultrasonic Flaw Detector.

The students are trained on the ASTM Basic calibration blocks, Normal probes, Angle probes and on 55 imported flawed welded specimens, 13 flawed forged specimens.
Radiation Safety Laboratory

NDT Training center is in the verge of getting approval for its X-ray RT Enclosure from King Abdulaziz City for Science & Technology (KACST) National Regulatory Agency. Students will be undergoing Radiation safety classes prior to radiography course & shall have passed the radiation safety to get involved in the practical sessions of Radiographic Testing. Workshop includes understanding of mandatory National regulations for safe use, handling, storage, and transport of ionizing radiation producing equipment and materials. It also covers usage & operation of all personnel radiation safety equipment (EPD, Survey meter, Direct Reading Pocket Dosimeter, TLD) required for radiation monitoring. Demonstrations will be carried out using a dummy Projector, Dummy source assembly, Remote Control Cranking unit, Guide tubes, Warning Signs, Barricades & Pennants to simulate and understand the general working principles of a Gamma radiography. Safety procedures & precautions required as per the working standards & emergency procedures of major Petrochemical industries are discussed & demonstrated during the course.

Radiography Testing (RT) Laboratory

Radiographic testing training provides the knowledge required to understand the method, operation of the Gamma Ray/X-ray equipment & interpretation of radiographs. Training includes theory and its applications, Advantages and limitations of RT, Codes/standards requirements, Familiarization of equipment, Exposure techniques and calculations, Selection of IQI and geometric requirements, Film Processing and dark room practices, Radiation safety, Interpreting and evaluating the radiographs, Preparation of the reports, hands-on practical on engineered weld flawed samples.

Our Radiography Testing lab is equipped with X-Ray tube of 200 KV YXLON International AS. With the aids of high quality film illuminators/viewers and some reference radiographs, students are specially trained with interpretation and evaluation. Our dark room is fully equipped with all facilities including wet tanks, running water arrangements for final washing, dryer for drying films, densitometers for measuring density of films, more number of screens, cassettes etc.
**Phased Array Ultrasonic Testing (PAUT) Laboratory**

The lab is equipped with the five (5) Olympus - RD Tech Omniscan MX phased array ultrasonic testing machines and electronically-controlled multi-element probe using the multichannel provided with the equipment. Interpretation by enhanced Tomoview software from Olympus Inc. and students will learn to draw ultrasonic beam with reflex to the weld configuration simulation using ES Beam Tool software from Eclipse Scientific Inc. The lab is also provided with choices of encoder and scanners for hands on practical in plate and pipe inspection.

**Time of Flight Diffraction (TOFD) Laboratory**

With the advanced machine from Olympus-RD Tech Omniscan MX, students will experience (TOFD) hands on practical inspection and will find out the advantage of TOFD for accurate defect sizing. Students will be provided with ES Beam Tool software from Eclipse Scientific for real simulation. There is also encoder and scanners for plate and pipe which are able to record the inspection activities. With Tomoview software from Olympus Inc. the interpretation can be analyzed accurately.

The Certified Welding Inspector certification is more than a rewarding career. It involves greater responsibility & remarkable skill demonstration. The CWI is widely recognized, both nationally and internationally, and successful companies have come to rely on this AWS certification when ensuring the highest level of quality workmanship.

JIC offers 7 days of intensive seminar that will help the aspirants to learn the course material, practical requirements and show how to use & understand the latest codes like API 1104. The training is oriented towards AWS-CWI examination and is taught by the tutors having abundant industrial experience in welding. Our AWS lab is well equipped with original weld replicas like groove weld specimens, lap joint specimens, T-joint specimens, bend / tensile specimens & measuring instruments like dial vernier caliper, micrometer, Palmgren gauge, V-WAC gauge,
fillet weld gauges, magnifying glass & rulers. The candidates can individually have the hands on practical training. Course seminar includes daily quizzes, practical exercises, model exam and complete guidance hence the better success rate in the examination.

Graduates of the program are most sought after in petrochemical, energy, nuclear, oil and gas, refineries, aviation and aerospace, construction, fabrication, pipeline, steel manufacturing, transportation and railways, and many other industries as NDT technicians for the following tasks:

- **NDT Testing & Evaluation of components and assemblies**
- **NDT Inspection of equipment and facilities during fabrication and when as-built**
- **Plant Service and Maintenance (General, preventive, scheduled or forced Shutdowns)**
- **Manufacturing Processes**
- **NDT Supervision**
- **Quality Control and Reliability Assurance and Inspection**
- **Welding Inspection**
# Degree Requirements: Associate of Science in Non-Destructive Testing (NDT)

## 1st Year Level I

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<tr>
<th>Course Code</th>
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## 2\textsuperscript{nd} YEAR LEVEL I

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**TOTAL** | **12** | **18** | **18** |

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</tr>
<tr>
<td>NDT 215</td>
<td>NDTE Project</td>
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<td>4</td>
<td>2</td>
<td>NDT 203</td>
</tr>
<tr>
<td>MIT 203</td>
<td>Organizational Behavior and Ethics</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>XXX xx</td>
<td>Elective*</td>
<td>2/3</td>
<td>3/0</td>
<td>3</td>
<td>XXX xx</td>
</tr>
</tbody>
</table>

**TOTAL** | **12/13** | **19/16** | **18** |

| NDT 290     | Cooperative Work Experience               | 0   | 40  | 3      | -             |

**Total credit hours** | **72** |
<table>
<thead>
<tr>
<th>Course code</th>
<th>Course title</th>
<th>Lec</th>
<th>Lab</th>
<th>Credit</th>
<th>Pre-requisite</th>
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<tbody>
<tr>
<td>MIT 101</td>
<td>Management Theory and Practice</td>
<td>3</td>
<td>0</td>
<td>3</td>
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</tr>
<tr>
<td>MIT 121</td>
<td>Principles of Marketing</td>
<td>3</td>
<td>0</td>
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<td>-</td>
</tr>
<tr>
<td>MIT 142</td>
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<td>0</td>
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<tr>
<td>MIT 175</td>
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<tr>
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<td>Management Information System</td>
<td>3</td>
<td>0</td>
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<td>-</td>
</tr>
<tr>
<td>MIT 217</td>
<td>Business English Correspondence</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>ELC 205</td>
</tr>
</tbody>
</table>
NDT 101 Engineering Drawing and Blueprint Reading [0-3-1]
*Pre-requisite: None*
This introductory course in drawing and drafting covers use of instruments, English letter and number construction, geometrical operations, sketching and shape descriptions, orthographic views, orthographic projection and sectional views. Basic principles of blueprint reading and the techniques of making shop sketches without the use of instruments are also covered.

NDT 102 Manufacturing Processes and NDT [2-3-3]
*Pre-requisite: None*
The course will introduce to the students the concept of discontinuity and defects in products from manufacturing processes mainly, casting, forging, and welding. Emphasis is placed on types of discontinuities and defects and the probability of their occurrence, the causes and the likely locations.

NDT 111 Visual Testing (VT) [1-3-2]
*Pre-requisite: None*
This course deals with Visual Testing requirements for detecting, interpreting and evaluating visible surface discontinuities. The primary focus is on welded joints and related discontinuities. The students will perform hands on training to the approved Visual Testing procedures, and learn to interpret and evaluate tests against the relevant acceptance criteria.

NDT 112 Material Science and Metallurgy [3-3-4]
*Pre-requisite: None*
This course deals with material science starting with the atom up to crystalline structures of metals, equilibrium phase diagrams, heat treatment and Welding; it aims at determining material properties and changes of these properties under the effect of crystal structure, grain size, dislocations, alloying elements and temperature.

NDT 201 Penetrant Testing (PT) [1-3-2]
*Pre-requisite: None*
This course deals with principles of Penetrant Testing, Penetrant Testing methods, steps to conduct the test, process control measures, developer types and its properties. Students will be taught in interpretation and evaluation of tests for acceptance with reference to procedure and standard code of practice. A detailed report shall be prepared to draw the location, dimension and type of discontinuity.

NDT 202 Magnetic Particle Testing (MT) [1-3-2]
*Pre-requisite: None*
The course will deal with principle of magnetic particle testing, ferromagnetic material and its interaction with magnetic field, different magnetization methods and its application, equipment, consumables and quality control checks. Students will be able to select, calibrate and use equipment to perform test and interpret results with reference to standards.

NDT 203 Ultrasonic Testing (UT) [2-4-3]
*Pre-requisite: EEE 217 and GES 132*
This course covers history and development of ultrasonic testing methods, principle of the test and the test equipment, importance of calibration. Students are taught hands-on the selection of UT method, equipment calibration, conduct tests, interpret and evaluate tests with reference to standards.
NDT 211 NDT Codes and Standards [2-0-2]  
**Pre-requisite: None**  
The course deals with codes and standards required in nondestructive testing and evaluation. Manufacturer's responsibilities, qualification and duties of authorized inspectors are also covered. Students are taught in standards of NDT evaluation for acceptance of methods used for detection of surface and internal discontinuities in materials, welds, fabricated parts and components.

NDT 212 Eddy Current Testing (ET) [2-4-3]  
**Pre-requisite: EEE 217**  
The course deals with principles of eddy current testing, eddy current instrumentation, different types of inspection coils and its applications, setup and equipment calibration, signal analysis and interpretation, preparation of test reports with reference to standard procedure.

NDT 213 Radiographic Testing (RT) [2-4-3]  
**Pre-requisite: None**  
This course provides an understanding of the principles of radiation formation and imaging, operation and testing, specific applications, interpretation and evaluation of test results. Radiation safety regulations, measures and precautions when dealing with X-Ray generators & radioactive materials, radiation hazards, radiation shielding and detection will also be taught.

NDT 214 Advanced NDT-PAUT and TOFD [2-4-3]  
**Pre-requisite: NDT 203**  
This course will introduce to the students the concept of Phased Array Ultrasonic Technology (PAUT) and the various instrumentation for its application. The course will also cover principle of Time of Flight Diffraction (TOFD), its advantages and limitations, applications of the technique in data acquisition, processing and analysis. Students will learn to calibrate and set up equipment, locate and evaluate flaws, analyze scan data/defects and generate reports.

NDT 215 NDTE Project [0-4-2]  
**Pre-requisite: NDT 203**  
Individual or group projects to enable students to apply knowledge and skills learned in the earlier courses; conception of a project; theoretical analysis; selection of method(s) appropriate for the material(s); testing and inspection; evaluation of results; formal report on the project.

NDT 290 Cooperative Work Experience [0-40-3]  
**Pre-requisite: None**  
An intensive on-the-job training program where the student spends at least fifteen weeks working in various plant facilities of the local petroleum, chemical/petrochemical or allied industry that involves the application of NDT methods for inspection and evaluation. The student produces a formal report and gives an oral presentation based on his training/field experience.
The Special Programs Unit’s (SPU) English Program provides training courses for trainees of the petrochemical and mining industries in the area; mainly but not exclusively SABIC and Maaden. The Unit is considered as an income generating entity for Jubail Industrial College.

The English program constitutes the major component of the whole training courses with 40 weeks of intensive English. After English, trainees proceed to the General Sciences Phase and finally by the Technical Courses Phase.

The English program was developed in 2008 upon instructions of the Managing Director of JIC, who asked for a unique, standardized and benchmarked program of English (34-week Program) to be offered to all the companies in the area. The program has been approved by SABIC as the standard English training course for its affiliates.

The English program has been revised and updated in 2013 due to the nature of the new intakes from the companies. The English program was redesigned to reflect an updated and improved new curriculum in English. The new program is for 40 weeks and starts from (A0-A1) up to (B1-B2) according to CER (the Common European Framework of Reference for Languages). The new program included ESP (English for Specific Purposes) through Technical English courses provided in the new program.

The mission of the English Program is to prepare trainees to gain sufficient mastery of the English language in order to continue their training in general sciences and technical courses. The purpose of the English program is to train non-native speakers in specific uses of General English, as well as to provide topics with technical language related to the petroleum and petrochemical industries where English is the medium of communication.

To provide a highly standardized and benchmarked level of English courses aligned with the requirements of the petrochemical industries in the Eastern Region of Saudi Arabia.

- Improving learning opportunities and raising the attainment of trainees;
- Improving the work environment and the physical infrastructure;
- Reshaping and developing inclusive provision to re-engage the business community and meet their requirements;
- Optimizing the usage of the resources available and prioritizing needs to achieve the best performance targets;
- Improving staff retention through ongoing training and professional development;
- Defining the core functions of the SPU and clarifying its role in increasing its autonomy and maturity into a Continuing Education Center;
- Implementing the necessary mechanism to convert the working culture into a learning organization.
The English program of the SPU has only one discipline; English as a Foreign Language (EFL) which is delivered at any time of the year. The table below indicates the pre and existing structures of the program.

Our objectives for the courses above are mainly focused on:

- Constant maintenance of the programs
- Periodic and systematic innovation of the curricula
- Standardization of the educational process through learning methodologies & assessments
- Integration of technology-led instruction

<table>
<thead>
<tr>
<th>PROGRAM COMPONENTS</th>
<th>CEF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BASIC PROGRAM</strong></td>
<td></td>
</tr>
<tr>
<td>40 weeks of English divided into 4 Phases:</td>
<td>A0-A1</td>
</tr>
<tr>
<td>- English Phase 1</td>
<td>A2</td>
</tr>
<tr>
<td>- English Phase 2</td>
<td>B1</td>
</tr>
<tr>
<td>- English Phase 3</td>
<td>B1-B2</td>
</tr>
<tr>
<td>- English Phase 4</td>
<td></td>
</tr>
<tr>
<td><strong>SPECIALIZATION PROGRAM</strong></td>
<td></td>
</tr>
<tr>
<td>Three Specialization English courses are offered:</td>
<td></td>
</tr>
<tr>
<td>- English Phase 5</td>
<td>B2</td>
</tr>
<tr>
<td>- English Phase 6</td>
<td>B2</td>
</tr>
</tbody>
</table>
The below listed table provides the approximate total numbers of the population of trainees that has registered for the English courses since its implementation (based on per Academic Year record). The figures do not represent the totals of those who have successfully passed the English courses.

Our rigorous selection criteria allow us to deliver standard quality of English teaching. All of our staff has both the necessary English teaching experience and the academic qualification. Our team of teachers includes:
- 17 Bachelor Degree holders
- 8 Master Degree holders
- 2 Ph. D. degree holders

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<thead>
<tr>
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<th></th>
<th></th>
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<tbody>
<tr>
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<td>319</td>
<td>294</td>
<td>215</td>
<td>284</td>
<td>173</td>
<td>2,297</td>
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<tr>
<td>MAADEN</td>
<td>100</td>
<td>80</td>
<td>203</td>
<td>173</td>
<td>238</td>
<td>224</td>
<td>1,018</td>
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<tr>
<td>SABIC SAUDIZATION</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>182</td>
<td>350</td>
<td>65</td>
<td>597</td>
</tr>
<tr>
<td>SAUDI CHEVRON</td>
<td>40</td>
<td>83</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>123</td>
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<tr>
<td>TASNEE</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>104</td>
<td>-</td>
<td>-</td>
<td>104</td>
</tr>
<tr>
<td>HRDF</td>
<td>-</td>
<td>70</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>70</td>
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<td>SASREF</td>
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<td>-</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td>JUBAIL O &amp; M</td>
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<td>-</td>
<td>-</td>
<td>15</td>
<td>-</td>
<td>-</td>
<td>15</td>
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<tr>
<td>SATORP</td>
<td>-</td>
<td>-</td>
<td>14</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td>SPIMACO</td>
<td>13</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>13</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,165</strong></td>
<td><strong>552</strong></td>
<td><strong>511</strong></td>
<td><strong>674</strong></td>
<td><strong>937</strong></td>
<td><strong>462</strong></td>
<td><strong>4,301</strong></td>
</tr>
</tbody>
</table>
The basic program is benchmarked against CER (the Common European Framework of Reference for Languages). The main goal is to improve the trainees’ English communicative skills to start from (A0) CEF to achieve (B1-B2) CEF in 40 weeks.

Duration: 16 weeks (25 hours/week)

The main goal is to improve the trainees’ English communicative skills to achieve the level of basic users by reaching from (A0) to (A1) according to CER. They must pass this phase with 60% through quizzes, CALL, Preparation & Participation, Mid-level exam, and Final exam. College regulations are applied for attendance. Absences must not exceed 40 absences.

Duration: 8 weeks (25 hours/week)

The main goal is to improve the trainees’ English communicative skills to achieve the level of independent users by reaching (B1-B2) according to CEF. ESP is also included in this phase by providing (Technical English course that focuses on providing situations related to the technical fields to help the trainees to contextualize their language with the target future situations. They must pass this phase with 60% through quizzes, CALL, Preparation & Participation, and Final Level exam. College regulations are applied for attendance. Absences must not exceed 20 absences.

CALL LABS

Computer Assisted Language Learning (CALL) systems are now considered as an essential part for any language institute. It has proven to provide important support for the teaching-learning activities of any language. They provide unlimited access to a variety of multimedia contents that cover the four skills of the English language.
Students often become more productive using the CALL software. It has been proven in many studies that CALL improves students’ language skills and enhances their learning motivation and their learning abilities and strategies.

The actual situation of the CALL labs under the custody and supervision of the SPU is the following:

- **6 labs with 320 computers**

The existing infrastructure exceeds the actual demand for lab hours. The labs can provide **240 hours/week** on an **8 hour/daily occupancy**.

Therefore, our main efforts in development of the labs would constitute the constant integration of Innovative Technology and e-training facilities and tools.
Each course in the specialization years has a certain credit value which depends on the prescribed number of lecture hours, laboratory hours and workshop hours.

- The minimum and maximum course loads in each department are between twelve and eighteen credit hours during a regular semester and a maximum of nine credit hours during the summer session.
- A student may reduce the course load in a regular semester to six credit hours if he presents a valid excuse.
- The minimum course load for part-time students is seven credit hours during the regular semester.
- A part-time student may reduce the course load to four credit hours, with the approval of the Chairman of the department concerned.
- There is no minimum course load for the summer session.

A student in his specialization years cannot withdraw from any course after the third week of a regular semester but he can withdraw from the College for good.

Two tests are held within each semester. One of them is held in the middle [Mid-term Test] and the other is held at the end of the semester. The Final Examination is comprehensive.

Course quality points shall be computed by registrar’s office according to the student’s marks as follows:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Level/Grade</th>
<th>Percentage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A +</td>
<td>Exceptional</td>
<td>95-100</td>
<td>4.00</td>
</tr>
<tr>
<td>A</td>
<td>Excellent</td>
<td>90 to less than 95</td>
<td>3.75</td>
</tr>
<tr>
<td>B +</td>
<td>Superior</td>
<td>85 to less than 90</td>
<td>3.50</td>
</tr>
<tr>
<td>B</td>
<td>Very Good</td>
<td>80 to less than 85</td>
<td>3.00</td>
</tr>
<tr>
<td>C +</td>
<td>Above Average</td>
<td>75 to less than 80</td>
<td>2.50</td>
</tr>
<tr>
<td>C</td>
<td>Good</td>
<td>70 to less than 75</td>
<td>2.00</td>
</tr>
<tr>
<td>D +</td>
<td>High Pass</td>
<td>65 to less than 70</td>
<td>1.50</td>
</tr>
<tr>
<td>D</td>
<td>Pass</td>
<td>60 to less than 65</td>
<td>1.00</td>
</tr>
<tr>
<td>F</td>
<td>Fail</td>
<td>Less than 60</td>
<td>0.00</td>
</tr>
</tbody>
</table>
The written and practical exams, the class and field activities as well as the research, the reports and projects assigned by the teacher, are aspects of the scholastic activities. Weekly quizzes are part of these activities.

At the end of each regular semester, all the names of students with high scholastic achievement shall be recorded on the Honors List provided that they are enrolled for twelve (12) or more credit hours.

The two Grades of Honor are:

- **First Honor**: Semester GPA should be between 3.75 and 4.00
- **Second Honor**: Semester GPA should be between 3.25 and 3.74
To qualify for graduation, a student must meet the following requirements:

- Satisfy all the preparatory year requirements.
- Pass all the required academic units specified by the College Council.
- Obtain a minimum cumulative GPA of 2.00.
- Pass the field training assigned to him according to the regulations.
- Full-time students must satisfy all degree requirements in their area of specialization within three scholastic years maximum.
- Part-time students must satisfy all JIC requirements (including Preparatory Year courses) within 7 years, provided that Preparatory Year requirements are met within three years maximum.

A First Honors Degree shall be awarded to students whose final cumulative GPA is between 3.75 and 4.00.

A Second Honors Degree shall be awarded to students whose final cumulative GPA is between 3.25 and 3.74.

In order to be considered for an honors degree, a student must meet the following requirements:

- Pass all courses.
- Achieve a minimum grade of ‘Good’ in all courses.
- Complete his majors (specialization courses) within a maximum period of 2 years for the full-time students and 4 years for the part-timers.
- Successfully complete his field training.

A student who fulfills all the graduation requirements shall be issued an Associate or Bachelor Degree certifying his specialization, date of graduation and the General Academic Grade. This certificate shall be authorized by HRH, The Secretary General of the Royal Commission for Jubail and Yanbu. The graduate shall have the right to receive a complete transcript and a copy of the ‘Student Performance Evaluation Report’ for OJT prepared by the training company.

To satisfy the Preparatory Year requirements:

- A student must pass all the courses of the preparatory year program with a minimum grade of D (pass).
- He must also pass English I or English II with a minimum grade of ‘C’ (Good).
- A student who successfully completes English and Mathematics courses but fails in other courses will be allowed to join specialization majors.

A student has to do all academic work without unauthorized aid of any kind. Instructors, for their part, direct students' work in a way that encourages them to perform honestly and sincerely in their assignments.
The main role of the department is to strengthen the relationship between Jubail Industrial College and the industrial and commercial companies, government and private agencies, educational institutions, and other stakeholders. Industrial Relations is also committed to connecting people – its alumni, valued partners in the industry, employers, and the like – with the College in various aspects, in various ways.

Public Relations Unit is the channel that links JIC with other major institutions and agencies, locally and kingdom wide.

The tasks of Public Relations are, but not limited to, the following:

- Assists in the arrangement of all educational and professional visits and invitations to or from the College.
- Initiate and schedule programs and visits, defining visit objectives.
- Take necessary steps for accommodation, catering and transportation when required.
- Arrange and coordinate College events and community occasions such as graduation ceremony, staff and student celebrations (honoring distinguished employees and students), lectures, conferences, etc.
- Provision of newly-arrived employees with information about the College. Liaison with various departments in preparing printed informative materials, brochures, booklets and handouts about the college.

The Industrial Placement Unit deals with the following:

**COOPERATIVE PROGRAMS**

The Cooperative Programs reflects the College's training philosophy that learning should not be confined solely within an academic environment, but should include practical extra-mural experience as an essential component.

This program offers the students the opportunity to perform in career area related to his academic major to integrate that theory with practice.

**JOB PLACEMENT**

The college keeps itself informed of job opportunities and the general job market both locally and throughout the Kingdom. It maintains connections with prospective employers and advises students on job application procedures. It regularly stages career days when major employers exhibit aspects of their company.

Students receive the opportunity to meet their representatives on campus. In addition, through the
cooperative program of in-company training, students themselves developed useful connections with prospective employers.

**PLACEMENT TESTS**

Jubail Industrial College is also recognized as a center for various placement tests. Among the many placement exams the College is actively administering are QIAS and English Placement Tests for various companies such as SABIC, SATORP and S-Chem. Moreover, Jubail Industrial College has its own placement test to evaluate and measure the applicants' / students' proficiency in English, Math and Basic Sciences. Various companies are using this test to assess and select new trainees and staff.

The Special Programs Unit is the channel that links JIC to various industrial companies who seek to utilize JIC’s resources to educate its employees.

The Unit handles the following courses:

**Short and Tailor-made courses.** These are offered for local employers on a cost basis. Such courses are designed for clients with specific needs of an industrial or a commercial nature.

**NDT Basic and Advance Training Programs.** These programs are offered to company trainees who seek to upgrade their knowledge and technical know-how in the field of NDT.

**Community Courses.** Offered to people who desire to obtain special knowledge and skills. This opportunity is given to everyone regardless of his educational qualifications or his profession. The courses are flexible and cover various areas of training to suit the different abilities of the participants.

In general, the Community Programs Unit supervises, implements and facilitates all community and industry-related programs. It serves as an avenue for business community leaders and managers seeking to upgrade their credentials and qualifications through highly specialized programs.

Other specific tasks of the unit include, but not limited to, the following:

- Supervision of external collaborations with various educational, industrial and other distinguished institutions. This includes the task of facilitating new agreements, establishment of contact with partner institutions locally and abroad concerning deployment of faculty or trainers, advance scheduling of courses, signing of MoU/MoA, among others.

- Periodic review of advertisements, pre-screening, admission of candidates, and sending of applications and supporting documents to partner institutions (if required).

- Periodic review of the progress of the community programs, and preparation of periodic reports on activities, actions and recommendation to JIC management.

- Liaison with concerned JIC departments on
matters of interests for the program, such as issues related to administrative, financial and marketing. This include initiating issues/minutes to be discussed and resolved during committee meetings.

- Supervision of the marketing plan and procedures for community-related activities such as Alumni Day, Career Day, Industrial Representatives’ Workshop, Exhibitions outside JIC, Conferences, etc.
Since its inception, Jubail Industrial College has been at the forefront of providing training to employees of industries in the Kingdom. A diverse range of special programs and short courses are offered in Engineering, Business and Information Technology with different duration in length; some lasting from three months to a year and others from five days to a week or two.

Special tailor-made courses in response to specific industrial and commercial needs can be made available based on consultation between representatives of industry and of the College. Most of these courses are offered in the College's own premises with specialized labs/workshops and some short courses are offered in the selected company's training sites as well.

The medium of instruction in the above courses is mainly English. Certain courses, however, can be taught in Arabic.

JIC prides itself as the foremost training provider in the region and in the country at large with well-established training partnerships with well known industrial groups in the region. A dedicated Special Program Unit (SPU) has been established to foster technical services which are responsive to industry and commerce evolving needs.

A selection of these short courses is listed hereunder. Further details are available upon request from:

**Industrial Relations**
Jubail Industrial College
PO Box 10099, Jubail Industrial City 31961
Tel: 340-2140 / 340-2011
Fax: 340-2060
e-mail: ir@jic.edu.sa / specialprograms@jic.edu.sa
<table>
<thead>
<tr>
<th>Polymers</th>
<th>Quality Control and Quality Assurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Introduction to Polymers</td>
<td>• Quality Control Methods in Chemical Laboratories</td>
</tr>
<tr>
<td>• Introduction to Polymer Science &amp; Engineering</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Environmental Pollution Control</td>
<td>• Safety in Chemical Laboratory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Treatment</th>
<th>Process Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Water Treatment Technology</td>
<td>• Chemical and Separation Processes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process Control</th>
<th>Petroleum and Petrochemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Advanced Process Control</td>
<td>• Petroleum Refining Technology</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Process Simulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Process Plant Simulation</td>
</tr>
<tr>
<td>Materials and Metallurgy</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>• Introduction to Engineering Materials</td>
</tr>
<tr>
<td>• The Metallurgy of Iron and Steel</td>
</tr>
<tr>
<td>• Mechanical Strength and Selection of Engineering Materials</td>
</tr>
<tr>
<td>• Microstructure, Properties and Applications of Iron and Steel</td>
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<table>
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<tr>
<th>Metal Fabrication</th>
<th>Failure Analysis</th>
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</thead>
<tbody>
<tr>
<td>• Basic Welding Technology</td>
<td>• Principles of Failure Analysis</td>
</tr>
<tr>
<td>• Gas Tungsten Arc Welding (GTAW/TIG)</td>
<td>• Machinery Failure Analysis and Prevention</td>
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<td>• Sheet Metal Work</td>
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<th>Quality Control</th>
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<tr>
<td>• Evolution and Management of Quality Function</td>
<td>• Basic Heat Transfer and Heat Exchangers</td>
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<td>• Reliability versus Quality</td>
<td>• Practical Thermodynamics</td>
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<td>• Acceptance Sampling Plans</td>
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<td>• Basic Probability and Statistical Modeling for Quality</td>
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<td>• Process Quality Control</td>
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<td>• Graphical Methods for Quality Improvement</td>
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<td>Safety</td>
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<td>• Industrial Safety and Environment</td>
<td>• Preventive Maintenance and Troubleshooting</td>
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<td>• Safety and Hazard Communication</td>
<td>• Valve Operation and Maintenance</td>
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<td>• Managing Health and Safety at Work</td>
<td>• Bearings, Seals and Lubrication</td>
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<td>• Hydraulic Systems and Troubleshooting</td>
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<td>• Pneumatic Systems and Troubleshooting</td>
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<th>Internal Combustion Engines</th>
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<td>• Basic Engineering Drawing</td>
<td>• An Introductory Course in Internal Combustion Engines</td>
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<td>• An Advanced Course in Internal Combustion Engines</td>
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<td>• Advanced Engineering Drawing</td>
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<td>• Production Technical Drawing</td>
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<th>Manufacturing Technology</th>
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<td>• CNC Machining</td>
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<td>• Production Planning</td>
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<td>• Time Analysis</td>
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<td>• Machining Parameters in Metal Cutting Operations</td>
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<td>• Metal Cutting using Lathe</td>
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<td>• Metal Cutting on Milling Machines</td>
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<td>Instrumentation and Control Engineering</td>
<td>Electrical Power Engineering</td>
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<tr>
<td>• Basic PLC</td>
<td>• Electrical Motors Maintenance and Troubleshooting</td>
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<tr>
<td>• Controller and Control Loops</td>
<td>• Protective Relays Testing and Calibration</td>
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<tr>
<td>• Industrial Process Measurement</td>
<td>• Electrical Drawing and Wiring</td>
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<tr>
<td>• Measurement and Control of Flow, Level Temperature and Pressure</td>
<td>• Industrial Switchgear Testing, Maintenance and Troubleshooting</td>
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<td>• Process Control Instrumentation</td>
<td>• Motor Control Circuits</td>
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<td>• Troubleshooting Analogue Circuits</td>
<td>• Transformer Testing and Maintenance</td>
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<tr>
<td>• Basic Process Control, Analog and Digital</td>
<td>• Switchgear</td>
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<td>• Distributed Control System</td>
<td>• Advanced PLC</td>
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<td>• DC/AC Drives</td>
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</table>
### General Management
- Managing Change
- Problem solving and Decision-Making
- Effective Leadership
- Introduction to Strategic Thinking
- Project Management
- Business Success using IT
- Introduction to E-Business

### Marketing Management
- Marketing for non-marketing managers
- Marketing planning skills
- Marketing research- Practical approach
- Strategic business planning
- Manager customer service
- Customer service- Meeting customer needs
- Developing integrated marketing communication plan
- Developing successful brand strategy

### Human Resource Management
- Psychology at Work
- Human Resource Planning Skills
- Training and Development – Methods and Procedures
- Understanding Corporate Social Responsibility for the Managers

### Purchasing Management
- Introduction to Purchasing Strategy
- Understanding International Logistics
- Managing Purchasing and Supply Relationships
- Strategic Supply Chain Management
- Supply Chain Management in Practice

### Accounting and Finance
- Microsoft Excel for Accounting
- Mastering Financial Calculations
- Understanding Saudi Financial Markets
- Capital Budgeting and Investment Analysis
- Marketing Financial Services
- Investment Management
- Accounting for Decision-Making and Control
- Computer Accounting with MS Office 2007
- Managing Financial Resources
- Budgeting
- Business Processes Integration Using SAP IDES

### Sales Management
- Sales Planning
- Sales Organization and Sales Strategy
- Selling Skills for B2B Markets
- Expanding Customer Care
- Essentials of Selling Skills
## Chemistry
- Basic Chemistry
- Basic Chemistry for Power Plant Operators
- Chemistry in Everyday Life
- Chemistry and Food
- Stoichiometry
- Organic Chemistry
- Industrial Chemistry
- Basic Theory of Catalyst
- Chemistry of the Environment
- Electrochemistry

## Physics
- Basic Physics
- Basic Radiation
- Radiation and Health
- Energy and Environment
- Properties of Matter for Industrial Applications
- Engineering Physics for Industrial Operators
- Material Processing and Modification
- Analyzer Engineering and Maintenance
- Engineering Sketching, Designing and Constructing Systems used for Material Processing
- Foundation Course and Engineering Physics for Mechanical and Electrical Engineering Technicians Working in Industry

## Mathematics
- Mathematics for Process Operators
- Mathematics for Industries
- Mathematics for Electricians
- Operational Mathematics I & II
- GMAT for EMBA Program

## Islamic Studies and Arabic Language
- Arabic Language for non-Arabic Speakers (Level I & II)

## Physical Education courses
- Swimming Course for Adults
- Basic Physical Fitness

## English Language
- English Language Courses for Company Employees
Testing and Inspection

- Introduction to NDT
- Basic Welding for Plant Inspectors
- Product Technology
- Heat Exchanger Tube Scanning
- Penetrant Testing (PT), Levels I & II
- Magnetic Particle Testing (MT), Levels I & II
- Radiographic Testing Film Interpretation (RTFI), Levels I & II
- Ultrasonic Testing (UT), Levels I & II
- Visual Testing (VT), Levels I & II
- Eddy Current Testing (ET), Levels I & II
- Advanced NDT (PAUT & TOFD), Levels I & II
The International Organization for Standardization (ISO) has been considered one of the most important means and techniques that ensures work standards and upgrades the level of performance in the present age which is called 'the ISO Era' by some thinkers. Quality is no longer a luxury to which the service and profitability institutions yearn, or a substitute to be applied or abandoned by the systems raised, but it has inevitably become an urgent need dictated by the movement of contemporary life—which is evidence of the spirit survival and the survival spirit of the organization.

As a result, Jubail Industrial College has sought to apply the Quality Management System (ISO 9001) that is laid down in all administrative and educational procedures and prepared an ambitious plan ended with gaining a Quality Certificate which represents the beginning to enter a quality world.

The quality can be merely realized through establishing a sound intellectual approach on which the administrative and educational process runs, and which ensures the addition of sciences and knowledge got by the student, moral values-based system, human relations systems, advanced means of communication, and other needs that make both employee's and student's lives inside the educational institutions a pleasure. Jubail Industrial College, therefore, regards all its faculty and trainees as the mainstay to continue excellence and maintain the highest quality.

Jubail Industrial College (JIC) is proud to be a unique educational Organization, known for its services, as well as for its practical and educational Outcomes.

The College provides the market with outstandingly educated and trained Human resources in both the technical and business sectors.

The College is fully committed to continual academic development. It provides qualified personnel and uses new technology to meet and satisfy Job market needs, while fulfilling the requirements of companies and Industry.

The College is also committed to implement and abide by all legislation and regulations with regard to its various activities for comprehensive implementation of the above, the College is committed to applying the ISO 9001 Quality Management System.
<table>
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<tr>
<th>Name of the Faculty</th>
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<tr>
<td>Highest Earned Degree with Specialization and Year of Graduation</td>
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</table>
ABDALLA, TARIG
M. A. in Linguistics (2000)
Westminster University, UK
Instructor (2005)

ABDULLAH, FAHAD
B. A. in English Language Teaching (2008)
King Abdulaziz University, KSA
Instructor (2009)

ABDULLAH, MUHAMMAD
M. A. in English (1999)
Portsmouth University, UK
Instructor (2008)

- B. A. in Criminal Justice (1990)
Saint Augustine College, USA
Instructor (2008)

ABDUL ALIM, RAFIQUE
B. A. in Education (2000)
Imam Muhammad Ibn Saud University, KSA
Instructor (2006)

ABDULHAKIM, SHEIKH
M. A. in Linguistics (1976)
Utkal University, India
Lecturer (1996)

- B. A. in English (1991)
Omdurman Ahlia University, Sudan
Instructor (2003)

AHMED, SAJJAD
M. A. in English Language and Linguistics (2001)
University of Peshawar, Pakistan
Instructor (2005)

- B. A. English Literature (1983)
Damascus University, Syria
Instructor (2009)

FAHRAN, ABDULHAKIM SULAIMAN
B. A. in English (2001)
King Faisal University, KSA
Instructor (2009)

- M. A. in Research Methodology (2008)
Leeds Metropolitan University, UK
M. A. in English Literature (1977)
University of Sindh, Pakistan
Senior Lecturer (1986)

- M. S. in Linguistics (2006)
Essex University, UK
Lecturer (2004)

- M. A. in English (2007)
Fort Hays State University, USA
Instructor (2005)
- NOFAIE, MOHAMMAD
Ph. D. in Education (2014)
Dublin University, Ireland
Assistant Professor (2004)

- OTAIBI, SULTAN
B. A. in English (2008)
King Abdulaziz University, KSA
Instructor (2009)

- SIBAI, SAMEER
M. A. in English (2007)
Nottingham Trent University, UK
Lecturer (2009)

- SHAHRANI, FAHAD
M.A. in English (2006)
Essex University, UK
Lecturer (2004)

- SHAMMARI, ABDULAZIZ
M. Ed. in English (2005)
Manchester University, UK
Lecturer (1999)

- SHOMRANI, SAAD
M. A. in ESL (2010)
Brook University, Canada
Lecturer (2007)

- WABI, YOUSEF
M. A. in TESOL (2006)
Indiana University of Pennsylvania
Lecturer (2004)

- ZAHRAINI, ANWER
M.A. in TESOL (2006)
Indiana University of Pennsylvania
Lecturer (2004)

- ZAHRAINI, IBRAHIM
Essex University, UK
Lecturer (2004)

- ASSAF, MAROUF
M. A. in English and Translation (2006)
Yarmark University, Jordan
Instructor (2009)

- BYRNE, MICHAEL
M. A. in Applied Linguistics (2009)
Victoria University of Wellington, New Zealand
Instructor (2007)
M. A. English (2006)
Mu’tah University, Jordan
Instructor (2009)

Dela Rosa, Jesus
Ph. D. Education (1982)
Wesleyan University, Philippines
Instructor (2004)

M. A. in English Education (1978)
University of Nice, France
Instructor (2006)

Northern Illinois University, USA
Instructor (2011)

Dogaroglu, Erkan
B. A. in English Language Teaching (1997)
Dokuz Eylul University, Turkey
Instructor (2009)

Erel, Ufku
B. A. American Literature
Hacepette University, Turkey
Instructor (2012)

B. A. in ELT (2006)
University of Anatolia, Turkey
Instructor (2011)

Faqeehi, Mohammed
Ph. D. in TESOL (2003)
Ball State University, USA
Assistant Professor (2008)

M. A. in Linguistics (1996)
Westminster University, UK
Instructor (2004)

Fouad, Osama
M. A. in Education (1998)
University of Jordan, Jordan
Instructor (2009)

Ghazanfar, Ali
M. A. in English Literature (1990)
Punjab University, Pakistan
Instructor (2005)

Harris, Toby
B. A. in English (1985)
University of Canterbury, New Zealand
Lecturer (2006)

Hayat, Kashif
L.L.B. Law
Nottingham University, UK
Instructor (2012)

Hoosen, Malek
B. A. in Paedagogics (1982)
University of Durban-Westville, South Africa
Instructor (2002)
Hurley, Martin
M. A. in Linguistics (2011)
University of South Africa, South Africa
Lecturer (2002)

B. A. in English (1985)
Mahendra Sanskrit University, Nepal
Instructor (2009)

Ph. D. in English Language Teaching
Mersin University, Turkey
Instructor (2009)

M. A. in English (1992)
Karachi University, Pakistan
Instructor (2006)

Khan, Muhammad Saleem
M. A. in English (2004)
University of the Punjab, Pakistan
Instructor (2006)

Marcelo, Ireneo
Benguet State University, Philippines
Instructor (2009)

Nannaparaju, Prashant
M. A. in English Language Literature (1990)
Andhra University, India
Lecturer (2009)

Ostrowski, Mark
Ph. D. in History (1996)
London University, UK
Assistant Professor (1999)

Paz, Emilio
B. A. in Philosophy (1998)
San Beda College, Philippines
Instructor (2009)

The University of New South Wales, Australia
Instructor (2006)

Rezki, Bounekhla
M. A. in Psychology (1982)
Essex University, UK
Lecturer (2007)

Roney, Stephen Kent
M.A. Literature & Religion (1979)
Syracuse University, USA.
Instructor (2011)

Saeed, Hussein
M. A. in English Language Teaching (1996)
Khartoum University, Sudan
Instructor (2006)

Sarakbi, Ghassan
B. A. in English Language Teaching (1981)
New Jersy University, USA
Lecturer (2005)
Senekel, Jan
B. A. in Psychology (1983)
Nelson Mandela Metropolitan Univ., South Africa
Instructor (2005)

Smith, Francis
B. A. in Language (2005)
Seville University, Spain
Instructor (2005)

Stoudamire, James
M. A. in Education (1980)
University of Toledo, USA
Instructor (2004)

Topaz, Yilmaz
B. A. in English (1986)
Hacette University, Turkey
Instructor (2005)

Traih, Othman
M. Ed. in Linguistics (1998)
University of Khartoum, Sudan
Lecturer (2005)

Vahid, Shahul
M. Phil. in English (1990)
Maduraj Kamaraj University, India
Lecturer (1996)

Wentzel, Sulayman
B. A. in English Language and Literature (1993)
University of Cape Town, South Africa
Instructor (2007)

M. A. in Translation (1998)
The University of Leeds, UK
Lecturer (1999)

B. A. in English Linguistics (1986)
Hacepette University, Turkey
Instructor (2005)

Zaidi, Syed
M. A. in English Literature (2003)
University of Sindh, Pakistan
Instructor (2006)

Zistakis, Alex
Ph. D. in TEFL (2001)
University of Athens, Greece
Senior Lecturer (2007)

College Faculty
ABDELKARIM, MOHAMMED A.  
M. S. in Mathematics (1997)  
Aligarh Muslim University, India  
Lecturer (2002)

ABDULRAHMAN, RIYADH F.  
Ph. D. in Chemistry (1995)  
Strathclyde University, UK  
Assistant Professor (2004)

AHMAD, KHAN PARWEZ  
B. S. in Physics (1992)  
Magadh University, India  
Instructor (1999)

-AAMRI, OMAI Y. T.  
M. A. in Physical Education (2000)  
University of Michigan, USA  
Senior Lecturer (2003)

-ALAWI, JASSEM H.  
Ph. D. in Physics (2010)  
Durham University, UK  
Assistant Professor (2001)

-ASSADI, KHALID F.  
Ph. D. in Physics (1981)  
Manchester University, UK  
Assistant Professor (1999)

-BASHRAWI, SALEH A.  
Ph. D. in Mathematics (2014)  
Iowa State University, USA  
Assistant Professor (2005)

-HUMAIDI, ABDULAZIZ  
Ph. D. in Comparative Religions (2011)  
Al-Imam M. Bin Saud University, KSA  
Assistant Professor (2003)

-HUMAIDI, SALEH  
Ph. D. in Mathematics (2010)  
Manchester University, UK  
Assistant Professor (2001)

-MOSHA IKEH, FAHAD A.  
B. S. in Physical Education (1985)  
King Saud University, KSA  
Lecturer (1986)

-MOSHAIKEH, FADH A.  
B. S. in Physical Education (1985)  
King Saud University, KSA  
Lecturer (1986)

-MOSHAIKEH, FADH A.  
B. S. in Physical Education (1985)  
King Saud University, KSA  
Lecturer (1986)
Ph. D. in Mathematics (1989)
Iowa State University, USA
Assistant Professor (2009)

Khan, Ahmad M.
Ph. D. in Mathematics (1978)
Aligarh Muslim University, India
Assistant Professor (2002)

M. S. in Physics (1989)
Punjab University, Pakistan
Lecturer (2007)

Khan, Mohabbat Hussain
Ph. D. in Mathematics (2007)
University of Madras, India
Assistant Professor (2008)

Aziz, Azad M.
M. S. in Plasma Physics (1988)
Salahaddin University, Iraq
Lecturer (2003)

Khan, Qamar Azam
Ph. D. in Mathematics (1993)
Aligarh Muslim University, India
Assistant Professor (2009)

Bettayeb, Abdellatif
Ph.D. in Mathematics (2007)
Dundee University, UK
Assistant Professor (2011)

Ph. D. in Physics (2010)
Manonmaniam Sundaranar University, India
Lecturer (2014)

Habib, Anwar Q.
Ph. D. in Mathematics (1979)
Aligarh Muslim University, India
Associate Professor (1996)

Narikuth, Shafeeqe P.
M. S. in Mathematics (2003)
Cochin University of Science and Technology, India
Lecturer (2009)

Haddad, Yousef S.
M. S. in Mathematics (1985)
Jordan University, Jordan
Lecturer (2009)

Pasha, Mohammad Khysar
Ph. D. in Chemistry (1993)
Aligarh Muslim University, India
Assistant Professor (2013)

Hammad, Kamal A.
M. Phil. in Mathematics (1994)
University of Wales, UK
Senior Lecturer (2008)

Qaosim, Hazem Q.
Ph. D. in Plasma Physics (1996)
University of Manchester Institute of Science and Technology, UK
Assistant Professor (2000)
RAHMAN, HABIBUR
Ph. D. in Chemistry (2006)
Aligarh Muslim University
Assistant Professor (2014)

Ph. D. in Mathematics (2000)
Andhra University, India
Assistant Professor (2008)

RAZMAK, GHASSAN S.
M. S. in Mathematics (1985)
University of Jordan, Jordan
Lecturer (1989)

RIZAN, ABDUL RASHEED M.
B. S. in Chemistry (1998)
University of Peradeniya, Sri Lanka
Instructor (2008)

SHABARO, KHALID M.
M. S. in Physics (1984)
University of Jordan, Jordan
Senior Lecturer (1989)

TAHAYNEH, MOHAMMED S.
M. S. in Mathematics (1990)
Karachi University, Pakistan
Lecturer (2003)

Ph. D. in Chemistry (2006)
KFUPM, KSA
Assistant Professor (2007)

VINAY, KUMAR
Ph. D. in Physics (2003)
Rohilkhand University, India
Assistant Professor (2014)
ABDUL BASEER, MOHAMMAD
M. S. in Mechanical Engineering (2003)
KFUPM, KSA
Lecturer (2009)

ABDUL MOGNI, SYED SHAH
M. S. in Metallurgical Engineering (1993)
Bangladesh University of Engineering Technology, Bangladesh
Lecturer (2011)

ABU TAOQI, MOHAMMAD IBRAHIM
B. S. in Mechanical Engineering (1987)
Southern Illinois University, USA
Instructor (2002)

AHMAD, KHALED
Ph. D. in Mechanical Engineering (1982)
Cranfield Institute of Technology, UK
Assistant Professor (1992)

-DHABABAT, IBRAHIM KHADER
B. S. in Mechanical Engineering (1989)
University of Technology, Iraq
Instructor (2002)

-DOSSARY, HAMDAN NASSER
B. S. in Mechanical Engineering Technology (2012)
Jubail Industrial College, KSA
Instructor (2007)

-EID, MOHAMMED IBRAHIM
University of Central England, UK
Instructor (1993)

-GHAMDI, AHMAD SALEM
M. S. in Mechanical Engineering (2011)
International Islamic University, Malaysia
Lecturer (2002)

-OBASI, HUSAM AHMAD
B. S. in Mechanical Engineering (1974)
Suez Canal University, Egypt
Instructor (2001)

-MUGHATI, BANDAR SAUD B.
Jubail Industrial College, KSA
Assistant Instructor (2008)

-MUGHRAM, HUSSEIN ALI
B. S. in Manufacturing System Engineering (2008)
Caledonian University, UK
Instructor (1986)

-MUSHREF, FARES RASHED
M. S. in Mechanical Engineering (2009)
University of Wollongong, Australia
Lecturer (2003)

-QAHTANI, ALI MUBARAK
M. S. in Mechanical Engineering (2010)
University of South Florida, USA
Lecturer (2010)

-SHAKHOURI, MOHSEN MOHAMMAD
B. S. in Electromechanical Engineering (2006)
Aston University, UK
Instructor (1986)
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<th>Name</th>
<th>Degree</th>
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<tr>
<td>B. Eng. in Metallurgical Engineering (1977)</td>
<td>University of Roorkee, India</td>
<td>Instructor (2002)</td>
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<td>M. S. in Mechanical Engineering (2000)</td>
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<td>Lecturer (2009)</td>
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<td>B. Eng. in Mechanical Engineering (1986)</td>
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<td>Instructor (2001)</td>
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<td>M. Eng’g. Sc. in Mechanical Engineering (2004)</td>
<td>University of Melbourne, Australia</td>
<td>Lecturer (2009)</td>
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<td>M.S. in Polymer Technology (2009)</td>
<td>Aalen University, Germany</td>
<td>Lecturer (2011)</td>
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<td>M. E. in Mechanical Engineering (2002)</td>
<td>Cornell University, USA</td>
<td>Lecturer (2011)</td>
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<td>B. Tech. in Mechanical Technology (1982)</td>
<td>NED University, Pakistan</td>
<td>Instructor (2005)</td>
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<td>Ph. D. in Mechanical Engineering (2006)</td>
<td>Loughborough University, UK</td>
<td>Assistant Professor (2008)</td>
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<td>Ph. D. in Mechanical Engineering (1989)</td>
<td>University of Birmingham, UK</td>
<td>Assistant Professor (1997)</td>
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</table>
SAUDAGAR, IMTIAZ AHMAD
M. Tech. in Mechanical Engineering (1988)
Indian Institute of Technology, India
Lecturer (1996)

SHABARO, YUSRI MOHAMMAD WALID
M. S. in Mechanical Engineering (2000)
Kiev International University, Ukraine
Lecturer (2002)

SUHEEL, MASOOD
M. Tech. in Mechanical Engineering (1990)
Kurukshetra University, India
Lecturer (1998)

YOUSEF, FARES KHALIL
B. S. in Mechanical Engineering (1992)
Damascus University, Syria
Instructor (2003)

ZARSHAD, ZARSHAD
M. E. in Mechanical Engineering (2006)
University of South Australia, Australia
Lecturer (2012)
- **KHALDI NASSER S.**
  M. S. in Network Engineering and Mgmt. (2012)
  De Paul University, USA
  Lecturer (2012)

- **KHALIFA, JALAL M.**
  M. S. in Microelectronics (2006)
  University of Newcastle Upon Tyne, UK
  Lecturer (2001)

- **MARZOUQ, SHAWQI M.**
  M. Eng. in Electrical Engineering (2008)
  University of Portland, UK
  Lecturer (2005)

- **NASER, ZUHAIR**
  M. S. in Electrical Engineering (2008)
  New Castle University, UK
  Lecturer (2004)

- **OMAR, ABDRAB A. R.**
  B. Tech. in Instrumentation and Control Eng’g. (2007)
  Coventry University, UK
  Instructor (1986)

- **SHAMMARI, SAUD J.**
  M. S. in Technology (2012)
  Purdue University Calumet, (USA)
  Lecturer (2014)

- **DHAFER, MOHAMMED S.**
  M. S. in Electrical Engineering (2007)
  New York Institute of Technology, Bahrain
  Instructor (1986)

- **GARNI, HASSAN Z.**
  M. S. in Electrical Engineering (2013)
  University of Toledo, USA
  Instructor (2008)

- **HAJRI, EID M.**
  Ph. D. in Electrical Engineering (2011)
  University of Sheffield, UK
  Assistant Professor (2012)

- **HARBI, FARIS T.**
  B. S. in Electrical Power Engineering (2012)
  KFUPM, KSA
  Instructor (2012)

- **HARBI, FARIS T.**
  M. S. in Electrical Engineering (2008)
  KFUPM, KSA
  Lecturer (2005)
SHARIF, BANDER S.
B. S. in Electrical Engineering (2009)
KFUPM, KSA
Instructor (2011)

SHEHRI, ABDULLAH S.
M. S. in Systems Engineering (2014)
KFUPM, KSA
Lecturer (2012)

SHAHRI, MOHAMMED
B. S. in Electrical Engineering (2011)
University of Texas at San Antonio, USA
Instructor (2012)

SHAHRI, SAMEER S.
B.S. in Electrical Engineering Technology (2012)
Purdue School of Engineering, USA
Instructor (2014)

SHAHRI
B. S. in Electrical Power Engineering (2009)
Jubail Industrial College, KSA
Instructor (2007)

YAMI, MOHAMMED
Ph. D. in Electrical Engineering (2009)
Cardiff University, UK
Assistant Professor (2003)

ZARA, MOHANAD
M. S. in Electrical Power with Business (2005)
University of Strathclyde, UK
Lecturer (2000)

ATTIA, HUSSAM ELDIN MUSTAFA
Ph. D. in Electrical Engineering (1999)
Ain Shams University, Egypt
Assistant Professor (2013)

AZHAR, AMEER
M. Tech. in Computer Engineering (2000)
University of Calicut, India
Senior Lecturer (2007)

BEN AMOR, LOFTI
Ph. D. in Power Electronics (1996)
University of Montreal, Canada
Assistant Professor (2007)

Memorial University of Newfoundland, Canada
Lecturer (2004)

SHEKSHAKY, SHAREEF M.
B. S. in Electrical Power and Machines (1980)
Helwan University, Egypt
Instructor (1990)

HAFEZ, FARRUKH
M. E. in Electrical Engineering (2009)
N. E. D. University, Pakistan
Lecturer (2012)

B. S. in Electromechanical Engineering (2000)
Al-Balqa Applied University, Jordan
Instructor (2008)
Irfan Mian, Muhammed
M. S. in Electrical Engineering (2002)
Arizona State University, USA
Senior Lecturer (2008)

Jaleel, Syed Abdul
B. E. in Electronics and Communications (1993)
Madurai Kamaraj University, India
Instructor (2002)

Kamaraju, Venkata
University of Jodhpur, India
Lecturer (2012)

M. E. in Electrical Engineering (2006)
University of Queensland, Australia
Lecturer (2012)

M. S. in Electrical Engineering (2003)
Jordan University of Science & Technology, Jordan
Lecturer (2004)

Masaid, Khaleel
M.S. in Electrical Engineering (1997)
Jordan University of Science & Technology, Jordan
Lecturer (2014)

Masud, Abdullahi A.
Ph.D. Electrical Power Engineering (2013)
Glasgow Caledonian University, UK
Assistant Professor (2014)

Qadri, Yameen M.
B. E. in Industrial Electronics (1994)
NED University of Engineering & Technology, Pakistan
Instructor (2005)

Sadiq, Muhammed G. H.
M. S. in Electrical Engineering (2001)
KFUPM, KSA
Lecturer (2008)

Saleh, Ibrahim
M. S. in Industrial Engineering (2007)
University of Michigan, USA
Lecturer (2007)
- **JUDEH, AHMAD**
  M. S. in Organic Chemistry (1987)
  University of Jordan, Jordan
  Lecturer (2009)

- **THABIT, NEDAL**
  Ph. D. in Polymer Chemistry (2010)
  KFUPM, KSA
  Assistant Professor (2012)

Ph. D. in Process Plant Design (1990)
University of Glamorgan, UK
Assistant Professor (2006)

- **AHMAD, AYMAN**
  M. S. in Analytical Chemistry (2002)
  University of Jordan, Jordan
  Lecturer (2003)

  B. S. in Polymer Engineering (2012)
  Pennsylvania College of Technology, USA
  Instructor (2013)

- **AWWAD, HUSSAIN**
  B. S. in Chemistry (2011)
  The University of Manchester, UK
  Instructor (2003)

- **GHAMDI, ABDUSALAM**
  B. S. in Chemical Engineering & Applied Science (2013)
  Jubail Industrial College, KSA
  Instructor (2014)

- **HAZZA, MAJID**
  B. S. in Chemistry (2008)
  University of Toledo, USA
  Instructor (2013)

- **KHALDI, ABDULLAH**
  B. S. in Chemistry (2006)
  University of Toledo, USA
  Instructor (2009)

K. S. in Chemical Engineering (2011)
Riyadh College of Technology, KSA
Instructor (2013)

- **SAWALHA, MURAD**
  Ph. D. in Industrial Chemistry (2004)
  Carl Von Ossietzky University of Oldenburg, Germany
  Assistant Professor (2010)

  BSc. In Chemical Engineering (2012)
  King Fahad University of Petroleum and Minerals, KSA
  Instructor (2014)

- **ZAHRANI, MOHAMMED**
  A. S. in Chemical Engineering Technology (2001)
  Jubail Industrial College, KSA
  Asst. Instructor (2007)

- **APPU, SREEKUMAR, P.**
  Ph. D. in Chemistry (2008)
  National Institute of Technology Calicut, India
  Assistant Professor (2012)
M. S. in Plastic Engineering (2006)
Biju Patnaik University of Technology, India
Lecturer (2008)

ASIEDU, KINGSLEY
Ph. D. in Reaction Engineering (1982)
University of Newcastle Upon Tyne
Assistant Professor (2004)

Ph. D. in Organic Chemistry (1996)
Aristotle University, Greece
Assistant Professor (2008)

M. S. in Engineering Design (2007)
University of Bath, UK
Lecturer (2011)

AZAD, ABDUL KALAM
M. Tech. in Plastics Technology (2011)
Anna University, India
Instructor (2012)

AZHAR, MASAUD
M. Phil. in Physical Chemistry (1999)
University of Peshawar, Pakistan
Lecturer (2014)

BARENG, EDGARD
B. S. in Chemical Engineering (1986)
Saint Louis University, Philippines
Instructor (2009)

M. S. in Chemical Engineering (2001)
University of the Philippines, Philippines
Lecturer (2009)

ELZAGHEID, MOHAMMED
Ph. D. in Organic Chemistry (2000)
Turku University, Finland
Assistant Professor (2006)

B. S. in Chemistry (2002)
University of Peradeniya, Sri Lanka
Instructor (2009)

HAQUE, MANIRUL
Ph. D. in Chemistry (2008)
Aligarh Muslim University, India
Lecturer (2012)

Haridi, Yasser
Ph. D. in Fluid Flow (1994)
University of Saskatchewan, Canada
Assistant Professor (2006)

Hussain, Amir
University of Manchester, UK
Assistant Professor (2004)

JABBAD, HUSSAM
Ph. D. in Chemical Engineering and Analytical Chemistry (2006)
University of Manchester, UK
Assistant Professor (1988)
Khan, Mohammed Sharaf  
I.S.M. Dhanbad, India  
Assistant Professor (1996)  

M. S. in Chemical Engineering (1993)  
India Institute of Science, India  
Lecturer (2008)  

Musa, Mohammed  
M. S. in Physical Chemistry (1989)  
Yarmouk University, Jordan  
Lecturer (2003)  

B. S. in Chemistry (1983)  
Yarmouk University, Jordan  
Instructor (1988)  

B. S. in Chemical Engineering (1998)  
NED University of England, Pakistan  
Instructor (2005)  

M. S. in Mass Transfer (1996)  
University of the Philippines, Philippines  
Lecturer (2010)  

Ratemi, Elaef  
Ph. D. in Synthetic Organic Chemistry (1997)  
University of Alberta, Canada  
Assistant Professor (2009)  

Rivera, Joseph  
B. S. in Chemical Engineering (1994)  
University of San Carlos, Philippines  
Instructor (1998)  

Sadique, Zakariya  
B. Tech. in Chemical Engineering Technology (2003)  
Cochin University of Science & Technology, India  
Instructor (2012)  

Salahudeen, Shafaat  
B. Tech. in Chemical Engineering Technology (2008)  
Bharathidasan University, India  
Instructor (2012)  

M. S. in Organic Chemistry (2000)  
Berhampur University, India  
Lecturer (2012)  

Sharafudeen, Riyaz  
Ph. D. in Chemistry (2005)  
University of Kerala, India  
Assistant Professor (2011)  

Surabhi, Ajit Kumar  
M. Tech in Biochemical Engineering (2013)  
Glyndwr University, UK  
Lecturer (2012)  

Ph. D. in Polymer Chemistry (2006)  
KFUPM, KSA  
Assistant Professor (2006)
AHMED, IMTIAZ
M. B. A. in Management (1995)
University of Texas at Tyler, USA
Lecturer (2012)

ALI, KHIDIR MOHAMED
Ph. D. in Computer Science (2006)
Brunel University, UK
Assistant Professor (2007)

FAYAD, FADYE SAUD
Ph. D. in Business Administration - Marketing (2013)
Huazhong University of Science and Technology, China
Assistant Professor (2008)

MUHEISEN, NASSAR MUTAWEH
M. S. in Computer Science (1998)
University of Science & Technology, Yemen
Lecturer (2002)

OTAIBI, JAMAL T.
M. S. in Computer Science (2001)
Western Michigan University, USA
Lecturer (2007)

SHAHRANI, SAEED ABDULRAHMAN
M. B. A. (2009)
KFUPM, KSA
Lecturer (2005)

SHAHRARY, AYED ALI
M. A. in Management Information Systems (1990)
University of Springfield, Illinois, USA
Senior Lecturer (1991)

RUWAIS, NAIF SAAD
M. A. in Accounting (2006)
Glasgow Caledonian University, UK
Lecturer (2008)

SMAIL, MOFED ALI
Stephen F. Austin State University, USA
Lecturer (2009)

SHMAILAN, ABDULWAHAB S.
Ph. D in Business Management (2011)
University of Portsmouth, UK
Assistant Professor (2004)

ASFOOR, AYMAN HASAN
M. S. in Information Technology (2004)
Capella University, USA
Lecturer (2007)

ASSOLI, BURHAN M.
B. S. in Business Administration (1992)
Yarmouk University, Jordan
Instructor (2004)

BADWI, SULEIMAN DAWUD
B. S. in Computer Information Systems (1990)
Jacksonville University, USA
Instructor (2004)
Ph. D. in Commerce (2011)
Aligarh Muslim University, India
Assistant Professor (2013)

GUPTA, SHOBHA
Ph. D. in Accounting (2003)
Rajasthan University, India
Assistant Professor (2003)

GERSOPPA, SYED RIYAZ
Master of Commerce (1991)
University of Mysore, India
Lecturer (2004)

University of Greenwich, UK
Lecturer (2004)

HOQ, MOHAMMAD ZIAUL
Ph. D in Business Administration - Marketing and Management (2011)
European University, Switzerland
Lecturer (2012)

Khan, Shoaib Ahmed
B. A. in Economics, Political Science & History (1990)
Osmania University, India
Instructor (1996)

MANASRAH, MURAD ALI
Philadelphia University, Jordan
Instructor (2004)

MUNAWAR, SYED YASER
B. S. in Computer Science (1999)
Karachi University, Pakistan
Instructor (2004)

MOHAMED, ALTAF NOOR
M. S. in Information Technology (1991)
J.R.N. Rajasthan Vidyapeeth University, India
Instructor (2001)

NODORA, CLEMENTE II
St. Louis University, Philippines
Lecturer (2008)

RAHMAN, MOHAhid
Ph. D in Management Development (1995)
Brunel University, UK
Assistant Professor (2001)

M. B. A. in Management (1994)
University of Hull, UK
Lecturer (2008)

RASHID, MUHAMMAD
M. B. A. Accounting and Finance (1993)
University of Karachi, Pakistan
Lecturer (2012)

SHAIK, FAZAL NUBUDDIN
B. S. in Commerce (1997)
University of Mumbai, India
Instructor (2001)
SULAIMAN, AKRAM FARES MOHAMMED
M. S. in Electrical and Electronics Eng’g. (1997)
Eastern Mediterranean University, Turkey
Lecturer (2004)

TABANGA, RABEA ABDUL FATTAH
B. S. in Education Technology (1995)
University of Tanta, Egypt
Instructor (2002)

Kings College London, UK
Lecturer (2005)

National Institute of Technology, India
Lecturer (2008)

WARD, SHAKOOR AHMED
Ph. D. in Workforce Education and Development (2010)
The Pennsylvania State University, USA
Assistant Professor (2013)

WIRBA, ASAN VERNYUY
Ph. D. in Leadership Management (2006)
University of Manchester, UK
Assistant Professor (2013)
- AYYASH, MOHAMMED SAEED
B. S. in Mechanical Engineering (2008)
KFUPM, KSA
NDT Level I - RT
Level I and II - VT, MT, PT
Instructor (2011)

- QAHTANI, ABDULLAH FALAH
B. S. in Mechanical Engineering (2008)
University of Toledo, USA
NDT Level II - RT, PT, MT, UT
Instructor (2009)

EID, MOHAMMED MAHMOUD
B. S. in Physics (1997)
Shaw University, USA
NDT Level III (EN ISO 9712): RT, UT, MT & PT
NDT Level III (ASNT): RT, MT & PT
NDT Level II (EN473): VT
Instructor (2012)

- GEORGE, JOMON
Diploma, Mechanical Engineering (2000)
Institute of Technical Education, India
ASNT NDT Level II - PAUT, ToFD, VT, RT, PT, ET
ASNT NDT Level III - UT, MT
Instructor (2008)

- MAGAT, JOSELITO M.
B. S. in Computer Engineering (1999)
Technological Institute of the Philippines, Philippines
ASNT Level II - UT, RT, PT, MT, MFL
Instructor (2012)

- OBEIDAT, AHMED RIZIQ M.
B. S. in Electrical and Computer Engineering (2005)
Hashemite University of Jordan, Jordan
Aramco approved Level II for RT
ASNT Level III Method Examination of RT
NDT Level II: RT & MT
Instructor (2012)

- ZAYADIN, FOUAD FAKHRI
M. S. in Material & Metallurgical Engineering (2006)
Balqaa’ Applied University, Jordan
NDT Level II (EN ISO 9712): RT, UT, MT & PT
NDT Level III (EN ISO 9712): UT, MT
NDT Level II Qualification (EN473): VT
NDT Level II (ASNT): UT
Lecturer (2012)
AHMAD, REHAN MUZAFFER
M. A. English (1992)
University of Bahawalpur, Pakistan
Instructor (2005)

BIJADI, OTHMAN
M.A. in English Language Teaching (2002)
Nottingham Trent University, UK
Lecturer (2005)

GARNI, ABDULFATTAH M.
B.A. in English Language (2014)
King Faisal University, KSA
Instructor (2006)

HAMADI, HANI
M. A. in TESOL (2013)
Plymouth State University, USA
Instructor (2008)

M. A. in Applied Linguistics (2013)
Nile Valley University, Sudan
Instructor (2003)

ATMACA, ILYAS
B. A. in English and CELTA (1998)
Konya Selcuk University, Turkey
Instructor (2009)

BARDAKCI, KADIR
B. A. in English Language Teaching (1991)
Hacettepe University, Turkey
Instructor (2011)

GALICANO, TORRES JOEL
M. A. in English Language Education (2005)
De La Salle University, Philippines
Lecturer (2006)

AZGORALLIE
B. A. in English (1991)
University of the Western Cape, South Africa
Lecturer (2010)

MOHAMED, ZAID
University of The Western Cape, South Africa
Instructor (2009)

NASSER, BILAL
M.A. in Bilingual Translation (2005)
Westminster University, UK
Instructor (2008)

PATEL, USMAN MUBEEN
B. S. in Internet Information Technology (2003)
Lancaster University, UK
Instructor (2010)

Ph. D. in Business English (2006)
Rockville University, USA
Lecturer (2008)

PETERSON, WILLIAM
B. A. in History (1974)
The College of Wooster, USA
Instructor (2009)
M. Phil. in English Literature (2011)
Annamalai University, India
Instructor (2010)

**Salman, Aleem**

Ph. D. in English (1997)
B. R. Ambedkar Agra University, India
Assistant Professor (2005)
TRAVEL DISTANCES FROM JUBAIL

- Dammam: 76 km.
- Dhahran: 90 km.
- Al-Khobar: 97 km.
- Riyadh: 490 km.
- Jeddah: 1221 km.
- Mecca (Makkah): 1173 km.
- Al Madinah: 1045 km.
- Taif: 1134 km.
- Abha: 1222 km
- Tabuk: 1295 km.
- Yanbu: 1195 km.
- Beirut, Lebanon: 1555 km.
- Cairo, Egypt: 1831 km.
- Doha, Qatar: 267 km.
- Dubai, UAE: 595 km.
- Kuwait, Kuwait: 310 km.
- Manama, Bahrain: 125 km.
- Muscat, Oman: 975 km.
Tel: +966 (3) 340-2000 (Main College Switchboard)
Fax: +966 (3) 341-1258
E-mail: md@jic.edu.sa
Website: www.jic.edu.sa
Address: P.O. Box 10099, Jubail Industrial City 31961, Kingdom of Saudi Arabia

College Registrar
College Registrar's Office
Tel: +966 (013) 340 2141
Fax: +966 (013) 340 2126

Department of General Studies
Office of the Chairman
Tel: +966 (013) 340 2028
Fax: +966 (013) 340 9906

Department of Electrical and Electronic Engineering Technology
Office of the Chairman
Tel: +966 (013) 340 2080
Fax: +966 (013) 340 9905

Department of Management and Information Technology
Office of the Chairman
Tel: +966 (013) 340 2123
Fax: +966 (013) 340 2102

NDT Training Center
Office of the Director
Tel: +966 (013) 340 2135
Fax: +966 (013) 340 9912

Special Programs Unit—English Courses
Office of the Director
Tel: +966 (013) 340 2494
Fax: +966 (013) 340 2021

Curriculum and Quality Assurance
Office of the Deputy
Tel: +966 (013) 340 2076
Fax: +966 (013) 341 1258

Industrial Relations
Office of the IR Director
Tel: +966 (013) 340 2090
Fax: +966 (013) 340 2060
e-mail: ir@jic.edu.sa

English Language Center
Office of the ELC Director
Tel: +966 (013) 340 2071
Fax: +966 (013) 340 2073

Department of Mechanical and Manufacturing Engineering Technology
Office of the Chairman
Tel: +966 (013) 340 2051
Fax: +966 (013) 340 9904

Department of Chemical and Process Engineering Technology
Office of the Chairman
Tel: +966 (013) 340 2124
Fax: +966 (013) 340 9903