Fahad Bin Sultan
University

University Catalogue
2013-2014
His Majesty King Abdul Aziz Al Saud
King Abdullah bin Abdul Aziz Al Saud
The Custodian of the Two Holy Mosques
His Royal Highness Prince Salman bin Abdul Aziz Al Saud
Crown Prince, Deputy Prime Minister and Defense Minister
His Royal Highness Prince Fahad bin Sultan bin Abdul Aziz Al Saud

Prince of Tabuk Region and Chairman of the Board of Trustees
“When we speak of education in the Kingdom, we speak of building-up the country and its citizen, of promoting the country and modernizing it, and of alleviating the citizen and enabling him, for there is no cause appertaining to man, in heaven or on earth, which is more honorable than education.”

His Royal Highness Prince Fahad bin Sultan bin Abdul Aziz Al Saud

Prince of Tabuk Region and Chairman of the Board of Trustees
Welcome to Fahad Bin Sultan University (FBSU)

At FBSU you will find challenging opportunities for a successful life and a bright future. With a strong commitment to excellence, inspired by the directives of HRH Prince Fahad Bin Sultan, Chairman of the Board of Trustees (BoT), and the technical support of the American University of Beirut (AUB), one of the top Universities in the region, FBSU strives to offer rigorous and stimulating academic programs that pave the way for a life full of growth and success.

As we share the joy and excitement of the new academic year, we are proud to provide you with the FBSU catalog for the academic year 2013-14 as a guide to students, faculty, and staff in their pursuit of excellence during their stay at FBSU, and as a beacon for future generations seeking new horizons of higher education. This catalog manifests essentially the achievements of FBSU and serves a manifold purpose: (i) introduce the administration and faculty members; (ii) highlight the modifications of some of the regulations, policies, procedures, and programs; (iii) announce revised versions for the study plans in the College of Business and Management and the College of Engineering; and (iv) announce the MBA program in the fall term of 2013-14.

The Foundation Year Program (FYP) continues to be a university priority geared to provide new students with the necessary background in English, Math and Information Technology skills to succeed in the chosen academic programs.

The Bridging Year Program (BYP) and the Executive Master in Business Administration (EMBA) have proven to be a successful endeavor and a testimony for the effective and dynamic role of the university in realizing the aspirations of the members of the Tabuk community and the Kingdom at large.

To this end, FBSU is happy to announce that the Ministry of Higher Education (MoHE) has approved the establishment of the of Sciences and Humanities. In addition, the university has submitted an application to MoHE for its first program in English Language. Concurrently, the College of Computing has already completed its proposal for an undergraduate program in Information Technology.

Moreover, during the academic year 2013-14, FBSU will be offering its second graduate program, Master’s in Business Administration (MBA), and it will be celebrating the graduation of its first EMBA class.

The next challenge for FBSU is to establish the College of Medical Sciences during the next academic year. The proposed college will start with three undergraduate programs: Medical Lab, Nursing, and Nutrition. The feasibility study of the college is already completed, and the respective proposal is currently undergoing the proper procedure for the MoHE approval.

To further enhance its programs, FBSU has furnished and/or renovated its science and engineering labs (civil, electrical and computer) with high-end equipment that support research and teaching activities. Moreover, during the current year, it will be installing two English labs, one for the male section and another for the female section, and a new up-to-date networking lab.

We are pleased to see a steady high increase in students’ enrollment and MoHE students’ scholarships indicating a growing interest in our university, its academic programs and achievements thus far. In this respect, we would like to acknowledge the major support that FBSU has been receiving from the MoHE.
Briefly, much is happening at FBSU at a critical time of further improvement and growth. After a decade of its establishment, FBSU continues to be a vigorous and dynamic university that quests confidently for exciting opportunities to be grasped and shared.

Ahmad Nasri, Professor
A/President
Student Responsibility for Catalog Information

FBSU students are responsible for reading the information in this catalog and on the university website (http://www.fbsu.edu.sa). Failure to comply with Faculty and University regulations will not exempt students from whatever consequences they may incur. Upon admission to the University, students will be assigned e-mail addresses, whence will be held responsible for checking their emails regularly for official University announcements and information.

Address

Fahad Bin Sultan University
PO Box 15700
Tabuk 71454, Saudi Arabia

Telephone: 00966 (0) 14 4252500
Fax: 00966 (0) 14 4276919
Email: admissions
or Info@fbsu.edu.sa
Website: www.fbsu.edu.sa

This catalog and relevant updates can also be viewed online at www.fbsu.edu.sa
Table of Contents

TABLE OF CONTENTS ............................................................................................................. 27

ADMINISTRATION .................................................................................................................. 38

UNIVERSITY ADMINISTRATION 2013-14 ......................................................................... 38
ACADEMIC ADMINISTRATION ............................................................................................. 38
DEANSHIP OF GRADUATE STUDIES AND SCIENTIFIC RESEARCH ......................... 38
COLLEGE OF BUSINESS & MANAGEMENT ...................................................................... 39
COLLEGE OF COMPUTING .................................................................................................. 39
COLLEGE OF ENGINEERING ............................................................................................... 39
ARTS AND SCIENCES UNIT ................................................................................................. 39
FOUNDATION YEAR PROGRAM ......................................................................................... 39
STUDENT AFFAIRS ................................................................................................................ 39
ADMISSIONS AND REGISTRATION DEPARTMENT ............................................................. 39
HUMAN RESOURCES DEPARTMENT .................................................................................. 40
FINANCE DEPARTMENT ..................................................................................................... 40
MARKETING AND PUBLIC RELATIONS ............................................................................ 40
PURCHASING DEPARTMENT ............................................................................................... 40
WAREHOUSE ....................................................................................................................... 40
COPY & MAIL CENTER ......................................................................................................... 40
LIBRARY ............................................................................................................................... 40
IT UNIT .................................................................................................................................. 40
FACILITIES MANAGEMENT UNIT ..................................................................................... 41
INFORMATION DESK ............................................................................................................ 41
TRANSPORTATION UNIT .................................................................................................... 41
SECURITY UNIT ................................................................................................................... 41
PRESIDENT’S OFFICE ........................................................................................................... 41

ACADEMIC CALENDAR 2013-2014 .................................................................................... 43

THE UNIVERSITY .................................................................................................................. 46

BACKGROUND ...................................................................................................................... 46
MISSION ................................................................................................................................. 46
VISION ................................................................................................................................... 46
ACADEMIC SERVICES AND FACILITIES ........................................................................... 46

Library .................................................................................................................................. 47
Lab Facilities.................................................47
Learning Assistance Center..................................47
Deanship of Student Affairs..................................47
Counseling and Advising Center..............................48
Student Activities Office......................................48
Student Services Office......................................48

ADMISSION POLICIES AND PROCEDURES.........................50
University Admission Criteria..................................50
Application Process ...........................................50
Admission Notification .........................................51
Duration of Study in an Academic Program ................51

FOUNDATION YEAR PROGRAM (FYP)...............................54
Officers of the Unit ...........................................54
Program Overview ............................................54
Vision ..................................................................54
Mission ............................................................54
Admission ..........................................................54
Structure ............................................................55
Duration of the Program ........................................55
Placement and Promotion in the FYP .......................55
Learner Evaluation ..............................................55

BRIDGING YEAR PROGRAM (BYP).................................58
Program Overview ..............................................58
Mission ............................................................58
Program Objectives .............................................58
Program Learning Outcomes ................................58
Admission ..........................................................58
Duration of the Bridging Year Program .....................59

GENERAL ACADEMIC INFORMATION .............................62
Academic Policies ..................................................62
Registration ......................................................62
Academic Advisors .............................................62
Registration Procedures .......................................62
Early Registration ...............................................62
Dean’s Honor .......................................................................................................................... 71

Transfer ................................................................................................................................ 71
  Transfer from Another Recognized University ................................................................. 71
  Transfer from One College to Another at the University .................................................. 71
  Transfer from One Major to Another within the College .................................................. 71
  FBSU ................................................................................................................................... 72

Graduation ............................................................................................................................... 72
  Duration of Study in an Academic Program ...................................................................... 72
  General Graduation Grade ................................................................................................. 73
  Graduation with Honors .................................................................................................... 73

ACADEMIC RECORDS ........................................................................................................ 74
  Transcript Request ............................................................................................................. 74
  Disclosure of Student Records ......................................................................................... 74

ACADEMIC AND INTELLECTUAL FREEDOMS ................................................................ 74
  Freedom in Classroom ....................................................................................................... 74
  Freedom of Inquiry and Expression .................................................................................. 74

Academic Integrity ................................................................................................................ 75
  Cheating ............................................................................................................................... 75

Plagiarism ............................................................................................................................... 75

Range of Disciplinary Actions ............................................................................................ 75
  Warning .............................................................................................................................. 75
  Reprimand .......................................................................................................................... 75
  Dean’s Warning .................................................................................................................. 75
  Suspension .......................................................................................................................... 76
  Expulsion ............................................................................................................................ 76

Student Academic Appeals and Grievance Procedures ...................................................... 76
  Appeals Process ................................................................................................................ 76

FEES AND EXPENSES ....................................................................................................... 77
  Payment of Fees ............................................................................................................... 77
  Refund policy ..................................................................................................................... 77

SCHOLARSHIPS AND FINANCIAL SUPPORT PROGRAM .................................................. 78
  Objectives .......................................................................................................................... 78

Awards ................................................................................................................................. 78
  King Abdullah Internal Scholarships Program ................................................................. 78
  Prince Sultan Scholarships ............................................................................................... 78
  Merit Scholarships Program ............................................................................................. 79
  Tuition Discount and Fee Waiver Program ..................................................................... 80

STUDENT EMPLOYMENT PROGRAM ............................................................................. 80
  Objectives .......................................................................................................................... 80

30
Administration
Administration

University Administration 2013-14

• Nasri, Ahmad; Acting President
• Lyzzaik, Abdallah; Acting VP for Academic Affairs, Acting VP for Graduate Studies and Scientific Research
• Al-Balawi, Abdullah; Acting VP for Development
• Al-Sayed, Waad; Assistant to the President for Female Section
• Al-Balawi, Massad; Acting Dean of Student Affairs
• Al Hwaiti, Hajjar; Female Assistant Dean of Student Affairs.
• Saagedin, Daoud; Acting Director of Quality Assurance and Institutional Research
• Hallal, Hicham H.; Assistant to the President for Information Technology
• Bitar, Shaker, Assistant to the President for Administrative Affairs
• Al-Zureiqi, Mohammad; Acting Registrar
• Falah, Ahmad; Interim Director of IT Unit
• Barake, Taha; Acting Director of Facilities
• Jaffal, Rami; Acting Director of Finance
• Al-Atawi, Abdullah; Human Resources Officer

Academic Administration

• Lyzzaik, Abdallah; Ph.D, Acting VP for Academic Affairs, Acting VP for Graduate Studies and Scientific Research
• Bayoud, Hussam; Ph.D, Acting Director, Arts and Sciences Unit
• Al-Sayed, Waad; Ph.D, Female Coordinator, Arts and Sciences Unit
• Tabsh, Ibrahim; Ph.D, Acting Dean, College of Business and Management
• Al-Masri, Lubna; Ph.D, Female Coordinator, College of Business and Management
• El-Fadil, Nazar; Ph.D, Acting Dean, College of Computing
• Haidar, May; Ph.D, Female Coordinator, College of Computing
• Tantawi, Hassan; Ph.D, Acting Dean, College of Engineering
• Btoosh, Mousa; Ph.D, Acting Director, Foundation Year Program
• Abu Atieh, Amani; MA, Female Coordinator, Foundation Year Program

Deanship of Graduate Studies and Scientific Research

• Lyzzaik, Abdallah; Acting VP for Graduate Studies Scientific Research, Acting Dean of Graduate Studies
College of Business & Management
• Tabsh, Ibrahim; Acting Dean, Director of EMBA Program
• Al-Masri, Loubna; Female Coordinator

College of Computing
• El-Fadil, Nazar; Acting Dean
• Mezher, Mohamed; Chairperson, Computer Science Department
• Riman, Chadi; Chairperson, Computer Engineering Department
• Haidar, May; Female Coordinator

College of Engineering
• Tantawi, Hassan; Acting Dean
• Hattamleh, Omar, Chairperson, Civil Engineering Department
• Hallal, Hicham H., Chairperson, Electrical Engineering Department

Arts and Sciences Unit
• Bayoud, Hussam; Acting Director
• Al Sayed, Waad; Female Coordinator

Foundation Year Program
• Btoosh, Mousa; Acting Director
• Abu Atieh, Amani; Female Coordinator

Student Affairs
• Al Balawi, Massad; Acting Dean of Student Affairs
• Al-Hwaiti, Hajjar, Female Section, Assistant Dean
• Matar, Jihad; Sports Officer

Admissions and Registration Department
• Al Zureiqi, Mohammad; Acting Registrar
• Abu Al-Hassn, Lama; Female Section, Assistant

1 Preliminarily approved by the MoHE as the College of Sciences & Humanities
Human Resources Department
• Al-Atawi, Abdullah; Officer
• Al-Nojom, Amro; Payroll
• Ghabban, Alaa; Female Section, Assistant

Finance Department
• Jaffal, Rami; Acting Director
• Al Hazmi, Amnah; Female Section
• Al-Balawi, Nasser, Cashier

Marketing and Public Relations
• Al Balawi, Abdullah, Acting VP
• Al-Balawi, Fahad, Officer
• Ellawand, Mirvat, Female Section, Webmaster
• Khaledi, Sami, Social Media Officer

Purchasing Department
• Qutishat, Ahmad; Administrative Assistant, President Office
• Al Sa`afen, Yousif; Officer

Warehouse
• Al Omrani, Mohammad

Copy & Mail Center
• Fteih, Adnan
• Al Atawi, Nourah; Female Section

Library
• Abed Al-Rahman, Mustapha; Acting Librarian
• Al-Atawi, Ibtissam; Female Section, Coordinator

IT Unit
• Al Falah, Ahmad, Interim Director, System Administrator
• Barakah, Abdullah, Moodle Assistant
• Ellawand, Mirvat, Webmaster, Female Section
• Halfawi, Omar; Database Administrator
• Al-fifi, Mouna; Female Section, Coordinator

Facilities Management Unit
• Barake, Taha; Acting Director
• Ellawand, Mirvat; Female Section, Coordinator

Information Desk
• Daghridi, Mousa
• Dosari, Nourah; Female Section

Transportation Unit
• Al Omrani, Ibrahim; Officer
• Abdel Haq, Nourah; Female Section

Security Unit
• Al Omrani, Abdullah; Officer
• Samti, Fatmah; Officer, Female Section

President’s Office
• Al Dosari, Mouhammad; Secretary
• Shehri Haifa, Female Section, Secretary
Academic Calendar
2013-2014
<table>
<thead>
<tr>
<th>Days</th>
<th>Gregorian</th>
<th>Hijri</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun - Thu</td>
<td>09/06-22/08/2013</td>
<td>30/08-15/10/1434</td>
<td>Admission notification for Fall 2013-14</td>
</tr>
<tr>
<td>Sun – Sat</td>
<td>04-17/08/2013</td>
<td>27/09 - 10/10/1434</td>
<td>Ramadan and Al-Fitr holiday</td>
</tr>
<tr>
<td>Sun</td>
<td>25/08/2013</td>
<td>18/10/1434</td>
<td>Faculty report to duty</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>1 – 05-09/2013</td>
<td>25-29/10/1434</td>
<td>Registration period for new students</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Orientation for new students of Fall 2013-14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Payment of fees for Fall 2013-14 for all students</td>
</tr>
<tr>
<td>Sun</td>
<td>1/09/2013</td>
<td>25/10/1434</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>1 – 12/09/2013</td>
<td>25/10 -06/11/1434</td>
<td>Drop and Add period</td>
</tr>
<tr>
<td>Mo</td>
<td>23/09/2013</td>
<td>17/11/1434</td>
<td>National holiday</td>
</tr>
<tr>
<td>Thu - Su</td>
<td>10-20/10/2013</td>
<td>05-15/12/1434</td>
<td>Adha holiday</td>
</tr>
<tr>
<td>Mo</td>
<td>21/10/2013</td>
<td>16/12/1434</td>
<td>Classes resume</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>27-31/10/2013</td>
<td>22-26/12/1434</td>
<td>Advising week for Spring 13-14 for continuing students</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>03-07/11/2013</td>
<td>29/12-04/01/1435</td>
<td>Registration week for Spring 13-14 for continuing students</td>
</tr>
<tr>
<td>Thu</td>
<td>05/12/2013</td>
<td>02/02/1435</td>
<td>Last day for withdrawal from courses</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>08-12/12/2013</td>
<td>05-09/02/1435</td>
<td>Payment of fees for Spring 13-14 for continuing students</td>
</tr>
<tr>
<td>Sun</td>
<td>15/12/2013</td>
<td>12/02/1435</td>
<td>Orientation sessions for new students of Spring 2013-14</td>
</tr>
<tr>
<td>Sun</td>
<td>15/12/2013</td>
<td>12/02/1435</td>
<td>Registration begins for new students of Spring 2013-14</td>
</tr>
<tr>
<td>Thu</td>
<td>02/01/2014</td>
<td>1/03/1435</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Sun - Tue</td>
<td>05-14/01/2014</td>
<td>04-13/03/1435</td>
<td>Final examination period</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>12-16/01/2014</td>
<td>11-15/03/1435</td>
<td>Payment of fees for Spring 2013-14 for new students</td>
</tr>
<tr>
<td>Thu</td>
<td>16/01/2014</td>
<td>15/03/1435</td>
<td>Registration ends for new students of Spring 13-14</td>
</tr>
<tr>
<td>Sun - Sat</td>
<td>19-25/01/2014</td>
<td>18-22/03/1435</td>
<td>In-between semesters break</td>
</tr>
</tbody>
</table>
### Spring Term

<table>
<thead>
<tr>
<th>Days</th>
<th>Gregorian</th>
<th>Hijri</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>26/01/2014</td>
<td>25/03/1435</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>26/01-06/02/2014</td>
<td>25/03- 06/04/1435</td>
<td>Drop and Add period</td>
</tr>
<tr>
<td>Sun – Sat</td>
<td>23-29/03/2014</td>
<td>22-28/05/1435</td>
<td>Midterm break</td>
</tr>
<tr>
<td>Sun</td>
<td>30/03/2014</td>
<td>29/05/1435</td>
<td>Classes resume</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>06-10/04/2014</td>
<td>06-10/06/1435</td>
<td>Advising week for Summer 2014 and Fall 2014-15</td>
</tr>
<tr>
<td>Thu</td>
<td>24/04/2014</td>
<td>24/06/1435</td>
<td>Last day for withdraw from courses</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>27/04-01/05/2014</td>
<td>76/06-02/07/1435</td>
<td>Registration week for Summer2014 and Fall 2014 Payment of fees for Summer 2014 and Fall 2014</td>
</tr>
<tr>
<td>Thu</td>
<td>22/05/2014</td>
<td>23/07/1435</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>Sun - Tue</td>
<td>25/05-03/06/2014</td>
<td>26/07/- 05/08/1435</td>
<td>Final examination period</td>
</tr>
<tr>
<td>Thu</td>
<td>05/06/2014</td>
<td>07/08/1435</td>
<td>Last working day</td>
</tr>
</tbody>
</table>

### Summer Term

<table>
<thead>
<tr>
<th>Days</th>
<th>Gregorian</th>
<th>Hijri</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>08/06/2014</td>
<td>10/08/1435</td>
<td>Training experience begins</td>
</tr>
<tr>
<td>Sun</td>
<td>08/06/2014</td>
<td>10/08/1435</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Sun - Thu</td>
<td>15-19/06/2014</td>
<td>17-21/08/1435</td>
<td>Drop and Add period</td>
</tr>
<tr>
<td>Thu</td>
<td>03/07/2014</td>
<td>06/09/1435</td>
<td>Last day for course withdrawal</td>
</tr>
<tr>
<td>Thu</td>
<td>17/07/2014</td>
<td>20/09/1435</td>
<td>Last day of classes Training experience ends</td>
</tr>
<tr>
<td>Sun - Tue</td>
<td>20-22/07/2014</td>
<td>23-25/09/1435</td>
<td>Final examination period</td>
</tr>
<tr>
<td>Thu</td>
<td>17/07/2014</td>
<td>20/09/1435</td>
<td>Training experience ends</td>
</tr>
</tbody>
</table>

**Note:** The first date (e.g. 04/12/2013) is Gregorian and the second (e.g. 01/02/1435) is Hijri.
The University
The University

Background
Based on the principle of integration between private and public sectors in KSA in offering higher education services, the Ministry of Higher Education encourages private higher education in all academic specialties. His Royal Highness Prince Fahad Bin Sultan – Prince of Tabuk Region encouraged investors to start a private university to spread culture and education in the city of Tabuk, which has a distinguished geographical location that serves the region and its surroundings.

FBSU was established in the year 1424 H in the city of Tabuk with one college, the College of Computing. At the beginning of the academic year 1427 – 28 H a branch for girls was added and was followed by the addition of the two colleges of Engineering and Business and Management in 1428 – 29 H. The University is governed by a Board of Trustees chaired by His Royal Highness Prince Fahad Bin Sultan Bin Abdul Aziz. The University continues to receive technical support from the American University of Beirut which offers consulting services on the design of curricula, selection of faculty, and the development of the University bylaws.

Mission
FBSU offers quality academic programs using state-of-the-art facilities, inspires students’ learning, helps develop their skills, shapes their attitudes, fosters in them the passion for life-long learning, and installs in them the leadership skills required to compete in the workplace and become leaders while committing to highest ethical and moral standards for the betterment of society.

Vision
FBSU is committed to the educational success of a diverse student body for productive lives in the global marketplace. It will be known for:

1. Promoting educational excellence with a faculty committed to teaching, research, scholarship, and service.
2. Providing innovative, experiential, and design opportunities for students;
3. Improving the quality of life for the communities being served through Business, IT, Engineering, cultural and civic partnerships.
4. Embracing the wide diversity for stakeholders by fostering a workplace where FBSU students, faculty, and staff feel valued.

Academic Services and Facilities
The mission of the Academic Services at FBSU is to ensure that the University’s mission and goals, such as academic excellence, community service, and other core educational values, are accomplished. FBSU provides the following facilities:
Library
Library services include print and electronic collections that provide first level resources in engineering, science, mathematics, business, computing, and humanities. The resources provide a good start to complete classroom assignments and projects, explore professional literature, pursue personal learning, and conduct research.

The library includes study areas equipped with PCs connected to the internet. Through the library webpage one can use search engines to access a number of quality information sources electronically in a full-text and full-image format and popular and scholarly journals, encyclopedias and engineering handbooks, standards, catalogs and books held by KSU Library, MOHE Digital library, as well as Proquest Central and Ebrary that offer hundreds of thousands of digital titles in all disciplines. The web address for the Library Webpage is: http:// www.fbsu.edu.sa

Lab Facilities
FBSU is totally committed to providing students with a quality lab experience in order to prepare them to succeed in today’s technology-based economies. As a vital hands-on component of all technology-based courses, the labs are well integrated into the curriculum giving FBSU graduates the ability to harness technology for the benefit of the institutions they work for.

FBSU also allocates computing and networking facilities to its faculty, staff, and students. These facilities are intended for teaching, learning, research and administration in support of the University’s mission.

Learning Assistance Center
The Learning support Center offers academic assistance in the areas of Chemistry, Computer Science, Mathematics, Physics, English, and Business. Faculty members dedicate several hours each week to tutor students and work with them on one-on-one basis on any subject the student needs. Students may also receive personal academic advisement, advice on improving study skills, and workshops/review sessions. The schedule of the center is published at the beginning of each semester.

Deanship of Student Affairs
FBSU is dedicated to the wellbeing and development of students. The Office of Student Affairs oversees student activities, athletics and recreation, counseling and advising, and all other student services. Through this Office, activities and services are provided to enhance, support, and complement the student’s personal and educational development. The Office is open from 8 am to 4 pm.

This holistic approach to student education enables the student to learn and practice the values of tolerance, civic and moral responsibility, inclusiveness and excellence in learning and leadership, values that best represent the mission of the University.
Counseling and Advising Center
The Counseling and Advising Center exists within the Office of Student Affairs to guarantee rendering to currently enrolled students a high quality professional service.

The Counseling and Advising Center provides services to students whose personal difficulties and problems interfere with their academic performance. It also assists students in formulating and achieving their educational goals through its psychological services, and assists gifted and talented students to further develop their abilities.

Counseling involves one-on-one discussions with a trained professional counselor who will listen, ask questions, and help explore options about the problems or areas of concern to the student. It is a process of self-discovery and self-knowledge.

The Center’s professionally trained counselors exert all possible efforts to assist and support students with emotional concerns in a sensitive, caring, and confidential manner.

Student Activities Office
The Student Activities Office is responsible for organizing and supporting a wide range of student activities. Its mission is to help students reach their full academic potential by collaborating with faculty, staff, and the community to organize extracurricular activities that enrich student life in the University.

Most student activities are organized by officially registered clubs and societies, with elected Officers. These Officers, including club president and club treasurer, play a key role in overseeing the activities and ensuring the financial state of the club. Clubs, societies and student publications are important channels for students to develop their talents. The University’s clubs and societies cover a very wide range of student interests which may be in the fields of drama, music, debate, writing, art and so on.

Student organizations should submit by the end of October a tentative yearly plan indicating the number, type and nature of activities planned to take place.

Student Services Office
The activities of this Office include:

• Issuing ID cards to students and maintaining their validity.
• Issuing authenticating medical and official excuses to students, when they are absent from classes or exams.
• Preparation and maintenance of students’ monthly stipend payments.
• Communication with parents/guardians of the students in matters related to their academic progress.
• Maintaining and updating the official and complete non-academic records of all students.
• Processing student complaints.
Admission Policies and Procedures
Admission Policies and Procedures

FBSU seeks students with a sound academic record, good personal character, strong interest to serve their communities, and eagerness to serve as professionals in allied fields. Students with the most promising overall profile will be selected to join either the Foundation Year Program (FYP) or any of the academic programs offered in the Colleges of Computing, Business and Management, or Engineering.

University Admission Criteria
Applicants to FBSU must satisfy the following eligibility requirements:

- Hold a Secondary Education Certificate from KSA or any equivalent certificate attained within the past five years.
- Passed the National Skills Exam.
- Be medically fit.
- Hold a good conduct certificate.
- Present a “No-Objection” letter from the employer, if applicable.
- Should not have been dismissed from any academic institution.
- Fulfill program requirements.
- Fulfill other University requirements.

A student who satisfies the above criteria has to take placement tests in English, Mathematics, and Information Technology. Students who fail to achieve the required minimum score on one or more of the placement tests will be required to complete additional remedial work by joining the University’s Foundation Year Program.

Application Process
Applicants are required to fill out an application form available at the Office of Admissions, and submit it with the following documents:

- A certified copy of the Secondary Education Certificate or an equivalent certificate.
- A certified copy of the National Skills Exam results.
- A copy of the Citizenship Card or the Residence Permit (Iqama) for non-Saudis.
- Four colored passport photos.
- “No-Objection” Certificate from employer, if applicable.
- Medical Certificate.
- Good conduct Certificate.
- Non-refundable application fee.

All documents received by the Office of Admissions become the property of FBSU, and thus cannot be returned. Applications for the fall semester are accepted until mid July and applications for the spring semester are accepted until mid December.
Admission Notification
Applicants who are admitted to an academic program or to the Foundation Year Program at FBSU are notified between August 1 and August 15 for the first semester, and between January 1 and January 15 for the second semester. Admitted students will be provided with a pamphlet containing all the necessary guidelines to proceed to the registration and payment processes. Students who have been informed of their initial acceptance but did not register during the registration, their acceptance will be revoked unless the student requested deferred entry.

Duration of Study in an Academic Program

- The minimum study period for a Bachelor degree is four calendar years encompassing eight semesters (two calendar years encompassing four semesters for the diploma).
- The maximum study period allowed for a Bachelor degree is eight calendar years (Four calendar years for a diploma). A student who fails to complete his/her degree program within these specified times must petition the College Administrative Committee for an extension of time.
- A student transferring to a diploma program at FBSU from other recognized institutions of higher learning must register in the final two regular semesters and must complete at least 30 credits at FBSU, of which a minimum of 15 credits must be in his/her major before s/he is allowed to graduate with a diploma. For purposes of this requirement, one summer session shall be considered equivalent to one semester.
- A student transferring to a Bachelor program at FBSU from other recognized institutions of higher learning must register in the final four regular semesters and must complete at least 60 credits at FBSU, of which a minimum of 30 credits must be in his/her major before s/he is allowed to graduate with a Bachelor Degree. For purposes of this requirement, two summer sessions shall be considered equivalent to one regular semester.
- A transfer student from within FBSU must meet the residency requirement of spending a minimum of three semesters in the new College during which s/he completes a minimum of 36 credits, out of which 12 are credits in the major, before s/he graduates with a Bachelor Degree. For purposes of this requirement, two summer sessions shall be considered equivalent to one semester.
Foundation Year Program
Foundation Year Program (FYP)

Officers of the Unit

Acting Director: Mousa A. Btoosh

Associate Professors: Mousa A. Btoosh


Assistant Instructors: Mustafa Abdelrahman

Program Overview

The Foundation Year Program at FBSU aims to prepare students to satisfy the university admission requirements. Its purpose is mainly to improve students’ English language proficiency, enhance their IT skills, and enrich their math content knowledge. Students who successfully complete the program will be able to join an appropriate academic major.

Vision

To become one of the leading institutes in the KSA and the region by setting standards of excellence in innovative curriculum design, teaching, professional development, and cross-cultural understanding.

Mission

To provide quality instruction in English Language, Math & IT to all students who have chosen FBSU as their academic institution for higher education.

Admission

It is important to note that admission of students to the Foundation Year Program and to FBSU will be usually in the first semester, and possibly in the second semester, but not in the summer. Each student is required to take placement tests in English, IT, and Mathematics to determine the entry level. The tests are designed by the FY Faculty in consultation with the AUB team specifically for this purpose.
**Structure**

Students joining the Foundation Year Program will be placed in one of two levels in English, IT, and Mathematics based on their performance on the corresponding placement tests. The duration of each level is one semester followed by properly designed proficiency tests.

**Duration of the Program**

The program could be completed in one or two semesters depending on the entry level of the learner as well as on the skills and content targets as determined by the proficiency tests. It is important, therefore, that all stakeholders realize that it takes time to acquire, reinforce, and build on literacy and content skills. Students who fail to complete the program in two years may be asked to withdraw from the University.

**Placement and Promotion in the FYP**

All applicants to the Foundation Year Program will be assigned a learning level in each of the three subjects (English, Information Technology, and Mathematics) based on their performance on special tests designed to measure their abilities, skills, and knowledge in these three areas.

In the English program, other specially prepared diagnostic tests may be used to test the mastery level in the various language skills and elements (listening, speaking, reading, writing, grammar, and vocabulary).

Promotion to a higher level in each of the three subjects (English, IT, Mathematics) is not automatic; learners must demonstrate that they have successfully met the instructional objectives set for the current level before moving on to a higher level. The placement test will be administered again to serve as a measurement of progress made by the learners over the period of one semester.

**Learner Evaluation**

In addition to traditional achievement tests and quizzes, learners will be assessed by alternative forms of assessment that are more formative and qualitative in nature, such as portfolios, focused observations with checklists, self and peer assessment, interviews, projects, oral presentations, and conferences.

Exit from the program will be determined upon achievement of a satisfactory score on well-designed measures of proficiency in the various areas.
Bridging Year Program
Bridging Year Program (BYP)

Program Overview
The Bridging Year Program (BYP) provides opportunities for students who hold a diploma from a two- or three- year technical college to pursue a Bachelor’s degree at Fahad Bin Sultan University. The courses of this Program are designed to bridge the gap between a student’s prior education and the requirements of the third year university courses as seamless as possible. The Program could be completed in two semesters or more depending on the entry level of the student, his/her skills, and the sought program of study. Students who pass the BYP need to spend the third and fourth years of the Bachelor’s degree at FBSU.

The BYP is offered in the following majors:
- College of Computing: Computer Science and Computer Engineering;
- College of Business and Management;
- College of Engineering: Civil and Electrical Engineering.

Mission
The BYP seeks to prepare holders of technical degrees to join FBSU at the third year level of the University programs.

Program Objectives
The BYP aims at developing students’ scientific competencies and increasing their opportunities to succeed in their academic courses and future careers. The Program aims at improving students' English language proficiency, IT skills, and natural and basic sciences.

Program Learning Outcomes
The BYP is designed to help students develop a basic set of skills and competencies that will prepare them to better engage their major course of study. Students who successfully complete the BYP will be able to:

1. Effectively utilize the English language essential to their success at the University.
2. Demonstrate the use of mathematical skills to solve various mathematical problems.
3. Apply study skills necessary for success at the college level.

Admission
To be admitted to the BYP, a diploma graduate must:

1. Satisfy University admission criteria; see the “University admission criteria”.

58
2. Be a graduate of a KSA-accredited academic organization.
3. Have passed the official technical exam administered by the relevant governmental authority in case the Diploma was issued by a private academic institution.
4. Have a High School degree (scientific stream) for admission to the Colleges of Computing and Engineering.

**Duration of the Bridging Year Program**
The duration of the BYP is normally one or two semesters depending on the entry level of the student, his/her performance, and the sought program of study.
General Academic Information
General Academic Information

Academic Policies

Registration

Academic Advisors
Each student is assigned an academic advisor who assists him/her in registration and selection of courses. The advisor is also involved in counseling on any academic difficulties or problems encountered, and in monitoring the academic progress of advisees.

The academic advisor is a faculty member in the academic division in which the student is enrolled; the advisor of the Foundation year program students is the Director of the Foundation Year Program or anyone he/she authorizes to act on his/her behalf.

Registration Procedures
Course registration can be done through the Office of the Registrar, by the Department to which the student belongs, or through the online registration system by the student himself/herself. A Student Identification Number (ID) is necessary for registration. Registration for the Fall semester normally starts two weeks prior to the first day of regular classes of that semester and continues for about one week after classes begin (the exact period is specified in the Academic Calendar), while, registration for the Spring semester takes place in the break between semesters (i.e. between the Fall and Spring semesters). A student must complete his/her own registration in person and pay the tuition fees and other charges during the registration period.

Once students have registered for classes in a semester, they may process schedule modifications during the scheduled drop/add period of that semester.

Early Registration
At approximately the middle of the first (fall) semester, early registration is held in each College for the courses to be taken by students during the second (spring) semester; and in the middle of the second semester of each year, students register for both the coming summer session and the first semester of the following academic year.

Early registration is required of all enrolled students who intend to continue their studies at the University during the following terms.

Late Registration
Students who, for a valid reason, are unable to complete formal registration during the designated periods may petition for late registration, which must take place within the drop/add period specified in the academic calendar. A late registration fee of 300SAR will be assessed to students who register after the announced registration period.
Auditing a Course
A student is allowed to audit a course only in his/her last semester before graduation. The audited course must not be a required course for graduation. The student must fill out the “Audit Form”. The form requires the signatures of the course instructor and the faculty advisor, and must be submitted to the Registrar’s Office during the drop/add period. A course taken for credit may be changed to an Audit course by submitting the Audit Form by the last day for withdrawal specified in the academic calendar.

Course Substitution
If a student is unable to complete the requirements of any program due to the termination of a course or when accrediting new programs that comprise courses the student has not studied, he/she can substitute a maximum of two courses with other equivalent courses, in terms of level, content, and credit hours. The Registrar’s Office must be informed of the substitution after the student has obtained the approval of his/her advisor and the Graduation Committee.

Minimum and Maximum Course Load
Course Load: course load is defined as the number of credit-hours for which a student is registered in a regular semester or a summer session. The course load varies from one major to another and is determined as follows:

Regular Semester
The minimum course load limit is 12 credit hours during a regular semester, provided that the total number of credit hours registered by a student in any two consecutive semesters is not less than 24. This condition is relaxed in the last semester before graduation.

The maximum course load is 19 credit hours. However, a student is permitted to register for up to 21 credit hours with the approval of his/her dean, if the student has maintained a minimum cumulative GPA of 4.00 out of 5.00 in all work undertaken during the preceding terms in which he/she earned his/her last 24 credit hours.

Summer Session
The maximum course load in a summer session is 9 credit hours.

Graduation Term
The minimum course load in this case is 1 credit hour, and the maximum is 20 credit hours during a regular semester (respectively 1 and 9 in the summer session). A maximum load of 20 credit hours in the graduation term is allowed provided the student’s cumulative GPA of all work undertaken during the preceding terms in which he/she earned his/her last 24 credit hours is not less than 3.00 out of 5.00.
Students on Academic Probation
The minimum course load in such cases is 12 credit hours; the maximum is 13 credit hours in each regular semester.

Adding and Dropping Courses
A student may change his/her schedule by adding or dropping courses, or changing sections only after obtaining the approval of his/her academic advisor.

Adding Courses
Students may add courses with available seats during the drop/add period of each semester. A course add is performed using a “Course Drop/Add Form”, which may be obtained from the Registrar’s Office. The form requires the advisor’s signature, and must be submitted to the Registrar’s Office during the drop/add period of the respective semester.

Important Reminders
1. The course load should not exceed the maximum permissible limit.
2. It is the advisor’s responsibility to ensure added courses do not result in conflicts in the student’s schedule.
3. Regularly scheduled courses cannot be added after the drop/add period.

Dropping Courses
Students may drop courses from their schedule during the drop/add period of each semester. A course drop is performed using “Course Drop/Add Form”, which may be obtained from the Registrar’s Office. The form requires the advisor’s signature, and must be submitted to the Registrar’s Office during the drop/add period of the respective semester.

Important Reminders
1. The course load must remain at or above the minimum allowable limit (12 credits for a regular semester and 1 credit for a summer session).
2. If the course dropped is a co-requisite for another registered course, the two courses should be dropped simultaneously, or continue to be studied together.
3. The process for dropping courses may not be used to officially withdraw from university after the first day of the semester.
4. Non-attendance does not constitute a drop or a withdrawal from a course.
5. Any student receiving a scholarship from FBSU is required to maintain a full-time status of 12-credits load in a regular semester (6 credits in a summer session); otherwise, he/she loses the scholarship.

Changing Sections
If a student wishes to change a section of a registered course, he/she may choose a section that will not create a time conflict with his/her current schedule, and must fill out the “Section Change
Form”. The form requires the signatures of the course instructor and the faculty advisor, and must be submitted to the Registrar’s Office during the drop/add period.

**Duration of the Drop/Add Period**
The initial drop/add period normally ends by the second week of the semester. Throughout this period, the dropped courses will not appear on the student’s transcript. Courses dropped beyond this period (until the final course drop deadline) will appear as (W) on the student’s permanent academic record.

**Tuition Adjustments for Drop and Add**
Tuitions at FBSU are computed on a semester basis rather than credit-basis. This means regardless of the number of credits for which a student is registered per semester, he/she pays the same amount of tuition, as long as he/she is taking the minimum number of credits permitted by the University.

**Attendance and Withdrawals**

**Class Attendance**

a. Students are expected to attend all classes, laboratories, or required field work. All missed laboratory or field work must be made up. A student is responsible for the work that is done, and for any announcements that are made, during his/her absence.

b. Tardiness to classes is not at all tolerated. In cases of tardiness, the following rule applies:

Students who are absent for more than 10 minutes of class time are considered as absent.

c. Students who absent themselves during a semester for more than 25% of the required number of lectures of any course are not allowed to continue the course, denied from sitting for the final examination, and assigned a course grade of DN, which is reported on their transcript. In some cases, the College Council may consider removing a DN grade, provided that the absence does not exceed 50%, and giving the student permission to sit for the final exam on condition that the student presents an excuse, which the College Council deems as valid.

**Withdrawal from Courses**

- A student who withdraws from, or is forced to drop, a course will receive a grade of “W.”
- A student cannot withdraw or be withdrawn from a course after the announced deadline (not later than 10 weeks from the start of the semester or five weeks in the summer term) unless approved by the College Academic Committee.
- A student cannot withdraw or be forced to withdraw from a course if this results in the student being registered for less than 12 credits (in a regular term) without the approval of the College Academic Committee.
- A student can withdraw from only one required course per semester. Students who wish to withdraw from more than one required course must petition the College Academic Committee for permission to do so.
Dropping a Semester
A student may apply to withdraw from the semester latest by the course withdrawal deadline. Application for withdrawal after the course withdrawal deadline announced in the University Calendar needs the approval of the Dean of the College. The student must fill the Withdrawal from Semester form from the Registrar’s Office, and the withdrawal is subject to the University’s refund policy as stated in the respective section in this catalog.

Dropped semesters are counted as part of the maximum duration of study.

Withdrawal from University
A student may apply to withdraw from the University at any time. The student should fill the Withdrawal from University form that he/she could obtain from the Registrar’s Office. The student should note the University’s refund policy as stated in the respective section in this catalog.

Postponement and Interruption of Study
A student may apply to take a leave of absence for a maximum of two consecutive semesters or a maximum of three non consecutive semesters during the course of his/her studies. The student must fill the Postponement of Study form that he/she can obtain from the Registrar’s Office, otherwise the student will be considered to have taken an unauthorized postponement and thus will be classified as an inactive standing (absent). The postponed and the absent semesters are not included in the maximum period of attaining the degree.

Conditions for Readmission
Students who withdraw from FBSU with a good academic record are granted readmission within a period not exceeding four semesters for one time only, provided that he/she was not on probation prior to the interruption date. Students who wish to return after the four-semester period, or those who were on probation, have to reapply for admission. Their files will be reevaluated based on the admission requirements applicable at the time of reapplication.

Assessment and Examinations
Examinations
Courses are evaluated either by (1) at least three written examinations, or by (2) oral and/or practical examinations, research, term papers and other activities plus at least two written exams. In any case, class work score must not be less than 30% of the final course grade. All examinations, excluding the finals, are scheduled by the instructors. It is recommended that at least one exam be conducted and the results disclosed before the last day of the final course withdrawal deadline so that a student can decide whether to withdraw from the course or not.

Final examinations are scheduled by the Registrar’s Office. The schedule indicates the date, time and location of all examinations. The day and time of a final examination should be strictly adhered to. In exceptional cases, with justifiable reasons, a faculty member may request a rescheduling of a final examination with the approval of the Dean of the College.

The duration of a final written examination should not be less than one hour and not more than three hours.
Final Grade Policy
It is expected that:

- At least 60 percent of the total course grade should be allocated to written examinations, with a minimum of 30% assigned to the final exam with emphasis on practical work and projects for the remaining percentage. Any grading scenario that does not meet this policy should be cleared with the dean early in the semester.

- A certain portion of the final grade will be assigned for class participation among other possible course requirements (e.g., term paper, project, homework, etc.).

Conduct of Final Examinations
No student will be allowed to sit for a final examination after the lapse of 30 minutes from the beginning of the examination. Also, no student will be allowed to leave the examination venue less than 30 minutes after the beginning of the examination.

Submission of Final Grades
All final grades must be submitted by the instructor to the Registrar’s Office by the deadline specified. The grades through grade rosters must be signed by the course instructor, the department chairperson and the College Dean.

Make-Up Examinations
If a student misses an examination, other than the final, the instructor will make arrangements for a make-up examination if the student submits an approved excuse for his/her absence.

If a student misses a final exam and does not present a valid excuse for his/her absence, he/she will get a grade of zero on that exam. The final grade he/she receives for that course will be calculated on the basis of his/her performance on previous course work.

If the student misses a final examination due to circumstances beyond his/her control, the student may request from the instructor, by means of a petition, a make-up examination before the end of the next semester. The instructor, then, submits his/her report to the College Council. If the petition is accepted, the Dean of the College informs the student in writing of the decision of the College Council and the date of the make-up examination.

Re-grading the Final Exam
A student may request review of the final exam paper by the beginning of the final exams of the following semester at the latest.

Request for a Review of the Final Course Grade
A student, who feels that the grading was unfair, must fill a form and promptly (within the first two weeks after the start of the next semester) discuss the matter with the instructor of the course. If the student and the instructor are unable to arrive at a solution, the student may write a petition to the chairperson of the department offering the course, no later than the end of the fourth week of the
next semester. The department chairperson will investigate through the Academic Committee the student’s arguments and may call for a review of the instructor’s evaluation of the student based on the student’s class work and final examination scores.

**Change of Grade**

Normally, grades cannot be changed after the submission of the final grades to the Registrar’s Office. Under certain circumstances, a written request from the course instructor can be addressed to the registrar explaining the reasons for the change. Such a request for a grade change must be endorsed by the department chairperson and the Dean of the College and approved by the College Council. The Registrar’s Office should be informed of the change of grade no later than the beginning of the final examinations for the following semester.

**Grading System and Codes**

The grading system is as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
<th>Letter Grade</th>
<th>Grade Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-100</td>
<td>5.00</td>
<td>A+</td>
<td>Outstanding</td>
</tr>
<tr>
<td>90-94</td>
<td>4.75</td>
<td>A</td>
<td>Excellent</td>
</tr>
<tr>
<td>85-89</td>
<td>4.50</td>
<td>B+</td>
<td>Superior</td>
</tr>
<tr>
<td>80-84</td>
<td>4.00</td>
<td>B</td>
<td>Very Good</td>
</tr>
<tr>
<td>75-79</td>
<td>3.50</td>
<td>C+</td>
<td>Above Average</td>
</tr>
<tr>
<td>70-74</td>
<td>3.00</td>
<td>C</td>
<td>Good</td>
</tr>
<tr>
<td>65-69</td>
<td>2.50</td>
<td>D+</td>
<td>High Pass</td>
</tr>
<tr>
<td>60-64</td>
<td>2.00</td>
<td>D</td>
<td>Pass</td>
</tr>
<tr>
<td>Below 60</td>
<td>1.0</td>
<td>F</td>
<td>Fail</td>
</tr>
<tr>
<td>AU</td>
<td></td>
<td></td>
<td>Audit</td>
</tr>
<tr>
<td>DN</td>
<td></td>
<td></td>
<td>Denied</td>
</tr>
<tr>
<td>DS</td>
<td></td>
<td></td>
<td>Disciplinary Action</td>
</tr>
<tr>
<td>NP</td>
<td></td>
<td></td>
<td>No grade-Pass</td>
</tr>
<tr>
<td>NF</td>
<td></td>
<td></td>
<td>No grade-Fail</td>
</tr>
<tr>
<td>IC</td>
<td></td>
<td></td>
<td>Incomplete</td>
</tr>
<tr>
<td>IP</td>
<td></td>
<td></td>
<td>In Progress</td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
<td>Withdrawn</td>
</tr>
<tr>
<td>WF</td>
<td></td>
<td></td>
<td>Withdrawn - Fail</td>
</tr>
<tr>
<td>WP</td>
<td></td>
<td></td>
<td>Withdrawn - Pass</td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
<td>Transfer</td>
</tr>
</tbody>
</table>
Work In Progress
For courses of a research nature which require more than one semester to complete, the grade of IP (In Progress) is assigned to the student in all terms, where the course if registered, prior to the completion of the designated work. After the completion of the course, the student will be given the grade he/she has earned. In case the work is not completed within the specified time, the Department Council concerned may recommend changing the grade from IP to IC (Incomplete).

Incomplete Work
If the work for a course is not completed by the date on which the semester ends, the following procedures will apply:

a. To secure permission to complete the work for a course, a student must submit a valid excuse to the instructor and the Department Council at least two weeks before the date of the scheduled final exam of the course.
b. Incomplete course work will be reported as an “IC” followed by a numerical grade reflecting the evaluation of the student available at the end of the semester. This evaluation is to be based on a grade of zero on all missed work. The student grade will not be included in the calculation of the cumulative or semester GPA.
c. Students permitted to complete work for a course must do so by the end of the following regular semester. After the incomplete work is done and evaluated by the faculty member, a grade change will be considered by the Department Council and a new grade is reported to the Office of the Registrar.
d. If no valid excuse is presented and the work, if permitted, is not completed within the time limits specified above, the “IC” will be changed, and the numerical grade available becomes the final grade in the course.
e. For the purposes of averaging, the numerical grade will not be used, until changed through the procedure set above.
f. It is the responsibility of the student to find out from his/her instructor the specific dates by which requirements must be fulfilled. The deadline for submission of incomplete grades by the instructor is within 72 hours after a student has completed the course work.

Failing and Repeating Courses

Failing Courses
If a student fails a course, no re-examination will be permitted. A student who fails a required course must repeat the course at the earliest opportunity. A student who fails an elective course is not required to repeat it as long as he/she can achieve the minimum cumulative average and the minimum number of credits required for graduation. However, the grade of the non-repeated course will be included in tallying the cumulative GPA.
Repeating Courses
A student who fails a required course must repeat the course. A student who wishes to improve his/her academic standing may repeat a course for which he/she has previously obtained a “C” or a lower grade. Should a student repeat a required course and fail, he/she must repeat the course. A student who fails a course three times may be dismissed from the University. If dismissed, the student may petition the Dean of the College to be granted another chance to pass the course. When a course is repeated, the highest grade is considered in computing the student’s cumulative average. All grades are included in the student’s transcript.

Academic Standing
A student is considered in good academic standing if he/she attains an overall grade point average of at least 2.0.

Academic Probation
If at the end of any semester, a cumulative grade point average of less than 2.0 is earned, the student will receive a warning and will be placed on probation. The status of academic probation can be revoked after the lapse of one regular semester from the date of the probation if the student achieves a semester and cumulative GPA of 2.0 or above at the end of this semester.

Academic Dismissal
Academic dismissal is the permanent separation of a student from the University. Academic dismissal occurs in one of two cases:

1. A student receives probation in three consecutive semesters. However, the University Council may, upon recommendation of the College Council, grant the student one more chance to raise his/her GPA by repeating some courses;
2. A student, at the end of a semester, has been in a program of study for more than 1.5 times the normal period to complete the study plan of that program, but has not yet completed the graduation. The University Council may grant the student additional time to complete the graduation requirement such that the total time the student spends in a program does not exceed twice the normal completion period.

In exceptional cases, the University Council may grant a student on whom the above conditions apply a final chance to complete program requirements in two extra semesters at most.

Appeal of Academic Dismissal
A letter officially notifying the student of academic dismissal will be mailed to him/her shortly after grades are finalized for the semester. Included with this letter is the form needed to officially appeal the academic standing. A student who wishes to appeal must complete all parts of the form and return it by the specified date. The University Council reviews appeals twice a year, in the beginning of the fall semester and at the end of the spring semester, and notifies the student of the final decision by email or telephone the day after the review meeting. Inquiries regarding academic standings and/or the appeal process should be directed to the University Council.
Dean’s Honor List
The Dean’s Honor List, published at the end of the fall and spring semesters, honors students for high scholastic achievement. Students who attain a grade point average of 4.25 or better in no fewer than 15 hours of graded university level work and who have completed all work for which they are registered by the end of the semester will be on the Dean’s Honor List for that semester.

Transfer
Transfer from Another Recognized University
The transfer of a student from outside the University may be accepted under the following conditions:

1. The student has been enrolled at a recognized university.
2. The student must not have been dismissed from that university for disciplinary reasons.
3. The student must satisfy the transfer provisions as determined by the University Council.
4. If, after his/her transfer, it is discovered that a student had been dismissed from his/her previous university for disciplinary reasons, his/her enrollment will be considered canceled as from the date of acceptance of his/her transfer to the University.

The student file is evaluated by the Department’s Equivalency Committee, which forwards its recommendation to the Dean of the College.

A course is deemed equivalent to a course offered at FBSU if it covers 70% of the topics, involves the same components (Lecture, Lab, Tutorial), and has the same number of credits. The student must have attained a passing grade in the transferred courses.

The courses deemed equivalent will be transferred to the student’s record but will not be included in the calculation of his/her cumulative GPA. Courses taken as Audit cannot be transferred.

A Student transferring to FBSU must earn at least 60% of his/her credits at FBSU, including the last 60 credits for the Bachelor degree.

Transfer from One College to Another at the University
A student may transfer from one College to another only after spending an entire academic year in his/her current College and meeting the admission requirements of the new College. A transfer application signed by the student and approved by the Dean of the college the student has departed should be sent to the Registrar’s Office then to the Admissions Committee of the new College at least one month before the beginning of the new semester. The Admission Committee of the College studies the applications of the students transferring to that College and forwards its recommendations to the Dean.

All transferred credits remain unchanged in the student’s record. Grades of transferred courses are preserved as well and do enter in the calculation of the student’s GPA.

Transfer from One Major to Another within the College
A student may transfer from one major to another only after spending an entire semester in his/her current major and meeting the admission requirements of the new major. A transfer application signed by the student and approved by the Dean of the College should be sent to the Registrar’s
Office at least one month before the beginning of the new semester. The Admission Committee of the College studies the applications of the students transferring and forwards its recommendations to the Dean.

All Transferred credits remain unchanged in the student’s record. Grades of transferred courses are preserved as well and do enter in the calculation of the student’s GPA.

**FBSU Students Visiting Other Institutions**

An FBSU student in good academic standing may be allowed to takes courses at another institution subject to the following conditions:

a. The student attains prior approval from his/her college.

b. The student studies at an accredited university and in the same major.

c. Courses to be taken are equivalent (a match of at least 70%) to those required for graduation.

d. The maximum number of credits must not exceed 21 credits of which no more than 9 credits are specialized/core courses. The final year project cannot be taken outside FBSU.

e. Students cannot normally take a course at another university if it is offered at FBSU during the same semester. Under special circumstances, students may petition the College Council for exemption.

f. The maximum total number of credits that a student can take at FBSU and outside during a regular semester is 19 credit hours. The maximum is 9 credits for the summer session.

g. Only courses with passing grades will be recorded in the student’s transcripts but will not be used in the calculation of his/her GPA.

A FBSU student in good academic standing, who did not transfer to FBSU from another institution and wishes to study abroad, may spend up to one year and earn up to 30 credits at a foreign university. An FBSU student must spend his/her final year at FBSU.

In all cases the student must register on a full-time basis during his/her last academic year at FBSU and that a student who had spent the last two academic semesters at an external institution is not eligible to receive a FBSU-sponsored scholarship.

All MOHE Rules pertaining to this issue supersede the abovementioned rules in case of conflict.

**Graduation**

To graduate with a Bachelor Degree, students must satisfactorily complete all graduation requirements of the College they are enrolled in with a cumulative GPA of not less than 2.0. A student must be registered for the semester at the end of which he/she graduates.

**Duration of Study in an Academic Program**

- The normal study period for a Bachelor degree is four calendar years encompassing eight semesters.

- The maximum study period allowed for a Bachelor degree is eight calendar years. A student who fails to complete his/her degree program within these specified times must petition the College Administrative Committee for an extension of time.
• A student transferring to a diploma program at FBSU from other recognized institutions of higher learning must register in the final two regular semesters and must complete at least 30 credits at FBSU, of which a minimum of 15 credits must be in his/her major before he/she is allowed to graduate with a diploma. For purposes of this requirement, one summer session shall be considered equivalent to one semester.

• A student transferring to a Bachelor program at FBSU from other recognized institutions of higher learning must register in the final four regular semesters and must complete at least 60% of credits at FBSU, of which a minimum of 30 credits must be in his/her major before he/she is allowed to graduate with a Bachelor Degree. For purposes of this requirement, two summer sessions shall be considered equivalent to one regular semester.

• A transfer student from within FBSU must meet the residency requirement of spending a minimum of three semesters in the new College during which he/she completes a minimum of 36 credits, out of which 12 are credits in the major, before he/she graduates with a Bachelor Degree. For purposes of this requirement, two summer sessions shall be considered equivalent to one semester.

**General Graduation Grade**

The grade stated on the student’s graduation diploma depends on his/her GPA at the time of graduation as follows:

<table>
<thead>
<tr>
<th>GPA</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least 4.50</td>
<td>Excellent</td>
</tr>
<tr>
<td>At least 3.75 and less than 4.5</td>
<td>Very Good</td>
</tr>
<tr>
<td>At least 2.75 and less than 3.75</td>
<td>Good</td>
</tr>
<tr>
<td>At least 2.00 and less than 2.75</td>
<td>Pass</td>
</tr>
</tbody>
</table>

**Graduation with Honors**

To graduate with Honors, students must have earned, in residence at FBSU, no fewer than 60% of study plan required for graduation; must not have failed in any course taken at FBSU or elsewhere; must not have been subjected to any disciplinary action within the University, and must have completed all graduation requirements within the allowed time. Grade Point Averages required for Honors are as follows:

• First Honors rank: Grade Point Average of 4.75 or above
• Second Honors rank: Grade Point Average of at least 4.25 and strictly less than 4.75

*Note:* Honors read at commencement are based on credit hours and the grade point average posted as of the previous semester and are not official. Official Honors will be awarded upon posting of final grades and completion of the degree, and will be noted on the final transcript and diploma.
Academic Records

Transcript Request
Transcripts will not be issued unless all obligations to the university are cleared. To request a transcript, the student needs to fill, sign, and return a “Transcript Request” Form to the Office of Registrar.

Disclosure of Student Records
The University may disclose routine information without prior written consent from the student like student’s name, degrees received, major field(s) of study, awards received, and participation in officially recognized activities and sports.

The University will disclose other information including academic records only upon receiving written consent of the student except in the cases below:

1. Upon the request from other educational institutions, where the student seeks to enroll and or the Ministry of Higher Education.
2. As necessary to academic Officers, academic advisors, and faculty members within the University.
3. To parents of a dependent student.
4. In compliance with a judicial order.

Academic and Intellectual Freedoms

Freedom in Classroom
Students are responsible for learning the content of the courses in which they enroll though they should be free to take reasoned exemption to the data or views offered in any course of study and reserve judgment about matters of opinion.

Students are responsible for complying with standards of academic performance required by each course in which they are enrolled. Such standards shall be communicated clearly in writing on or before the first meeting of each course. Students should have protection against prejudiced, arbitrary, and unfair academic evaluation.

Freedom of Inquiry and Expression
Students and their official organizations are free to examine and discuss questions and issues of interest to them and to express their opinions whether in public or private.

Such freedom does not, however, permit student groups to disrupt the orderly processes of the educational environment, nor does it permit the expression of ideas in ways which violate civil or criminal laws, blatantly disregard the truth, threaten, demean, or libel others.

In expressing their views, students and their official organizations should make clear that such views are not necessarily those of the University.
**Academic Integrity**

Academic Integrity and honesty are central components of a student’s education. Ethical conduct maintained in an academic context will eventually be taken into student’s professional career. Anything less than total commitment to honesty undermines the efforts of the entire academic community. Both students and faculty are responsible for ensuring the academic integrity of the University.

**Cheating**

Students who use non-permissible written, verbal, or oral assistance, including that obtained from another student during examinations, in course assignments, or on projects, are guilty of cheating. Cheating is essentially fraud. It deceives others and causes them to make an assessment based on the misinterpretation of a student’s actual ability, or performance. Cheating is a violation of the university’s academic regulations and is subject to disciplinary action.

**Plagiarism**

Students who fail to credit properly ideas or materials taken from others commit plagiarism. Putting his/her name on a piece of work—any part of which is not yours—constitutes plagiarism, unless that piece is clearly marked and the work from which he/she has borrowed is fully identified. Plagiarism is a violation of the university’s academic regulations and is subject to disciplinary action.

**Range of Disciplinary Actions**

Abusing any of the intellectual freedoms will result in disciplinary actions that correspond to the type of abuse. The possible disciplinary actions are also applicable in other situations as clarified in the student handbook.

**Warning**

This may be oral or written. It is a statement that the student has inadvertently violated a university regulation. The warning will be documented and recorded. Examples: Attempt to cheat in an exam, littering, and smoking in prohibited areas.

**Reprimand**

This will be in writing. It is a statement that the student has violated a university regulation. It is intended to communicate most strongly, both the disapproval and the reprimand of the university community. Examples: Inadvertent plagiarism – failure to cite sources appropriately, and inappropriate conduct in examinations.

**Dean’s Warning**

This will be in writing. Only two Dean’s warnings are allowed in a student’s academic career at the University. It is recommended that any violation of the university regulations after the second Dean’s warning results in consideration of suspension. Dean’s warnings are normally accompanied by secondary disciplinary actions. Examples: Plagiarism, academic dishonesty, in-class disruption, mental or physical harm, discrimination and harassment.
Suspension
This will be in writing and will form part of the student’s permanent record (it will appear on the student’s transcript). A student may be suspended for a fixed period of time during which the student may not participate in any academic or other activities at the University. At the end of the suspension period, the student may be readmitted to the university, only upon the recommendation of the University Disciplinary Committee. Examples: Cheating, theft, and vandalism.

Expulsion
This will be in writing and will form part of the student’s permanent record (it will appear on the student’s transcript). Expulsion denies the student the right to participate in any academic or other activities at the University for an indefinite time. Only under the most unusual circumstances, and upon the recommendation of the University Disciplinary Committee, will an expelled student be readmitted to the University. On the other hand, cases whereby other committees, e.g., the student affairs committee recommend suspension or expulsion of a student, should be referred to the University Disciplinary Committee. Example cases include: Academic dishonesty, possession of dangerous weapons or materials, and endangering public safety.

Note: Any person who maliciously lies to cover up an act sanctioned by the code of conduct will be considered an accessory after the fact and may be subject to disciplinary action.

Student Academic Appeals and Grievance Procedures
These procedures should be used to appeal or resolve disputes concerning an academic grade or other academic decision considered by a student to be arbitrary or contrary to University policy. For the purposes of these procedures, a student is someone holding “active” registration status as the time of the alleged violation.

Appeals Process
The following procedures outline the steps of the academic appeal and/or grievance process. It is recommended but not required that the student first arrange a conference to discuss the appeal or grievance with the faculty member(s) whose action is addressed in the student’s appeal or grievance. It is expected that all of the parties involved at each step of the appeals/grievance process will make a good faith effort to resolve the issues.

Step 1: Department Chair. In the event that a student feels he/she has not received satisfaction from his discussion with the faculty involved or in the event that a student prefers not to discuss his/her concerns directly with the involved faculty, the student may arrange a conference to discuss the appeal or grievance with the department chair (or equivalent). If the department chair is the involved faculty member, this step may be skipped.

Step 2: Dean (or equivalent). In the event there is no department chair in the College or academic unit involved, or in the event the involved faculty member is the department/unit chair, or in the event a student still feels aggrieved after consultation with the appropriate department chair, he/she may ask for a review by the appropriate dean (or equivalent). If the involved faculty member is the Dean of the College (or equivalent) this step may be skipped.
Step 3: Student Academic Review Committee. In the event the student is not satisfied with the results of the reviews by the department chair and the dean (or equivalent) he/she may ask for a review committee to be formed. This request shall be in writing to the Coordinator of Academic Affairs Committee.

It is the responsibility of a student to initiate the appeals procedure at each step. If the appeal is pursued through Step 3, it is expected that, unless there are unusual circumstances, the request for a hearing by the Student Academic Review Committee will be submitted within 90 days from the last day of the term in which the alleged violation arose. If the student fails to pursue the matter in the manner provided by this policy, after a conference with the College Dean if applicable, the original academic decision will be final. The student should bring to the various conferences and to the Student Academic Review Committee hearing all evidence on which he/she intends to rely.

Fees and Expenses
Costs to students in tuition and other university fees, are kept at a minimum consistent with the provision of high quality instruction and adequate facilities and equipment. The University reserves the right to change any or all fees at any time without prior notice. Such changes are applicable to students currently registered with the University as well as to new students.

Students are not permitted to enter classes at the beginning of the term until their fees are paid or special arrangements have been made with the Office of the Comptroller.

Payment of Fees
- Each FBSU student must pay all his/her tuitions and other university fees.
- Statements of Fees are available at the Office of the Comptroller or on the FBSU website.
- Under special circumstances, late payment of tuition fees is permitted during a period of no more than five working days after the announced deadline, and is subject to a late payment fee.
- Checks must be issued to the order of the bank concerned using the following format: Pay to the order of (Name of Bank) - Account FBSU.
- Students are expected to meet all financial obligations to the University by the appropriate due date. For any student who fails to promptly meet his/her financial obligations, the University reserves the right to place an encumbrance on the student’s record that prevents registration for future semesters and the release of transcripts and diplomas, and also prevents access to other university services. It is each student’s responsibility to be informed of all registration and fee payment dates and deadlines.

Up-to-date schedules for registration and payment of fees are available through the Office of the Registrar.

Refund policy
If for justifiable reasons a student withdraws after registration from either the fall or the spring semester, fees are refunded according to the following schedule:
Before the official start of classes & 100% of full tuition
| During the first week of classes & 75% of tuition |
| During the second week of classes & 50% of tuition |
| During the third week of classes & 25% of tuition |

No refunds are due after the end of the third week of classes.

**Scholarships and Financial Support Program**

**Objectives**
The objective of the Scholarship and the Financial Support Program at FBSU is to help students with strong potential for academic success to pursue post-secondary higher education that would not be possible otherwise. Under this policy, scholarships will be granted to students who meet the established eligibility criteria without any form of discrimination. Scholarships and Financial Support funds come from a variety of sources as outlined below.

**Awards**

**King Abdullah Internal Scholarships Program**
Under this program, scholarships are awarded by the Ministry of Higher Education (MoHE) to, but not necessarily all, Saudi students of good academic standing. The primary purpose of this program is to prepare distinguished generations for a knowledge society built upon a knowledge-based economy. Customarily, the University provides its students with the timely and needed support to fulfill the scholarship requirements.

**Prince Sultan Scholarships**
Under this program, 50 scholarships are awarded to orphans and persons with disabilities. Each scholarship covers 100% of the tuition and fees for one year, renewable for up to four years. Awards are granted to the students who satisfy the following criteria:

a. Acquired the High school certificate (Thanauia) within five years from the date of application.

b. Attained a score among the top 50 applicants.

c. Provide evidence of either being orphan or has a disability for which the university has adequate supporting facilities.

d. Provide evidence of financial need.

e. Have exemplary character and a sense of community.

f. Be the only member of the same family to apply.
Merit Scholarships Program
The aim of the Merit Scholarship Program is to promote academic excellence and create a positive competitive environment among students. Awards recipients are selected on the basis of scholastic abilities as well as character, integrity, leadership, and potential contribution to the community.

The Merit Scholarship Program awards, each year, scholarships to undergraduate students who had spent the last two academic semesters at FBSU and are deemed to have a promising scholastic potential as evidenced by their scholastic achievement. Students are required to apply for financial aid to receive these scholarships. Recipients of any scholarship will not be included in this program. Eligible students for the MoHE scholarship program must have applied to this program and been denied before being considered for the Merit Scholarship Program.

Available scholarships under this program are:

Prince Fahad Bin Sultan Scholarships
Under this program, 25 Scholarships are awarded. Each scholarship covers 100% of the tuition and fees for one year. Awards are granted to Saudi students who satisfy the following criteria:

a. Maintain a cumulative GPA of 3.75 or higher for third and fourth year students and a cumulative GPA of 4.00 or higher for first and second year students.

b. Provide evidence of financial need.

c. Had not violated university rules and policies.

d. Have maintained exemplary character and a sense of community.

e. All outstanding fees are paid within university set deadlines.

Students leaving Level II of the Foundation Year Program and entering a regular degree program are eligible to receive the scholarship provided that their Foundation Year Level II Cumulative Average is equivalent to a GPA of 3.75 or above.

Sabih Al-Masri Scholarships
Under this program, 10 scholarships are awarded, 5 for males and 5 for females. Each scholarship covers 100% of the tuition and fees for one year. Awards are granted to students who satisfy the following criteria:

a. Maintains a cumulative GPA of 3.75 or higher for third and fourth year students and a cumulative GPA of 4.00 or higher for first and second year students.

b. Had not violated university rules and policies.

c. Have maintained exemplary character and a sense of community.

d. All outstanding fees are paid within university set deadlines.

Students leaving Level II of the Foundation Year Program and entering a regular degree program are eligible to receive the scholarship provided that their Foundation Year Level II Cumulative Average is equivalent to 3.75 or above.
Scholastic Achievement Scholarship Program
The purpose of the Scholastic Achievement Scholarship Program is to encourage students at FBSU to maintain and perhaps further their scholastic performance. This type of scholarship may be sponsored by individuals or agencies.

Individual Sponsored Scholarships
Any individual or family may provide a set number of scholarships as an act of philanthropy. The awarding individual sets the amount and the criteria under which the scholarships are awarded.

Institution Sponsored Scholarships
Any private or public institution may provide any number of scholarship awards. The institution sets the criteria under which the scholarships are awarded pending the approval of the University.

Tuition Discount and Fee Waiver Program
Tuition is partially waived for students in undergraduate programs if the students are associated with the university in one of the following ways:

Dependents of University Staff
Up to three dependents (sons, and/or daughters, and/or wives) of University Staff are eligible for 30% discount on their tuition and fees provided that other outstanding fees are paid within university set deadlines.

Siblings
Siblings attending the university are eligible for 10% discount each on their tuition and fees provided that other outstanding fees are paid within university set deadlines.

Full-Payment Discount
Students who pay full tuition for a whole academic year within the university set deadlines will receive a 1000 SAR cash back refund.

Student Employment Program

Objectives
FBSU offers a limited number of packages under the Student Employment Program every term, excluding summer. This form of privilege is a win-win proposition: it provides some help to qualified students who need assistance with college expenses and in return, students are required to work in various campus Offices up to 15 hours per week. Students benefiting from this program can benefit from a tuition waiver to be decided by the University Council.

Eligibility Requirements
To be eligible for FBSU Student Employment Program, a student must demonstrate an evidence of need and should maintain the following average and status requirements:
a. A minimum cumulative GPA 3.0  
b. A minimum GPA of 3.0 in the student’s last full-load term.  
c. Carry a minimum load of 12 credits during the term of employment.

Any student who fails to satisfy the eligibility criteria will not be granted a privilege under this program. Newly admitted students are not eligible for this program during their first term at FBSU.

**Application**

Students are required to submit in person a Student Employment Application by August 10th, for the Fall Term and by the end of December for the Spring Term.

Students granted employment should coordinate with the Student Affairs Office for their work assignments.

**Disqualification**

Student Employment privilege will be revoked if the student:

- Does not fulfill his/her duties in a previous contract as required.
- Receives a disciplinary probation as a result of misbehavior.
- Had intentionally presented false evidence or misleading statements in the employment application. Such violations may jeopardize the student’s chances of benefiting from the program in the future.
Unit of Arts and Sciences
Unit of Arts & Sciences

Officers of the Unit
Acting Director: Husam Bayoud
Professors: Abdullah Lyzzaik
Assistant Professors: Haider Abdul Hamid, Waad Al-Sayed, Mahmoud Abu Samha, Husam Bayoud, Imad Ladadwa
Instructors: Ahmad Mansour, Yazan Muqbel, Adel Al-Balawi, Iman Al-Balawi, Hajar Al-Hwaiti, Mohammad Zaatreh, Awad Al-Shammari, Mohammad Al-Amrani
Assistant Instructors: Maryam Al-Hwaiti, Ayat Al-Enezi

Unit Overview
The Arts and Sciences Unit (ASU) is an academic unit that serves the entire student population at FBSU by offering different courses in basic sciences (Chemistry and Physics), Mathematics, English and social and cultural studies (Arabic and Islamic studies).

ASU offers numerous opportunities for interdisciplinary studies. Graduates today live in a world in which the ability to integrate knowledge and skills from a variety of disciplines is increasingly important. The Unit fully recognizes this fact and is constantly working to create opportunities for students to integrate and apply what they learn.

Mission
The Unit has a strong commitment to excellence in the transmission of knowledge and service, providing high quality education in the subject of basic sciences and social and cultural studies, and providing a nurturing and conducive environment to quality teaching and learning in order to meet the needs of all students in the university programs.

Goals/Objectives
ASU is committed to achieve the following goals and objectives:

---

2 Preliminarily approved by the MoHE as the College of Sciences and Humanities
3 Part-time
4 Part-time
• Nurturing students to acquire knowledge, skills and attitudes to effectively complete their specific degrees.
• Ensuring that students obtain appropriate scientific foundation for life-long learning.
• Helping students to become critical thinkers and problem solvers when managing challenges in their workplace.
• Developing an intellectually stimulating and caring environment that will facilitate student academic achievement by providing them with the relevant learning resources to enhance their academic development.

Core Values
The core values include:

• Excellence in Teaching and Learning.
• Relevant and Applied Knowledge.
• Development of Critical Thinking.
• Teamwork and Personal Development.
• Scientific Integrity.

Student learning outcomes
Upon successful completion of the Unit courses, students are expected to have:

• The ability to effectively use the English language essential to their success at the university.
• A fundamental understanding of social and cultural studies.
• A fundamental understanding of the basic sciences, particularly the major principles and theories.
• The ability to apply knowledge of mathematics, chemistry, physics and humanities.
• The ability to understand the relationship among disciplines.
• The ability to apply mathematical and/or basic statistical reasoning to analyze data.
• Improved critical thinking and problem-solving skills.
Course Descriptions

ARAB 101  Basic Academic Arabic  3(3, 0, 0)
This course is intended to provide training in the basic elements of Arabic grammar, syntax, and morphology to enhance the competency of students who may be deficient in those respects. Emphasis will be placed on training students to proficiently use Arabic for the purpose of writing academic papers, official letters, and professional reports.

ARAB 201  Advanced Academic Arabic  3(3, 0, 0)
Students will be provided with opportunities to conduct close textual and analytical studies of a variety of selections from classical and modern literary and professional Arabic texts. The study of selected texts is designed to enhance the students’ knowledge and appreciation of the Arabic language and its literature, in addition to strengthening their analytical and writing skills. Prerequisite: ARAB 101.

CHEM 101  General Chemistry I  3(3, 0, 0)
An introduction to chemical principles covering atomic structure, chemical bonding, Molecules & Compounds, stoichiometry, gas laws, Chemical Composition, acid-base and solubility equilibria and solution.

CHEM 101L  General Chemistry I Lab  1(0, 0, 2)
Weekly introductory applied and simulated laboratory sessions which include an introduction to chemical principles covering significant figures, accuracy and precision, chemical bonding, precipitation reactions, stoichiometry, chemical equilibrium, qualitative analysis, acid-base titration and solubility, CHEM LAB computer simulation. Pre- or co-requisite: CHEM 101.

CHEM 102  General Chemistry II  3(3, 0, 0)
This course covers the nature and composition of matter, atoms and molecules, solutions, chemical bonding and chemical structure, molecules and materials, energy and chemistry, thermodynamics, entropy and the second law, chemical kinetics, chemical equilibrium, gas laws, chemical reactions, equilibria, kinetics, electrochemistry, corrosion and redox reactions. Prerequisite: CHEM 101.

ENGL 101  Basic Academic English I  3(3, 0, 0)
The students’ sentence writing skill is reviewed and polished to insure that they are able to write clear and correctly structured sentences. Students are also trained to understand the structure of a paragraph and to be able to produce coherent paragraphs. The course reviews some of the basics of English grammar and provides training in reading comprehension and oral expression.

ENGL 102  Basic Academic English II  3(3, 0, 0)
Students will develop paragraph writing skills and be able to identify and produce paragraphs of diverse styles. Students will also be trained in the writing of short expository essays of various types including description, developing comparisons and contrasts, and relating antecedents and
consequents. Students will be provided in the class with opportunities for improving oral expression through debates and discussions. Prerequisite: ENGL 101.

**ENGL 203  Advanced Academic English I**  
3(3, 0, 0)  
The emphasis in the course will be placed on the development of effective communication and reasoning skills essential for proper comprehension and critical reading of academic texts. Students will also be enabled to develop other useful skills such as note-taking, summarizing and outlining. Students will be provided with training in the writing of expository and argumentative essays. Prerequisite: ENGL 102.

**ENGL 204  Advanced Academic English II**  
3(3, 0, 0)  
The emphasis in the course will be placed on the writing of papers independently researched by the students. Skills that have already been acquired such as comprehension, critical reading of texts, and writing expository essays will be enhanced and put to use in the researching and writing of a paper on a specific topic. Emphasis will be placed on proper referencing and documentation. Oral presentation skills and proficiency in presenting an argument will be tested and refined when students present their papers in class. Prerequisite: ENGL 203.

**ENGL 206  Technical Writing**  
3(3, 0, 0)  
This course offers students in professional schools training in the writing and presentation of papers related to their fields of study. It includes individual and/or group preparation of reports, term papers, multimedia presentations, and other specialized forms of writing. Prerequisite: ENGL 203.

**FREN 101  Basic French 1**  
3(3, 0, 0)  
This course is designed for students who have no or very little knowledge of French. It introduces fundamentals of grammar, pronunciation and vocabulary. The course will also focus on developing students’ basic communication skills through classroom drills and language lab work.

**MATH 101  Calculus I**  
3(3, 0, 0)  
Calculus of one variable: limits, continuity, differentiation, chain rule, maxima and minima, curve plotting, Roll’s theorem, integration by substitution, definite integrals with applications to areas, volumes and arc length, fundamental theorem of integral calculus, exponential and logarithmic functions, trigonometric functions, parametric equations, analytic geometry in space.

**MATH 102  Calculus II**  
3(3, 0, 0)  
Methods of integration; inverse trigonometric functions; limits; sequences and series; tests for convergence; Taylor approximations; Taylor series; polar coordinates; complex numbers: Cartesian and polar representation of complex numbers, mathematical operations with complex numbers. Prerequisite: MATH 101.
MATH 201  Calculus and Analytic Geometry III  3(3, 0, 0)
Multivariable calculus: partial derivatives, directional derivatives, chain rule, tangent planes, maxima and minima, Lagrange multipliers, cylindrical and spherical coordinates, multiple integrals, substitutions, line and surface integrals, theorems of Green, Gauss and Stokes. Prerequisite: MATH 102.

MATH 202  Differential Equations  3(3, 0, 0)
First-order differential equations; linear differential equations of second and higher order; homogeneous and non-homogeneous with constant coefficients; power series solutions; Bessel functions and Legendre polynomials; Laplace transforms; inverse Laplace transforms; initial value problems; Fourier Series. Prerequisite: MATH 201.

MATH 203  Mathematics for Social Sciences I  3(3, 0, 0)
Factorization of polynomials, second degree equations, equations for straight lines, inequalities, systems of linear equations, Gaussian elimination, curve plotting, derivatives, maxima and minima, limits, algebra of exponents, the exponential and logarithmic functions. The emphasis is on applications.

MATH 204  Mathematics for Social Sciences II  3(3, 0, 0)
This course is a continuation of MATH 203 where the emphasis is on applications. Determinants matrix inversion, combinatorics, introduction to probability, methods of integration, approximations of definite integrals, differential equations, multivariable functions, partial derivatives, chain rule, constrained and unconstrained optimization. Prerequisite: MATH 203.

MATH 211  Discrete Mathematics  3(3, 0, 0)
This course covers logical reasoning, sets, relations and functions, modular arithmetic, mathematical induction, recurrence relations, counting methods, inclusion- exclusion, binomial theorem, elementary probability, introduction to graphs and trees, recursive algorithms, and some Boolean algebra.

MATH 215  Linear Algebra and Numerical Techniques  3(3, 0, 0)
Number representations and round-off errors; systems of linear equations and Gaussian elimination; vectors, matrices, determinants; vector spaces, subspaces and dimension; orthogonal projection and least-squares approximation; eigenvalues, eigenvectors; root finding; approximation of functions; integration; solving initial value problems. Prerequisite: MATH 102.

MATH 225  Numerical Computing  3(3, 0, 0)
This course is intended for engineering and computing students. It introduces students to the formulation, methodology, and techniques for numerical solution of mathematical problems. This course covers: Root finding of nonlinear equations by using Bisection, Newton-Raphson, Fixed Point and Secant methods, approximation of functions, numerical integration and discrete summation by using Trapezoidal, Simpson, Romberg and Gauss methods, Solving initial value
problems, Monte-Carlo (Simulation) methods. Implementations and analysis of the algorithms are stressed. Projects using MATLAB. Prerequisite: MATH 215.

**PHED 101   Physical Education 1**  
3(3, 0, 0)
This course is designed to promote the students’ physical fitness through participation in a variety of individual and team activities including, but not limited to, football, volleyball, basketball and track and field. The course focuses on skills, proficiency, and playing courtesies. Students will learn the importance of being fit; improve their team-working skills and enhance collegial competitiveness, thus leading to healthier lifestyles and balanced personalities.

**PHYS 101   General Physics I**  
3(3, 0, 0)
Measurements, motion in one dimension, vectors, motion in two dimensions, Newton's laws with applications, work and energy, circular motion, linear momentum and collisions, rotation and angular momentum, oscillations, and gravity. Co-requisite MATH 101.

**PHYS 101L   General Physics I Lab**  
1(0, 0, 2)
Basic laboratory techniques and methods; taking measurements, data evaluation and report writing with application to selected experiments related to Newtonian mechanics, vibrations, light and optics including density of metals, free fall motion, addition and resolution of vectors, conservation of linear momentum, conservation of energy, simple pendulum, Hook’s law, measuring focal length, and index of refraction. Pre- or co-requisite: PHYS 101.

**PHYS 102   General Physics II**  
3(3, 0, 0)
Electrostatics, current, resistance, Ohm's law, Kirchhoff's laws, RC circuits, magnetostatic theory, Ampere's law, Biot-Savart law, Faraday's law, LR circuit, RLC circuits, and a qualitative discussion of Maxwell's equations. Prerequisite: PHYS 101

**PHYS 102L   General Physics II Lab**  
1(0, 0, 2)
Basic laboratory techniques and methods; taking measurements, data evaluation and report writing with application to selected experiments in electricity and magnetism including electrostatics, magneto-statics, Coulomb and current balance, DC and AC circuits, linear and nonlinear circuit elements, Kirchhoff’s laws, oscilloscope in AC measurements, charge and discharge of a capacitor, filters, damped oscillations, inductors and measurement of magnetic induction fields. Pre- or co-requisite: PHYS 102.

**SOCS 101   Islamic Civilization I**  
3(3, 0, 0)
This course surveys of Arab Islamic civilization tracing its intellectual and cultural development from pre-Islamic times to the present. Emphasis will be placed on the major contributions of Arab Islamic civilization.
SOCS 201  Islamic Civilizations II  3(3, 0, 0)
Islamic civilization; Islamic law & governance, human rights laws, state and human rights in Islam, education, ethics & morality, war, peace, aggression, self-defense theory, sovereignty, life and death, human dignity, etc. Pre-requisite: SOCS 101

SOCS 202  World Civilizations  3(3, 0, 0)
This course surveys of ancient Near Eastern and Medieval Civilizations and world views, starting with Mesopotamia and including the classical Greek and Roman periods up to the beginning of the Renaissance in Europe. Some emphasis is placed on Islamic civilization.

STAT 230  Probability and Statistics  3(3, 0, 0)
This course is intended for engineering and computing students. A course on random variables, laws of probability, probability distributions, expectation and variance, moment generating functions, joint distributions, independence, probability models, Chi-square, Student’s t and f distributions, estimation, confidence intervals, the central limit theorem, significance tests, regression. Prerequisite: MATH 201.
College of Business and Management

Officers of the College
Acting Dean: Ibrahim Tabsh
Professors: Abdallah Lyzzaik
Assistant Professors: Lubna Al-Masri, Abdul Rahman Beydoun, Saqr Tahat,
Instructor(s): Suzan Al-Najjar, Ahmad Shariah, Yaser Al Hweiti

Program Overview
The College of Business and Management grants a four-year Bachelor of Business Administration in generic Business Administration or with a concentration in Management, Marketing, Accounting or Finance. The Bachelor of Business Administration aims to help the students gain an understanding of the social, cultural and economic environments in which they operate. Towards this end, the College is committed to providing superior quality academic education in English, and to continually strive to impart and nurture the highest levels of business knowledge, professionalism, and integrity.

Through its four-year program, the College aspires to provide its students with a dynamic balance between up-to-date business theory and the practical acumen to make meaningful impacts in the region, so as to provide the local and national business community with young managers who are deeply grounded in analytical and soft skill areas such as leadership, decision-making and ethical reasoning.

The College is structured around two departments: the Accounting and Finance Department and the Management, Marketing, and Entrepreneurship Department. Both departments seek to provide high education standards in business management. They aim to build appropriate management skills among students and facilitate their access to the job market. Together with the Fahd Bin Sultan University, their goal is to provide academic support to the business community throughout the kingdom, and to contribute to the welfare of the kingdom through various applied and theoretical research activities.

The College also offers two graduate programs: An MBA Program and an Executive MBA (EMBA).

5 Part timer
Vision
The College of Business and Management at FBSU is dedicated to foster managerial talent and prepare graduates with professional competences and commitment to business ethics to serve the business development needs in Tabuk and the rest of KSA.

Mission
The College of Business and Management at FBSU seeks to achieve, maintain and enhance a recognized position as a credible provider of undergraduate, and in time, graduate business education in service of the Tabuk region and the rest of KSA. In pursuit of this goal, the CBM endeavors to strive for academic currency and long-term relevance of its programs. It pledges to uphold the highest ethical principles and to impart to students advanced knowledge tempered with a commitment to life-long learning and professional competence.

Core Values
- Uncompromising pursuit of quality educational services to students in ways that enhance cognitive skills, cultivate personality and help the development of character
- Critical thinking and broad exposure to major global currents
- Life-long learning and investment in self-renewal
- Integrity and adherence to ethical behavior in all ways at all levels
- Community spirit and commitment to social service
- Reinforcement of national identity and cultural authenticity

Philosophy
The philosophy espoused by the College of Business and Management at FBSU is based on the following precepts:
- Each individual student is a major asset and a key responsibility for which we are strictly accountable. Students will be treated at all times with dignity and respect in ways that simultaneously encourage their own unique character as well as their ability to work together as a team.
- While we are deeply committed to providing business graduates of FBSU with the highest feasible level of technical competence, we also expect them to be leaders who can develop other people and stand out as community-spirited pioneers who can combine quality work with a keen sense of social responsibility.
- In all programs we offer, we seek to combine the twin criteria of local relevance and global currency. Our programs are predicated on the principle of combining state-of-the-art know-how and a strategy-focus centered on present and emerging local challenges.
- Integrity is a major requirement to effective business performance. Based on this reality, concern for business ethics looms large in all our programs at all levels.
• A broad-based business education is, in our view, better able to meet the challenges of the 21st century, than a narrowly-focused highly specialized model. Our programs conform to this rule and are based on a broad common case that branches out into specific lines of expertise.
• Constantly operating in the spirit of continuous improvement.

College Objectives
• Providing sound business education to Saudi youth from the Tabuk area and other parts of the Kingdom.
• Producing highly qualified employable graduates who can meet the changing requirements of the labor market at the para-professional, professional and senior professional levels in such areas as Management, Marketing, Accounting, Management Information Systems and related competencies.
• Providing faculty members with the needed facilities and with an international exposure to partner institutions in order for them to develop their academic expertise.
• Building close ties of cooperation with industry within and beyond Tabuk with a view to fostering strategic partnerships, cultivating various programs of cooperation and complementing each other in the interest of better management practices.
• Providing relevant open-ended, customized, function-specific and sector-specific management training programs to private and public organizations in Tabuk and the rest of the Kingdom.
• Building capacity for conducting applied research relevant to the problem-solving needs of various companies and sectors.
• Cooperating with other Business Colleges in KSA and outside to build networks, leverage resources and better fulfill its mission.

Program Standards
The College of Business and Management curriculum was prepared while considering the requirements of the Ministry of Higher Education in the Saudi Kingdom, and the recommendations of the Association to Advance Collegiate Schools of Business (AACSB-International). The AACSB promotes excellence and continuous improvement for educational organizations. It provides support to administrators and faculty, encourages diversity, and enhances the understanding of the value of management education.

Job Opportunities
The Business Program is committed to providing the local region's residents with meaningful, up-to-date skills and knowledge that will allow them to pursue successful careers and make deep impacts both within the Tabuk province, and across the Gulf region at large. With these objectives in mind, the program is designed around fostering contemporary best practices and skills in line with the job opportunities within Tabuk and the Middle East.
Situated in north-western Saudi Arabia, approximately one hour from the Jordanian border, the region of Tabuk has a population of approximately 800,000. Agriculture has been the most prominent sector in the province, with large agricultural firms such as ASTRA Agricultural Company having significant presence and operations in the region. Tabuk is now beginning to witness marked growth in other business sectors, with the emergence of a number of small banks and services firms. The military is also substantially linked to the Tabuk region through the military base located in the province, with a large segment of Tabuk's inhabitants having some form of personal or professional relation or interaction with the military base.

Given this, graduates from the College's Bachelor Degree are poised to take advantage of numerous job opportunities within the Tabuk province itself, and in the growing Saudi and Gulf markets. As such, the business program aims to provide the residents of Tabuk with relevant business knowledge and practices to cater to these three key areas, and to help promote development, growth and prosperity in the region. Courses target the cultivation of practical business tools to pursue strategic development and integration of the agricultural sector with other prominent sectors in the region, and to allow students to pursue managerial and administrative positions within the growing firms in this sector.

Management, accounting, finance, and entrepreneurship courses within the program cater to the development of these key skills. Similarly, the program will enable students to join the growing financial services industry within Tabuk and become the future leaders within the Gulf's top financial services firms. The program also seeks to add value to students from the army by helping develop management and higher administrative skills through workshops and coursework, and to provide synergistic knowledge and solutions between business and engineering for the military.

Finally, the program was designed with the aim of attracting the best and brightest students from all regions within Saudi Arabia, by providing the highest standards in business education to allow students to capitalize on and continue to drive the phenomenal growth that the region has witnessed in recent years, through dedicated teaching and the provision of the best and most up-to-date business knowledge in the fields of finance, accounting, management, marketing, and business information and decision support systems.

**Admissions and Graduation Requirements**

- Student admission to the Bachelor of Business Administration is based on the requirements of the national center for evaluation and measurement, the general University admission criteria, as well as specific criteria set by the College of Business and Management. All direct admissions are decided by the University Admissions Committee.

- To graduate with a Bachelor of Business Administration, students must satisfactorily complete 134 credit hours with a cumulative average as decided by the University Council.

- All third year business students are required to fulfill a summer (July and August) internship period of at least eight weeks of specialized work on individual basis. This includes training and practice in an actual service in a technical, business, or governmental establishment under both faculty supervision by a mentor and corporate guidance by a preceptor who will acquaint students with the world of work. The preceptor will also help interns acquire the core values.
and basic skills necessary for an understanding of the business world. Interns will be assigned tasks and responsibilities commensurate with their skills and qualifications.

Program of Study
The College of Business & Management Program at FBSU offers a broad range of avenues for study and exploration. In keeping with the traditional interest in business education, students study the credits equivalence of two years in Business Administration to help them understand the basics of the different areas of Business and Management in an organization, in addition to the equivalence of two years of courses of broad education.

The CBM has two departments:
  - The Accounting and Finance Department
  - The Management, Marketing and Entrepreneurship Department

Both departments contain a cluster of distinct academic business disciplines or concentrations. In order to cope with these expanding horizons, the Bachelor Program is designed to provide a broad exposure to the advanced literature in business. Students can select an area for intensive study and develop a program that trains them to comprehend and perform cutting-edge knowledge in that field.

Students may undertake advanced courses to more deeply understand strategic management and marketing concepts such as consumer choice processes, the allocation of marketing resources, and product development. They are also exposed to the art and science of human resource management, and communication processes at the industrial levels.

Students who choose to focus on the study of financial analysis and accounting systems will develop their skills in advanced courses related to auditing, corporate finance, investment banking, and financial markets.

Successful students will obtain a Bachelor in Business Administration in generic Business Administration or with a concentration in one of the following areas:
  - Management
  - Marketing
  - Accounting
  - Finance

Bachelor Degree
The College grants a Bachelor of Business Administration (BBA) in generic Business Administration or with one of the following areas of concentration:
  - Management
  - Marketing
  - Accounting
  - Finance
A concentration in a specific area is obtained if a student takes a minimum of five elective courses in the same area of expertise.

The Bachelor Degree program allows eligible students to develop enhanced knowledge in these areas through a balanced curriculum of required/elective intermediate and advanced courses in specific business track concentrations. The courses offered in the Bachelor Program provide students with more in-depth skills and knowledge in their chosen track area. Alternatively, students may elect to pursue a generic Bachelor Degree.

**Program Objectives**
- Provide students with a broader knowledge of business environment.
- Provide students with the knowledge and tools required for meaningful and successful careers.
- Prepare students for management responsibilities.
- Prepare students for further studies in graduate schools.
- Provide the educational background for various professional certification examinations such as the Chartered Financial Analyst (CFA), Certified Public Accountants (CPA), Certified Management Accountant, Certified Marketing Analyst, etc.

**Learning Objectives**
- Strengthen students’ understanding of technical and quantitative aspects of management.
- Improve students’ ability to focus on appropriate issues and develop proper solutions to problems faced by companies.
- Refine students’ oral and written communication skills.
- Expand students’ understanding of professional and ethical issues relevant to core business areas such as marketing, financial accounting, economics, information systems, strategic management, and organizational behavior.

**Program Requirements**
In order to graduate with a Bachelor Degree in Business Administration, students are expected to complete a total of 134 credit hours by the end of their fourth year of studies. These are divided as follows:

1. University Requirements 36 Credits
2. College Requirements 82 Credits
3. Concentration Electives 15 Credits
4. Summer Internship 1 Credit

Total 134 Credits
**University Requirements**

Students working towards the Bachelor Degree must complete a total of 36 credit hours in University requirements. The 36 credit hours in University general educational requirements for Bachelor program are as follows:

- 6 credits of Arabic: ARAB 101 and ARAB 201
- 9 credits of English communication skills: ENGL 101, ENGL 102, and ENGL 203
- 9 credits of Social and Cultural studies: SOCS 101, SOCS 201, and SOCS 202
- 3 credits of Computing: CSC 100
- 6 credits of Mathematics: MATH 203 (instead of MATH 101) and Math 204
- One 3-credit non-business elective course

**College Requirements**

**A. Accounting and Finance Department**

The Accounting and Finance Department requires 30 credits. These are: ACCT 110, ACCT 215, ACCT 321, BUSS 330, ECON 211, ECON 212, FINA 110, FINA 215, FINA 310, and FINA 420.

**B. Management, Marketing and Entrepreneurship Department**

The Management, Marketing and Entrepreneurship Department requires 52 credits. These are: BUSS 100, BUSS 110, BUSS 200, BUSS 210, BUSS 300, BUSS 400, BUSS 440, BUSS 445, BUSS 460, ENTM 420, DCSN 200, DCSN 305, DCSN 415, MKTG 210, MKTG 320, MNGT 110, MNGT 215, MNGT 428, MNGT 420 and INFO 200.

**Declaring a Concentration**

A student in the College of Business and Management may select a concentration in his third year of study if his/her cumulative GPA is at least 3.25. In addition, a student wishing to select a concentration in Finance or Accounting must acquire a GPA of at least 3.75 in related courses. A student must complete at least 15 credits in the concentration area in conjunction with the core requirements. Students who finish all “major” requirements are not allowed to declare a concentration. Both the major and concentration requirements shall appear on the transcript.

**Concentration Electives**

Concentration Electives consist of 15 Credit hours from the list of elective courses of the concentration (each student is expected to choose a concentration at the beginning of the third year or opt for a generic degree). These are:

**A. Accounting and Finance Department Electives**

- Five elective courses (15-credits) chosen from the following list: ACCT 422, ACCT 425, ACCT 430, ACCT 435, ACCT 445, BUSS 490, FINA 410, FINA 422, FINA 425, FINA 430, FINA 450.

**B. Management, Marketing and Entrepreneurship Department**
• Five elective courses (15-credits) chosen from the following list: BUSS 490, INFO 400, MKTG 420, MKTG 430, MKTG 435, MKTG 440, MNGT 430, MNGT 440, MNGT 450, MNGT 460.

C. **Generic Business Administration Option**
Electives: choice of all electives from both the above listed tracks.

**Summer Internship**
A summer internship in Business (BUSS 346) is required for a two month period in the third year of studies. By the end of their internships, students have to write and submit a report to their advisors who are full-time faculty members.

**Course Coding System**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT</td>
<td>Accounting</td>
</tr>
<tr>
<td>BUSS</td>
<td>Business</td>
</tr>
<tr>
<td>DCSN</td>
<td>Business Decision Support Systems</td>
</tr>
<tr>
<td>ECON</td>
<td>Economics</td>
</tr>
<tr>
<td>ENTM</td>
<td>Entrepreneurship</td>
</tr>
<tr>
<td>FINA</td>
<td>Finance</td>
</tr>
<tr>
<td>INFO</td>
<td>Business Information Systems</td>
</tr>
<tr>
<td>MNGT</td>
<td>Management</td>
</tr>
<tr>
<td>MKTG</td>
<td>Marketing</td>
</tr>
</tbody>
</table>
Study Plan of the BBA Program
(134 Credits)

Year I

First Semester (15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSS 100</td>
<td>Orientation Workshop</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SOCS 101</td>
<td>Islamic Civilizations I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>MNGT 110</td>
<td>Principles of Management</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>ENGL 101</td>
<td>Basic Academic English I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>MATH 203</td>
<td>Introduction for Business Mathematics I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>ACCT 110</td>
<td>Financial Accounting</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Credits 15

Second Semester (15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 102</td>
<td>Basic Academic English II</td>
<td>3</td>
<td>ENGL 101</td>
</tr>
<tr>
<td>ARAB 101</td>
<td>Basic Academic Arabic</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CSC 100</td>
<td>Introduction to Computing</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>BUSS 110</td>
<td>Statistics and Data Analysis</td>
<td>3</td>
<td>MATH 203</td>
</tr>
<tr>
<td>FINA 110</td>
<td>Business Finance</td>
<td>3</td>
<td>ACCT 110</td>
</tr>
</tbody>
</table>

Total Credits 15

Year II

Third Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSS 200</td>
<td>Business Communication Skills</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>DCSN 200</td>
<td>Managerial Decision Making</td>
<td>3</td>
<td>CSC 100</td>
</tr>
<tr>
<td>ACCT 215</td>
<td>Managerial Accounting</td>
<td>3</td>
<td>ACCT 110</td>
</tr>
<tr>
<td>ECON 211</td>
<td>Principles of Microeconomics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SOCS 201</td>
<td>Islamic Civilizations II</td>
<td>3</td>
<td>SOCS 101</td>
</tr>
<tr>
<td>MKTG 210</td>
<td>Principles of Marketing</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
</tbody>
</table>

Total Credits 17
### Fourth Semester (15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 212</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
<td>ECON 211</td>
</tr>
<tr>
<td>FINA 215</td>
<td>Financial Markets and Institutions</td>
<td>3</td>
<td>FINA 110</td>
</tr>
<tr>
<td>BUSS 210</td>
<td>Business Law</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>INFO 200</td>
<td>Management Information Systems</td>
<td>3</td>
<td>MNGT 110, CSC 100</td>
</tr>
<tr>
<td>MNGT 215</td>
<td>Organizational Behavior</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
</tbody>
</table>

**Total Credits** 15

### Year III

#### Fifth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSS 300</td>
<td>Strategic Career Planning</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>MATH 204</td>
<td>Introduction for Business Mathematics II</td>
<td>3</td>
<td>MATH 203</td>
</tr>
<tr>
<td>ENGL 203</td>
<td>Advanced Academic English I</td>
<td>3</td>
<td>ENGL 102</td>
</tr>
<tr>
<td>BUSS 330</td>
<td>Managerial Economics</td>
<td>3</td>
<td>ECON 211</td>
</tr>
<tr>
<td>ACCT 321</td>
<td>Intermediate Financial Accounting 1</td>
<td>3</td>
<td>ACCT 110</td>
</tr>
<tr>
<td>FINA 310</td>
<td>Islamic Finance and Management</td>
<td>3</td>
<td>FINA 110, MNGT 110</td>
</tr>
</tbody>
</table>

**Total Credits** 16

#### Sixth Semester (18 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKTG 320</td>
<td>Competitive Marketing Strategies</td>
<td>3</td>
<td>MKTG 210, ELEVTIVE</td>
</tr>
<tr>
<td>DCSN 305</td>
<td>Operations Management</td>
<td>3</td>
<td>DCSN 200</td>
</tr>
<tr>
<td>ARAB 201</td>
<td>Advanced Academic Arabic</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ELECTIVE</td>
<td>Business Elective Course</td>
<td>3</td>
<td>Concentration</td>
</tr>
<tr>
<td>ELECTIVE</td>
<td>Business Elective Course</td>
<td>3</td>
<td>Concentration</td>
</tr>
<tr>
<td></td>
<td>Non Business Elective Course</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 18
### Summer Semester (4 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSS 346</td>
<td>Internship in Business (two months)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ELECTIVE</td>
<td>Business Elective Course</td>
<td>3</td>
<td>Concentration</td>
</tr>
</tbody>
</table>

**Total Credits**: 4

### Year IV

#### Seventh Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSS 400</td>
<td>Developing Business Plan</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>FINA 420</td>
<td>Investment Management</td>
<td>3</td>
<td>FINA 215</td>
</tr>
<tr>
<td>DCSN 415</td>
<td>Decision Support Systems: Applications</td>
<td>3</td>
<td>DCSN 200</td>
</tr>
<tr>
<td></td>
<td>in Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUSS 445</td>
<td>Business Research Methods</td>
<td>3</td>
<td>BUSS 110</td>
</tr>
<tr>
<td>ELECTIVE</td>
<td>Business Elective Course</td>
<td>3</td>
<td>Concentration</td>
</tr>
<tr>
<td>MNGT 428</td>
<td>Business Ethics</td>
<td>2</td>
<td>MNGT 110</td>
</tr>
</tbody>
</table>

**Total Credits**: 16

### Eighth Semester (18 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCS 202</td>
<td>World Civilizations</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>BUSS 440</td>
<td>Strategic Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>ENTM 420</td>
<td>Entrepreneurship and Small Business</td>
<td>3</td>
<td>MNGT 215,</td>
</tr>
<tr>
<td></td>
<td>Management</td>
<td></td>
<td>ACCT110,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FINA110,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BUSS 400</td>
</tr>
<tr>
<td>MNGT 420</td>
<td>Human Resource Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>ELECTIVE</td>
<td>Business Elective Course</td>
<td>3</td>
<td>Concentration</td>
</tr>
<tr>
<td>BUSS 460</td>
<td>Graduation Project</td>
<td>3</td>
<td>Concentration</td>
</tr>
</tbody>
</table>

**Total Credits**: 18

### Total Program Credits: 134*

*Completion of Bachelor degree in Business Administration or with a Concentration in Accounting, Finance, Management, Marketing.*

A concentration in a specific area is obtained if a student takes a minimum of five Elective courses in the same area of expertise.
### Recommended Non Business Elective Courses (3 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 204</td>
<td>Advanced Academic English</td>
<td>3</td>
<td>ENGL 203</td>
</tr>
<tr>
<td>ENGL 206</td>
<td>Technical Writing</td>
<td>3</td>
<td>ENGL 203</td>
</tr>
<tr>
<td>STAT 230</td>
<td>Probability and Statistics</td>
<td>3</td>
<td>MATH 204</td>
</tr>
<tr>
<td>FREN 101</td>
<td>Basic French</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>PHED 101</td>
<td>Physical Education</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>SPTP 495</td>
<td>Special Topics</td>
<td>3</td>
<td>None</td>
</tr>
</tbody>
</table>

### Management and Marketing Elective Courses (Required 15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSS 490</td>
<td>Special Topics in Business Administration</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MNGT 430</td>
<td>International Business and Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MNGT 440</td>
<td>Total Quality Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MNGT 450</td>
<td>Case Studies in Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MNGT 460</td>
<td>Change Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MKTG 420</td>
<td>Marketing Research</td>
<td>3</td>
<td>MKTG 210, BUSS 200</td>
</tr>
<tr>
<td>MKTG 430</td>
<td>Professional Selling and Sales Management</td>
<td>3</td>
<td>MKTG 420</td>
</tr>
<tr>
<td>MKTG 435</td>
<td>Public Relations</td>
<td>3</td>
<td>MKTG 210</td>
</tr>
<tr>
<td>MKTG 440</td>
<td>Consumer Behavior</td>
<td>3</td>
<td>MKTG 210</td>
</tr>
<tr>
<td>MKTG 450</td>
<td>Logistic Marketing Management</td>
<td>3</td>
<td>MKTG 210</td>
</tr>
<tr>
<td>INFO 400</td>
<td>E-Commerce Strategies and Applications</td>
<td>3</td>
<td>INFO 200</td>
</tr>
</tbody>
</table>

### Accounting and Finance Elective Courses (Required 15 Credit Hours)


<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 422</td>
<td>Intermediate Financial Accounting 2</td>
<td>3</td>
<td>ACCT 321</td>
</tr>
<tr>
<td>ACCT 425</td>
<td>Cost Accounting</td>
<td>3</td>
<td>ACCT 215</td>
</tr>
<tr>
<td>ACCT 430</td>
<td>Auditing</td>
<td>3</td>
<td>ACCT 321</td>
</tr>
<tr>
<td>ACCT 435</td>
<td>Accounting Information Systems</td>
<td>3</td>
<td>ACCT 321, INFO 200</td>
</tr>
<tr>
<td>ACCT 445</td>
<td>International Accounting</td>
<td>3</td>
<td>ACCT 215</td>
</tr>
<tr>
<td>BUSS 490</td>
<td>Special Topics in Business Administration</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>FINA 410</td>
<td>Financial Planning and Control</td>
<td>3</td>
<td>FINA 110</td>
</tr>
<tr>
<td>FINA 422</td>
<td>Valuation Methods</td>
<td>3</td>
<td>FINA 110, FINA 215</td>
</tr>
<tr>
<td>FINA 425</td>
<td>Commercial Bank Management</td>
<td>3</td>
<td>FINA 215</td>
</tr>
<tr>
<td>FINA 430</td>
<td>International Financial Management</td>
<td>3</td>
<td>FINA 110</td>
</tr>
<tr>
<td>FINA 450</td>
<td>Risk Management in Financial Institutions</td>
<td>3</td>
<td>FINA 110</td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>Credits</td>
<td>Prerequisites</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------</td>
<td>---------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>ACCT 422</td>
<td>Intermediate Financial Accounting 2</td>
<td>3</td>
<td>ACCT 321</td>
</tr>
<tr>
<td>ACCT 425</td>
<td>Cost Accounting</td>
<td>3</td>
<td>ACCT 215</td>
</tr>
<tr>
<td>ACCT 430</td>
<td>Auditing</td>
<td>3</td>
<td>ACCT 321</td>
</tr>
<tr>
<td>ACCT 435</td>
<td>Accounting Information Systems</td>
<td>3</td>
<td>ACCT 321, INFO 200</td>
</tr>
<tr>
<td>ACCT 445</td>
<td>International Accounting</td>
<td>3</td>
<td>ACCT 215</td>
</tr>
<tr>
<td>BUSS 490</td>
<td>Special Topics in Business Administration</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>FINA 410</td>
<td>Financial Planning and Control</td>
<td>3</td>
<td>FINA 110</td>
</tr>
<tr>
<td>FINA 422</td>
<td>Valuation Methods</td>
<td>3</td>
<td>FINA 110, FINA 215</td>
</tr>
<tr>
<td>FINA 425</td>
<td>Commercial Bank Management</td>
<td>3</td>
<td>FINA 215</td>
</tr>
<tr>
<td>FINA 430</td>
<td>International Financial Management</td>
<td>3</td>
<td>FINA 110</td>
</tr>
<tr>
<td>FINA 450</td>
<td>Risk Management in Financial Institutions</td>
<td>3</td>
<td>FINA 110</td>
</tr>
<tr>
<td>INFO 400</td>
<td>E-Commerce Strategies and Applications</td>
<td>3</td>
<td>INFO 200</td>
</tr>
<tr>
<td>MNGT 430</td>
<td>International Business and Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MNGT 440</td>
<td>Total Quality Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MNGT 450</td>
<td>Case Studies in Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MNGT 460</td>
<td>Change Management</td>
<td>3</td>
<td>MNGT 110</td>
</tr>
<tr>
<td>MKTG 420</td>
<td>Marketing Research</td>
<td>3</td>
<td>MKTG 210, BUSS 200</td>
</tr>
<tr>
<td>MKTG 430</td>
<td>Professional Selling and Sales Management</td>
<td>3</td>
<td>MKTG 420</td>
</tr>
<tr>
<td>MKTG 435</td>
<td>Public Relations</td>
<td>3</td>
<td>MKTG 210</td>
</tr>
<tr>
<td>MKTG 440</td>
<td>Consumer Behavior</td>
<td>3</td>
<td>MKTG 210</td>
</tr>
<tr>
<td>MKTG 450</td>
<td>Logistic Marketing Management</td>
<td>3</td>
<td>MKTG 210</td>
</tr>
</tbody>
</table>
Course Descriptions

Accounting Courses

ACCT 110  Financial Accounting  3(3, 0, 0)
An introduction to financial accounting that covers the use, interpretation, and analysis of the principal financial statements and other sources of financial information from a national and international perspective.

ACCT 215  Managerial Accounting  3(3,0, 0)
This course covers the use, interpretation, and analysis of management accounting information for management decision-making, planning, and control of operations. The focus is on cost behavior, cost measurement, budgeting, performance measurement and valuation, responsibility accounting, and product costing. Prerequisites  ACCT 110.

ACCT 321  Intermediate Financial Accounting 1  3(3,0, 0)
This course covers concepts and standards of external financial reporting, systems to record and prepare financial accounting information, contents and presentation of basic financial statements, and financial reporting issues of assets. Prerequisites: Business third year standing and ACCT 110. Corequisite: ACCT 110.

ACCT 422  Intermediate Financial Accounting 2  3(3, 0, 0)
This course covers concepts of financial reporting related to liabilities, equity, and other selected financial reporting issues and disclosure. Prerequisites: Business third year standing and ACCT 321. Corequisite: ACCT 110.

ACCT 425  Cost Accounting  3(3, 0, 0)
A course on accounting in manufacturing operations; cost concepts and classifications; cost accounting cycle; accounting for materials, labor, and burden; process cost accounting; budgeting; standard costs; cost reports; direct costing and differential cost analysis; cost-volume-profit analysis and gross profit analysis. Prerequisites: Business third year standing and ACCT 215.

ACCT 430  Introduction to Auditing  3(3,0, 0)
As an introduction to auditing and the professional responsibilities of a career in accounting, the course covers a comprehensive study of procedures used in the verification of financial statements. Topics include the legal and ethical responsibilities of accountants; professional auditing standards; international auditing standards; the acquisition, evaluation, and documentation of audit evidence; reports on the results of the engagement, evaluation in internal control, compliance testing, substantive testing, and statistical sampling and auditing EDP. Prerequisites: Senior standing and ACCT 321.

6 Credits (Lecture, Tutorial, Lab)
ACCT 435  Accounting Information System  3(3, 0, 0)
This course explores in detail several typical Accounting Information System (AIS) application subsystems, such as order entry/sales, billing/receivables/cash receipts, inventory, purchasing/accounts payable/cash disbursements, payroll, and materials planning/production. This course includes understanding, documenting, designing, using, and auditing these application subsystems. Prerequisites: Senior standing and INFO 200.

ACCT 445  International Accounting  3(3, 0, 0)
This course focuses on the main challenges faced by professional accountants in international business that includes the financial reporting standards, foreign currency, budgeting, management control, and the analysis of the profit plan. Prerequisites: Senior standing and ACCT 215.

Business Courses

BUSS 100  Orientation Workshop  0(1, 0, 0)
The main objectives of this orientation are to give students general insight into the fields of business and management, to introduce recent regional developments and career possibilities, and to familiarize students with the requirements of the business study program. The primary aims of this course are to help students plan out their study programs for the business diploma or for a specific track within the business bachelor's degree program, and to advice students on course and degree objectives.

BUSS 110  Statistics and Data Analysis  3(3, 0, 0)
This course covers basic statistical concepts and introduces some advanced concepts and tools that are useful for decision-makers. Topics include descriptive statistics, probability distribution, statistical inference (hypothesis testing and analysis of variance) from small and large samples of data, correlation and regression, forecasting and time series and statistical quality controls. An emphasis will be given to the understanding, applicability of statistical analysis and interpretation of the output of analyses using Excel spreadsheet tools and small mini real-life cases. Prerequisites: MATH 203.

BUSS 200  Business Communication Skills  2(2, 0, 0)
This course is designed to introduce students to the various communication skills needed in a typical work environment. Mastering these skills plays a profound role in shaping and advancing professional careers in all types of industries and work scopes. Prerequisite: None

BUSS 210  Business Law  3(3, 0, 0)
The main objective of the course is to help business students understand Saudi and Gulf legal environment and the legal aspect of common business activities and the formation and functioning of commercial companies along with the related ethical principles. Topics covered include laws pertaining to business people and employment, labor laws, business associations, the business firm, breach of contract, commercial papers and letters of credit. Prerequisite: MNGT 110.
**BUSS 300  Strategic Career Planning  1(1, 0, 0)**
This course is designed to build awareness of changing career patterns and major personal and professional influences that impact future careers. The course covers issues such as preparation for joining the labor market, basic career guidance, understanding career stages, and practicing self-assessment. Prerequisite: Business third year standing.

**BUSS 330  Managerial Economics  3(3, 0, 0)**
The main objective of this course is to equip students with the necessary economic theory and techniques and the ability to apply them in order to inform and enhance managerial decision making. Topics covered include: optimization techniques, demand theory and estimation, forecasting and measurement, theory of production and estimation, cost theory and estimation, pricing and output determination under different market structures, game theory, and pricing in practice. Prerequisites: Business third year standing and ECON 211.

**BUSS 346  Internship/Practicum  1(1, 0, 0)**
A summer period of guided work experience under faculty supervision by a mentor, and corporate guidance by a preceptor is designed to acquaint students with the ground realities and help them acquire core values and basic skills necessary for an understanding of the field operations of a firm. Prerequisites: Business third year standing and FINA 110, MNGT 110, MKTG 210, INFO 200.

**BUSS 400  Developing Entrepreneurial Plan  2(2, 0, 0)**
This course focuses on starting your own business from inception to IPO, passing through the stages of feasibility study, VC financing, launching, and operating. Prerequisites: Senior standing.

**BUSS 440  Strategic Management  3(3, 0, 0)**
This capstone course exposes seniors to the strategic management process of local, regional, and multinational corporations. Emphasis is placed on identifying the tools needed for strategic analysis of the firm and the industry, and on comprehending the key strategic issues that managers face in managing corporations. Prerequisites: Senior standing and MNGT 110.

**BUSS 445  Business Research Methods  3(3, 0, 0)**
The course provides students with an introduction to the main theories and practices in the field of business research. Topics include: business research process; research design and strategies; methods of qualitative and quantitative research; design of experiments including sampling, survey design, data collection, basic data analysis, and research reporting and evaluation. (Pre-requisites: BUSS 110)

**BUSS 460  Graduation Project  3(3, 0, 0)**
The project requires, among other things, that the student works on a problem faced by one of the local or regional businesses, and recommend a set of possible solutions under the supervision of a faculty mentor in the particular area of concentration. The results of the project are normally presented in a meeting in the presence of representatives from the business subject to the consulting assignment. Prerequisites: Senior standing.
BUSS 490  Graduation Project  3(3, 0, 0)
This is a general course intended to reinforce the student’s knowledge in a specific functional area of Business Administration usually not offered in one of the regular core or other elective courses. Through a combination of lectures, case studies and independent reading, the course aims to expand the students’ knowledge of the related concepts and applications. Pre-requisite: at least a third year standing.

Decision Systems Courses

DCSN 200  Managerial Decision Making: Models and Techniques  3(3, 0, 0)
This course addresses formulation of models that can be used to analyze complex problems taken from various functional areas of management, including finance, marketing, operations, and human resources. The goal is to understand how business decisions are reached, what tradeoffs are made, and how outcomes depend on the underlying data. A broad range of analytical methods is covered, including linear programming, integer linear programming, decision analysis, decision trees, queues, and Monte Carlo simulation. Software packages like Excel, Tree Plan, and Crystal Ball are used. Prerequisites: CSC 100.

DCSN 305  Operations Management  3(3, 0, 0)
This course offers an overview of the issues involved in how operations managers make strategic decisions to operate a production or service system in order to give the firm a sustainable competitive advantage in a global marketplace. Specific topics covered include operations strategy framework; project management; product design and process management; total quality management; capacity planning; supply chain design; and control of operations. Prerequisites: Business third year standing and DCSN 200.

DCSN 415  Advanced Managerial Decision Making Models  3(3, 0, 0)
This course addresses advanced models from functional areas of management, including finance, marketing, operations, and human resources, through case studies and use of applications software. Prerequisites: Senior standing and DCSN 200.

Economics Courses

Econ 211  Principles of Microeconomics  3(3, 0, 0)
This is an introductory course which presents the general Principles of microeconomics. Topics include supply and demand, market equilibrium, consumer theory, market equilibrium, production, market structures (monopoly and oligopoly), and welfare economics and income distribution.

Econ 212  Principles of Macroeconomics  3(3, 0, 0)
This course deals with principles of economics that apply to an economy as a whole. It includes elements on the determinants of the general price level and national output, consumption, investment, inflation and unemployment. The course introduces the monetary and fiscal policies to promote long-term economic growth. It also provides a basic understanding of the foreign
exchange markets, balance of payments and the effects of currency changes on a country’s imports and exports. Prerequisites: ECON 211

Entrepreneurship Courses

ENTM 420   **Entrepreneurship and Small Business Management 3(3, 0, 0)**
This course covers the management, organization, and operational issues of small business enterprises. This course emphasizes the identification and resolution of managerial problems from the perspective of small business focusing mainly on marketing, finance and HR areas. Prerequisites: Senior standing and ACCT 110, FINA 110, MNGT 215, BUSS 400.

Finance Courses

FINA 110   **Business Finance 3(3, 0, 0)**
This course teaches the tools that determine and analyze the major decisions a financial manager has to make, including identification of the firm’s goals, time value of money, use of discount cash flow models, capital budgeting under certainty, capital structure as it relates to cost of capital, dividend policy, and ethics in finance. Prerequisites: ACCT 110.

FINA 215   **Financial Markets and Institutions 3(3, 0, 0)**
This course covers analysis of existing financial systems, money and capital markets, banks and non-bank financial intermediaries, term structure of interest rates, and securities markets including the stock and bond exchanges. It introduces the role of risk management in the financial institutions industry. Both quantitative and qualitative measures of risks are emphasized. Prerequisites: FINA 110.

FINA 310   **Islamic Finance and Management 3(3, 0, 0)**
This course introduces financial institutions, transactions and instruments that comply with Islamic principles. The course focuses on Shariah compliant transactions and instruments such as financial partnerships and profit sharing, asset-backed equity and debt, and Shariah compliant insurance. Further topics include the development of new instruments and practices to offer a broader range of Islamic financial solutions, practical management uses and implications of Islamic finance. Prerequisites: Business third year standing and FINA 110, MNGT 110.

FINA 410   **Financial Planning and Control 3(3, 0, 0)**
This course focuses on topics such as the financial planner’s role and environment, cash flow budgeting, consumer credit, controlling and planning labor and overhead costs, expense and capital expenditure planning, debt management, insurance, taxation and financial planning. The course also covers aspects of personal financial planning, including retirement planning, estate planning and wills, personal bankruptcy and insolvency, and preparation of financial plans. Prerequisites: Senior standing and FINA 110.
FINA 420  Investment Management  3(3, 0, 0)
A study of the operations of securities markets, investment policies, valuation of individual securities, and techniques of investing in securities. This course also introduces students to analysis of investment information, evaluation of risks and returns, and principles of portfolio selection in investment decisions. Prerequisites: Senior standing and FINA 215.

FINA 422  Valuation Methods  3(3, 0, 0)
This course covers techniques used by investment bankers and analysts for enterprise valuation. The techniques used are divided into intrinsic valuation and relative valuation. Intrinsic valuation includes dividend discount models, free cash flow to equity, free cash flow to firm. Relative valuation includes measures are price-to-earnings, price-to-sales, price-to-book, price-to-cash flow. Prerequisites: Senior standing and FINA 215.

FINA 425  Commercial Bank Management  3(3, 0, 0)
This course focuses on the management aspects of commercial banks, financial analysis of bank statements, liquidity management, assets and liability management, profitability, capital adequacy, credit analysis, trade finance, and banking regulations. Prerequisites: Senior standing and FINA 215.

FINA 430  International Financial Management  3(3, 0, 0)
This course examines international regulatory and environment differences, access to money and capital markets, use of derivatives to hedge exchange rate risk, exposure to different types of risks, and international diversification handled by multinational corporations. Prerequisites: Senior standing and FINA 110.

FINA 450  Risk Management in Financial Institutions  3(3, 0, 0)
This course defines the role of risk management in the financial industry. It focuses on the qualitative and quantitative measures of risk, and considers the management of various risks faced by investors: interest rate risk, foreign exchange rate risk, credit risk, operational risk. It also discusses portfolio analysis and the role of asset and liability management and risk control processes. Prerequisites: Senior standing and FINA 110.

Management Courses

MNGT 110  Principles of Management  3(3, 0, 0)
A course that focuses on the modern corporate entity: rationale, structure, processes and functions; internal dynamics of supervision and leadership, functions of management, performance and change management, systems dynamics, and interface with the environment.

MNGT 215  Organizational Behavior  3(3, 0, 0)
This course deals with corporate behavioral dynamics at the individual and group levels, managerial communication, team building, leadership, motivation, and conflict resolution. Prerequisites: MNGT 110.
**MNGT 428 Business Ethics**  
2(2, 0, 0)  
This course covers the topics of instrumental expediency and moral imperatives, ethical dimensions of corporate decision making, intra- and interpersonal ethical conflicts, and limits of individual and corporate responsibility. Prerequisite: Business third year standing & MNGT 110.

**MNGT 420 Human Resource Management**  
3(3, 0, 0)  
A course that deals with understanding and managing human capital as a major strategic asset, macro and micro manpower planning, skill surveying, management learning, de-learning and relearning, results-driven performance in the age of virtual organizations and telecommuting, and knowledge workers in a rapidly changing corporate context within a global knowledge economy. Prerequisites: Senior standing and MNGT 110.

**MNGT 430 International Business and Management**  
3(3, 0, 0)  
This course examines substantive and stylistic challenges for senior and middle management in international cross continent corporations and conglomerates, standardization and diffusion of authority and operations, mobility and self reinvention, and integration and differentiation. Prerequisites: Senior standing.

**MNGT 440 Total Quality Management**  
3(3, 0, 0)  
This course covers an advanced analytical account of TQM as a modern management philosophy and a program for reaching customer satisfaction. It includes a large set of practical applications at different firm levels in sustaining the relationship with customers. Prerequisite: Senior standing.

**MNGT 450 Case Studies/Special Topics**  
3(3, 0, 0)  
This course deals with special issues and management concerns that are not covered in regular courses. Students will solve in-depth business case studies covering different strategic management problems and situations. Prerequisite: Senior standing.

**MNGT 460 Change Management**  
3(3, 0, 0)  
This course discusses a central paradigm in modern management theory and practice. It reviews various organizational forces that enable and resist change. It includes the change processes at the individual, group, and organizational levels and introduces theories and approaches related to managing changes. Prerequisite: Senior standing.

### Management Information Systems Courses

**INFO 200 Management Information System**  
3(3, 0, 0)  
This course introduces the IT applications in businesses that raise productivity, create customer value and sustain competitive advantage. The survey of the underlying information technology and information systems (IT/IS) show how business processes and transactions are supported. Prerequisites: MNGT 110, CSC 100.
INFO 400  E-Commerce (EC) Strategies and Applications  3(3, 0, 0)
This course explores strategies and applications in the context of planning an EC initiative or startup. Business models and competitive strategies are used as the framework: (a) for understanding how EC is different from and similar to other businesses; and (b) how to create business value from the combined use of internet technology and the underlying IS/IT. Students/teams outline key items of an EC business plan; write high-level requirements for an E-Commerce initiative/startup; and study cases. Prerequisites: Senior standing.

Marketing Courses

MKTG 210  Principles of Marketing  3(3, 0, 0)
This course presents an overview of marketing activities including marketing inputs in strategic planning, global marketing, marketing research, analysis of buyer behavior, market segmentation and positioning, and development of the marketing mix elements. Prerequisite: MNGT 110.

MKTG 320  Competitive Marketing Strategies  3(3, 0, 0)
This course provides the insight and skills necessary to formulate and implement sound marketing strategies. The process of strategy formulation is divided into three stages: strategic analysis, strategic decision-making, and implementation of strategies. Specific topics include strategic planning, consumer decision-making, life cycle segmentation, product positioning, market response, competitive behavior, new product development, product line management, and the marketing plan. Prerequisites: Senior standing and MKTG 210.

MKTG 420  Marketing Research  3(3, 0, 0)
A course that provides thorough coverage of various marketing research tools along with an applied orientation, including a systematic analysis of the steps comprising the marketing research process, starting with research problem definition and terminating with data collection, analysis, and presentation. Prerequisites: Senior standing and MKTG 210, BUSS 110.

MKTG 430  Professional Selling and Sales Management  3(3, 0, 0)
This course examines sales management functions and strategies, developing the selling function, sales goals and structure, building a sales program, and leading and motivating the sales force. This course also examines the opportunities and problems faced by marketers in contemporary retail formats. The principle issues involved in retailing are explored, including store location and layout, merchandise planning, buying and selling, category management, and coordination of store activities. Overall the course allows students to develop appropriate skills and knowledge for effective and efficient decision making in the contemporary retail environment. Prerequisites: MKTG 420

MKTG 435  Public Relations  3(3, 0, 0)
This course focuses on the communication between an individual or organization and the public to promote stakeholder acceptance and approval. Students explore traditional and emerging components of the public relations process through mass media, as well as the needs of different
types of businesses, such as corporations, non-profit organizations, and government agencies. Prerequisites: Senior standing and MKTG 210.

**MKTG 440   Consumer Behavior   3(3, 0, 0)**
This course introduces behavioral science perspective to analyze and predict consumer behavior by focusing on the decision-making processes followed by consumers in different situations. Prerequisites: Senior standing and MKTG 210.

**MKTG 450   Logistics Marketing Management   3(3, 0, 0)**
This course examines on the organizational, management and technology issues related to the sales and marketing function. It covers the business approaches that support sales and marketing plans as well as information and knowledge management considerations. It also explores the knowledge linkages between the sales and marketing function and the supply chain functions. Prerequisites: Senior standing and MKTG 210.
MASTER of Business Administration Program (MBA)

Introduction
The economic growth in the Kingdom in general and Tabuk in particular necessitates a cadre of high-quality managers who can contribute effectively to the economic development strategies of the private as well as the public sectors.

The MBA Program at FBSU has been designed to provide an advanced business education for highly motivated Bachelor degree holders, mid-level managers and professionals in order to boost their performance, efficiency, and productivity in a variety of organizational settings. In addition, it has been tailored to build the necessary knowledge and skills for entrepreneurs to launch new businesses or improve existing ones.

Program Objectives
The MBA program at FBSU aims to provide students with the knowledge and skills that enable them to function as successful managers, leaders and entrepreneurs in the dynamic and globalized Saudi economy during the third millennium.

The MBA Program intends to:

- Provide students with an in-depth understanding of the literature in the functional areas of business.
- Develop the managerial capabilities of students on the basis of the core functions and disciplines of business administration.
- Enhance the analytical, organizational, and communication skills of students to become effective managers in a variety of organizational settings.
- Elevate the leadership and decision-making abilities of students to enable them to encounter effectively contemporary challenges in an increasingly complex business environment.

Program Structure
The program is composed of a total of 42 credits to be offered over 4 semesters. This excludes the pre-requisite foundation module (a maximum of 15 credits) that will be offered to compensate for any deficiency in the students’ knowledge. The grades of the Foundation module are not included in the cumulative GPA. Students must normally pass these courses with a minimum GPA of 3.75 out of 5 before they can start Core courses.

Students can opt to pursue a general MBA program or a program with a concentration in one of the following areas: Marketing, Human Resource Management, Accounting, Finance, General Management, Management Information Systems or Engineering Management. The latter two are inter-disciplinary in nature and are offered in collaboration with the Colleges of Computing and
Engineering. To earn an MBA with a concentration, the student must pass 12 credits in courses of that concentration.

The degree requirements can be completed in four semesters (21 months of study). The program uses English language as the main medium of instruction.

**Program Plan of Study**

<table>
<thead>
<tr>
<th>Pre-MBA Foundation Courses (Credits not counted in GPA)*</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBA 400: Introduction to Business Administration &amp; Management</td>
<td>3</td>
</tr>
<tr>
<td>MBA 410: Principles of Economics</td>
<td>3</td>
</tr>
<tr>
<td>MBA 420: Principles of Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>MBA 430: Principles of Finance</td>
<td>3</td>
</tr>
<tr>
<td>MBA 440: Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>*A Maximum of 15 credits depending on the background of the Applicant</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 1:</th>
<th>Cr</th>
<th>Semester 2:</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBA 505: Organizational Behavior</td>
<td>3</td>
<td>MBA 525: Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>MBA 510: Management Info. Systems</td>
<td>3</td>
<td>MBA 530: Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>MBA 515: Quantitative Methods in Business</td>
<td>3</td>
<td>MBA 605: Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>MBA 520: Managerial Accounting</td>
<td>3</td>
<td>MBA 610: Leadership &amp; Entrep.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 3:</th>
<th>Cr</th>
<th>Semester 4:</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBA 615: Research Methods in Business</td>
<td>3</td>
<td>Course in Concentration</td>
<td>3</td>
</tr>
<tr>
<td>MBA 620: Strategic Management</td>
<td>3</td>
<td>Course in Concentration</td>
<td>3</td>
</tr>
<tr>
<td>Course in Concentration (See Table 2)</td>
<td>3</td>
<td>MBA 690: Final Project in Concentration</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

**Cumulative Credits**  

42+15 = 57
Admission Requirements
For admission, the applicant must satisfy the following:

A. Hold a Bachelor’s degree in any field from an academic institution accredited/ recognized by the KSA’s Ministry of Higher Education (MOHE) with a minimum ranking/rating of “Upper Good; 3.5/5 or 2.5/4”. However, applicants with a rating of “Good” can be accepted if their GPA in their major of study is at least “Very Good”.

B. Achieve a minimum score of 5.5 on the IELTS exam (about 500 in paper-based TOEFL or 61 in internet-based tests) or a minimum score of 75% on the University English placement exam.

C. Pass a personal interview with the MBA Admissions Officer.

Applicants with non-business backgrounds are normally required to pass the foundation courses with a minimum GPA of 3.75 out of 5 before starting the core courses.

Work experience gives the applicant an advantage but is not required for admission.

A program accepts candidates on a competitive basis as seats are limited. Criteria for selection include, but are not limited to, competitive GPA, English proficiency, work experience, supportive references and successful personal interview with an Admissions Officer.

Note: Students can also pursue the program on a part-time basis.
Executive Master of Business Administration (EMBA) Program

Background
The Executive MBA Program has been designed to deliver excellence in business education to middle and upper level managers in the private and public sectors.

The rigorous program will enable participants to acquire the conceptual knowledge and improved decision-making skills to improve their on-the-job performance in an increasingly complex business environment.

During the course of study, participants are guided through case analyses and simulations to ensure a quick transfer of skills and knowledge from the seminar room to the workplace with a special attention to the present and future needs of Saudi and foreign firms across the Kingdom. As a result, participants will quickly realize personal and professional benefits and their contributions will be recognized through greater responsibilities, promotions and self-satisfaction.

Program Objectives
FBSU's EMBA program will strive to:

- Enhance the general managerial capabilities of participants by building upon the core functions and disciplines of business administration.
- Develop leaders and entrepreneurs with a clear strategic vision, strong critical analytical skills, a problem-solving orientation and a broad sensitivity to global issues.
- Strengthen the leadership, creative and teamwork skills that would sharpen the participants’ competitive edge, and add value to their organizations.

Program Structure
The program is composed of a total of 42 credits divided over 8 semesters. This excludes the prerequisite foundation module that covers Math and Computer skills, and which is given at the beginning of studies. Lectures are scheduled on weekends twice per month. The degree requirements can be met in 21 months of study. The program uses both Arabic and English languages for instruction.
Table 1. EMBA Program Structure & Plan of Study

<table>
<thead>
<tr>
<th>Term</th>
<th>Module No.</th>
<th>Course No.</th>
<th>Module &amp; Courses</th>
<th>Course Crs</th>
<th>Module Crs</th>
<th>Term Crs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Module 1. Foundation &amp; Business Environment</td>
<td>3 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pre-requisite: Basic Math + I.T. Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EMBA 500 - Graduate Studies in Business &amp; EMBA 505 - Contemporary Business Environment</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>EMBA 510 - Business Mathematics &amp; EMBA 515 - Data Analysis</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>EMBA 525 - Managerial Economic Decisions &amp; EMBA 520 - Financial Economics</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>EMBA 530 - Financial Accounting Decisions &amp; EMBA 535 - Managerial Accounting Decisions</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>5</td>
<td>Module 2. Business Communication</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>EMBA 555 - Information and Communication Technologies &amp; EMBA 560 - Managerial Communication</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>EMBA 565 - Business Negotiations</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>8</td>
<td>Module 3. Functional Competency</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>EMBA 600 - Organizational Behavior &amp; EMBA 620 - Change Management</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>EMBA 605 - Strategic Marketing</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>EMBA 610 - Corporate Finance</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Admission

Admission to the program is based on a combination of academic and professional criteria. To be admitted to the program, the applicant must satisfy the following conditions:

1. Hold a Bachelor’s degree in any field from a KSA-accredited university.
2. Have a cumulative GPA with a minimum rating of “Good”.
3. Have at least three years of work experience in a middle or upper management position.
4. Achieve a score of at least 5 in the IELTS exam or Pass the University’s English Entrance Exam.
5. Pass the interview with the Program Director.
Bridging Program in Business Administration
The bridging program allows students with a two year technical diploma to continue their studies to earn a Bachelor of Science in Business Administration. The program gives credit to up to 40% of equivalent courses previously taken. Placement exams are administered at the beginning of studies to offer compensatory coursework and build a solid foundation to participating students.

Admission Requirements
Admission of Diploma graduates to the Bachelor Program at the College of Business & Management is based on the General University admission requirements. The applicant must, however, be a graduate of a KSA-accredited academic organization and must have passed the official technical exam administered by the relevant governmental authority.

A student applying to the program may first be admitted to the foundation program that may take up to one year to complete based on his/her performance in the English Entrance Exam and in the placement exams.

Program Requirements
In order to graduate with a Bachelor Degree in Business Administration, new students are expected to complete a total of 134 credit hours by the end of their fourth year of academic courses. Diploma graduates are entitled to get exemption from up to 40% of the required credits, depending on their entry qualifications. Hence the program of study can normally be completed in about two years beyond the foundation year program (for a student entering in Bridging English level 2).
College of Computing

Officers of the College
Acting Dean: Nazar El-Fadil
Professors: Ahmad Nasri
Associate Professors: Nazar El-Fadil, Monther Aldwairi,
Assistant Professors: Chadi Riman, Homam Eltaj, May Haidar, Mohamed Mezher,
Nisrine Jrad
Lecturers: Faizan Zaidi, Fedaa Farhat, Hiba AbdelHakim, Khaled Abu
Hmeidan, Khairi Arafeh, Fahad Al-Balawi, Ahmed Al-
Balawi.
Assistant Instructors: Raghad Noufei, Mona Al-fifi

Mission
The College of Computing at Fahad Bin Sultan University is a professional school committed to providing quality programs in the various computing fields, following a liberal arts educational philosophy, and combining theory and practice. The College prepares its graduates to be professionals who take up leading positions in the Kingdom and the region. It also prepares them to be life-long learners, and critical thinkers who respect diversity and ethical standards.

Core Values
• Reinforcement of national identity and cultural authenticity
• Uncompromising pursuit of quality educational services to students in ways that cognitive skills, cultivate personality and help the development of character
• Integrity and adherence to ethical behavior in all ways at all levels
• Life-long learning and investment in self-renewal
• Critical thinking and board exposure to major global currents
• Community spirit and commitment to social service

Objectives
• Provide students with basic foundations in computing to enable them to identify, formulate, and solve computing problems,
• Equip students with basic principles in software and/or hardware and the necessary tools to be able to implement computing solutions,
• Enable students to communicate effectively, think critically, and be life-long learners,
• Instill in students an appreciation of the ethical, social and professional issues in an increasingly diverse and technological society, and
• Prepare students to undertake higher studies in computing or related fields.

Career Opportunities
The College of Computing is committed to providing its students with meaningful, up-to-date skills and knowledge that will allow them to pursue successful careers and make deep impacts both within the Tabuk province, and across the Gulf region at large. With these objectives in mind, the College programs are designed around fostering contemporary best practices and skills in line with the job opportunities for computing professionals within Tabuk, the Kingdom of Saudi Arabia, and the Gulf.

Graduates of the College are poised to take advantage of numerous job opportunities within the Tabuk province itself, and in the growing KSA and Gulf markets. Computing is a broad and diverse field and rivals all other disciplines in its impact on society. The expanding role of computer science and engineering in today’s society reflects the variety and scope of this exciting profession. Local as well as regional career opportunities available for computer scientists and engineers include software development companies, computer hardware companies dealing in PCs, workstations, and servers, computer networking companies, consulting offices, telecommunications companies, and internet service providers.

Program Standards
The computing curriculum is designed to comply with the requirements of ABET accreditation and IEEE/ACM guidelines. It includes courses in basic sciences and mathematics, analysis and design, communications skills, and humanities and social sciences. Lab hands-on experience and emphasis on design are important elements that are integrated throughout the curriculum.

Admission Requirements
Admission of students to the CSC and CEN programs at the College of Computing is based on the General University admission requirements in addition to specific criteria set by the College of Computing. All direct admissions are decided by the University Admissions Committee.

Programs of Study
The College of Computing at FBSU offers a broad range of avenues for study and exploration.
Bachelor Degrees Offered
The bachelor degree programs allow eligible students to develop enhanced knowledge in these areas through a balanced curriculum of required/elective intermediate and advanced courses in specific computing concentrations. The courses offered in the bachelor program provide students with more in-depth skills and knowledge in their chosen track area. The College grants the following degrees

- Bachelor of Computer Science.
- Bachelor of Engineering Sciences in Computer Engineering

University Requirements
To complete a bachelor degree program at FBSU, 30 credits of general education are required. The following are the general education requirements:

- 6 credits of Arabic: ARAB 101 and 201
- 9 credits of English communication skills: ENGL 101, 102, and 203
- 9 credits of Social and Cultural studies: SOCS 101, 201, and 202
- 3 credits of Computing essentials: CSC 100
- 3 credits of Mathematics: MATH 101

College Requirements
The College of Computing requires the following 27 credits for the bachelor degree:

- 4 credits of physics: PHYS 101 and PHYS 101 L
- 3 credits of Mathematics: MATH 102
- 3 credits of statistics: STAT 230
- 3 credits of technical English writing: ENGL 206
- 11 credits of computing: CSC 102, CSC 102L, CSC 212, CEN 221, CEN 221L
- 3 credits in computing ethics: CSC 492

Final Year Project
As part of their fourth year, all College of Computing students following the bachelor program are required to carry out a project and submit a technical report. This project is a substantial piece of work that will require creative activity and original thinking. Students in groups, normally three per group, are supervised while working on a project accounting for 4 credits, extending over a full academic year. The project aims to provide students with a transitional experience from the academic world to the professional world. It is designed to serve as a platform on which students in teams engage in a meaningful design experience requiring the solution of engineering design projects. The objectives of the final year project are:
• To allow students to demonstrate a wide range of the skills learned at the College of Computing during their course of study by asking them to deliver a product that has passed through the design, analysis, testing and evaluation stages.
• To encourage multidisciplinary research through the integration of material learned in a number of courses.
• To allow students to develop problem solving, analysis, synthesis and evaluation skills.
• To encourage teamwork.
• To improve students' communication skills by asking them to produce both a professional report and a professional poster and to give an oral presentation on their work.

The project is important for a number of reasons:
• It is the largest single piece of design work that a student does during his/her bachelor degree program.
• It allows students to specialize in a topic that they enjoy.
• It is the work that prospective employers will most likely ask students about during an interview.
• It allows students to show a wide range of the skills learned since the first year.
• Students must demonstrate these skills by delivering a product that has passed through the design, analysis, testing and evaluation stages.

**Practical Training/Summer Internship Requirement**

All students of College of Computing are required to fulfill a 1-credit hour summer internship period of 8 to 12 weeks. This graduation requirement entails that each student gain practical training experience during the summer prior to graduation with either a company or another academic institution.
COMPUTER SCIENCE PROGRAM (CSC)
The curriculum is designed to grant students the Bachelor of Computer Science degree upon the successful completion of the four-year program.

Program Mission
Computer Science at FBSU is a core high-technology discipline which integrates theoretical and practical education. Through a combination of courses and a final degree project, the computer Science Program provides quality teaching, and prepares students to assume positions in public and private sectors, computer industry, or educational institutions in the Kingdom. The program also offers prospective students opportunities to pursue a higher education in Computer Science.

Learning Outcomes
The Computer Science program at FBSU strives to achieve success by insuring that graduates:

- Have the necessary knowledge in computer science, both theoretical and practical,
- Demonstrate ability to apply computer science skills to analyze problems, design and implement solutions, and verify their correctness,
- Are able to integrate ethical, social and legal concerns in solutions to problems,
- Are able to participate smoothly and effectively in team work as members and leaders to develop and deliver quality solutions,
- Are able to prepare technical reports and conduct professional presentations in the discipline,
- Are able to communicate effectively orally and in writing
- Show evidence of being self-motivated life-long learners.

Degree Requirements
To graduate with a Bachelor of Computer Science, students must satisfactorily complete a four year program consisting of 128 credit hours. The distribution of courses is as follows:

- University Requirements 30 Credits
- College Requirements 27 Credits
- Computer Science Requirements 71 Credits

Total 128 Credits

University Requirements
Students working towards the BCS degree must complete a total of 30 credit hours in University requirements. The 30 credit hours in University general educational requirements for BS programs are as follows:

- 6 credits of Arabic: ARAB 101 and ARAB 201
- 9 credits of English communication skills: ENGL 101, ENGL 102, and ENGL 203
- 9 credits of Social and Cultural studies: SOCS 101, SOCS 201, and SOCS 202
- 3 credits of Computing essentials: CSC 100
• 3 credits of Mathematics: MATH 101

College Requirements
The College of Computing requires students to take the following 27 credits for the bachelor degree:

• 4 credits of physics: PHYS 101 and PHYS 101L
• 3 credits of Mathematics: MATH 102
• 3 credits of statistics: STAT 230
• 3 credits of technical English writing: ENGL 206
• 11 credits of computing: CSC 102, CSC 102L, CSC 212, CEN 221, CEN 221L
• 3 credits in computing ethics: CSC 492

Program requirements
The computer science requirements consist of 71 credits of which 47 credits are from required courses and 24 from elective courses.

The required courses are: CSC 201, CSC 201L, CSC 356, CSC 357, CSC 358, CSC 360, CSC 360L, CSC 371, CSC 371L, CSC 372, CSC 377, CSC 382, CSC 384, CSC 398, CSC 498, CSC 499, MATH 201, MATH 211, MATH 215.

The electives courses include:

• 15 credits of Computer Science electives
• 6 credits of Free Electives
• 3 credits of Science Elective

---

7 For Computing, Computing ethics, final year projects and internship courses needed for the bachelor degree, see details in each program: CSC and CEN
# BCS Program Study Plan

(128 Credits)

## Year I

### First Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Basic Academic English I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH 101</td>
<td>Calculus I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CSC 102</td>
<td>Computer Programming I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CSC 102L</td>
<td>Computer Programming I Lab</td>
<td>1</td>
<td>CSC 102</td>
</tr>
<tr>
<td>CSC 100</td>
<td>Introduction to Computing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SOCS 101</td>
<td>Islamic Civilization I</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 16

### Second Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 102</td>
<td>Basic Academic English</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH 102</td>
<td>Calculus II</td>
<td>3</td>
<td>MATH 101</td>
</tr>
<tr>
<td>CSC 201</td>
<td>Computer Programming II</td>
<td>3</td>
<td>CSC 102</td>
</tr>
<tr>
<td>CSC 201L</td>
<td>Computer Programming II Lab</td>
<td>1</td>
<td>CSC 201</td>
</tr>
<tr>
<td>PHYS 101/101L</td>
<td>College Physics I + Lab</td>
<td>3+1</td>
<td></td>
</tr>
<tr>
<td>ARAB 101</td>
<td>Arabic Communication Skills</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 17

## Year II

### Third Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 212</td>
<td>Algorithms and Data Structure</td>
<td>3</td>
<td>CSC 102</td>
</tr>
<tr>
<td>CEN 221</td>
<td>Computer Organization and Assembly Language</td>
<td>3</td>
<td>CSC 212</td>
</tr>
<tr>
<td>CEN 221L</td>
<td>Computer Organization and Assembly Language Lab</td>
<td>1</td>
<td>CSC 212, CEN 221</td>
</tr>
<tr>
<td>STAT 230</td>
<td>Probability and Statistics</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>MATH 201</td>
<td>Calculus and Analytic Geometry III</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>ENGL 203</td>
<td>Advanced Academic English I</td>
<td>3</td>
<td>ENGL 102</td>
</tr>
</tbody>
</table>

**Total Credits** 16
### Fourth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 356</td>
<td>Design and Analysis of Algorithms</td>
<td>3</td>
<td>CSC 212</td>
</tr>
<tr>
<td>CSC 377</td>
<td>Database Systems</td>
<td>3</td>
<td>CSC 356</td>
</tr>
<tr>
<td>CSC 371</td>
<td>Introduction to Linux Operating Systems</td>
<td>3</td>
<td>CEN 221</td>
</tr>
<tr>
<td>CSC 371L</td>
<td>Introduction to Linux Operating Systems Lab</td>
<td>1</td>
<td>CSC 371</td>
</tr>
<tr>
<td>MATH 211</td>
<td>Discrete Mathematics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SOCS 201</td>
<td>Islamic Civilizations II</td>
<td>3</td>
<td>SOCS 101</td>
</tr>
</tbody>
</table>

**Total Credits** 16

### Year III

#### Fifth Semester (15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 384</td>
<td>Computer Networks</td>
<td>3</td>
<td>CEN 221, CSC 356</td>
</tr>
<tr>
<td>CSC 358</td>
<td>Programming Languages</td>
<td>3</td>
<td>CSC 212</td>
</tr>
<tr>
<td>MATH215</td>
<td>Linear Algebra and Numerical Techniques</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>CSC 357</td>
<td>Theory of Computation</td>
<td>3</td>
<td>MATH 211, CSC 212</td>
</tr>
</tbody>
</table>

**Total Credits** 15

### Sixth Semester (15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 372</td>
<td>Operating Systems</td>
<td>3</td>
<td>CEN 221+CSC 356</td>
</tr>
<tr>
<td>CSC 382</td>
<td>Software Engineering</td>
<td>3</td>
<td>CEN 221, CSC 358, CSC 377</td>
</tr>
<tr>
<td>ENGL 206</td>
<td>Technical Writing</td>
<td>3</td>
<td>ENGL 203</td>
</tr>
<tr>
<td></td>
<td>Computer Science Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Free elective</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 15
### Summer Semester (1 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 398</td>
<td>Internship</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 1

---

### Year IV

#### Seventh Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 360</td>
<td>Internet Programming and Web Design</td>
<td>3</td>
<td>CEN 221 + CSC 356</td>
</tr>
<tr>
<td>CSC 360L</td>
<td>Internet Programming and Web Design</td>
<td>1</td>
<td>CSC 360</td>
</tr>
<tr>
<td>CSC 492</td>
<td>Computing Ethics</td>
<td>3</td>
<td>Senior Standing</td>
</tr>
<tr>
<td>CSC 498</td>
<td>Final Year Project I</td>
<td>1</td>
<td>Senior Standing</td>
</tr>
<tr>
<td></td>
<td>Computer Science Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer Science Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Free Elective</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 17

---

#### Eighth Semester (15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 499</td>
<td>Final Year Project II</td>
<td>3</td>
<td>CSC 498</td>
</tr>
<tr>
<td>ARAB 201</td>
<td>Advanced Academic Arabic</td>
<td>3</td>
<td>ARAB 101</td>
</tr>
<tr>
<td>SOCS 202</td>
<td>World Civilizations</td>
<td>3</td>
<td>SOCS 101</td>
</tr>
<tr>
<td></td>
<td>Computer Science Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Natural Science Elective</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 15

---

### Total Program Credits 128*

*Completion of the Bachelor of Computer Science Degree*
Course Description

CSC 100  Introduction to Computing  3(3, 0, 0)
This course is an introduction to computers and their applications. Common applications are considered in word processing, spreadsheets, presentation, and database systems. This course also includes introduction to number systems, concepts of Algorithms, and an introduction to the Internet and the World Wide Web. This course provides an introduction to programming. Prerequisite: None.

CSC 101  Introduction to Computing for Engineers  3(3, 0, 0)
This course includes the following topics: an overview of electrical engineering as a profession; introduction to the use of different CAD tools (e.g., SPICE, MATLAB, LabVIEW and basic laboratory instruments) in areas of Electrical Engineering such as circuits, electromagnetic fields, energy, machines, signal processing, communications, and control.

CSC 102/ELEE 230  Computer Programming I  3(3, 0, 0)
Introduction to computer science with emphasis on problem solving, programming and algorithm design; use of a high-level programming language for solving problems and emphasizing program design and development; topics include basic programming constructs, expressions, conditional statements, loop statements, functions, classes and objects, data types, arrays, and strings. Prerequisite: None.

CSC 102L  Computer Programming I Lab  1(0, 0, 2)
Laboratory experiments to cover CSC 102 material. Pre- or co-requisite: CSC 102.

CSC 201  Computer Programming II  3(3, 0, 0)
Introduction to the following object-oriented programming concepts: Object-oriented design; abstraction, encapsulation and information hiding; classes; separation of behavior and implementation; class hierarchies; inheritance; and polymorphism; constructor and accessory concepts; overloading principles. Prerequisite: CSC 102.

CSC 201L  Computer Programming II Lab  1(0, 0, 2)
This Lab complements the contents of CSC 201. Pre- or co-requisite: CSC 201.

CSC 212  Algorithms and Data Structures  3(3, 0, 0)
This course covers basic data structures and related algorithms. It includes detailed studies of data structures and data abstraction such as queues, linked lists, hashing techniques, trees, data structure for representing graphs with emphasis on algorithm design and programming techniques in large programs; introduction to program complexity and verification as well as fundamental algorithms and their implementation for sorting, searching, merging, hashing, graph theoretic models, and recursive procedures. Prerequisite: CSC 102.

8 Credits (Lecture, Tutorial, Lab)
CSC 356/CEN 432  Design and Analysis of Algorithms  3(3, 0, 0)
Techniques of the design and analysis of efficient algorithms and advanced data structures: asymptotic analysis, divide and conquer, greedy algorithms, dynamic programming, and optimization algorithms. This course includes an introduction to NP-Completeness; application to searching, sorting, graphs, matrices, and set manipulation. Prerequisite: CSC 212.

CSC 357  Theory of Computation  3(3, 0, 0)
Introduction to formal languages and computational models: finite automata, pushdown automata, Turing machines, undecidability, recursive, recursively enumerable functions, and an introduction to Computability and Complexity; applications to compiler design and text processing. Prerequisites: MATH 211 and CSC 212.

CSC 358  Programming Languages  3(3, 0, 0)
Comparative study of the design and implementation of advanced programming language features in imperative, scripting, object-oriented, functional, logic, and visual languages. Formal methods for syntactic and semantic description of imperative programming languages are examined. Statement types, data types, variable binding, method binding, and backtracking mechanisms; functional programming language (Haskell or LISP) or logic programming language (Prolog or LISP) with associated Lab. Prerequisite: CSC 212.

CSC 360  Internet Programming and Web Design  3(3, 0, 0)
Hands-on approach in understanding how medium-sized interactive client/server Web applications are built using different types of integrated Web technologies; implementation of a database-driven website, relevant technologies involved in each tier of the web architectural model; accessibility of Web agents and end-users, Web caching and proxy techniques, and security issues and strategies of Web-based applications; operational concepts of the internet and the web, static and client content, dynamically served content, and n-tiered architecture. Prerequisites: CEN 221 and CSC 356.

CSC 360L  Internet Programming and Web Design Lab  1(0, 0, 2)
Laboratory experience to complement CSC 360 material  Co-requisites: CSC 360

CSC 371  Introduction to Linux Operating Systems  3(3, 0, 0)
Essentials of the Linux Operating Systems and Inter-process Process Communications: Linux graphical environments, terminal interfaces and bash, the file system, file manipulation commands, networking tools, and system administration tools; It also covers programming under Linux with emphasis on concurrency, communications. Hands-on exercises are important to reinforce the lectures. Prerequisite: CEN 221.

CSC 371L  Introduction to Linux Operating Systems Lab  1(0, 0, 2)

CSC 372/CEN 360  Operating Systems  3(2, 0, 0)
An overview of operating systems: operating system principles, scheduling and resource management, virtual memory, file systems, concurrent processing and synchronization, Deadlocks,
Disk Scheduling; Programming under UNIX with the emphasis on concurrency and Inter-Process Communication (IPC). Prerequisites: CEN 221 and CSC 356.

CSC 475 Computer Arabization 3(3, 0, 0)
Issues and techniques in Computer Arabization: System Arabization level such as font and codepage manipulation – keyboard, screen and printer Arabization, Arabic text-editing, morphology, information retrieval, language comprehension, spell and grammar checking, world-wide-web browsers, and computer-aided education; foundations of applications in Speech Recognition – Neural network - Pattern Recognition for Arabic Language - Machine Translation. Prerequisites: Consent of the instructor. Should be moved to the electives section

CSC 377/CEN 430 Database Systems 3(3, 0, 0)
An introduction to data modeling and various relational models (with relational algebra, and calculus) in a database system; the entity relationship model, SQL and integrity constraints, file organization and index files; and normalization. Co-requisite: CSC 356.

CSC 379 Human-Computer Interaction 3(3, 0, 0)
Formal methods for facilitating human-computer communication: information processing characteristics important to facilitate human-computer interaction, and formal models of human-computer interaction; dialogue techniques, response times and display rates, information presentation, interaction devices, computer training, help systems, information search and visualization, and hypermedia, Usability evaluation – Other forms of input/output. Prerequisites: CSC 358 and CSC 382

CSC 382/CEN 330 Software Engineering 3(3, 0, 0)
Overall process of software development: principles of software requirements, analysis, implementation, testing, and maintenance; professional practices, risks and liabilities; a brief survey of available tools and techniques of analysis, planning, design and structure charts, system and information flow diagrams, testing and quality control; basic modeling and design, particularly using UML; project in software engineering techniques. Prerequisites: CEN 221, CSC 358 and CSC 377.

CSC 384/CEN 340 Computer Networks 3(3, 0, 0)
Foundation in computer networks - a top-down view of the layered architectural elements of communication systems, focusing on the Internet and TCP/IP; client/server systems, packet switching, protocol stacks, queuing theory, application protocols, socket programming, remote service calls, reliable transport (Error detection and recovery, multimedia networking with quality of service and multicasting), UDP, TCP, and security. Prerequisite: CEN 221 and CSC 356.

CSC 492/COEN 400 Computing Ethics 3(3,0,0)
Critical examination of ethical problems and research methods associated with computer technology; discussion of these problems conducted within the framework of classical philosophical ethical theories; legal and quasi-legal (i.e., policy and regulative) issues; topics addressed include the process of ethical decision-making, privacy and confidentiality, computer crime, professional
codes and responsibilities, software piracy, the impact of computers on society, and proliferation of Computers in our World (Education, Medicine, e-government, e-learning, etc.) Prerequisite: Senior standing.\footnote{The student has completed 80 or more credits}

**CSC 398 Internship/Practicum** \(1(0, 1, 0)\)
This is an eight to twelve-week professional training course in computer science. Pre-requisite: Senior standing\footnote{The student has completed 80 or more credits}.

**CSC 498 Final Year Project in Computer Science I** \(1(0, 1, 0)\)
A significant teamwork project experience to integrate much of the material learned in lead-up courses including applications of computer science in various domains. This course involves project selection, literature survey, preparation of the necessary materials for the specific project to be accomplished in CSC 499. Prerequisite: Senior standing.

**CSC 499 Final Year Project in Computer Science II** \(3(0, 3, 0)\)
Continuation of CSC 399: significant project team experience that integrates material learned in lead-up courses, including applications of computer science in various domains. Prerequisite: CSC 498.

**Elective Courses**

**CSC 262 Introduction to Multimedia Concepts** \(3(3, 0, 0)\)
Concepts of multimedia: principles of graphics, sound, video, and animation; scripting techniques; use of contemporary multimedia programs to develop and create an interactive multimedia project. Prerequisite: CSC 212

**CSC 351 Discrete Mathematics for Computer Science** \(3(3, 0, 0)\)
Survey of logic and set theory, mathematical induction, number theory, relations, functions, algebraic structures, advanced counting and introductory graph theory. Prerequisite: MATH 211, STAT 230, and CSC 212.

**CSC 359 Parallel Computing** \(3(3, 0, 0)\)
Essentials of parallel computers and associated programming methodology; basic architecture of parallel computers including shared memory, message passing, meshes, and hyper-cubes; basic techniques of parallel computations, portioning and divide-conquer; basic algorithms such as searching algorithms, numerical algorithms, etc. Prerequisites: CEN 221 and CSC 356.

**CSC 363/CEN 320/ELEE 422 Computer Architecture** \(3(3, 1, 0)\)
A comprehensive understanding of the structure and function of a computer system from architectural and integration viewpoint focusing on two broad architectural perspectives: the internal perspective, which entails the architecture and design integration of the data path logic, control path
logic, memory and I/O; and the external perspective, which provides consumer views and system selection aspects of real machines examples. Prerequisite: CEN 221/ELEE 320 and CSC 372.

**CSC 374  Compiler Construction  3(3, 0, 0)**  
An understanding of how compilers work: a simple compiler, context-free grammars, lexical analysis, top-down parsing, bottom-up parsing, semantic analysis, and code generation; programming projects. Prerequisites: CEN 221 and CSC 357.

**CSC 378  Database Management Systems  3(3, 0, 0)**  
Essentials of database management system with the emphasis on relational ones: query and transaction processing, concurrency control, recovery, distributed transactions and database security; web deployed database systems – data mining – data warehousing, OLAP – Object Oriented. Prerequisite: CSC 377.

**CSC 379  Human-Computer Interaction  3(3, 0, 0)**  
Formal methods for facilitating human-computer communication: information processing characteristics important to facilitate human-computer interaction, and formal models of human-computer interaction; dialogue techniques, response times and display rates, information presentation, interaction devices, computer training, help systems, information search and visualization, and hypermedia, Usability evaluation – Other forms of input/output. Prerequisites: CSC 358 and CSC.

**CSC 380  Graphical User Interface  3(3, 0, 0)**  
Concepts and techniques used in the design and implementation of interactive systems: interface design guidelines, human factors, technical methods of user interface design, and the design and execution of usability studies; application of various techniques through the design, creation, and testing of an interactive software application. Prerequisite: CSC 358.

**CSC 481  Introduction to Computer Security  3(3, 0, 0)**  
Introduction to cryptography and the security of networks and databases: classical encryption; modern encryption techniques; public key encryption; elliptic curve cryptography; message authentication, message digest functions; and methods for relational database security, including access control, system and network attacks and defenses – intrusion detection and preventions– risk assessment and management. Prerequisite: CSC 356.

**CSC 383  Digital Media  3(3, 0, 0)**  
Technical aspects of digital media: capturing, storage, digital representation, compression, and generation of digital media; forms of media including text, images, 2D animation, video, sound, and 3D graphics and animation. Prerequisites: CSC 356.

**CSC 385/ELEE 421  Computer Graphics  3(3, 0, 0)**  
Fundamentals of computer graphics with emphasis on 2-D graphics using an application-based approach: graphics output primitives, their attributes, colors, transformations, anti-aliasing, texture
mapping, and curves and surfaces; 2D graphics algorithms, essentials of user interface and window management systems, and graphics hardware; programming using OpenGL. Prerequisites: CSC 212.

CSC 386 Advanced Computer Graphics 3(3, 0, 0)
Basic concepts of 3D computer graphics using an application-based approach: 3D object representations and manipulations; 3D transformation and viewing; hidden-surface and hidden-line removal; shading models; rendering; texture mapping; ray-tracing; animation techniques; programming using OpenGL. Prerequisite: CSC 385.

CSC 387 Artificial Intelligence 3(3, 0, 0)
Introduction to the automation of intelligent capabilities, including intelligent agents, constraints satisfaction problems, knowledge representation and reasoning (search and logical inference), interpreting, behavior modeling and learning; expert systems, knowledge acquisition, and machine learning will also be stressed; programming projects using an Artificial Intelligence programming Language. Prerequisites: CSC 356 and 358.

CSC 388 Computer-Aided Geometric Design 3(3, 0, 0)
An overview of the use of a computer in modeling 2- and 3-D objects: representation of free-form curves and surfaces with emphasis on Bezier and B-spline; approximation and interpolation, visual smoothness, geometric continuity, parameterization and subdivision surfaces; programming projects using OpenGL with various applications including animation. Prerequisite: CSC 385.

CSC 389 Computer Vision 3(3, 0, 0)
Introduction to the basic techniques of automated (computer) processing, analysis, and understanding of image/video data: geometry and physics of image formation, image enhancement, feature extraction, video imagery, multi-view imagery analysis. Prerequisites: CSC 212, MATH 201.

CSC 390 Computer Animation 3(3, 0, 0)
Basic techniques of computer animation in 2D and 3D with hands-on experience: transformations, morphing, free form deformation, Rigid-body motion, camera control, subdivision surfaces, NURBS curves and Surfaces, implicit surfaces. Prerequisites: CSC 385.

CSC 391 Scientific Visualization 3(3, 0, 0)
Techniques in scientific data visualization with an object oriented approach: basic data representation, visualization schemes for scalar, vector and other types of data, basic algorithms for generation of ISO-surface and volume visualization; applications include 3D medical imaging, financial applications, modeling, algorithms visualization and others. Prerequisites: CSC 385 and CSC 356.

CSC 397 Selected Topics in Computer Science 3(3, 0, 0)
This course includes presentation on a selected topic of interest to the instructor and/or students. Topics will be chosen from state-of-the-art innovations in computer Science. Prerequisite: Senior Standing or consent of instructor.


CSC 487  Computer Security  3(3, 0, 0)
Principles, mechanisms and implementation of computer security and data protection; Policy,
encryption and authentication, access control and integrity models and mechanisms; network
security; secure systems; programming and vulnerabilities analysis. Study of an existing operating
system. Pre-requisite: Consent of instructor.

CSC 488  System Programming  3(3, 0, 0)
Components of computer hardware such as processor, data paths and control, and memory design
taking into consideration the performance evaluation; Basic principles involved in instruction set
architecture and design using assembly coding; advanced techniques in computer organization -
pipelining, multiprocessors, multiprocessors on-chip, and network on-chip. Pre-requisite: Consent of
instructor.
COMPUTER ENGINEERING PROGRAM (CEN)
The CEN curriculum is a four-year program designed to grant students the Bachelor of Engineering Sciences (BES) degree upon the successful completion of the requirements. The first common year with College of Engineering majors allows students to switch between the engineering majors at the start of the second year of their study.

Mission
The mission of the undergraduate program in Computer Engineering is to impart a basic understanding of computer engineering built on a foundation of mathematics, physical sciences, and technology; to expose students to practical and major design experiences; and to provide students with a global perspective and an awareness of their leadership role in regional development.

Objectives
Graduates of the Bachelor of Engineering Sciences (BES) in CEN program:
1. Possess skills and knowledge that qualify them for professional practice in computer engineering and for admission to reputable graduate programs.
2. Are capable of applying fundamental knowledge, appropriate mathematical principles and computing tools, critical thinking, and best practices in computer engineering analysis and design.
3. Are provided with an educational foundation that fosters creativity, team work, leadership, and communication skills, and prepares them for life-long learning along diverse career paths.
4. Have an appreciation of technical, social, economic, environmental, ethical, and global aspects of engineering practice.

Learning Outcomes
By the time of graduation, students with a BES in CEN will be expected to demonstrate:

a. Ability to apply knowledge of mathematics, science, and engineering;
b. Ability to design and conduct experiments, as well as to analyze and interpret data;
c. Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, ethical, health and safety, manufacturability, and sustainability;
d. Ability to function on multi-disciplinary teams;
e. Ability to identify, formulate, and solve engineering problems;
f. An understanding of professional and ethical responsibility;
g. Ability to communicate effectively;
h. Attaining a broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
i. A recognition of the need for, and an ability to engage in life-long learning;
j. Knowledge of contemporary issues;
k. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
l. Knowledge of Probability and Statistics;
m. Knowledge of Discrete Mathematics;
n. Knowledge of mathematics, basic sciences, computer sciences, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

**Degree Requirement**

To graduate with a Bachelor of Engineering Science (BES) in Computer Engineering, students must satisfactorily complete a four year program consisting of 134 credit hours distributed as follows:

- University Requirements 30 Credits
- College Requirements 27 Credits
- Computer Engineering Requirements 77 Credits
  
  **Total** 134 Credits

**University Requirements**

Students working towards the BES degrees must complete a total of 30 credit hours in University requirements. The 30 credit hours in University general educational requirements for BS programs are as follows:

- 6 credits of Arabic: ARAB 101 and ARAB 201
- 9 credits of English communication skills: ENGL 101, 102, and 203
- 9 credits of social and cultural studies: SOCS 101, 201, and 202
- 3 credits of computing essentials: CSC 100
- 3 credits of mathematics: MATH 101

**College Requirements**

The College requirements consist of 27 credits distributed as follows:

- 4 credits of physics: PHYS 101 and PHYS 101L
- 3 credits of Mathematics: MATH 102
- 3 credits of statistics: STAT 230
- 3 credits of technical English writing: ENGL 206
- 11 credits of computing: CSC 102, CSC 102L, CSC 212, CEN 221, CEN 221L
- 3 credits in computing ethics: CSC 492
Program Requirements
The computer engineering program requirements consist of 77 credits. The courses in this group include 63 required credits, 13 elective credits, and 1 credit for internship.

The required courses are:
- 12 credits of Mathematics: MATH 201, 202, 211, 215
- 4 credits of Chemistry: CHEM 101, CHEM 101L
- 10 credits of Electrical Engineering courses: ELEE 210, 210L, 240, 250
- 4 credits of Physics: PHYS 102 and 102L
- 3 credits of Engineering Economy: COEN 300

The electives courses include:
- 9 credits of Computer Engineering electives
- 3 credit hours of Free electives
- 1 credit of lab elective

The internship course:
- 1 credit for internship
# BES-CEN Program Study Plan

(134 Credits)

## Year I

### First Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Basic Academic English I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH 101</td>
<td>Calculus I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHYS 101/101L</td>
<td>College Physics I + Lab</td>
<td>3+1</td>
<td></td>
</tr>
<tr>
<td>CSC 100</td>
<td>Introduction to Computing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SOCS 101</td>
<td>Islamic Civilization I</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 16

### Second Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 102</td>
<td>Basic Academic English II</td>
<td>3</td>
<td>ENGL 101</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Calculus II</td>
<td>3</td>
<td>MATH 101</td>
</tr>
<tr>
<td>PHYS 102/102L</td>
<td>College Physics II + Lab</td>
<td>3+1</td>
<td>PHYS 101</td>
</tr>
<tr>
<td>CHEM 101/101L</td>
<td>College Chemistry + Lab</td>
<td>3+1</td>
<td></td>
</tr>
<tr>
<td>ARAB 101</td>
<td>Basic Academic Arabic</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 17

### Summer Semester (6 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 203</td>
<td>Advanced Academic English I</td>
<td>3</td>
<td>ENGL 102</td>
</tr>
<tr>
<td>SOCS 201</td>
<td>Islamic Civilizations II</td>
<td>3</td>
<td>SOCS 101</td>
</tr>
</tbody>
</table>

**Total Credits** 6

## Year II

### Third Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 201</td>
<td>Calculus and Analytic Geometry III</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>MATH 211</td>
<td>Discrete Mathematics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ELEE 210/210L</td>
<td>Electric Circuits I + Lab</td>
<td>3+1</td>
<td>PHYS 102</td>
</tr>
<tr>
<td>CEN 220</td>
<td>Logic Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CSC 102/102L</td>
<td>Computer Programming I and Computer Lab</td>
<td>3+1</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 17
## Fourth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 202</td>
<td>Differential Equations</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>CEN 221/221L</td>
<td>Computer Organization + Lab</td>
<td>3+1</td>
<td>CSC212 (pre/co)</td>
</tr>
<tr>
<td>ELEE 250</td>
<td>Electric Circuits II</td>
<td>3</td>
<td>ELEE 210</td>
</tr>
<tr>
<td>CSC 212</td>
<td>Algorithms and Data Structures</td>
<td>3</td>
<td>CSC 102</td>
</tr>
<tr>
<td>CEN 240</td>
<td>Digital Communications and Signal Processing</td>
<td>3</td>
<td>ELEE 250 (pre/co)</td>
</tr>
</tbody>
</table>

**Total Credits** 16

## Year III

### Fifth Semester (15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 230</td>
<td>Probability and Statistics</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>ENGL 206</td>
<td>Technical Writing</td>
<td>3</td>
<td>ENGL 203</td>
</tr>
<tr>
<td>CEN 320</td>
<td>Computer Architecture</td>
<td>3</td>
<td>CEN 221</td>
</tr>
<tr>
<td>ELEE 240</td>
<td>Electronics</td>
<td>3</td>
<td>ELEE 210</td>
</tr>
<tr>
<td>CEN 360</td>
<td>Operating Systems</td>
<td>3</td>
<td>CEN 221, CSC 212</td>
</tr>
</tbody>
</table>

**Total Credits** 15

### Sixth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>COEN 300</td>
<td>Engineering Economy</td>
<td>3</td>
<td>STAT 230</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Linear Algebra and Numerical Techniques</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>CEN 321</td>
<td>Embedded Systems</td>
<td>3</td>
<td>CEN 221</td>
</tr>
<tr>
<td>CEN 322L</td>
<td>Digital Systems Lab</td>
<td>1</td>
<td>CEN 321 (pre/co)</td>
</tr>
<tr>
<td>CEN 330</td>
<td>Software Design</td>
<td>3</td>
<td>CSC 212</td>
</tr>
<tr>
<td>CEN 340</td>
<td>Computer Networks</td>
<td>3</td>
<td>CEN 240</td>
</tr>
</tbody>
</table>

**Total Credits** 16

### Summer Semester (1 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEN 398</td>
<td>Internship</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 1
**Year IV**

**Seventh Semester (14 Credit Hours)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEN 498</td>
<td>Final Year Project I</td>
<td>1</td>
<td>Senior Standing</td>
</tr>
<tr>
<td>ARAB 201</td>
<td>Advanced Academic Arabic</td>
<td>3</td>
<td>ARAB 101</td>
</tr>
<tr>
<td>CSC 492</td>
<td>Computing Ethics</td>
<td>3</td>
<td>Senior Standing</td>
</tr>
<tr>
<td>CEN 350</td>
<td>Digital Integrated Circuits</td>
<td>3</td>
<td>ELEE 240</td>
</tr>
<tr>
<td>CEN 440L</td>
<td>Networking Lab</td>
<td>1</td>
<td>CEN 340</td>
</tr>
<tr>
<td></td>
<td>Computer Engineering Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>14</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Eighth Semester (16 Credit Hours)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEN 499</td>
<td>Final Year Project II</td>
<td>3</td>
<td>CEN 498</td>
</tr>
<tr>
<td>SOCS 202</td>
<td>World Civilizations</td>
<td>3</td>
<td>SOCS 101</td>
</tr>
<tr>
<td></td>
<td>Free Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer Engineering Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Computer Engineering Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lab Elective</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>16</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Total Program Credits** 134*

*Completion of the Bachelor of Engineering Sciences in Computer Engineering
Course Description

Required Courses

CEN 220/ELEE 220 Logic Design 3(3, 1, 0)
A course that covers number systems and codes, switching algebra; combinational circuit analysis, synthesis, and practice; minimization methods; sequential logic design principles; latches and flip-flops, clocked synchronous state machines, designing state machines using state tables and state diagrams; introduction to the VHDL hardware description language. Co-requisite: MATH 211.

CEN 221/ELEE 320 Computer Organization and Assembly Language 3(3, 1, 0)
This is an introductory course in computer organization and architecture. Topics include basic hardware and software structure, addressing methods, programs control, processing units, I-O organization, arithmetic and logic units, main-memory organization, peripherals, microprocessor families, CSIC and RISC architectures, and multiprocessors. Assembly language is used as an aid to studying computer organization. Co-requisite: CSC 212.

CEN221L/ELEE320L Computer Organization and Assembly Language Lab 1 (0, 0, 2)
This Lab complements the contents of CEN 221L. Co-requisite: CEN 221.

CEN 240/ELEE 350 Digital Communication and Signal Processing 3(3, 1, 0)
Study of basic digital communication principles; sampling and quantization; digital signal processing basics; basic audio and image processing concepts; discrete Fourier transforms; principles of data and computer communications at the physical layer. Co-requisite: ELEE 250.

CEN 320/CSC 363/ELEE 422 Computer Architecture 3(3, 1, 0)
Study of computer architecture from classical to advanced perspectives; explores architectural characteristics of modern computer systems such as performance, instruction sets, assemblers, data-paths, pipelining, caching, memory management, I/O considerations, multiprocessing, and other advanced systems. Prerequisite: CEN 221.

CEN 321/ ELEE 423 Embedded Systems 3(3, 1, 0)
Implementation of microprocessors and microcontrollers in embedded digital computer systems; topics include architecture, operations, software; hardware/software design methodology; interfacing of microcomputers to peripherals or other computers for purposes of data acquisition, device monitoring and control, and other communications. Prerequisite: CEN 221/CSC 102.

CEN 322L Digital Systems Laboratory 1(0, 0, 2)
This laboratory course covers digital systems design. Experiments cover hardware design tools and technologies: hardware description language, high-level synthesis, ASIC and FPGA design flow; hardware/software co-design. Co-requisite: CEN 321.
CEN 330  Software Design  3(3, 0, 1)
Study of the nature of the program development task when many people, modules and versions are involved in designing, developing and maintaining a large program or system; issues addressed include software design, specification, version control, testing, cost estimation and management; study of software systems in different domains such as database systems and HCI systems are also addressed. Prerequisite: CSC 212.

CEN 340/ CSC 384/ELEE 431  Computer Networks  3(3, 1, 0)
This course presents the foundations of computer networks. It includes a top-down view of the layered architectural elements of communication systems: Application Layer, Transport Layer, Network Layer, and the Link Layer. In particular, the emphasis is on the Internet protocols, TCP/IP, client/server systems, packet switching, protocol stacks, queuing theory, application protocols, socket programming, remote service calls, reliable transport (Error detection and recovery, multimedia networking with quality of service and multicasting), UDP, and security. Prerequisites: CEN 240/ CEN 221, CSC 356.

CEN 350/ ELEE 442  Digital Integrated Circuits  3(3, 0, 1)
Study of basic methods of digital integrated circuit design; emphasis will be on structured design methodologies for MOS systems with focus on performance considerations and design methodologies for VLSI IC chips; VLSI CAD tools are used to design and simulate a small CMOS chip. Prerequisite: ELEE 240.

CEN 360  Operating Systems  3(3, 0, 1)
A study of the internal design of operating systems; topics include memory management, multiprogramming, virtual memory, paging and segmentation; job and process scheduling; multiprocessor systems; device and file management; thrashing, cache memory. Prerequisites: CEN 221 and CSC 212.

CEN 398  Summer Internship  1(0, 1, 0)
This is an eight to twelve-week professional training course in computer engineering. Prerequisite: Senior standing.

CEN 440L  Networking Laboratory  1(0, 0, 2)
This laboratory course covers the technologies and protocols of the Internet. The experiments cover the Internet Protocol (IP), Address Resolution Protocol (ARP), Internet Control Message Protocol (ICMP), User Datagram Protocol (UDP) and Transmission Control Protocol (TCP), the Domain Name System (DNS), routing protocols (RIP, OSPF, BGP), network address translation (NAT), dynamic host configuration (DHCP), network management protocols (SNMP), and IP multicast. Prerequisite: CEN 340.

CEN 498  Final Year Project I  1 (0, 1, 0)
A supervised project in groups of normally three students aimed at providing practical experience in some aspect of computer engineering. Students are expected to complete a literature survey, project
specification, critical analysis, and to acquire the necessary material needed for their intended end product. Prerequisite: Senior standing.

**CEN 499 Final Year Project II**  
A course that seeks to impart in students the skill to integrate the knowledge gained in different courses by asking them to deliver a product that has passed through the design, analysis, testing, and evaluation stages. This course includes production of a professional report, design process and outcome, implementation and testing, verification and validation, and critical appraisal of the project. Prerequisite: CEN 498.

**Elective Laboratories**

**CEN 430L Mobile Computing Laboratory**  
1(0, 0, 2)  
This laboratory course covers the technologies involved in integrating front-end mobile devices into local and global networks. Lab experiments involve programming in Java2ME, and .NET Compact Framework. The lab course provides a general coverage of underlying technologies and standards, including IEEE 802.11, WAP, GPRS, Bluetooth, and Jini. Prerequisite: CEN 340.

**CEN 460L Multimedia Laboratory**  
1(0, 0, 2)  
This laboratory course covers the technologies used in multimedia storage and communications. Multimedia formats for voice, music, and video are covered. Experiments also cover coding, streaming, and quality of service for multimedia applications. Prerequisite: Senior standing.

**Required Electrical Engineering Courses**

**ELEE 210 Electric Circuits I**  
3(3, 1, 0)  
A course on fundamentals of electric circuits; basic elements and laws; independent and dependent sources; techniques of circuit analysis: node voltage, mesh current, and source transformation; circuit theorems: superposition, Thevenin and Norton equivalents; inductors, capacitors, mutual inductance, and transformers; steady-state AC circuits; power calculations; circuit simulation using SPICE. Prerequisite: PHYS 102.

**ELEE 210L Electric Circuits Laboratory**  
1(0, 0, 2)  
This laboratory course covers passive electronic components; laboratory instruments; voltage-divider circuits; sources and Thevenins’s theorem; RC lead-lag networks; the transformer; AC circuits. Co-requisite: ELEE 210.

**ELEE 240 Electronics**  
3(3, 1, 0)  
This course covers semiconductors: PN junctions; diodes and diode circuits; field effect transistor; MOS transistor and applications such as amplifier and switch; bipolar junction transistor and applications such as amplifier and switch; and circuit simulation using SPICE. Prerequisite: ELEE 210.
ELEE 250  Electric Circuits II  3(3, 1, 0)
A course on Laplace transform and its use in circuit analysis; s-domain representation; network functions; transient response of RC, RL, and RLC circuits; frequency-selective circuits; Bode plots; two-port networks; ideal op-amp; active filters; circuit simulation using SPICE. Prerequisite: ELEE 210.

Elective Courses

CEN 403  Special Topics in Computer Engineering  3(0, 0, 0)
This course covers contemporary topics of interest to students. Prerequisite: Consent of the instructor.

CEN 410  Computer-Aided Analysis and Design of VLSI Circuits  3(3, 1, 0)
This course covers circuit and logic simulation; timing analysis and verification; testing and fault simulation; logic and high-level synthesis; physical design automation. Prerequisite: CEN 350.

CEN 420/ CSC 385/ ELEE 421  Computer Graphics  3(3, 1, 0)
A course on interactive graphics; graphics hardware; graphical input devices; windowing; clipping; viewports; zooming, geometrical transformations (2D and 3D); data structures; advanced raster display architectures; raster algorithms; special graphics techniques; applications. Prerequisite: CSC 102/ ELEE 230.

CEN 421  Advanced Computer Architecture  3(3, 1, 0)
A course that focuses on the allocation of hardware and software resources in solving large-scale computing problems, with emphasis on the relationships between hardware organization, system programming, and language support in the evolution of advanced computer architectures. Prerequisite: CEN 320.

CEN 422  VLSI for Communications and Signal Processing  3(3, 1, 0)
This course introduces concepts in the design and implementation of digital signal processing systems using integrated circuits. The main emphasis is on the architectural exploration, design and optimization of signal processing systems for communications. Algorithm, architecture, and circuit design techniques will be introduced that enable joint optimization across the algorithmic, architectural and circuit domains. Prerequisite: CEN 350.

CEN 423  Reconfigurable Computing  3(3, 1, 0)
A course dealing with the design issues pertaining to the implementation of application specific architectures using the reconfigurable computing paradigm allowing the same circuit to be reused in order to run different applications. Emphasis will be on the systematic design of reconfigurable computing platforms that exploit a high degree of parallelism. Prerequisite: CEN 320.
CEN 424  Digital Systems Testing  3(3, 1, 0)
A course on digital systems testing and testable design; test economics, fault modeling, logic and fault simulation, testability measures, test generation for combinational and sequential circuits, memory test, delay test, scan design, built-in self test, and boundary scan. Prerequisite: CEN 220.

CEN 425  Advanced Embedded Systems  3(3,1, 0)
This course covers embedded hardware and software design; system design process requirements: analysis, specification, hardware/software co-design, testing; Embedded computing platforms: general- and special-purpose processors, hardware accelerators, systems-on-a-chip, intellectual property (IP) core-based design, embedded networks; Software design tools and technologies: CAD tools, compilers, and assemblers. Hardware design tools and technologies: hardware-description languages, high-level synthesis tools, ASIC and FPGA design flows; Real-time operating systems: multiple tasks and processes, context switching, task scheduling, inter-process communication mechanisms. Prerequisite: CEN 321.

CEN 426  Computer System Analysis  3(3, 1, 0)
This course focuses on the development of analytical models of computer systems and application of such models to performance evaluation. Topics covered include scheduling policies, paging algorithms, multi-programmed resource management, and queuing theory. Prerequisite: CEN 320.

CEN 430  Database Systems  3(3, 1, 0)
A course that covers the nature and purposes of database systems and an introduction to data modeling: entity relationship model, relational model with relational algebra, relational calculus and SQL; integrity constraints; file organization and index files; and normalization. Prerequisite: CEN 330.

CEN 431  Distributed and Object Database Systems  3(3, 1,0)
Fragmentation, replication and allocation; strategies used in executing distributed queries subject to given criteria and the commit protocols for managing transactions in a distributed environment; parallel database implementations and the design of object database management systems; designing distributed database systems using a design project that requires the implementation of low level functionality associated with the functions of distributed database system. Prerequisite: CEN 430.

CEN 432  Design and Analysis of Algorithms  3(3, 1, 0)
Sorting algorithms including merge-sort, quick-sort, and counting-sort; median and order statistics algorithms; sorting lower bound; divide-and-conquer design strategy; polynomial and matrix multiplication algorithms; balanced search trees; hash tables; augmenting data structures; number-theoretic algorithms; dynamic programming; greedy algorithms; graph algorithms including graph traversal algorithms and applications, minimum spanning tree, shortest path algorithms; distributed algorithms; introduction to NP-completeness and intractability. Prerequisite: CSC 212.
CEN 433  Advanced Topics in Algorithms  3(3, 1, 0)
General principles of algorithm design and analysis; linear programming; randomized algorithms; advanced graph algorithms; NP completeness; introduction to complexity theory; approximation algorithms; number theoretic algorithms; selected topics. Prerequisite: CEN 432.

CEN 434  Cryptography and Computer Security  3(3, 1, 0)
Overview of encryption and computer security; classical encryption techniques, block ciphers and the data encryption standard, finite fields, advanced encryption standard, confidentiality using symmetric encryption, public-key cryptography, key management, hash and MAC algorithms, digital signatures; authentication applications, intruders, and malicious software. Prerequisite: Senior standing.

CEN 435  Optimizing Compilers  3(3, 1, 0)
This course covers theoretical and practical aspects of building modern optimizing compilers. Topics: intermediate representations, basic blocks and flow graphs, data flow analysis, partial evaluation and redundancy elimination, loop optimizations, register allocation, instruction scheduling, and inter-procedural analysis. Students will implement significant optimizations within the framework of a modern research compiler. Prerequisites: CSC 212 and CEN 320.

CEN 441/ELEE 472  Information Theory  3(3, 1, 0)
This course introduces the field of information theory and its applications to communications theory, computer science, statistics, and probability theory. Covering all the essential topics in information theory, we introduce the basic quantities of entropy, relative entropy, and mutual information, and show how they arise as natural answers to questions of data compression, channel capacity, rate distortion, and hypothesis testing; Shannon’s fundamental coding theorem. Prerequisites: STAT 230 and MATH 215. Should be CEN 240

CEN 442/ELEE 473  Coding Theory  3(3, 1, 0)
This course introduces the theory of error-correcting codes. The course will focus on results of asymptotic or algorithmic significance. Topics include: construction and existence results for error-correcting codes; limitations on the combinatorial performance of error-correcting codes; BCH codes, Reed-Solomon codes; low density parity check codes; algebraic geometric codes; Turbo codes; and decoding algorithms; unique and soft decoding; applications in computer engineering such as: computer storage, compact disk player, satellite communications, bandwidth-limited systems. Prerequisites: STAT 230 and MATH 215.

CEN 447  Queuing Theory  3(3, 1, 0)
Poisson counting and renewal processes; Markov chains and decision theory, branching processes, birth death processes, and semi-Markov processes; simple Markovian queues, networks of queues, general single and multiple-server queues, bounds and approximations. Prerequisite: Senior standing. Should be STAT230, CEN340
CEN 450     Client-Server Computing     3(3, 1, 0)
Internet and intranet technologies; the client-server model of interaction; design and implementation of clients and servers; interactive and concurrent servers; distributed computing; application gateways; design project. Prerequisite: CEN 340.

CEN 451     Internet Engineering     3(3, 1, 0)
Examining major protocols used in Internet: IP, ICMP, TCP, UDP; new technologies introduced on the Internet: IP Multicast, Mobile IP, IPv6, VPNs, and quality of service; routing on the Internet; network security and firewall design; overview of the application protocols: SMTP, HTTP, RTP, and SNMP. Prerequisite: CEN 340.

CEN 452     Web Server Design and Programming     3(3, 1, 0)
Major technologies used in building Web servers. Alternate versions are to be given each year: The Windows-based IIS Server and the Linux-based Apache server. For IIS, ASP.NET along with C# will be used for programming Web servers. For Apache, PHP will be the language of choice. The course starts with a fast track on client programming, the HTTP protocol, SQL database servers, and XML programming. Prerequisite: Senior standing.

CEN 453     Multimedia and Networking     3(3, 1, 0)
Multimedia topics: system requirements, performance requirements, representation and compression; Multimedia networking is emphasized by discussing multicasting, streaming, multimedia networking protocols and quality of service based traffic management protocols; synchronization, VoIP, and Internet2; Multimedia networking applications are designed and implemented as student projects. Prerequisite: CEN 340.

CEN 454     Pervasive Computing Systems and Applications     3(3, 1, 0)
Technologies involved in integrating front-end mobile devices into local and global networks.; emphasis is placed on the programmability and networking of mobile phones, PDAs, and Pocket PCs; hands on experience involve programming in Java ME, C/C++ for Palm OS, and .NET Compact Framework for Windows CE; general coverage of underlying technologies and standards: XML, WAP, UMTS, GPRS, Bluetooth, and Jini. Prerequisite: Senior standing.

CEN 491/ ELEE 451     Digital Signal Processing     3(3, 1, 0)
Revision of signals, systems, and transforms; design of Digital Filters: FIR and IIR; sampling and reconstruction of signals; multi-rate signal processing with applications; effects of finite word length; discrete random signals and Spectral Estimation; introduction to 2D signal and image processing. Prerequisite: CEN 240/ELEE 350.

CEN 493     Neural Networks     3(3, 1, 0)
Perceptron, Madeline, back propagation, and adaptive neural networks; transformation by layered networks, statistical neuro-dynamics, associative memory, and neural learning; applications to functional approximations, signal filtering, and pattern classification. Prerequisite: Senior standing.
CEN 494/ ELEE 454  Digital Image Processing  3(3, 1,0)
Two-dimensional signals and systems; image formation and perception; representation, coding, filtering restoration, and enhancements; feature extraction and scene analysis; introduction to computer vision. Prerequisite: CEN 240CEN 491.
College of Engineering

Officers of the College
Acting Dean: Hassan Tantawi
Associate Professors: Omar Hattamleh, Hassan Tantawi
Assistant Professors: Jihad Baghdadi, Shaker Bitar, Moustapha Doumiati, Hicham H. Hallal, Yazan Issa
Instructors: Mohammad Akhtar, Yazan Gharaibeh, Omar Otoom, Khalid Al Zaarir
Lab Assistant: Ayman Al-Qudah

Mission
The mission of the College of Engineering at FBSU is to graduate high quality engineering students and to produce cutting-edge research leading to innovative technology for the benefit of society, locally and globally.

At the college of engineering, we believe in equipping students with the necessary skills to advance the engineering “state of the art” and to become life-long learners, innovators, and professionals capable of being leaders in their chosen careers while being committed to personal integrity and civic responsibility.

Vision
The college of engineering seeks to contribute to the development of the Kingdom of Saudi Arabia and the Gulf region by providing undergraduate education of the highest quality through developing strong programs, enhancing research activities, and disseminating expert engineering culture.

Core Values
The core values that guide the decisions and actions at the college of engineering are:
1. Academic excellence by fostering lifelong excellence in learning, teaching, and research.
2. Collaboration through encouraging teamwork and building partnership across disciplines and with the community.
3. Professionalism and integrity by instilling high engineering ethics and the values of perseverance in industry.
4. Respect, collegiality and civility by appreciating the contribution of everyone at the college and acknowledging his/her indigenous rights and responsibilities.
5. Responsiveness by encouraging feedback from students and faculty members alike

Academic Programs
Currently, the College of Engineering offers the following undergraduate programs:
1. Bachelor in Civil Engineering (BCE)
2. Bachelor in Electrical Engineering (BEE)
3. Bachelor in Mechanical Engineering (BME/ Currently inactive)

Admission Requirements
Applicants to the college of engineering are first admitted to the foundation year program, where they receive a thorough enforcement of their knowledge in mathematics, English, and IT skills. Upon completion of the foundation year program, eligible applicants are selected for admission into the first year of engineering program they choose. Special attention is given to the following factors:
1. Level of proficiency in English
2. Level of proficiency in mathematics and IT skills
3. Academic performance in the subject matters related to engineering

University requirements
Students working towards the Bachelor degrees must complete a total of 30 credit hours in University requirements, which are detailed as follows:
- 6 credit hours of Arabic: ARAB 101 and ARAB 201;
- 9 credit hours of English communication skills: ENGL 101, ENGL 102, and ENGL 203;
- 9 credit hours of social and cultural studies: SOCS 101, SOCS 201, and SOCS 202;
- 3 credit hours of computing for engineers: CSC 101;
- 3 credit hours of mathematics: MATH 101.

College requirements
The College of Engineering requirements for the Bachelor degrees include 41 credit hours detailed as follows:
- 12 credit hours in sciences: PHYS 101/ 101L, PHYS 102/ 102L, and CHEM 101/ 101L;
- 15 credit hours in mathematics and statistics: MATH 102, MATH 201, MATH 202, MATH 215, and STAT 230;
- 3 credit hours in technical writing: ENGL 206;
• 3 credit hours in engineering economy: COEN 300;
• 3 credit hours in engineering ethics: COEN 400.

In addition, Bachelor degree students should complete a 4-credit hour final-year project during the senior year and 1-credit hour, eight-week-minimum internship after they complete their third year.

Program (major) requirements
The specific program requirements for each of the offered programs are shown under the respective department sections. The total number of credit hours required for a Bachelor degree in each of the three programs is:

1. Civil Engineering: 137 credit hours;
2. Electrical Engineering: 134 credit hours;
3. Mechanical Engineering: 135 credit hours.
DEPARTMENT OF CIVIL ENGINEERING

Mission
The mission of the Civil Engineering Department (CE) is to:
- Offer high-quality education that encompasses basic engineering sciences in both the traditional and emerging areas of the discipline;
- Prepare graduates to adapt to global and domestic engineering challenges and changing industry practices;
- Foster student-faculty relationship that enrich teaching and learning;
- Develop scholarship and encourage public service;
- Maintain an academic environment characterized by integrity and respect;
- Prepare graduates for lifelong intellectual and professional development;
- Contribute to economic prosperity of the Kingdom and the region.

Objectives
The Civil Engineering program is designed to achieve the following objectives:
- To impart a sound understanding of the fundamental principles and concepts of civil engineering.
- To develop the mathematical, scientific, and computational skills in formulating and solving civil and environmental engineering problems.
- To cultivate the skills pertinent to the engineering design process, conduct of experiment, analysis and interpretation of data.
- To expose students to real-world problems of multi-disciplinary nature while addressing relevant social, environmental, economical and aesthetic concerns.
- To develop effective teamwork and communication skills and prepare students for leading roles in the profession and the community.

Learning Outcomes
Upon graduation, Bachelor holders in CE will be expected to demonstrate:
- Ability to apply knowledge of Mathematics, science and engineering;
- Ability to identify, formulate and solve engineering problems;
- Ability to conduct experiments, analyze and interpret data;
- Ability to design a system, component or process to meet desired needs;
- Ability to use the techniques, skills and modern tools necessary for engineering practice;
- Ability to appreciate the impact of engineering solutions in local and global contexts;
- Ability to function in a team environment;
- Ability to communicate effectively;
• Ability to understand professional and ethical responsibility;
• Knowledge of contemporary issues;
• Ability to engage in life-long learning;
• Experience in engineering practice or undergraduate research.

Civil Engineering Laboratory Facilities
The Civil Engineering Department is furnished with high quality state-of-art laboratories that support research and teaching activities for Structural, Environmental, Hydrology, Surveying and Highway Engineering Programs.

These laboratories extend over an area exceeding 610 m2 and are manned with highly qualified and well-trained personnel. Furthermore, most of the lab equipments are support advanced computerized data acquisition systems.

The Department hosts the following eight major laboratories:
1. Soil Mechanics Laboratory;
2. Concrete Laboratory;
3. Aggregate Laboratory;
4. Surveying Laboratory;
5. Fluid Mechanics and Hydraulics Laboratory;
6. Asphalt Laboratory;
7. Environmental Engineering Laboratory;
8. Structures Laboratory.

Career Opportunities
As one of the oldest engineering disciplines, Civil Engineering involves planning, designing and executing structural works. The profession deals with a wide variety of engineering tasks including design, supervision and construction activities of public works like roads, bridges, tunnels, buildings, airports, dams, water works, sewage systems, ports etc.; and offers a multitude of challenging career opportunities.

A civil engineer is responsible for planning, designing, constructing and maintaining civil engineering projects. He is required to have a high standard of engineering knowledge as well as supervisory and administrative skills. The planning part of his work involves site investigation, feasibility studies, creating solutions to complications that may occur and the actual designing of structures. He has to work with the guidelines of the local government authority and get his plans approved by them. He may prepare cost estimates and set construction schedules; deal with clients, architects, contractors etc.; and supervise the work according to standards.

Demand for civil engineers has been consistently high during the last decades particularly in the Gulf region where engineers have been involved primarily in large development projects. The emerging construction activity offers ever increasing and expanding opportunities for civil engineers.
The Civil Engineering Department is committed to providing its students with meaningful, up-to-date skills and knowledge that will allow them to pursue successful engineering careers within Tabuk and across the Gulf region.

**Curriculum and Program Structure**

The curriculum is designed to comply with the requirements of ABET accreditation. It includes courses in basic sciences and mathematics, engineering sciences, engineering design, communication skills, and humanities and social sciences. Lab hands-on experience and emphasis on design are important elements that are integrated throughout the curriculum.

The requirements of the BCE include:

- At least 30 credit hours of mathematics and basic sciences,
- At least 66 credit hours of engineering sciences and engineering design, and
- At least 15 credit hours of social sciences and humanities, excluding language and technical writing courses.

The curriculum is designed to grant students the Bachelor degree upon the successful completion of the four-year program. The first year is shared with all engineering majors in order to allow students to transfer from one major to another without losing any credits earned in the first year.

**Final Year Project**

As part of their fourth year, students are required to carry out a project and submit a technical report. This project is a substantial piece of work that will require creative activity and original thinking. Students in groups, normally three per group, are supervised while working on a project accounting for four credit hours, extending over a full academic year. The project aims to provide students with a transitional experience from the academic world to the professional world. It is designed to serve as a platform in which CE students in teams engage in a practical design experience requiring the solution of civil engineering design problems.

The objectives of the final year project are:

- To allow students to demonstrate a wide range of the skills learned at the College of Engineering during their course of study by asking them to deliver a complete and original design for a Civil Engineering scheme.
- To encourage work on multidisciplinary projects, where students get to apply material learned in a number of courses.
- To allow students to develop problem solving, analysis, synthesis, evaluation and design skills.
- To encourage teamwork.
- To improve students' communication skills by asking them to produce both a professional report and a professional poster and to give an oral presentation of their work.
- The project is important for a number of reasons:
  - It is the largest single piece of design work that a student does during his/her Bachelor degree program.
It is the work that prospective employers will most likely ask students about during an interview. It allows students to show a range of the skills they have learned during their course of study.

**Practical Training Internship**
All engineering students are required to fulfill a 1-credit hour internship period of 8 to 12 weeks. This graduation requirement entails that each student gains practical training experience during the last summer term, or in the last regular term, prior to graduation with either a company or another academic institution.

**Degree Requirements**
To graduate with a Bachelor Degree in Civil Engineering (BCE), students must satisfactorily complete 137 credit hours. The distribution of courses in the proposed study plan is as follows:

**University requirements**
The University requirements for the Bachelor degree in CE total 30 credit hours and are distributed as follows:
- 6 credit hours of Arabic: ARAB 101 and ARAB 201;
- 9 credit hours of English communication skills: ENGL 101, ENGL 102, and ENGL 203;
- 9 credit hours of social and cultural studies: SOCS 101, SOCS 201, and SOCS 202;
- 3 credit hours of computing for engineers: CSC 101;
- 3 credit hours of mathematics: MATH 101.

**College requirements**
The College of Engineering requirements for the Bachelor degree in CE total 41 and are distributed as follows:
- 12 credit hours in basic sciences: PHYS 101/101L, PHYS 102/102L, and CHEM 101/101L;
- 15 credit hours in mathematics: MATH 102, MATH 201, MATH 202, MATH 215, and STAT 230;
- 3 credit hours in technical writing: ENGL 206;
- 3 credit hours in engineering economy: COEN 300;
- 3 credit hours in engineering ethics: COEN 400;
- 4 credit hour final-year project during the senior year: CIVE 401 and CIVE 402;
- 1 credit hour internship (CIVE 400) after completing 41 credits of College requirements.

**Program requirements**
The program requirements for the BCE total 66 credit hours and are distributed as follows:
• 51 credit hours for the courses: CIVE 210, CIVE 211, CIVE 220, CIVE 220L, CIVE 240, CIVE 240L, CIVE 250, CIVE 260, CIVE 310, CIVE 320, CIVE 330, CIVE 330L, CIVE 340, CIVE 351, CIVE 360, CIVE 460, and CIVE 480; ELEE 230; MECH 200 and MECH 211;
• Four 3-credit hour electives from Civil Engineering;
• One 3-credit hour free elective Course.
# Study Plan for the BCE Degree
(137 Credit Hours)

## Year I

### First Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Basic Academic English I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>MATH 101</td>
<td>Calculus I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 101/101L</td>
<td>College Physics I + Lab</td>
<td>3+1</td>
<td>MATH 101 (co)</td>
</tr>
<tr>
<td>CSC 101</td>
<td>Introduction to Computing for Engineers</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>SOCS 101</td>
<td>Islamic Civilization I</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total Credits** 16

### Second Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 102</td>
<td>Basic Academic English II</td>
<td>3</td>
<td>ENGL 101</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Calculus II</td>
<td>3</td>
<td>MATH 101</td>
</tr>
<tr>
<td>PHYS 102/102L</td>
<td>College Physics II + Lab</td>
<td>3+1</td>
<td>PHYS 101</td>
</tr>
<tr>
<td>CHEM 101/101L</td>
<td>College Chemistry + Lab</td>
<td>3+1</td>
<td>-</td>
</tr>
<tr>
<td>ARAB101</td>
<td>Basic Academic Arabic</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total Credits** 17

### Summer Semester I (6 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCS 201</td>
<td>Islamic Civilizations II</td>
<td>3</td>
<td>SOCS 101</td>
</tr>
<tr>
<td>SOCS 202</td>
<td>World Civilizations</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 6

## Year II

### Third Semester (18 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 201</td>
<td>Calculus &amp; Analytic Geometry III</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>CIVE 210</td>
<td>Statics</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>MECH 211</td>
<td>Thermodynamics</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>CIVE 260</td>
<td>Spatial Measurements</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>CIVE 250</td>
<td>Environmental Engineering</td>
<td>3</td>
<td>CHEM 101</td>
</tr>
<tr>
<td>ENGL 203</td>
<td>Advanced Academic English I</td>
<td>3</td>
<td>ENGL 102</td>
</tr>
<tr>
<td>MECH 200</td>
<td>Engineering Graphics</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 18
### Fourth Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 202</td>
<td>Differential Equations</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>CIVE 211</td>
<td>Structural Mechanics</td>
<td>3</td>
<td>CIVE 210</td>
</tr>
<tr>
<td>CIVE 220/220L</td>
<td>Engineering Materials + Lab</td>
<td>3+1</td>
<td></td>
</tr>
<tr>
<td>CIVE 240/240L</td>
<td>Fluid Mechanics +LAB</td>
<td>3+1</td>
<td>MECH 211</td>
</tr>
<tr>
<td>STAT 230</td>
<td>Probability and Statistics</td>
<td>3</td>
<td>MATH 201</td>
</tr>
</tbody>
</table>

**Total Credits** 17

### Year III

#### Fifth Semester (18 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 215</td>
<td>Linear Algebra and Numerical Techniques</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>ENGL 206</td>
<td>Technical Writing</td>
<td>3</td>
<td>ENGL 203</td>
</tr>
<tr>
<td>CIVE 310</td>
<td>Structural Analysis</td>
<td>3</td>
<td>CIVE 211</td>
</tr>
<tr>
<td>CIVE 340</td>
<td>Engineering Hydrology</td>
<td>3</td>
<td>CIVE 240</td>
</tr>
<tr>
<td>CIVE 351</td>
<td>Water and Wastewater Treatment and Laboratory</td>
<td>3</td>
<td>CIVE 250</td>
</tr>
<tr>
<td>ELEE 230</td>
<td>Programming for Engineers</td>
<td>3</td>
<td>CSC 101</td>
</tr>
</tbody>
</table>

**Total Credits** 18

#### Sixth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARAB 201</td>
<td>Advanced Academic Arabic</td>
<td>3</td>
<td>ARAB 101</td>
</tr>
<tr>
<td>COEN 300</td>
<td>Engineering Economy</td>
<td>3</td>
<td>STAT 230</td>
</tr>
<tr>
<td>CIVE 320</td>
<td>Concrete I</td>
<td>3</td>
<td>CIVE 211</td>
</tr>
<tr>
<td>CIVE 330/330L</td>
<td>Geotechnical Engineering + LAB</td>
<td>3+1</td>
<td>CIVE 211</td>
</tr>
<tr>
<td>CIVE 360</td>
<td>Transportation Engineering</td>
<td>3</td>
<td>CIVE 260</td>
</tr>
<tr>
<td>ARAB 201</td>
<td>Advanced Academic Arabic</td>
<td>3</td>
<td>ARAB 101</td>
</tr>
</tbody>
</table>

**Total Credits** 16

#### Summer Semester II (1 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE 400</td>
<td>Internship for ELEE Students</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 1
Year IV

Seventh Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE 401</td>
<td>Final Year Project I</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CIVE 480</td>
<td>Construction Management</td>
<td>3</td>
<td>COEN 300</td>
</tr>
<tr>
<td>CIVE 460</td>
<td>Highway Engineering</td>
<td>3</td>
<td>CIVE 360</td>
</tr>
<tr>
<td>CIVE Elective</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CIVE Elective</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Free Elective</td>
<td></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 16

Eighth Semester (12 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE 402</td>
<td>Final Year Project II</td>
<td>3</td>
<td>CIVE 401</td>
</tr>
<tr>
<td>COEN 400</td>
<td>Engineering Ethics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CIVE Elective</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CIVE Elective</td>
<td></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 12

**Total Program Credits** 137*

*Completion of Bachelor degree in Civil Engineering
Course Descriptions

CIVE 210  Statics  3(3, 0, 0)
A course outlining vector mechanics of forces and moments; free-body diagrams; equilibrium of particles and rigid bodies in two and three dimensions; plane and space trusses; frames and machines; axial, shear, and moment diagrams of beams and simple frames; friction; center of gravity and centroid; area moment of inertia; computer applications. Prerequisite: MATH 102.

CIVE 211  Structural Mechanics  3(3, 0, 0)
A course on stresses, strains, and stress-strain relationship; tension and compression; torsion of circular bars; bending and shear stresses in beams; combined stresses; stress transformation and Mohr’s circle. Prerequisite: CIVE 210.

CIVE 220  Engineering Materials  3(3, 0, 0)
This course introduces Civil Engineering materials that include cement, aggregates, admixtures, plain concrete, steel, masonry, plastics and polymers. Concrete mix design, concrete curing and durability; construction equipment and technologies; hot and cold weathering concreting. Prerequisite: Discretion of advisor.

CIVE 220L  Engineering Materials Lab  1(0, 0, 2)
Hands-on laboratory experiments to introduce students to testing different materials including cement, aggregates, admixtures, plain concrete, steel, masonry, and plastics. Co-requisite: CIVE 220.

CIVE 240  Fluid Mechanics  3(3, 0, 0)
An introductory course on fluid behavior emphasizing conservation of mass, momentum, and energy and dimensional analysis; study of fluid motion in terms of the velocity field, fluid acceleration, the pressure field, and the viscous effects; applications of Bernoulli’s equation, Navier-Stokes, and modeling; flow in ducts, potential flows, and boundary layer flows. Prerequisite: MECH 211.

CIVE 240L  Fluid Lab  1(0,0,2)

CIVE 250  Environmental Engineering  3(3, 0, 0)
A course that introduces the fundamentals of environmental engineering. A screening course of major topics in environmental engineering including water and wastewater, environmental hydrology, environmental hydraulics and pneumatics, air, solid waste, noise, environmental modeling, and hazardous waste. Prerequisite: CHEM 101.
CIVE 260  **Spatial Measurements**  \( 2(1, 0, 2) \)
A course on the theory of measurements and errors; linear measurements; surveying instruments; leveling; angles, bearings, and azimuths; stadia measurements; traversing—field aspects; traverse computations and adjustment; topographic surveying; triangulation. Prerequisite: Discretion of advisor.

CIVE 310  **Structural Analysis I**  \( 3(3, 0, 0) \)
An introductory course covering stability and determinacy of structures: influence lines; deflection of beams and frames by double integration method, moment-area theorems, and conjugate beam; principle of virtual work and applications on beams, frames and trusses; introduction to indeterminate structures; approximate analysis of building frames. Prerequisite: CIVE 211.

CIVE 320  **Concrete I**  \( 3(3, 0, 0) \)
A course that covers the mechanical properties of concrete materials; ultimate strength theory of flexure and shear; flexural and shear design of beams; service load behavior; bond properties of reinforcing bars; design of solid and ribbed one-way slabs; design of short, slender and bi-axially columns. Prerequisite: CIVE 211.

CIVE 330  **Geotechnical Engineering**  \( 3(3, 0, 0) \)
A course on engineering geology, soil classification and index properties; soil structure and moisture; compaction; seepage; effective stress concept; compressibility and consolidation; stress and settlement analysis; shear strength. Prerequisite: CIVE 211.

CIVE 330L  **Geotechnical Engineering Lab**  \( 1(0, 0, 2) \)
Water content determination, liquid and plastic limits, shrinkage limit, grain size distribution (sieve analysis), hydrometer analysis, compaction, in-situ field density, constant and falling head permeability tests, unconfined compression test, tri-axial test, direct shear test. Pre- or co-requisite: CIVE 330.

CIVE 340  **Engineering Hydrology**  \( 3(3, 0, 0) \)
A course outlining hydrology cycle, hydrologic principles, rainfall-runoff analysis, over land flow, flood routing, frequency analysis, and ground water hydrology; hydrograph analysis. Prerequisite: CIVE 240.

CIVE 351  **Water and Wastewater Treatment and Laboratory**  \( 3(2, 0, 2) \)
A course that examines the quality and treatment methods of water and wastewater; testing for physical, chemical, and biological parameters. Prerequisite: CIVE 250.

CIVE 360  **Transportation Engineering**  \( 3(2, 0, 2) \)
A course that introduces the field of transportation engineering through a presentation of the basics of traffic engineering, traffic flow theory, and pavement design. A laboratory component consists of carefully structured experiments that reinforce students’ understanding of the academic concepts and principles. Prerequisite: CIVE 260.
CIVE 400  Internship for CE Students  (1cr.)
An eight- to twelve-week professional training course in Civil Engineering. Prerequisite: Senior standing and ENGL 206.

CIVE 401  Final Year Project I  (1 cr.)
A chosen design topic of wide range of civil engineering application including structural, geotechnical, transportation, highway, material, hydrologic, water resources and environment and preparation of a detailed execution program for CIVE 402, through Define the project, State the objectives, Complete a literature survey, Set project specifications and master plan, Select a design method or experimental matrix. Prerequisite: Senior standing and ENGL 206.

CIVE 402  Final Year Project II  (3 crs.)
A supervised project in groups of normally three students aimed at providing practical design experience in a civil engineering application. Prerequisite: CIVE 401.

CIVE 460  Highway Engineering  3(3, 0, 0)
A course that examines road vehicle performance; principles of geometric design and highways; horizontal and vertical alignment; earthwork; intersections and interchanges; parking facilities; basic traffic models; queuing theory and traffic analysis; travel demand forecasting. Prerequisite: CIVE 360.

CIVE 480  Construction Management  3(3, 0, 0)
A course on organizing for construction projects; pre-construction activities; bidding and contracts; fundamentals of construction planning, monitoring, and control; application of construction control tools: CPM, materials management, operations analysis, and quality control. Prerequisite: COEN 300.

Elective Courses

Elective Courses - General
CIVE 403  Special Topics in Civil Engineering  3(3, 0, 0)
Any selected topic in the state-of-the-art in Civil Engineering. Prerequisite: discretion of advisor.

CIVE 470  Introduction to Geographic Information Systems  3(3, 0, 0)
An introductory course on Geographic Information Systems (GIS) and their applications in the planning and engineering fields, alternatives in computer-based graphics, data concepts and tools, network data management and planning applications, and implementation issues. Prerequisite: CIVE 260

CIVE 481  Specifications and Cost Estimation  3(3, 0, 0)
A course on the structure of construction documents and their interrelationships, bidding requirements; general and particular contract conditions; administrative and procedural requirements
for construction; technical specifications; construction cost estimations process; unit rates
determination. Prerequisite: discretion of adviser.

**Elective Courses - Structural**

**CIVE 410  Structural Analysis II**  3(3, 0, 0)
A course on the solution of statically indeterminate structures by flexibility (force) and stiffness
methods for plane and space trusses and frames introduction to the direct stiffness method; influence
lines for indeterminate structures; computer applications. Prerequisite: CIVE 310.

**CIVE 411  Bridges**  3(3, 0, 0)
A course that discusses types of bridges; influence lines; loads and their distribution on bridges;
serviceability of bridges; methods of design of bridge deck, superstructure, and substructure.
Prerequisites: CIVE 310 and CIVE 320.

**CIVE 412  Steel Design**  3(3, 0, 0)
A course that examines loads on structures; philosophies of design: LRFD versus ASD; behavior,
analysis, and design (according to AISC) of tension members, bolted connections, welded
connections, compression members, and beams. Prerequisite: CIVE 310.

**CIVE 420  Concrete II**  3(3, 0, 0)
A course that builds upon Concrete I and covers continuous beams; wall footings, concentrically
and eccentrically loaded single column footings, and combined footings; staircases; bearing walls;
cantilever retaining walls; two-way slabs. Prerequisite: CIVE 320.

**CIVE 421  Special Topics in Concrete**  3(3, 0, 0)
A course that reviews reinforced concrete design; wind load on structures; seismic design of
structures; design of shear walls; brackets, corbels, and deep girders; torsion in concrete members;
circular, rectangular, and elevated water tanks; spherical, conoidal, and ellipsoidal domes.
Prerequisite: CIVE 420.

**CIVE 422  Pre-Stressed Concrete**  3(3, 0, 0)
A course on materials characteristics; prestress losses; working strength design procedures;
composite construction; ultimate flexural strength and behavior; shear design; continuous pre-
stressed concrete members. Prerequisite: CIVE 420.

**Elective Courses - Geotechnics**

**CIVE 423  Strength and Rehabilitation of Concrete Structural Systems**  3(3, 0, 0)
A course on assessment of structural deficiency using analytical and field test methods;
strengthening materials; strengthening of structural members in flexure, shear, and axial load;
upgrading of gravity load-designed members for earthquake load resistance. Prerequisite: CIVE
320.
CIVE 430  Foundation Engineering  3(3, 0, 0)
A course that covers site investigations; evaluation of data from field and laboratory tests; estimation of stresses in soil masses; applications of principles of soil mechanics to determination of bearing capacity and settlement of spread footings, mats, single piles, and pile groups. Prerequisite: CIVE 330.

CIVE 431  Applied Foundation Engineering  3(3, 0, 0)
A course on braced excavations, retaining structures, deep foundations, slope stability, and computer applications. Prerequisite: CIVE 330.

CIVE 432  Environmental Geotechnics  3(3, 0, 0)
A course on geotechnical practice in environmental protection and restoration; methods of soil and site characterization for sifting of waste repositories and site restoration; influence of physical and chemical processes in soils on the evaluation of contaminant distribution; design of waste containment systems including landfills, slurry walls, and soil stabilization; the applicability and use of geosynthetics; technologies for site restoration and cleanup. Prerequisite: CIVE 330.

CIVE 433  Soil and Site Improvement  3(3, 0, 0)
A course that covers compaction, admixture stabilization, foundation soil treatment, reinforced soil and composite materials, and material sites reclamation. Prerequisite: CIVE 330.

CIVE 434  Geotechnical Earthquake Engineering  3(3, 0, 0)
A course on causative mechanisms of earthquake, earthquake magnitudes, ground motion; influence of soil conditions on site response; seismic site response analysis; evaluation and modeling of dynamic soil properties; analysis of seismic soil-structure interaction; evaluation and mitigation of soil liquefaction and its consequences; seismic code provisions and practice; seismic earth pressures, seismic slope stability and deformation analysis, seismic safety of dams and embankments, seismic performance of pile foundations, and additional current topics. Prerequisite: CIVE 330.

Elective Courses - Transportation

CIVE 461  Pavement Design  3(3, 0, 0)
A course examining highway and airport pavement design; flexible and rigid pavement types and wheel loads; stresses in flexible and rigid pavements; pavement behavior under moving loads; soil stabilization. Prerequisite: CIVE 360.

CIVE 462  Urban Transportation Planning I  3(3, 0, 0)
An introductory course on methods and models used in transportation planning with emphasis on the urban context. Prerequisite: CIVE 360.

CIVE 463  Traffic Engineering  3(3, 0, 0)
A course outlining traffic engineering studies; traffic control of signalized and unsignalized intersections; signal control hardware and maintenance; arterial performance and operations; network optimization. Prerequisite: CIVE 360.
CIVE 464  Transportation Systems Analysis  3(3, 0, 0)
A course on transportation and traffic problems in modern society. Among the topics covered are travel forecasting problems and methods; theoretical techniques for traffic flow description and management; highway, railway, and runway capacity and performance characteristics; economic considerations; cost functions. Prerequisite: CIVE 360.

CIVE 465  Design and Management of Transport Operations  3(3, 0, 0)
A course that covers the application of quantitative techniques from operations research and probabilistic analysis to transportation problems. Applications covered include: pickup and delivery systems, emergency urban services, facility location, and network problems. Prerequisite: CIVE 360.

CIVE 466  Transportation Economics  3(3, 0, 0)
A course that investigates the application of economic principles to the evaluation of projects and policies in the transport sector such as transport project benefits, costs, and financing, and pricing in the transport sector. Prerequisite: CIVE 360 and COEN 300.

Elective Courses - Water Resources
CIVE 440  Hydraulics and Laboratory  3(2, 0, 2)
Flow in conduits, flow in open channels, flow measurements, and laboratory experiments. Prerequisite: CIVE 240.

CIVE 441  Hydraulic Structures  3(3, 0, 0)
A course that covers closed conduit flow, water distribution systems, transient analysis, open channel flow, flood control, culvert hydraulics, design of various hydraulic structures. Prerequisite: CIVE 240.

CIVE 442  Surface Water Hydrology  3(3, 0, 0)
A course on design storm, rainfall-runoff modeling, overland flow, flood routing, reservoir routing, simulation models, hydrologic design, urban hydrology, and stochastic hydrology. Prerequisite: CIVE 340.

CIVE 443  Groundwater Hydrology  3(3, 0, 0)
A course that deals with properties of groundwater, groundwater movement, general flow equations, steady-state well hydraulics, seepage forces, unsteady well hydraulics, infiltration, and groundwater modeling. Prerequisite: CIVE 340.

CIVE 444  Hydraulics of Open Channels  3(3, 0, 0)
A course that examines gradually varied flow theory and analysis, spatially varied flow, and numerical modeling of unsteady flow in open-channels. Prerequisite: CIVE 240.
CIVE 445  Coastal Engineering  
A course on small-amplitude wave theory, finite-amplitude wave theory, conoidal waves, solitary wave theory, wave refraction, diffraction, and reflection, wave forces, and design of maritime structures (e.g., breakwaters). Prerequisite: CIVE 240.

CIVE 446  Transport Phenomena in Surface and Subsurface Waters  
A course on advection, diffusion, and dispersion of pollutants; transport in rivers and estuaries; transport in groundwater; numerical modeling; design of wastewater discharge system. Prerequisite: CIVE 240 and CIVE 250.

CIVE 447  Water Resources Systems: Planning and Management  
A course that introduces the main concepts and principles of water resources planning and management; logical steps in engineering planning and decision making; water resources systems analysis, modeling, simulation, and optimization; economic and financial analysis; flood protection and reservoir operation; and water resources management case studies. Prerequisite: Senior Standing.

CIVE 448  GIS for Water Resources and Environmental Engineering  
A course that introduces the concepts and principles of Geographic Information Systems (GIS) from the perspective of water resources and environmental engineering. It provides coverage of state-of-the-art GIS methods and tools, specifically targeting water resources and environmental applications including: spatial and terrain analysis, geo-statistical analysis, watershed delineation and identification of river networks, representation of groundwater and aquifer systems, time series analysis, and development of GIS integrated water and environmental models. Prerequisite: Senior Standing.

Elective Courses – Environmental
CIVE 450  Methods of Environmental Sampling and Analysis  
A course on sampling techniques and instrumental methods in environmental sciences; determination of pollutants in water, air, and soil; analytical techniques; adaptation of procedures to specific matrices; case studies. Prerequisite: CIVE 250.

CIVE 451  Environmental Chemistry and Microbiology  
A course that deals with organic, inorganic, and physical chemistry; chemical equilibrium; reaction kinetics; acidity, alkalinity; composition, morphology, and classification of microorganisms; energy, metabolism, and synthesis; growth, decay, and kinetics; biological water quality indicators. Prerequisite: CHEM 101.

CIVE 452  Environmental Management and Decision Making  
A course that deals with mathematical programming techniques, multi-objective optimization, and the generation of alternatives, as these are used in environmental systems analysis and management; as well as introducing how considerations such as economics, uncertainty, equity, and other sociopolitical parameters may influence environmental management and decision-making. Prerequisite: Senior Standing and CIVE 250.
CIVE 453  Water and Sewage Works Design  3(3, 0, 0)
A course that examines the design of water and wastewater schemes, including design reports and a literature search on the development of conventional treatment processes. Prerequisites: CIVE 351.

CIVE 454  Solid Waste Management I  3(3, 0, 0)
A course on nature and effects of solid wastes including hazardous wastes; engineering management principles, practices, and techniques for management of solid wastes administration; solid waste generation, storage, collection and transport, processing, resource recovery, and disposal; trip to a local facility. Prerequisite: Senior Standing.

CIVE 455  Solid Waste Management II  3(3, 0, 0)
A course on the design of solid waste disposal schemes, including design reports and a literature search on the development of conventional treatment and disposal processes. Prerequisite: CIVE 454.

CIVE 456  Air Pollution and Control  3(3, 0, 0)
An introductory course on air pollutants, sources, and effects; emissions estimates, regulations, and monitoring techniques; particulate matter characterization; meteorology and atmospheric dispersion; air pollution control processes. Prerequisite: CIVE 250.

CIVE 457  Industrial/Hazardous Waste Management  3(3, 0, 0)
A course that deals with sources, quantity, and quality of industrial wastes; basic industrial waste treatment processes; major industries, types of wastes, and existing treatment practices; disposal and fate of industrial wastes. Prerequisites: CIVE 250 and CIVE 451, or consent of instructor.

CIVE 458  Environmental Impact Assessment  3(3, 0, 0)
A course that outlines theories and procedures of assessing environmental impact; analysis of the impact of development on various measures of environmental quality; benefit-cost considerations in environmental impact assessment. Prerequisite: CIVE 250.
Mission
The mission of the Department of Electrical Engineering is to provide undergraduate students with quality education based on a thorough foundation in electrical engineering, mathematics, physical sciences, and technology; to guarantee students an exposure to major research and practical design experiences in electrical engineering; and to enrich the students’ academic experience with global perspective and awareness of their leadership role in regional development.

Program Objectives
The Department of Electrical Engineering offers an undergraduate program in Electrical Engineering that has the following main objectives:

1. Provide students with knowledge of the fundamental prerequisites in theory, design, and basic science for a career in electrical engineering.
2. Develop in students a range of skills based on theoretical and practical knowledge as well as specialized training in electrical engineering.
3. Develop in students a professional approach to engineering based on strong communication skills, teamwork, responsibility, and high ethics.
4. Equip students with proper tools to address open research problems in electrical engineering and to explore opportunities to apply the acquired knowledge in industrial settings.

Learning Outcomes
Students who graduate from the Department of Electrical Engineering are expected to possess:

a) a good command of engineering fundamentals in mathematics and physical sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components,
b) knowledge of advanced engineering mathematics, probability and statistics, and physics concepts,
c) the ability to analyze and interpret data to conduct experiments and complete design projects in electrical engineering,
d) the ability to work in teams,
e) the ability to identify, formulate, and solve engineering problems,
f) the ability to communicate effectively,
g) the ability to engage in life-long learning and to approach research related problems in electrical engineering,
h) knowledge of contemporary issues in electrical engineering along with the ability to use the techniques, skills, and modern engineering tools necessary for engineering practice,
i) a clear understanding of the impact of engineering solutions in a global, economic, environmental, and social context, and
j) the ability to initiate and complete a design project in electrical engineering taking into account realistic constraints including technical, economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
Electrical Engineering Laboratories

In conformance with its mission and educational objectives, the Department of Electrical Engineering provides practical and advanced hands-on experience for students through state-of-the-art instructional and research laboratories including:

1. Circuits Laboratory: to introduce students to fundamental circuit analysis and measurement equipment including simulation based analysis of circuits using packages like PSPICE.
2. Digital Systems Laboratory: to offer students the proper environment, with electronic equipment, computers, and software, to design, implement, and test microprocessor and microcontroller systems.
3. Electronics Laboratory: to allow students to apply classroom instruction and to investigate electronic systems at a component level and perform fundamental tests to understand the principles operating electronic components and devices.
4. Computer-based Laboratories: to allow students an exposure to simulation based analysis of control, electronics, power, and communication systems using the MATLAB software.

Career Opportunities

Modern electrical engineering is a broad and diverse field that rivals all engineering disciplines in its impact on society. The expanding role of electrical engineering in today’s society reflects the variety and scope of this exciting profession. Local as well as regional career opportunities now available for electrical engineers span communications companies; hardware companies; consulting offices; design and implementation of electronic systems; electric power industry; biomedical equipment companies; radio and television broadcasting; control and manufacturing; electrical power generation, transmission and distribution; and industrial automation companies.

The Department of Electrical Engineering is committed to provide its students with meaningful, up-to-date skills and knowledge that allow them to pursue successful engineering careers and make deep impacts in their workplace. With these objectives in mind, the Electrical Engineering program is designed around fostering contemporary best practices and skills in line with the job opportunities for electrical engineers primarily within Tabuk and the Gulf region.

Consequently, graduates of the Department of Electrical Engineering are poised to take advantage of numerous job opportunities within the Tabuk province, and in the growing Saudi and Gulf markets.

Curriculum and Program Structure

The curriculum of the Electrical Engineering program is designed to comply with the requirements of major international accreditation bodies including NCAAA and ABET. It includes courses in basic sciences and mathematics, engineering sciences, engineering design, communications skills, and humanities and social sciences. In addition, Lab hands-on experience with emphasis on design is an important element that is integrated throughout the curriculum.

The Electrical Engineering program requirements include:

- 36 credit hours of mathematics and basic sciences,
• 67 credit hours of engineering sciences and engineering design,
• 15 credit hours of social sciences and humanities,
• 12 credit hours of English language and technical writing skills,
• 3 credit hours in engineering ethics, and
• 1 credit hour in practical training.

The curriculum is designed to grant students a Bachelor degree in Electrical Engineering (BEE) upon the successful completion of the four-year program. The first year is shared with all engineering majors, which allows students to transfer from one major to another without losing any credits earned in the first year.

**Final Year Project**

As part of the fourth year, students are required to carry out a design project in electrical engineering and submit a technical report. The project is a substantial piece of work that will require creative activity, original thinking, and extensive teamwork to complete the usual four phases of projects: initiation, analysis, design and implementation. Approved projects account for four credit hours and extend over a full academic year. Throughout the phases of the project, students work in groups under the supervision of a faculty member. The project aims to provide students with a transitional experience from the academic world to the professional world. It is designed to serve as a platform in which teams of Electrical Engineering students engage in a meaningful design experience requiring the solution of significant and practical engineering design problems. The objectives of the final year project are:

• Allow students to demonstrate a wide range of the skills learned at the College of Engineering during their course of study by asking them to deliver a product that has passed through the design, analysis, testing and evaluation stages.
• Encourage multidisciplinary research through the integration of material learned in a number of courses.
• Allow students to develop problem solving, analysis, synthesis and evaluation skills.
• Encourage teamwork and interaction between students.
• Improve students' communication skills by asking them to produce both a professional report and a professional poster and to give an oral presentation on their work.
• The project is important for a number of reasons:
  • It is the largest single piece of design work that a student does during his/her BE degree.
  • It allows students to specialize in a topic that they enjoy.
  • It is the work that prospective employers will most likely ask students about during interviews.
  • It allows students to show a wide range of the skills learned since the first year.
  • Students must demonstrate these skills by delivering a product that has passed through the design, analysis, testing and evaluation stages.

**Practical Training/Internship**

All engineering students are required to fulfill a 1-credit hour internship period of 8 to 12 weeks. This graduation requirement entails that each senior student (one who has completed around 80%
of the total credit requirement) gains practical training experience during the summer term prior to graduation, or in the graduation semester, with either a company or an academic institution while involved in a practical experience.

Degree Requirements
To graduate with a Bachelor in Electrical Engineering, students must satisfactorily complete 134 credit hours. The distribution of courses is as follows:

University requirements
A total of 30 credit hours of general educational requirements:
- 6 credits of Arabic language: ARAB 101 and 201
- 9 credits of English communication skills: ENGL 101, 102, and 203
- 9 credits of social and cultural studies: SOCS 101, 201, and 202
- 3 credits of computing basics for engineers: CSC 101
- 3 credits of mathematics: MATH 101

College requirements
Students in the Electrical Engineering department are required to complete a total of 41 credit hours in college requirements distributed as follows:
- 12 credits in physics and chemistry: PHYS 101/101L, PHYS 102/102L, and CHEM 101/101L,
- 15 credits in mathematics: MATH 102, 201, 202, 215, and STAT 230,
- 3 credits in technical writing: ENGL 206,
- 3 credits in engineering ethics: COEN 400, and
- 3 credits in engineering economy: COEN 300.

In addition, Electrical Engineering students should also complete a 4-credit hour final-year project during the senior year (ELEE 498 and 499) and a 1-credit hour internship (ELEE 400).

Program requirements
Electrical Engineering students must complete 63 credit hours in program requirements including the following courses: MECH 210, Math 225, ELEE 210, ELEE 220, ELEE 230, ELEE 240, ELEE 250, ELEE 250L, ELEE 290, ELEE 290L, ELEE 340, ELEE 340L, ELEE 350, ELEE 360, ELEE 380, ELEE 380L, ELEE 390, ELEE 399L, and ELEE 470.

In addition, Electrical Engineering students must take five 3-credit hour electives and 1 one-credit hour elective lab. The accepted electives include:
- 1 course in the area of Electric Machines and Power Systems,
- 1 course in the area of Electromagnetism,
- 2 courses in any Electrical Engineering subject or approved subjects from other departments,
- 1 one-credit hour Electrical Engineering elective laboratory, and
- 1 free elective course in any approved non Electrical Engineering discipline.
Study Plan for the BEE Degree
(134 Credit Hours)

Year I

First Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Basic Academic English I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>MATH 101</td>
<td>Calculus I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 101/101L</td>
<td>College Physics I + Lab</td>
<td>3+1</td>
<td>-</td>
</tr>
<tr>
<td>CSC 101</td>
<td>Introduction to Computing for Engineers</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>SOCS 101</td>
<td>Islamic Civilization I</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Credits 16

Second Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 102</td>
<td>Basic Academic English II</td>
<td>3</td>
<td>ENGL 101</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Calculus II</td>
<td>3</td>
<td>MATH 101</td>
</tr>
<tr>
<td>PHYS 102/102L</td>
<td>College Physics II + Lab</td>
<td>3+1</td>
<td>PHYS 101</td>
</tr>
<tr>
<td>CHEM 101/101L</td>
<td>College Chemistry + Lab</td>
<td>3+1</td>
<td>-</td>
</tr>
<tr>
<td>ARAB101</td>
<td>Basic Academic Arabic</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Credits 17

Summer Semester I (6 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 203</td>
<td>Advanced Academic English</td>
<td>3</td>
<td>ENGL 102</td>
</tr>
<tr>
<td>SOCS 201</td>
<td>Islamic Civilizations II</td>
<td>3</td>
<td>SOCS 101</td>
</tr>
</tbody>
</table>

Total Credits 6

Year II

Third Semester (15 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 201</td>
<td>Calculus and Analytic Geometry III</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>MECH 210</td>
<td>Thermodynamics</td>
<td>3</td>
<td>PHYS 102</td>
</tr>
<tr>
<td>ELEE 210</td>
<td>Electric Circuits I</td>
<td>3</td>
<td>PHYS 102</td>
</tr>
<tr>
<td>ELEE220/CEN220</td>
<td>Logic Design</td>
<td>3</td>
<td>CSC 101</td>
</tr>
<tr>
<td>ELEE230/CSC102</td>
<td>Programming for Engineers</td>
<td>3</td>
<td>CSC 101</td>
</tr>
</tbody>
</table>

Total Credits 15
### Fourth Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 202</td>
<td>Differential Equations</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>ELEE 240</td>
<td>Electronics</td>
<td>3</td>
<td>ELEE 210</td>
</tr>
<tr>
<td>ELEE 250</td>
<td>Electric Circuits II</td>
<td>3</td>
<td>ELEE 210</td>
</tr>
<tr>
<td>ELEE 250L</td>
<td>Electric Circuits Lab</td>
<td>1</td>
<td>ELEE 250</td>
</tr>
<tr>
<td>ELEE 290</td>
<td>Digital Systems</td>
<td>3</td>
<td>ELEE 220</td>
</tr>
<tr>
<td>ELEE 290L</td>
<td>Digital Systems Lab</td>
<td>1</td>
<td>ELEE 290</td>
</tr>
<tr>
<td>STAT 230</td>
<td>Probability and Statistics</td>
<td>3</td>
<td>MATH 201</td>
</tr>
</tbody>
</table>

**Total Credits** 17

### Year III

#### Fifth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEE350/CEN240</td>
<td>Signals and Systems</td>
<td>3</td>
<td>MATH 202</td>
</tr>
<tr>
<td>ELEE 340L</td>
<td>Electronics Lab</td>
<td>1</td>
<td>ELEE 240</td>
</tr>
<tr>
<td>ELEE 360</td>
<td>Electric Machines</td>
<td>3</td>
<td>ELEE 250</td>
</tr>
<tr>
<td>COEN 300</td>
<td>Engineering Economy</td>
<td>3</td>
<td>STAT 230</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Linear Algebra</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>ENGL 206</td>
<td>Technical Writing</td>
<td>3</td>
<td>ENGL 203</td>
</tr>
</tbody>
</table>

**Total Credits** 16

#### Sixth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 225</td>
<td>Differential Equations</td>
<td>3</td>
<td>MATH 215</td>
</tr>
<tr>
<td>ELEE 340</td>
<td>Electronic Circuits</td>
<td>3</td>
<td>ELEE 240</td>
</tr>
<tr>
<td>ELEE 38</td>
<td>Electronics</td>
<td>3</td>
<td>ELEE 350</td>
</tr>
<tr>
<td>ELEE 390</td>
<td>Electromagnetic Field Theory</td>
<td>3</td>
<td>PHYS 102 + MATH 215</td>
</tr>
<tr>
<td>ELEE 399L</td>
<td>MATLAB for Engineers</td>
<td>1</td>
<td>MATH 225 + ELEE 230</td>
</tr>
<tr>
<td>ARAB 201</td>
<td>Advanced Academic Arabic</td>
<td>3</td>
<td>ARAB 101</td>
</tr>
</tbody>
</table>

**Total Credits** 16

#### Summer Semester II (1 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEE 400</td>
<td>Internship for BEE Students</td>
<td>1</td>
<td>ENGL 206</td>
</tr>
</tbody>
</table>

**Total Credits** 1
Year IV

Seventh Semester (14 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEE 498</td>
<td>Final Year Project I</td>
<td>1</td>
<td>ENGL 206</td>
</tr>
<tr>
<td>ELEE 470</td>
<td>Communication Systems</td>
<td>3</td>
<td>ELEE 350 + STAT 230</td>
</tr>
<tr>
<td>ELEE 480L</td>
<td>Control Systems Lab</td>
<td>1</td>
<td>ELEE 380</td>
</tr>
<tr>
<td>COEN400/CSC 492</td>
<td>Engineering Ethics</td>
<td>3</td>
<td>ENGL 206</td>
</tr>
<tr>
<td>ELEE Elective</td>
<td>Machines and Power Systems</td>
<td>3</td>
<td>ELEE 360</td>
</tr>
<tr>
<td>ELEE Elective</td>
<td>General ELEE Elective</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Credits 14

Eighth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEE 499</td>
<td>Final Year Project II</td>
<td>3</td>
<td>ELEE 498</td>
</tr>
<tr>
<td>SOCS 202</td>
<td>World Civilizations</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Free Elective</td>
<td></td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>ELEE Elective</td>
<td>General ELEE Elective</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>ELEE Elective</td>
<td>Electromagnetism</td>
<td>3</td>
<td>ELEE 390</td>
</tr>
<tr>
<td>ELEE Elective</td>
<td>Lab</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Total Credits 16

Total Program Credits 134*

*Completion of Bachelor degree in Electrical Engineering.
## Course Descriptions

### ELEE 210 Electric Circuits I 3(3, 0, 0)
A course on fundamentals of electric circuits; basic elements and laws; independent and dependent sources; techniques of circuit analysis: nodal and mesh analysis; circuit theorems: linearity, superposition, source transformation, Thevenin and Norton equivalents; inductors and capacitors. Prerequisite: CSC 101 and PHYS 102.

### ELEE 220 Logic Design 3(3, 0, 0)
Number systems and codes, Boolean algebra; combinational circuit design; minimization methods; sequential logic design principles; latches and flip-flops, design of sequential circuits using flip flops, counters and registers; introduction to VHDL. Pre-requisite: CSC 101.

### ELEE 230 Programming for Engineers 3(3, 0, 0)
This course introduces the basic concepts and principles of structured and object oriented programming in a high level language. The course also covers basic data types, control structures, methods, arrays, conditional statements, loop statements, functions, classes and objects, recursion, pointers and strings. The course is offered in a computer laboratory. Pre-requisite: CSC 101.

### ELEE 240 Electronics 3(3, 0, 0)
A course on semiconductors; semiconductor devices including PN junctions, diodes, Bipolar junction transistors (BJT), MOS field effect transistors (MOSFET), operational amplifiers (OP-AMPS); device characteristics; diode and transistor circuits. The course covers fundamental skills in analysis of electronic circuits: DC biasing, AC small signal analysis, and circuit simulation. Pre-requisite: ELEE 210.

### ELEE 250 Electric Circuits II 3(3, 0, 0)
A course on analysis of one-phase AC circuits under steady-state; AC power calculations and power factor correction; transient response of RL, RC and RLC circuits; ideal transformers. Prerequisite: ELEE 210.

### ELEE 250L Electric Circuits Laboratory 1(0, 0, 2)
A laboratory course that covers the use of laboratory instruments; passive electronic components; voltage-divider circuits; sources and Thevenins’s theorem; RC lead-lag networks, series resonance, and transformers. This lab course also introduces circuit simulation using PSPICE. Co-requisite: ELEE 250.

### ELEE 290 Digital Systems 3(3, 0, 0)
Microprocessor and Microcontroller design and applications: internal architecture, programming, interfacing techniques, and performance evaluation. The course includes a design project. Prerequisite: ELEE 220 and ELEE 230.
ELEE 290L  Digital Systems Lab  1(0, 0, 2)
Logic circuit design: combinational and sequential circuits; computer organization and interfacing techniques; program-controlled and interrupt-driven I/O; memory organization; simple peripheral devices and controllers; bus interfaces; microcontroller-based designs. Co-requisite: ELEE 290.

ELEE 340  Electronic Circuits  3(3, 0, 0)
A course on BJT amplifiers; MOSFET amplifiers; differential amplifiers; frequency response of amplifiers; negative and positive feedback; operational amplifiers; oscillators; digital CMOS circuits; TTL circuits, SPICE simulations. Prerequisite: ELEE 240.

ELEE 340L  Electronics Lab  1(0, 0, 2)
Single-phase diode rectifier circuits; LEDs; Zener diode regulator; diode clamping and clipping; BJT and MOSFET characteristics; op-amp circuits. Co-requisite: ELEE 240.

ELEE 350/CEN 240  Signals and Systems  3(3, 0, 0)
Signals and systems: definition, properties, and analysis; the Fourier series; the Fourier transform and its applications; the Laplace transformation and its applications; analysis and design of analog filters, MATLAB for analog signal processing. Prerequisite: MATH 202 and ELEE 250.

ELEE 360  Electric Machines  3(3, 0, 0)
A course on three-phase circuits and power calculations; magnetic circuits; single-phase and three-phase transformers; DC and AC machines under steady-state: construction, equivalent circuit, testing and performance characteristics. Prerequisite: ELEE 250.

ELEE 380  Linear Control Systems  3(3, 0, 0)
A course that covers mathematical modeling (transfer functions, block diagrams, signal flow graph) of linear continuous single input/single output dynamical systems; Open-loop and Closed-loop systems analysis; First and second order systems, Systems Stability (Routh-Hurwitz criterion); Steady-state error analysis of unity-feedback control systems; Frequency response analysis (Bode plots, Nyquist, Root-locus method); Introduction to PID controllers (performances, Ziegler-Nichols tuning method). Prerequisite: ELEE 350.

ELEE 390  Electromagnetic Field Theory  3(3, 0, 0)
This course presents a review of vector analysis and covers the study of static electric fields in vacuum and dielectrics, conductors, capacitance, the study of magnetic fields in magnetic and non-magnetic media, and inductance. The concepts of electrostatic and magnetic potentials, energy and forces are introduced. The course also covers the basic concepts of time-varying fields (Maxwell’s equation). Prerequisites: PHYS 102 and MATH 215.

ELEE 399L  MATLAB for Engineers  1(0, 0, 2)
Introduction to the MATLAB programming environment: Desktop, command window, graph window; application of MATLAB in engineering problems, especially numerical computing techniques. Prerequisites: MATH 225.
**ELEE 400  Internship for ELEE Students**  (1 Cr)
This is an eight to twelve-week professional training course in electrical engineering. This course is open for students with senior standing (who have completed around 80% of the total credit requirement) to gain practical training experience during the summer prior to graduation, or during graduation semester, with either a company or an academic institution while involved in a practical experience. Prerequisite: Senior standing and ENGL 206.

**ELEE 470  Communication Systems**  3(3, 0, 0)
This is an introductory course on modern communication systems. The course covers the following main topics: fundamentals of analog and digital modulation methods; analog to digital conversion and pulse coded modulation; transmission and reception of digital signals; introduction to noise modeling and the effects of channel noise on the performance of analog and digital communication systems. Prerequisites: ELEE 350 and STAT 230.

**ELEE 480L  Control Lab**  1(0, 0, 2)
A laboratory course that covers analysis of linear systems; second order systems; effects of poles and zeros on the transient response; effect of gain on response and stability; compensation implementation. Pre-requisite: ELEE 380.

**ELEE 498  Final Year Project I**  1(1, 0, 0)
This course is intended to provide students with practical experience in a wide range of electrical engineering applications including electronics, power, control, computer, and communications. Students learn how to initiate a project in an engineering discipline by completing the main tasks: define the project, state the objectives, complete a literature survey, set project specifications, and select a design method. Prerequisite: Senior standing and ENGL 206.

**ELEE 499  Final Year Project II**  3(0, 3, 0)
Students work in groups to complete the project initiated in ELEE 401 under the supervision of an instructor. The course is offered either in lecture style with covered subjects including: design and implementation issues related to projects, progress evaluation, change management, and closure; or as individual groups supervised by different instructors. Prerequisite: ELEE 498.
Elective Courses

Elective Laboratories

**ELEE 440L  Electronic Circuits Lab** 1(0, 0, 2)
PSPICE simulation of electronic circuits; linear applications of op-amp; Wein-bridge oscillator; active filters: LPF and HPF; Schmitt trigger and astable multi-vibrator; differential amplifier using BJT; CMOS inverter characteristics; TTL inverter characteristics. Prerequisite: ELEE 340.

**ELEE 460L  Machines Lab** 1(0, 0, 2)
Transformers: open circuit, short circuit, and load test; unbalanced loading and parallel operation of transformers; speed control and load characteristics of shunt, series and compound dc machines; induction machines: blocked rotor, no-load, and loading tests; operation of single-phase induction motors; operation of a synchronous machine connected to a large external source. Prerequisite: ELEE 260.

**ELEE 470L  Communications Lab** 1(0, 0, 2)
A laboratory course with experiments covering the following topics: AM and FM modulation/demodulation, sampling and quantization, digital modulation (PSK, FSK, MSK, GMSK), digital demodulation, and inter-symbol interference. Prerequisite: ELEE 370.

**ELEE 490L  Radio Frequency Lab** 1(0, 0, 2)
Transmission line parameters; attenuation, magnitude and phase of voltage and current on lines; reflected waves; waveguide characteristics and techniques; antenna patterns and impedances; optical devices. Prerequisite: ELEE 390.

Electives - General

**ELEE 403  Special Topics in Electrical Engineering** 3 (3, 0, 0)
Any selected topic in the state-of-the-art in Electrical Engineering. Prerequisite: discretion of advisor.

**ELEE 421  Computer Graphics** 3(3, 0, 0)
A course on interactive graphics; graphics hardware; graphical input devices; windowing; clipping; viewports; zooming, geometrical transformations (2D and 3D); data structures; advanced raster display architectures; raster algorithms; special graphics techniques; applications. Prerequisite: Senior standing.

**ELEE 422  Computer Architecture** 3(3, 0, 0)
A course on the principles, techniques, and trade-offs used in designing modern processor architectures. Topics include: benchmarking and performance evaluation, long-latency instruction pipelining, hardware and software techniques for exploiting instruction-level parallelism (out-of-order, speculative, and predicated instruction execution; multithreading; loop unrolling, software pipelining, and trace scheduling), high performance memory systems, and multiprocessor systems and programming. Prerequisite: ELEE 290.
ELEE 423 Embedded Systems Design 3(3, 0, 0)
This is a course on embedded hardware and software design. The system design process: requirements analysis, specification, hardware/software co-design, testing; Embedded computing platforms: general- and special-purpose processors, hardware accelerators, systems-on-a-chip, intellectual property (IP) core-based design, embedded networks; Software design tools and technologies: CAD tools, compilers, and assemblers. Hardware design tools and technologies: hardware-description languages, high-level synthesis tools, ASIC and FPGA design flows; Real-time operating systems: multiple tasks and processes, context switching, task scheduling, inter-process communication mechanisms; Low-power computing: circuit, architecture, and application techniques; System reliability and fault tolerance. Prerequisites: ELEE 290.

ELEE 431/CEN 340/CSC 384 Computer Networks 3(3, 0, 0)
A course that outlines data communications; wide area networks; circuit and packet switching; routing; congestion control; local area networks; communications architecture and protocols; internetworking. Prerequisites: ELEE 350 and STAT 230.

ELEE 441 Analog Integrated Circuits 3(3, 0, 0)
A course on the design of analog integrated circuits with an emphasis on MOS circuits; op-amp design; feedback and stability; applications of analog integrated circuits such as filtering and A/D conversion; comparison with bipolar circuits; extensive use of SPICE for circuit simulation. Prerequisite: ELEE 340.

ELEE 442 Digital Integrated Circuits 3(3, 0, 0)
A course on digital electronic circuits; models, current equations, and parasitic of CMOS transistors for digital design; study of CMOS inverter and logic gates, including analysis, design, simulation, layout, and verification; advanced circuit styles; sequential circuits; advanced topics: semiconductor memories, power grid, clocking strategies, data-path building blocks, deep-submicron design issues, interconnect. Prerequisite: ELEE 290 and ELEE 340.

ELEE 451 Digital Signal Processing 3(3, 0, 0)
Review of signals, systems, and transforms; design of Digital Filters: FIR and IIR; sampling and reconstruction of signals; multi-rate signal processing with applications; effects of finite word length; discrete random signals and Spectral Estimation; introduction to 2D signal and image processing. Prerequisite: ELEE 350.

ELEE 454 Digital Image Processing 3(3, 0, 0)
A course on two-dimensional signals and systems; image formation and perception; representation, coding, filtering restoration, and enhancements; feature extraction and scene analysis; introduction to computer vision. Prerequisite: ELEE 350.

ELEE 455 Adaptive Filtering 3(3, 0, 0)
A course that examines the fundamentals of adaptive filter analysis and design, with emphasis on applications in linear and decision-feedback equalization, beam forming, channel estimation and
tracking, noise and echo cancellation, source separation, and blind equalization; stochastic gradient algorithms (LMS-type) and recursive least-squares algorithms (RLS-type). Prerequisite: ELEE 350.

ELEE 471  Wireless Communications  3(3, 0, 0)
A course on wireless channel models; performance of digital modulation schemes in wireless channels; diversity techniques; channel coding and interleaving in fading channels; adaptive equalization in wireless channels; multiple access techniques; fundamentals of cellular communications; current wireless communication systems. Prerequisite: ELEE 370.

ELEE 472  Information Theory  3(3, 0, 0)
This course introduces the field of information theory and its applications to communications theory, computer science, statistics, and probability theory. Covering all the essential topics in information theory, we introduce the basic quantities of entropy, relative entropy, and mutual information, and show how they arise as natural answers to questions of data compression, channel capacity, rate distortion, and hypothesis testing. Prerequisite: Senior standing.

ELEE 473  Coding Theory  3(3, 0, 0)
This course introduces the theory of error-correcting codes. The course will focus on results of asymptotic or algorithmic significance. Topics include: construction and existence results for error-correcting codes; limitations on the combinatorial performance of error-correcting codes; low density parity check codes; algebraic geometric codes; Turbo codes; and decoding algorithms. Prerequisite: Senior standing.

ELEE 475  Stochastic Processes, Detection, and Estimation  3(3, 0, 0)
This is a course on types of random processes, series representation, and filtering; hypothesis testing and parameter estimation from a probabilistic point of view; extension to detection and estimation of known signals in white and non-white noise; prediction and filtering problems. Prerequisites: STAT 230 and ELEE 350.

ELEE 481  Control System Analysis and Design  3(3, 0, 0)
This course outlines state-space models of discrete and continuous, linear and nonlinear systems; controllability; observability; minimality; Eigenvector and transforms analysis of linear time invariant multi-input multi-output systems; pole shifting; computer control; design of state feedback controllers and observers. Prerequisite: ELEE 380.

ELEE 482  Robotics  3(3, 0, 0)
A course that examines robot manipulators: kinematics, control, programming, task planning, and effect of load; design of robot controllers: path tracking, force feedback control, real-time computation issues; a set of laboratory experiments and a design project. Prerequisite: ELEE 380.

ELEE 483  Optimal Control  3(3, 0, 0)
A course on optimization theory and performance measures; calculus of variations; the maximum principle; dynamic programming; numerical techniques; LQR control systems. Prerequisite: ELEE 380.
ELEE 484  System Identification  3(3, 0, 0)
This course provides an introduction to time series; auto regressive moving average models and their characteristics; modeling; forecasting; stochastic trends and seasonality; multiple series and optimal control; and applications. Prerequisite: Senior standing.

ELEE 485  Instrumentation  3(3, 0, 0)
This is a design course for complete instrumentation systems including measurements, sensors, data acquisition, and component integration. Application areas and course projects include industrial control, laboratory measurements, automation systems, and the like. This course is completed with a set of laboratory experiments. Prerequisite: ELEE 380.

ELEE 486  Intelligent Control Systems  3(3, 0, 0)
Introduction to artificial intelligence concept and techniques; fuzzy control systems: fuzzy logic; fuzzy sets; fuzzification and defuzzification; fuzzy inference and control; neural network control: single-layer and multi-layer perceptrons, self-organizing networks, feedforward networks, training techniques; considerations of practical implementation of intelligent control. Prerequisite: Senior standing.

Electives - Electric Machines and Power Systems

ELEE 461  Fundamentals of Power Systems Analysis  3(3, 0, 0)
Basic concepts and modeling of generation, transmission, and distribution systems; load flow analysis; economic load dispatch problem; symmetrical and asymmetrical short circuit studies; simplified power system stability analysis; introduction to power system operation and control problems. Prerequisite: ELEE 360.

ELEE 462  Power Electronics  3(3, 0, 0)
A course on diodes; diode circuits and rectifiers; thyristors; controlled rectifiers; power transistors; DC choppers; pulse width modulated inverters; introduction to gate and base drive circuits; switching power supplies. Prerequisite: ELEE 340 and ELEE 360.

ELEE 463  Electric Drives  3(3, 0, 0)
A course that covers steady-state analysis of dc and poly-phase induction motors, starting, and control; AC drives: solid-state control, dc link in adjustable speed drives, voltage and frequency controls, braking and plugging; DC drives: rectifier and chopper drives, dynamic and regenerative braking, plugging. Stepper motors: types, operational characteristics, control algorithms, power drive configurations. Special- purpose motors. Prerequisite: ELEE 360.

ELEE 464  Industrial Electrification  3(3, 0, 0)
A course on medium and low voltage installations; lighting; practical applications of electric machines; motor control centers; emergency power supplies; auxiliary systems. Prerequisite: ELEE 360.
ELEE 465  Power System Planning  3(3, 1, 0)
A course that investigates energy and peak load forecasts, weather-sensitive forecasts, generation reliability, load duration curves, loss-of-load expectation, capacity reserve evaluation, generation and transmission expansion, power flow analysis, reliability of bulk supply, and cost-benefit analysis. Prerequisite: ELEE 461.

ELEE 466  Environmental Aspects of Energy Systems  3(3, 0, 0)
A course that examines world energy resources and classifications; sources and effects of air pollution; air quality modeling, Gaussian dispersion models for pollution estimation; motor vehicle emissions and noise pollution; environmental impacts of electricity generation, pollution control systems, electromagnetic radiation, production and impacts in high-voltage applications; environmental impact assessment; basic concepts. Prerequisite: Senior standing.

ELEE 467  Energy Planning and Policy  3(3, 0, 0)
This course focuses on features of modern energy planning and policy. Topics covered include the interaction among the technological, economic, environmental, and sociopolitical aspects of energy supply and use; electricity, oil, and gas industries, and their market structures; elements of energy planning on the sectoral and national levels; energy decision making under uncertainties, risk management in energy planning; liberalization of energy markets; case studies. Prerequisite: Senior standing.

ELEE 468  Renewable Energy Systems  3(3, 0, 0)
A course that covers wind, solar, hydro, biomass, and geothermal resources; resource assessment, electric drive options, control problems, environmental aspects of electricity generation, and stand-alone and utility applications; institutional and policy issues, and integrated energy systems. Prerequisite: Senior standing.

ELEE 469  Power System Protection  3(3, 0, 0)
This course introduces the concept of power system protection, objectives, requirements, components; instrument transformers; protective relays; overcurrent and distance protection of networks; differential protection of generator; bus and transformer; digital protection. Prerequisite ELEE 461.

Electives - Electromagnetism
ELEE 443  RF and Microwave Circuits for Communications  3(3, 0, 0)
The course focuses on the analysis and design of high-frequency electronic circuits, with emphasis on RF and Microwave circuits and components for communication systems. The course covers the basic principles of radio-frequency (RF) and microwave circuits design, as applied to the design of microstrip and coplanar lines, impedance transformers, low-pass and band-pass filters, directional couplers, power dividers, amplifiers, mixers, and diode detectors. It provides understanding of S-parameters and signal-flow graph analysis techniques. The course enables the student to get hands-on experience in RF and Microwave circuit design through the use of computer-aided design tools to simulate and analyze high frequency circuits, build them as part of a course project, and perform
measurements in the lab using network and spectrum analyzers. Prerequisites: ELEE 340 and ELEE 390.

**ELEE 474  RF and Microwave Communication Systems  3(3, 0, 0)**
A course that introduces students to hardware components, system parameters, and architectures of RF and microwave wireless systems; focus on the design of a radio system for transmission and reception of information: types of receivers and transmitters, matching techniques, antenna types in wireless systems, RF and microwave radio components, receiver and transmitter RF system parameters, and radio links; basic modulation and demodulation schemes and multiple-access techniques used in present RF systems, including an overview of different RF and microwave point-to-point, mobile, and satellite communications systems. Prerequisites: ELEE 340 and ELEE 390.

**ELEE 491  Antenna Theory and Design  3(3, 0, 0)**
This course covers radiation systems, wire antennas, aperture antennas, arrays, input impedance, microstrip antennas, dielectric antennas, antennas in material layers. Prerequisite: ELEE 390.

**Electives - Biomedical Engineering**

**ELEE 411  Biomedical Instrumentation  3(3, 0, 0)**
This course introduces general instrumentation configuration, living cells, and performance of instrumentation systems; types and characteristics of transducers; sources and characteristics of bioelectric signals and electrodes; cardiovascular system, measurements, and diagnostic equipment; patient care and monitoring.

**ELEE 412  Biomedical Signal and Image Processing  3(3, 0, 0)**
A course that introduces the fundamentals of digital signal processing as implemented in biomedical applications. It provides a concise treatment of the tools utilized to describe deterministic and random signals as the basis of analyzing biological signals: data acquisition; imaging; de-noising and filtering; feature extraction; modeling. The course is tightly coupled with a practical component as it looks at and assigns several laboratory projects. Examples include the auditory system, speech generation, electrocardiogram, neuronal circuits, and medical imaging. Students should have reasonable software skills in Matlab. Prerequisite: ELEE 350.
DEPARTMENT OF MECHANICAL ENGINEERING

Mission
The mission of the undergraduate program in Mechanical Engineering (ME) is to instill in students an understanding of the fundamentals of mechanical engineering, to integrate classroom theory and practical hands-on design projects, to emphasize the process of learning and critical thinking, to develop in students the skills that are necessary to become lifelong learners, and to enlighten them of their leadership role in regional development.

Program Objectives
The objectives of the Bachelor of Mechanical Engineering (BME) program are to produce graduates who will:

• be equipped with a broad educational background in Mechanical Engineering needed to become leaders in industry and the public sector;
• correctly apply gained knowledge, work well with other people, effectively communicate technical information and ideas with the public, their peers, customers, and employers;
• understand the need for life-long learning, the importance of community and professional involvement, are aware of cultural, societal, and professional issues;
• successfully pursue advanced studies.

Learning Outcomes
Each student receiving a bachelor degree from the ME Department will be expected to demonstrate:

• Ability to apply knowledge of mathematics, science and engineering;
• Ability to design a system, component, or process to meet desired needs;
• Ability to develop, conduct and analyze experiments or tests and interpret data that may aid in the design process;
• Ability to identify, formulate and solve engineering problems;
• Ability to use computer-based techniques and modern engineering tools necessary for engineering practice;
• Understanding the importance of functioning on multi-disciplinary teams in the pursuit of a goal;
• Realization of the professional and ethical responsibilities of a practicing engineer;
• Ability to communicate effectively;
• Broad education necessary to understand the impact of engineering solutions in a global and societal context and increase the appreciation of the “non-technical” world;
• Awareness of the business environment in which engineering is practiced and other contemporary issues;
• Awareness and necessity of life-long learning experiences such as graduate studies or continuing education.
Job Opportunities
The Mechanical Engineering Department is committed to providing its students with meaningful, up-to-date skills and knowledge that will allow them to pursue successful engineering careers and make deep impacts both within the Tabuk province and across the Gulf region at large. With these objectives in mind, the ME program is designed around fostering contemporary best practices and skills in line with the job opportunities for mechanical engineers within Tabuk and the Gulf.

Mechanical systems are part of our everyday life, whether it is the car we drive, the plane we fly, the lift we use, or the products we handle. The fields that are part of mechanical engineering are numerous and cover a very large spectrum. This means that the mechanical engineering student has a challenging program to cover, but it also means that the opportunities offered to mechanical engineers are as wide and diverse.

Mechanical engineers are concerned with the planning, design, construction, implementation and operation of mechanical and related systems in a wide variety of situations. Other disciplines including biomechanics, environment protection and many other vital and emerging fields frequently rely on the expertise of mechanical engineers. Mechanical engineers work in a variety of areas including research and development, design, operations, maintenance, quality assurance, bioengineering, transportation (especially automotive and aerospace), energy, heating, ventilating, refrigeration and air conditioning, environmental and life-support systems, chemical, food production, materials processing, automated manufacturing and construction, heavy and precision machinery, robotics, and mechatronics. A wide spectrum of career opportunities is open to them. Because of the very broad nature of their discipline, mechanical engineers are usually in high demand. Beyond working for private enterprise, some graduates may work in government and non-government organizations, others may choose to pursue graduate studies or start their own business.

Curriculum and Program Structure
The curriculum is designed to comply with the requirements of ABET accreditation. It includes courses in basic sciences and mathematics, engineering sciences, engineering design, communications skills, and humanities and social sciences. Lab hands-on experience and emphasis on design are important elements that are integrated throughout the curriculum.

The requirements of the BME include:

- 30 credit hours of mathematics and basic sciences,
- 67 credit hours of engineering sciences and engineering design, and
- 15 credit hours of social sciences and humanities, excluding language and technical writing courses.

The curriculum is designed to allow students to receive the Bachelor of Engineering degree upon the successful completion of the four-year program. The first common year with other engineering majors allows students to switch between the engineering majors at the start of the second year of their study.

Final Year Project
As part of their fourth year, students are required to carry out a project and submit a technical report. This project is a substantial piece of work that will require creative activity and original thinking.
Students in groups, normally three per group, are supervised while working on a project accounting for four credit hours, extending over a full academic year. The project aims to provide students with a transitional experience from the academic world to the professional world. It is designed to serve as a platform in which ME students in teams engage in a meaningful design experience requiring the solution of engineering design projects. The objectives of the final year project are:

- To allow students to demonstrate a wide range of the skills learned at the College of Engineering during their course of study by asking them to deliver a product that has passed through the design, analysis, testing and evaluation stages.
- To encourage multidisciplinary research through the integration of material learned in a number of courses.
- To allow students to develop problem solving, analysis, synthesis and evaluation skills.
- To encourage teamwork.
- To improve students' communication skills by asking them to produce both a professional report and a professional poster and to give an oral presentation on their work.

The project is important for a number of reasons:

- It is the largest single piece of design work that a student does during his/her BE degree program.
- It allows students to specialize in a topic that they enjoy.
- It is the work that prospective employers will most likely ask students about during an interview.
- It allows students to show a wide range of the skills learned since the first year.
- Students must demonstrate these skills by delivering a product that has passed through the design, analysis, manufacturing, testing and evaluation stages.

**Practical Training/Summer Internship**

All engineering students are required to fulfill a 1-credit hour internship period of 8 to 12 weeks. This graduation requirement entails that each senior student (one who has completed around 80% of the total credit requirement) gains practical training experience during the summer term prior to graduation, or in the graduation semester, with either a company or an academic institution while involved in a practical experience.

**Degree Requirements**

To graduate with a BME, a student must satisfactorily complete 135 credit hours. The distribution of courses is as follows:

**University Requirements**

The University requirements for the BME total 30 credit hours and are distributed as follows:

- 6 credits of Arabic: ARAB 101 and ARAB 201;
- 9 credits of English communication skills: ENGL 101, ENGL 102, and ENGL 203;
• 9 credits of social and cultural studies: SOCS 101, SOCS 201, and SOCS 202;
• 3 credits of computing essentials: CSC 101;
• 3 credits of mathematics: MATH 101.

**College Requirements**
The College requirements for the BME degree total 41 credit hours and are distributed as follows:

- 12 credit hours in physics and chemistry: PHYS 101/ 101L, PHYS 102/ 102L, and CHEM 101/ 101L;
- 15 credit hours in mathematics: MATH 102, MATH 201, MATH 202, MATH 215, and STAT 230;
- 3 credit hours in technical writing: ENGL 206;
- 3 credit hours in engineering ethics: COEN 400;
- 3 credit hours in engineering economy: COEN 300.

The BME students must also complete a 4-credit hour final-year project during the senior year (MECH 401 and 402), and a 1-credit hour internship (MECH 400).

**Program Requirements**
The program requirements for the BME degree in ME total 63 credit hours and are distributed as follows:

- 51 credit for the following courses: CIVE 210; ELEE 210, ELEE 210 L, ELEE 230, and ELEE 260; MECH 200, MECH 210, MECH 220, MECH 230, MECH 231, MECH 320, MECH 330, MECH 331, MECH 340, MECH 341, MECH 350, MECH 360, MECH 361, MECH 490, MECH 491, and MECH 441;
- Four 3-credit hour electives from the ME Department and approved courses from other departments.
# Study Plan of the BME Degree

(135 Credit Hours)

## Year I

### First Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Basic Academic English I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>MATH 101</td>
<td>Calculus I</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>PHYS 101/101L</td>
<td>College Physics I + Lab</td>
<td>3+1</td>
<td>MATH 101 (co)</td>
</tr>
<tr>
<td>CSC 101</td>
<td>Introduction to Computing for Engineers</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>SOCS 101</td>
<td>Islamic Civilization I</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total Credits** 16

### Second Semester (17 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 102</td>
<td>Basic Academic English II</td>
<td>3</td>
<td>ENGL 101</td>
</tr>
<tr>
<td>MATH 102</td>
<td>Calculus II</td>
<td>3</td>
<td>MATH 101</td>
</tr>
<tr>
<td>PHYS 102/102L</td>
<td>College Physics II + Lab</td>
<td>3+1</td>
<td>PHYS 101</td>
</tr>
<tr>
<td>CHEM 101/101L</td>
<td>College Chemistry + Lab</td>
<td>3+1</td>
<td>-</td>
</tr>
<tr>
<td>ARAB 101</td>
<td>Basic Academic Arabic</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total Credits** 17

### Summer Semester I (6 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 203</td>
<td>Advanced Academic English</td>
<td>3</td>
<td>ENGL 102</td>
</tr>
<tr>
<td>SOCS 201</td>
<td>Islamic Civilizations II</td>
<td>3</td>
<td>SOCS 101</td>
</tr>
</tbody>
</table>

**Total Credits** 6

## Year II

### Third Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 201</td>
<td>Calculus and Analytic Geometry III</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>MECH 210</td>
<td>Thermodynamics</td>
<td>3</td>
<td>D. of Advisor</td>
</tr>
<tr>
<td>ELEE 210/210L</td>
<td>Electric Circuits I +LAB</td>
<td>3+1</td>
<td>PHYS 102</td>
</tr>
<tr>
<td>CIVE 210</td>
<td>Statics</td>
<td>3</td>
<td>MATH 102</td>
</tr>
<tr>
<td>ELEE 230/CSC 102</td>
<td>Programming for Engineers</td>
<td>3</td>
<td>CSC 101</td>
</tr>
</tbody>
</table>

**Total Credits** 16
Fourth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 202</td>
<td>Differential Equations</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>MECH 220</td>
<td>Dynamics</td>
<td>3</td>
<td>MATH 201 + CIVE 210</td>
</tr>
<tr>
<td>MECH 230</td>
<td>Engineering Materials</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MECH 231</td>
<td>Strength of Materials</td>
<td>3</td>
<td>CIVE 210</td>
</tr>
<tr>
<td>ELEE 260</td>
<td>Electromechanical Devices</td>
<td>3</td>
<td>ELEE 210</td>
</tr>
<tr>
<td>MECH 200</td>
<td>Engineering Graphics</td>
<td>2</td>
<td>D. of adviser</td>
</tr>
</tbody>
</table>

Total Credits 16

Year III

Fifth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 230</td>
<td>Probability and Statistics</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>ENGL 206</td>
<td>Technical Writing</td>
<td>3</td>
<td>ENGL 203</td>
</tr>
<tr>
<td>MECH 320</td>
<td>Kinematics of Mechanical Systems</td>
<td>3</td>
<td>MECH 220</td>
</tr>
<tr>
<td>MECH 331</td>
<td>Materials Lab</td>
<td>1</td>
<td>MECH 230</td>
</tr>
<tr>
<td>MECH 341</td>
<td>Fluid Mechanics</td>
<td>3</td>
<td>MECH 220</td>
</tr>
<tr>
<td>MECH 350</td>
<td>Instrumentation and Measurements</td>
<td>3</td>
<td>MECH 341</td>
</tr>
</tbody>
</table>

Total Credits 16

Sixth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>COEN 300</td>
<td>Engineering Economy</td>
<td>3</td>
<td>STAT 230</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Linear Algebra and Numerical Techniques</td>
<td>3</td>
<td>MATH 201</td>
</tr>
<tr>
<td>MECH 330</td>
<td>Mechanical Design</td>
<td>3</td>
<td>MECH 200, 230, 231</td>
</tr>
<tr>
<td>MECH 342</td>
<td>Heat Transfer</td>
<td>1</td>
<td>MECH 341</td>
</tr>
<tr>
<td>MECH 360</td>
<td>Manufacturing Processes I</td>
<td>3</td>
<td>MECH 230</td>
</tr>
<tr>
<td>MECH 361</td>
<td>Manufacturing Processes Lab</td>
<td>3</td>
<td>MECH 361 (co)</td>
</tr>
</tbody>
</table>

Total Credits 16

Summer Semester II (1 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 400</td>
<td>Internship for BME Students</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits 1
## Year IV

### Seventh Semester (14 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 401</td>
<td>Final Year Project I</td>
<td>1</td>
<td>Senior Standing</td>
</tr>
<tr>
<td>ARAB 201</td>
<td>Advanced Academic Arabic</td>
<td>3</td>
<td>ARAB 101</td>
</tr>
<tr>
<td>MECH 490</td>
<td>System Dynamics and Control</td>
<td>3</td>
<td>MECH 220 + ELEE 210</td>
</tr>
<tr>
<td>MECH 491</td>
<td>System Dynamics and Control Lab</td>
<td>1</td>
<td>MECH 350 + MECH 490</td>
</tr>
<tr>
<td>ME Elective</td>
<td>Mechanical Engineering Elective</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>ME Elective</td>
<td>Mechanical Engineering Elective</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total Credits** 14

### Eighth Semester (16 Credit Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 402</td>
<td>Final Year Project II</td>
<td>3</td>
<td>MEC 401</td>
</tr>
<tr>
<td>SOCS 202</td>
<td>World Civilizations</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>COEN 400</td>
<td>Engineering Ethics</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>MECH 411</td>
<td>Thermal-Fluid Systems Lab</td>
<td>1</td>
<td>MECH 342</td>
</tr>
<tr>
<td>ME Elective</td>
<td>Mechanical Engineering Elective</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>ME Elective</td>
<td>Mechanical Engineering Elective</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total Credits** 16

### Total Program Credits 135*

*Completion of Bachelor degree in Mechanical Engineering.
## Course Descriptions

### Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits (Lecture, Tutorial, Lab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH 200</td>
<td>Engineering Graphics</td>
<td>2(1, 0, 2)</td>
</tr>
<tr>
<td>MECH 210</td>
<td>Thermodynamics I</td>
<td>3(3, 0, 0)</td>
</tr>
<tr>
<td>MECH 211</td>
<td>Thermodynamics For Civil Engineering</td>
<td>2(2, 0, 0)</td>
</tr>
<tr>
<td>MECH 220</td>
<td>Dynamics</td>
<td>3(3, 1, 0)</td>
</tr>
<tr>
<td>MECH 230</td>
<td>Engineering Materials</td>
<td>3(3, 0, 0)</td>
</tr>
<tr>
<td>MECH 231</td>
<td>Strength of Materials</td>
<td>3(3, 0, 0)</td>
</tr>
</tbody>
</table>

An introductory course on 2-D drawing, orthogonal projection, auxiliary views, sectioning and sectional views, dimensioning and tolerance schemes, and standard drawing layouts and an introduction to the use of AutoCAD. Prerequisite: Discretion of advisor.

A course on the thermodynamic state and properties of a pure substance, system and control volume concepts, work and heat, the first law of thermodynamics, energy and mass conservation, entropy, the second law of thermodynamics; applications to closed setups and flow devices; simple vapor and gas cycles applications. Prerequisite: Discretion of advisor.

Introduction to the thermodynamics: which include thermodynamics state and properties of a pure substance, system and control volume concepts, work and heat, the first law of thermodynamics, energy and mass conservation, entropy, the second law of thermodynamics; applications to closed setups and flow devices; simple vapor and gas cycles applications.

A course on kinematics and kinetics of particles, systems of particles, and rigid bodies in 2-D and 3-D motion, Newton’s laws, work and energy, impulse and momentum, impact, and mass moments of inertia. Prerequisites: MATH 201 and CIVE 210.

The course introduces fundamental concepts in materials science as applied to engineering materials: crystalline structures; imperfections, dislocations, and strengthening mechanisms; diffusion; phase diagrams and transformations. Ferrous and non-ferrous metal alloys, ceramics, and polymers. Structure-property relationships. Material selection case studies.

A course on stresses, strains, and stress-strain relationship; stress and deformation of axially loaded members; thermal stresses; torsion of circular bars; bending and shear in beams; combined stresses; stress transformation and Mohr’s circle. Stress concentration; stresses in pressurized cylinders. Deflection and stiffness; deflection due to bending; beams deflection by superposition; beam deflection by singularity functions; Castigliano’s theorem; deflection in columns. Prerequisite: CIVE 210.

---

10 Credits (Lecture, Tutorial, Lab)
MECH 320   Kinematics of Mechanical Systems  3(3, 0, 0)
A course that deals with the mechanization of motion, kinematics analysis of linkage mechanisms, synthesis of cam-follower mechanisms, gear terminology and types of gears, analysis and synthesis of gear trains, force analysis, and introduction to linkage synthesis; computer aided project. Prerequisite: MECH 220.

MECH 330   Mechanical Design  3(3, 0, 0)
A course covering the analytical tools needed for the mechanical design of various machine components for rigidity and strength. The course covers the design of machine elements such as screws and joints, bearings, gears, shafts, and mechanisms. The course offers practice in skills needed for machine design such as estimation, drawing, and experimentation. The course deals with failures theories that result from static and variable loading. Applications are covered through case studies and a team project. Prerequisites: MECH 200, MECH 230 and MECH 231.

MECH 331   Materials Lab  1(0, 0, 2)
A laboratory course consisting of standard metallurgical and mechanical characterization tests on metals. Stress-strain plots, derived properties, fracture toughness, crystallography, hardness, and other properties. Ceramic flexure testing: Weibull plots. Polymers: stress-strain plots and derived properties, impact properties, creep, and relaxation. Prerequisite: MECH 230.

MECH 341   Fluid Mechanics  3(3, 0, 0)
An introductory course on fluid behavior emphasizing conservation of mass, momentum, and energy and dimensional analysis; study of fluid motion in terms of the velocity field, fluid acceleration, the pressure field, and the viscous effects; applications of Bernoulli’s equation, Navier-Stokes, and modeling; flow in ducts, potential flows, and boundary layer flows. Prerequisite: MECH 341.

MECH 342   Heat Transfer  3(3, 0, 0)
A course investigating steady and transient heat conduction; extended surfaces; numerical simulations of conduction in one and two-dimensional problems; external and internal forced convection of laminar and turbulent flows; natural convection; heat exchanger principles; thermal radiation, view factors and radiation exchange between diffuse and gray surfaces as well as the use of computer packages in problem solving. Prerequisite: MECH 341.

MECH 350   Instrumentation and Measurements  3(2, 0, 2)
This course introduces general concepts of measurement systems; classification of sensors and sensor types; interfacing concepts; data acquisition, manipulation, transmission, and recording; introduction to LabVIEW; applications; team project on design, and implementation of a measuring device. Pre- or co-requisite: MECH 341.

MECH 360   Manufacturing Processes I  3(3, 0, 0)
A course on material removal processes, processes both traditional and non-traditional. Assembly processes such as welding, brazing, soldering, and fastening are also covered with an emphasis on process capabilities and limitations, relative cost, and guidelines for process selection. This course
examines the behavior of materials under processing conditions and design for manufacturing guidelines, and involves hands-on exercises in a machine shop environment. Prerequisite: MECH 230.

MECH 361  Manufacturing Processes Laboratory  1(0, 0, 2)
An introduction to the use and operation of selected industrial machinery, various machining operations, selected welding processes and precision measuring instruments. Laboratory projects will emphasize safety and apply selected manufacturing processes, various inspection processes, fixturing and engineering materials. Pre- or co-requisite: MECH 360.

MECH 400  Summer Internship  (1 Cr.)
This is an eight to twelve-week professional training course in mechanical engineering. Prerequisite: Senior standing.

MECH 401  Final Year Project I  (1 Cr.)
A supervised project in groups of normally three students aimed at providing practical experience in some design aspects of mechanical engineering. Students are expected to complete a literature survey, to critically analyze, and to acquire the necessary material needed for their intended end product. Prerequisite: Senior Standing.

MECH 402  Final Year Project II  (3 Crs.)
A course in which the student integrates his/her acquired knowledge to deliver the product researched and planned in MECH 401. Prerequisite: MECH 401.

MECH 441  Thermal-Fluid Systems Laboratory  1(0, 0, 2)
This lab includes a series of experiments on basic thermodynamic cycles, psychrometry, combustion, and elementary fluid mechanics, with special emphasis on the use of the computer as a laboratory tool for data acquisition, reduction, analysis, and report preparation. Prerequisite: MECH 342.

MECH 490  Control Systems  3(3, 0, 0)
This course is intended to provide students with the tools that enable them to model and control physical systems. It includes the following: modeling of mechanical, fluid, electrical, and thermal systems; transfer function and block diagrams; time-domain analyses; root-locus; frequency-domain methods; stability analysis; design of PID controllers and dynamic compensators via the root locus and frequency methods. Prerequisites: MECH 220 and ELEE 210.

MECH 491  Control Systems Laboratory  1(0, 0, 2)
This course involves a series of hands-on experiments on modeling and design of control systems using Matlab, Simulink, and LabVIEW. The course also includes a team project. Pre- or co-requisites: MECH 350 and MECH 490.
Elective Courses

MECH 430  Product Design and Development  3(3, 1, 0)
This course covers modern tools and methods for product design and development. Teams of students conceive, design, and prototype a new physical product. Topics include identifying customer needs, product planning, product specifications, concept generation, industrial design, product architecture, product development economics, and design-for-manufacturing. Prerequisites: MECH 320 and MECH 330.

MECH 431  Manufacturing Processes II  3(2, 0, 2)
A course on heat treatments, deformation, phase-change, and particulate consolidation processing of metals; fabrication processing of non-metallic engineering materials such as ceramics, polymers, and composites; emphasis on process capabilities and limitations, relative cost, and guidelines for process selection; the behavior of materials under processing conditions; design for manufacturing guidelines. This course emphasizes hands-on training exercises. Prerequisite: MECH 230.

MECH 432  Mechanical CAD/CAE/CAM  3(2, 0, 2)
This course seeks to expose the senior ME students to the realm of computer-aided design (CAD), computer-aided engineering (CAE), and computer-aided manufacturing (CAM); geometric modeling; numerical control; dimensioning and tolerancing; statistical tolerancing; process selection; metrology. Prerequisites: MECH 200, MECH 330, and MECH 360.

MECH 433  Mechatronics System Design  3(2, 0, 2)
A course that discusses mechatronics; data; numbering systems, architecture of microcontrollers, assembly language programming, A/D and D/A conversion; parallel I/O, programmable timer operation, interfacing sensors and actuators, applications; a team project on design and implementation of a mechatronic system. Prerequisites: MECH 350.

MECH 434  Mechanical Vibrations  3(3, 0, 0)
A course on free and forced response of non-damped and damped system; damping vibration absorption; response of discrete multi-degree of freedom systems; modal analysis; vibration measurement, case studies, vibration analysis with Matlab and Simulink. Prerequisite: MECH 220.

MECH 435  Dynamics and Applications  3(3, 0, 0)
This course examines the dynamics of particles and rigid bodies moving in three dimensions. Topics include Lagrange’s equations of motion for particles, rotations of rigid bodies, Euler angles and parameters, kinematics of rigid bodies, and the Newton-Euler equations of motion for rigid bodies. The course material will be illustrated with real-world examples such as gyroscopes, spinning tops, vehicles, and satellites. Applications of the material range from vehicle navigation to celestial mechanics, numerical simulations, and animations. Prerequisites: MECH 220.
MECH 436  Intermediate Mechanics of Materials  3(3, 0, 0)
Review of energy methods, Betti's reciprocal theorem; bending of beams of asymmetrical cross-section; shear center and torsion of thin-walled sections; membrane stresses in axisymmetric shells; axisymmetric bending of circular plates; elastic, thermoelastic analysis of axisymmetric thick cylinders and rotating discs; bending of rectangular and circular plates, including asymmetric problems; beams on elastic foundations; axisymmetric bending of cylindrical shells; Analysis of torsion: non-circulation sections. Prerequisites: MECH 231.

MECH 440  Thermodynamics II  3(3, 0, 0)
A course investigating the availability and work potential of systems; irreversibility; second law efficiency; availability; gas mixtures, air-conditioning; chemical reactions; high speed flow, nozzles and diffusers, environmental, economic, and social implications. Prerequisite: MECH 210.

MECH 442  Modeling and Design of Thermal Systems  3(3, 0, 0)
This course covers analysis, modeling, and design of engineered systems involving applications of thermodynamics, economics, heat transfer, and fluid flow; selection of components in fluid- and energy-processing systems to meet system performance requirements; system simulation and optimization techniques; use of modern computational tools to model thermal performance characteristics of components and systems. Prerequisite: MECH 342.

MECH 443  Intermediate Fluid Mechanics  3(3, 0, 0)
A course that deals with potential flow and boundary layer analysis; lift and drag; flow separation; the use of computational techniques to solve boundary layer problems; viscous internal channel flow and lubrication theory; one-dimensional compressible flow in nozzles and ducts; normal shock waves and channel flow with friction or heat transfer; fluid machinery including pumps and hydraulic turbines. Prerequisites: MECH 342.

MECH 444  Internal Combustion Engines  3(3,0, 0)
This course examines the fundamentals of internal combustion engine design and operation, with emphasis on fluid/thermal processes. Topics include analysis of the respiration, combustion, and pollutant formation processes; heat transfer and friction phenomena; engine types and performance parameters; thermo-chemistry of fuel-air mixtures; the use of engine cycle models for performance predictions; and social implications of motorization. Prerequisites: MECH 210 and MECH 350.

MECH 445  Air Conditioning  3(3, 0, 0)
A course on human thermal comfort and indoor air quality; solar radiation; heating and cooling load calculations in buildings; air conditioning systems; air and water distribution systems; computer-based calculations. Prerequisite: MECH 342.

MECH 446  Gas Turbines  3(3, 0, 0)
A course that introduces the thermodynamic and aerodynamic theory forming the basis of gas turbine design: shaft power cycles; gas turbine cycles for aircraft propulsion; turbofan and turbojet engines; design and analysis of centrifugal and axial flow compressors and turbines. Prerequisite: MECH 341.
MECH 447  Steam Turbines  3(3, 0, 0)
A course that deals with impulse and reaction steam turbines, steam turbine cycles, flow of steam in nozzles, design aspects of turbines stage losses and efficiency, velocity diagrams; and impulse and reaction blading velocities; nucleation, condensation, and two-phase phenomena in flowing steam; boiler room and its various equipment; the complete steam power plants; governors, electric generator, and power transmission lines. Prerequisite: MECH 341.

MECH 448  Aerodynamics  3(3, 0, 0)
A course on theoretical and empirical methods for calculating the loads on airfoils and finite wings by application of classical potential theory, thin airfoil approximations, lifting line theory, and panel methods; wings and airplanes; application of linearized supersonic flow to supersonic airfoils; performance and constraint analysis; longitudinal stability and control. Prerequisite: MECH 341.

MECH 449  Compressible Flow  3(3, 0, 0)
This course covers general one-dimensional flow of a perfect gas homenergetic and homentropic flow in nozzles and constant area ducts, normal shock waves, and one-dimensional unsteady gas flow. Prerequisite: MECH 341 and MATH 202.

MECH 450  Refrigeration  3(3, 0, 0)
This course covers fundamental concepts and principles of mechanical vapor compression refrigeration cycles; gas cycle refrigeration; ultra-low-temperature refrigeration, cold storage refrigeration; functions and specifications of refrigeration equipment, applications. Prerequisite: MECH 210 and MECH 342.

MECH 451  Solar Energy  3(3, 0, 0)
This course discusses the fundamentals of solar radiation, collectors and concentrators, energy storage, estimation and conversion formulas for solar radiation. Prerequisite: MECH 342.

MECH 460  Finite Element Methods in Mechanical Engineering  3(3, 0, 0)
A course on the classification of machine components; displacement-based formulation; line elements and their applications in design of mechanical systems; isoparametric formulation; plane stress, plane strain, axi-symmetric, and solid elements and their applications; modeling considerations and error analysis; introduction to ALGOR general formulation and Galerkin approach; and analysis of field problems. Prerequisites: MATH 215, MECH 330, and MECH 342.

MECH 461  Mechanical Engineering Analysis  3(3, 0, 0)
A course dealing with the application of numerical techniques to the solution of a variety of mechanical engineering problems involving systems of linear or non-linear algebraic equations, systems of ordinary differential equations of the initial and boundary value types, systems of ordinary differential equations, and partial differential equations of the parabolic, elliptic, and hyperbolic types. Engineering applications are introduced through a number of case study problems. Prerequisite: MATH 202, MECH 220, and MECH 231.
MECH 470 Mechanics of Composite Materials 3(3, 0, 0)
This course covers anisotropic elasticity and laminate theory, analysis of various members of composite materials, energy methods, failure theories, and micromechanics. Materials and fabrication processes are introduced. Prerequisites: MECH 230 and MECH 231.

MECH 471 Fatigue of Materials 3(3, 0, 0)
A course that deals with high cycle fatigue; low cycle fatigue; S-N curves; notched members; fatigue crack growth; cycling loading; Manson-Coffin curves; damage estimation; creep and damping. Prerequisite: MECH 231.

MECH 472 Metals and their Properties 3(3, 0, 0)
A course that investigates ferrous and non-ferrous alloys; industrial equilibrium diagrams; heat treatment of metals; surface properties of metals; plastic deformation of metals; elements of fracture mechanics; process-structure-properties relations. Prerequisite: MECH 230.

MECH 473 Polymers and their Properties 3(3, 1, 0)
This course focuses on chemistry and nomenclature, polymerization and synthesis, characterization techniques, physical properties of polymers, viscoelasticity and mechanical properties and applications. Prerequisite: MECH 230.

MECH 480 Design of Mechanisms 3(3, 0, 0)
A course involving graphical and analytical synthesis of single- and multi-loop linkage mechanisms for motion, path, and function generation through 2-3-4- and 5-precision positions; optimum synthesis of linkage mechanisms; synthesis of cam-follower mechanisms; synthesis of gear trains. Prerequisite: MECH 320.

MECH 481 Micro Electro Mechanical Systems (MEMS) 3(3,0, 0)
A course that deals with materials for micro-sensors and micro-actuators, materials for microstructures, microfabrication techniques and processes for micromachining, computer-aided design and development of MEMS, commercial MEMS structures and systems, packaging for MEMS, future trends, and includes a team project. Prerequisite: MECH 350.

MECH 492 Robotics 3(3, 1, 0)
A course discussing concepts and subsystems; robot architecture; mechanics of robots: kinematics and kinetics; sensors and intelligence; actuators; trajectory planning of end effector motion; motion and force control of manipulators; robot languages. Prerequisites: MECH 350, MECH 490, and MECH 491.

MECH 493 Noise and Vibration Control 3(3, 0, 0)
This course covers fundamental concepts in noise and vibration, passive and active damping strategies, damping materials, control methods; and applications. Prerequisites: MECH 220 and MECH 434.
MECH 499  Special Topics in Mechanical Engineering  3(3, 0, 0)
Any selected topic in the state-of-the-art in Mechanical Engineering. Prerequisite: discretion of advisor.
Engineering Bridging Program
ENGINEERING BRIDGING PROGRAM

Overview
The Bridging Program at the College of Engineering prepares students who hold Technical diplomas from two-year or three-year Technical Colleges to pursue a Bachelor of Science in Engineering at FBSU.

The duration of the Bridging Program ranges between two and three years after the bridging preparatory year. The bridging year consists of two components in two semesters. The first component covers intensive instruction in English (12 Credit Hours) and Bridging Math. In addition, the student is allowed to take a moderate academic load mainly in basic sciences and humanities for the purpose of raising the students’ skills level in these subjects, facilitate their integration in the university programs, and enhance their conditions for success.

The level of a student is assessed by the placement tests. According to his performance on the English and Math tests, a student shall follow one of the following three study tracts:

1. Student’s score is above 75%, the student would be exempted from the Bridging English courses and can start directly the academic courses
2. Score between 50 and 75%, the student would be enrolled in the Bridging English level 2 (BENG 2: 9 Contact Weekly Hours), which would take one full semester to complete.
3. Score below 50% the student must take the full Bridging year.

The College of Engineering offers the Bridging Program in the following majors:

- Civil Engineering
- Electrical Engineering

Program Requirements
The specific program requirements are shown under the respective department section. The total number of credit hours required in each of the majors depends on the number of credit hours transferred from his/her study at the technical college.

Program Graduation requirements
Students graduate from the Engineering Bridging program when they satisfactorily complete 137 credit hours for a Bachelor in Civil Engineering and 134 for a Bachelor in Electrical Engineering.
Faculty List

Abdelrahman, Mustafa; Assistant Instructor, Librarian, BA English Language and Literature, Assiout University, Egypt, 1990.

Abu Atieh, Amani; Instructor, MA Translation, University of Jordan, 2002.

Abu Humaidan, Khaled; Instructor, MS Applied Computer Science, Free University of Brussels, Belgium, 2001.

Abu Samha, Mahmoud; Assistant Professor, Ph.D. Chemistry, University of Bergen, 2006.

Akhtar, Mohammad; MS Civil Engineering, Aligarh Muslim University, India, 2011.

Al-Alawneh, Hamzeh; Instructor, MA English Methodology, Mutah University, 2007.

Al-Atawi, Noura; Assistant Instructor, B.S. Computer Science, Fahad Bin Sultan University, 2013.


Al-Balawi, Ahmad; Instructor, MA Computer Science, New Haven University, USA, 2012.

Albalawi, Fahad; Instructor, MA Computer Science, University of New Brunswick, Canada, 2012.

Al-Balawi, Iman; Instructor, MA Linguistics, University of Mutah, Jordan, 2010.

Al-Damen, Ahmad; Instructor, MA Applied Linguistics & TESOL, Ohio State University, USA, 2010.

Al-Dowiri, Waleed; Instructor, MA English Literature, Yarmouk University, Jordan, 2012.

Al-Fanatisah, Samar; Instructor, MA English Methodology, Mutah University, Jordan, 2006.

Al-Fifi, Mona; Assistant Instructor, B.S. Computer Science, Fahad Bin Sultan University, 2013.

Al-Huwaiti, Hajar; Instructor, MS Chemical science, New South Wales University, 2013.

Al-Huwiti, Maryam; Assistant Instructor, B.S. Computer Science, Fahad Bin Sultan University, 2012.

Al Hussein, Jareer; Assistant Professor, Ph.D. Education, University of Jordan, Jordan, 2007.

Al-Masri, Lubna; Assistant Professor, Business & Management, Exeter University, UK, 2011.


Al-Najjar, Suzan; Instructor, MA Business, Yarmouk University, Jordan, 2011.

Al-Nefaie, Raghad; Assistant Instructor, B.S. Computer Science, Fahad Bin Sultan University, 2012.
Al-Qudah, Ayman; Lab Assistant, B.E Engineering, Al-Balqa`a Applied University, Jordan, 2010.

Al-Qatawna, Mohammad; Instructor, MA Applied Linguistics & TESOL, Anglia Ruskin University, UK, 2012.

Al-Shammari, Awwad, MA Arabic Language, Mutah University, 2009.

Al-Sayed, Waad; Assistant Professor, Ph.D. Mathematics, University of Francois Rabelais, France, 2008.

Al-Senawi, Hiba; Instructor, MS Commuter Science, Al Balqaa University, Jordan, 2010.

Al-Tahat, Saqer; Assistant Professor, Ph.D. Accounting, Utara University, Malaysia, 2010.

Al-Taj, Homam; Assistant Professor, Ph.D. Network Resource Management, Sains University, Malaysia, 2011.

Al-Zaarir, Khalid, Instructor, MSc Electrical Engineering, Yarmouk University, 2012.

Arafeh, Khairi; Instructor, MS Computer Science, Uppsala University, Sweden, 2010.

Ass’ad, Mohammad; Instructor, MA English Language, University of Jordan, Jordan

Barake, Taha; Instructor, MS Electrical and Computer Engineering, Virginia Tech, USA, 1997.

Baghdadi, Jihad; Assistant Professor, Ph.D. Science in Electrical Engineering, Virginia, USA, 1998.

Bayoud, Husam; Assistant Professor, Ph.D. Mathematics, University of Jordan, Jordan, 2007.

Beydoun, Abdul Rahman; Assistant Professor, Ph.D. Business Administration, Florida International University, USA, 2012.

Bitar, Shaker; Assistant Professor, Ph.D. Civil Engineering, University of Manchester, UK, 1995.

Btoosh, Mousa; Associate Professor, Ph.D. Linguistics, University of Texas, USA, 2004.

Doumiati, Moustapha; Assistant Professor, Ph.D. Technology of Science and Information, University of Technology of Compiegne, France, 2010.

El-Fadil, Nazar; Associate Professor, Ph.D. Electrical and Computer Engineering, University of Technology, Malaysia, 2002.

Farhat, Fedaa; Instructor, ME Electrical and Computer Engineering, American University of Beirut, Lebanon, 1998.

Gharaibeh, Yazen, Instructor, Electrical Engineering, New Jersey Institute of Technology, USA, 2010.
Haidar, Abdulhameed; Assistant Professor, Ph.D. Mathematics, Tours University, France, 2010.

Haidar, May; Assistant Professor, Ph.D. Computer Science, University of Montreal, Canada, 2007.

Hallal, Hicham H.; Assistant Professor, Ph.D. Electrical and Computer Engineering, McGill University, Canada, 2007.

Hattamleh, Omar; Associate Professor, Ph.D. Civil Engineering, Washington State University, USA, 2003.

Issa, Yazan; Assistant Professor, Ph.D. Civil Engineering, King Fahd University of Petroleum and Minerals, KSA, 2012.

Jihan, Kaiser; Instructor, MA English Literature, N.S.P. Orissa, India, 2008.

Jbara, Mohammad; Instructor, MA Linguistics, University Utara Malaysia, Malaysia, 2012.

Kanani, Khalid; Instructor, MA Applied Linguistics, Jordan University of Science and Technology, Jordan, 2012.

Ladadwa, Imad; Assistant Professor, Ph.D. Physics, Bergen University, Norway, 2001.

Lyzzaik, Abdallah; Professor, Ph.D. Mathematics, University of Cincinnati, USA, 1977.

Mansour, Ahmad; Instructor, MS Mathematics, Toledo University, USA, 1985.


Mezher, Mohammed; Assistant Professor, Ph.D. Computer Science, Brunel University, UK, 2011.

Mohammad, Hani; Instructor, MA Applied Linguistics, Jordan University of Science and Technology, Jordan, 2009.

Nasri, Ahmad; Professor, Ph.D. Computer Science, University of East Anglia, UK, 1985.

Otoom, Omar; Instructor, M.S. Civil Engineering, University of Sydney, Australia, 2003.

Riman, Chadi; Assistant Professor, Ph.D. Computer Science, University of Versailles, France, 2008.

Sariera, Anas; Instructor, MA Applied Linguistics, Mutah University, Jordan, 2012.

Shariah, Ahmad; Instructor, MA Economy & Administration, Yarmouk University, Jordan, 2009.
Tabsh, Ibrahim; Assistant Professor, Ph.D. Economics, Bath University, UK, 2002.

Tahsildar, Abir; Instructor, MA Literatures and Civilizations of Anglophone countries, Francois Rabelais University, France, 2010.

Tantawi, Hasan; Associate Professor, Ph.D Civil Engineering, The University of Michigan, Ann Arbor, USA, 1986.

Zaatreh, Mohammed; Instructor, MS physics, University of Jordan, Jordan, 2010.

Zaidi, Syed; Instructor, MS Computer Science, Dr. H. S. Gour University, India, 2001.


Riman, Chadi; Assistant Professor, Ph.D. Computer Science, University of Versailles, France, 2008.

Sariera, Anas; Instructor, MA Applied Linguistics, Mutah University, Jordan, 2012.

Shariah, Ahmad; Instructor, MA Economy & Administration, Yarmouk University, Jordan, 2009.

Tabsh, Ibrahim; Assistant Professor, Ph.D. Economics, Bath University, UK, 2002.

Tahsildar, Abir; Instructor, MA Literatures and Civilizations of Anglophone countries, Francois Rabelais University, France, 2010.

Tantawi, Hasan; Associate Professor, Ph.D Civil Engineering, The University of Michigan, Ann Arbor, USA, 1986.

Zaatreh, Mohammed; Instructor, MS physics, University of Jordan, Jordan, 2010.

Zaidi, Syed; Lecturer, MS Computer Science, Dr. H. S. Gour University, India, 2001.
Index

AACSB, 94
ABET, 125, 161, 176, 192
abilities, 48, 55, 79, 115
ability, 47, 75, 84, 85, 93, 97, 108, 128, 140, 175
absence, 65, 66, 67
abuse, 75
Abusing, 75
academic, 13, 46, 47, 48, 50, 51, 54, 58, 59, 62, 63, 64, 65, 66, 70, 71, 72, 74, 75, 76, 77, 78, 79, 80, 84, 85, 86, 87, 92, 93, 94, 96, 117, 120, 122, 126, 127, 159, 161, 162, 168, 175, 177, 178, 184, 193, 207
acceptance, 51, 71, 113
accepted, 50, 67, 71, 117, 178
access, 47, 77, 92, 111, 137, 139, 187, 190
accessory, 76, 133
accompanied, 75
accomplished, 46, 136
accountable, 93
Accountant, 97
accounting, 95, 96, 97, 106, 126, 161, 193
accreditation, 125, 161, 176, 192
accredited, 59, 72, 117, 120, 122
ACCT, 98, 99, 100, 101, 104, 105, 106, 107, 110
achievement, 55, 71, 79, 85
ACM, 125
acquire, 55, 85, 95, 98, 108, 118, 148, 200
acquired, 87, 175, 200
acquisition, 106, 138, 146, 160, 188, 190, 199, 200
act, 62, 76, 80
action, 73, 75, 76
actions, 75, 156
activities, 13, 47, 48, 66, 74, 76, 89, 92, 107, 113, 156, 160, 169
activity, 126, 160, 161, 177, 192
acumen, 92
adapt, 159
add, 62, 63, 64, 65, 95, 118
added, 46, 64
adding, 64
additional, 50, 70, 171
addressed, 68, 76, 135, 147
addressing, 146, 159
adequate, 77, 78
adhered, 66
adherence, 93, 124
administered, 55, 59, 122
administration, 13, 47, 115, 118, 134, 174
administrative, 95, 160, 169
administrators, 94
admission, 15, 54, 58, 59, 66, 71, 95, 117, 122, 125, 140, 157
admissions, 15, 95, 125
admitted, 51, 58, 81, 120, 122, 157
advance, 156
advanced, 93, 96, 97, 107, 109, 112, 115, 126, 134, 136, 139, 146, 149, 151, 160, 175, 176, 185, 186, 191
advantage, 95, 109, 112, 117, 125, 176
advice, 47, 107
advisees, 62
advisement, 47
advising, 47
advisor, 62, 63, 64, 65, 167, 168, 169, 185, 198, 205
advisors, 74, 99
aerospace, 192
aesthetic, 159
candidates, 117
capabilities, 115, 118, 138, 199, 201
capable, 140, 156
capacity, 94, 109, 151, 171, 172, 187, 189
capitalize, 95
career, 75, 106, 107, 108, 125, 140, 160, 175, 176, 192
careers, 58, 94, 97, 107, 108, 125, 156, 161, 176, 192
caring, 48, 85
cash, 80, 107, 110, 111
catalog, 66
catalogues, 47
CBM, 93, 96
CE, 152, 156, 159, 161, 162, 169
CEN, 125, 126, 129, 130, 131, 132, 134, 135, 136, 137, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 179, 180, 186
centered, 93
central, 75, 90, 112
century, 94
certificate, 50, 78
certification, 97
certified, 50
CFA, 97
chaired, 46
chairperson, 67, 68
challenges, 85, 93, 94, 107, 112, 115, 159
challenging, 13, 160, 192
changing, 64, 69, 94, 108, 112, 159
channels, 48, 172, 187
characterized, 159
Chartered, 97
cheat, 75
cheating, 75
checklists, 55
CHEM, 86, 142, 143, 157, 162, 164, 167, 173, 178, 179, 194, 195
chemical, 86, 168, 171, 173, 192, 202
chemistry, 85, 86, 173, 178, 194, 202, 204
circuit, 89, 146, 147, 148, 149, 176, 182, 183, 185, 186, 188, 189
circuits, 89, 133, 148, 149, 150, 176, 182, 183, 185, 186, 188, 189, 190
circumstances, 67, 68, 72, 76, 77
cite, 75
Citizenship, 50
civic, 46, 47, 156
civil, 13, 74, 159, 160, 161, 169
civility, 157
clarified, 75
classified, 66
classroom, 47, 87, 176, 191
cleared, 67, 74
cluster, 96
code, 76, 137, 171
Codes, 68
Coding, 99, 151, 187
COEN, 135, 142, 144, 158, 162, 165, 166, 169, 172, 178, 180, 181, 194, 196, 197
cognitive, 93, 124
collaborating, 48
collaboration, 115
collections, 47
collegiality, 157
Collegiate, 94
colored, 50
combination, 109, 120, 128
combine, 93
combining, 93, 124
command, 175, 183
equipped, 47, 191
equipping, 156
equivalence, 96
Equivalency, 71
equivalent, 50, 51, 63, 71, 72, 73, 76, 77, 79, 122, 183
espoused, 93
essential, 58, 85, 87, 151, 187
essentials, 126, 128, 138, 141, 194
established, 46, 78
establishment, 13, 14, 95
estimates, 160, 174
ethical, 46, 92, 93, 97, 106, 107, 112, 124, 125, 128, 135, 140, 160, 175, 191
ethics, 90, 93, 110, 126, 129, 141, 156, 158, 162, 175, 177, 178, 194
evaluated, 66, 69, 71
evaluation, 68, 69, 74, 89, 95, 106, 108, 111, 127, 135, 137, 139, 148, 150, 151, 161, 171, 172, 177, 182, 184, 185, 189, 193
everyday, 192
evidenced, 79
exam, 59, 65, 66, 67, 69, 75, 117, 121, 122
examination, 43, 44, 65, 66, 67, 68, 69, 135
examinations, 66, 67, 68, 75, 97
examine, 74
exams, 48, 66, 67, 122
exceed, 64, 65, 70, 72
exceeding, 66, 160
excellence, 13, 46, 47, 54, 79, 84, 94, 118, 156
Excellent, 68, 73
exceptional, 66, 70
exciting, 14, 125, 176
excludes, 115, 118
executing, 150, 160
Executive, 13, 92, 118
exemplary, 78, 79
exempted, 207
exemption, 72, 74, 122
exert, 48
existing, 110, 115, 139, 174
Exit, 55
Expand, 97
expanding, 96, 125, 160, 176
expected, 65, 67, 76, 77, 85, 97, 98, 122, 140, 147, 159, 175, 191, 200
expelled, 76
experiential, 46
experiment, 159
experiments, 89, 108, 133, 140, 147, 148, 159, 167, 168, 172, 175, 185, 187, 188, 191, 200
expert, 138, 156
expertise, 94, 97, 102, 192
explaining, 68
exploration, 96, 125, 149
explore, 47, 48, 113, 175
expose, 140, 159, 201
exposed, 96
exposure, 93, 94, 96, 111, 124, 175, 176
expressing, 74
expression, 74, 86, 87
expulsion, 76
extend, 160, 177
extending, 126, 161, 193
extension, 51, 72, 187
extensive, 177, 186
external, 72, 106, 137, 185, 199
extracurricular, 48
faced, 97, 107, 108, 111, 113
facilitate, 85, 92, 135, 137, 207
facilities, 46, 47, 77, 78, 94, 169
Facilities, 38, 41, 46, 47, 160
factors, 137, 157, 199
grade, 65, 66, 67, 68, 69, 70, 71, 73, 76
graded, 71
grades, 67, 68, 69, 70, 72, 73, 115
grading, 67, 68
graduate, 13, 51, 58, 59, 72, 73, 92, 93, 95,
   97, 122, 128, 140, 141, 156, 162, 175,
   178, 191, 192, 193, 207
graduates, 47, 51, 72, 73, 93, 94, 95, 122,
   124, 128, 159, 176, 191, 192
graduation, 13, 63, 69, 70, 72, 73, 127, 140,
   159, 162, 177, 184, 193
grammar, 55, 86, 87, 135
greater, 118
grievance, 76
grounded, 92
growing, 13, 95, 125, 176
guarantee, 48, 175
guardians, 48
guidance, 95, 108
guided, 108, 118
guidelines, 51, 125, 137, 160, 199, 201
guilty, 75
handbook, 75
handbooks, 47
handle, 192
harassment, 75
hardware, 125, 138, 139, 141, 146, 149, 150,
   171, 175, 176, 185, 186, 190
harm, 75
harness, 47
having, 95
heating, 192, 202
helping, 95
higher, 13, 46, 51, 54, 55, 73, 78, 79, 88, 95,
   125, 128
highest, 46, 70, 92, 93, 95, 156
highly, 94, 115, 160
Highness, 7, 9, 11, 46

Highway, 160, 166, 169
holders, 58, 115, 159
holding, 76
holistic, 47
homework, 67
honesty, 75
Honor, 71
honors, 71
horizons, 13, 96
hosts, 160
human, 90, 96, 109, 112, 135, 137, 202
humanities, 47, 85, 125, 161, 176, 177, 192,
   207
Hydraulics, 160, 172
Hydrology, 160, 165, 168, 172
IC, 68, 69, 147
ID, 48, 62
Identification, 62, 188
identified, 75
identity, 93, 124
IEEE, 125, 148
IELTS, 117, 121
image, 47, 138, 146, 152, 153, 186
impact, 108, 125, 136, 140, 159, 174, 175,
   176, 189, 191, 198, 199
impacts, 92, 94, 125, 176, 189, 192
impart, 92, 93, 140, 148, 159
implement, 113, 125, 128, 151, 176
implementation, 113, 133, 134, 135, 137,
   139, 148, 149, 150, 152, 169, 176, 177,
   184, 188, 192, 199, 201
importance, 89, 191
improved, 118
improvement, 14, 94, 157
improving, 47, 58, 87
inactive, 66, 157
Inadvertent, 75
inappropriate, 75
males, 79
maliciously, 76
management, 92, 94, 95, 96, 97, 106, 107, 
108, 109, 110, 111, 112, 113, 114, 120, 
134, 137, 138, 146, 147, 150, 151, 152, 
169, 172, 173, 174, 184, 189
managerial, 93, 95, 108, 110, 111, 115, 118
managing, 85, 108, 112, 150
manned, 160
manner, 48, 77
manufacturability, 140, 175
manufacturing, 106, 176, 192, 193, 200, 201
marked, 75, 95
marketing, 95, 96, 97, 109, 110, 113, 114
marketplace, 46, 109
Masri, 38, 39, 79, 92, 209
MASTER, 115
mastery, 55
material, 127, 133, 134, 136, 148, 161, 169, 
171, 177, 190, 193, 199, 200, 201
materials, 75, 76, 86, 106, 107, 136, 167, 
168, 169, 170, 171, 192, 198, 200, 201, 
204
math, 54
mathematical, 58, 85, 87, 88, 136, 140, 159, 
173, 183
mathematics, 47, 85, 125, 140, 141, 157, 
161, 162, 175, 176, 178, 191, 192, 194
MATLAB, 89, 133, 176, 180, 183
maximum, 51, 63, 64, 66, 72, 115, 187
MBA, 13, 92, 115, 116, 117, 118
meaningful, 92, 94, 97, 125, 126, 161, 176, 
177, 192, 193
measurement, 55, 89, 95, 106, 108, 176, 
199, 201
mechanical, 168, 191, 192, 199, 200, 203, 
204
Mechanical, 157, 158, 191, 192, 196, 197, 
199, 201, 203, 204, 205
Mechanics, 160, 165, 167, 196, 199, 202, 
204
mechatronics, 192, 201
medical, 48, 138, 190
medically, 50
medium, 116, 134, 188
mental, 75
mentor, 95, 108
Merit, 79
microcontroller, 176, 183
microprocessor, 146, 176
millennium, 115
minimum, 50, 51, 63, 64, 65, 67, 69, 73, 77, 
81, 97, 102, 115, 117, 120, 150, 158
Ministry, 13, 46, 74, 78, 94, 117
misbehavior, 81
misinterpretation, 75
misleading, 81
missed, 65, 69
mission, 46, 47, 48, 94, 140, 156, 159, 175, 
176, 191
model, 94, 134, 135, 150, 152, 200, 202
moderate, 207
modern, 86, 111, 112, 137, 141, 146, 151, 
159, 172, 175, 184, 185, 189, 191, 201, 
202
modifications, 13, 62
module, 115, 118
monitoring, 62, 146, 169, 174, 190
monthly, 48
moral, 46, 47, 112
motivated, 115, 128
moving, 55, 171, 188, 201
multi, 138, 140, 150, 152, 159, 173, 185, 
186, 187, 188, 191, 201, 204
multidisciplinary, 127, 161, 177, 193
partially, 80
participants, 118
participate, 76, 128
participating, 122
participation, 67, 74, 89
particularly, 85, 135, 160
partner, 94
partnership, 156
partnerships, 46, 94, 110
passed, 59, 122, 127, 148, 177, 193
passing, 71, 72, 108, 136
passion, 46
passport, 50
paths, 139, 140, 146
PCs, 47, 125, 152
peer, 55
peers, 191
percentage, 67
perform, 96, 176, 189
performance, 48, 55, 59, 67, 74, 75, 78, 80, 93, 106, 111, 112, 115, 118, 122, 139, 146, 147, 150, 151, 152, 157, 169, 171, 172, 182, 183, 184, 185, 187, 190, 202, 203, 207
performed, 64
permanent, 65, 70, 76
permissible, 64, 75
permission, 65, 69
permit, 74
permitted, 63, 65, 69, 77
perseverance, 156
personal, 47, 48, 50, 95, 108, 110, 117, 118, 156
personality, 93, 124
personnel, 160
persons, 78
perspective, 106, 110, 114, 136, 140, 173, 175
pertinent, 159
petition, 51, 62, 65, 67, 70, 72
phases, 177
phenomenal, 95
philanthropy, 80
philosophy, 93, 112, 124
photos, 50
PHYS, 89, 126, 129, 130, 141, 142, 143, 148, 157, 162, 164, 178, 179, 180, 182, 183, 194, 195
physical, 75, 89, 140, 146, 149, 168, 171, 173, 175, 200, 201, 204
physics, 85, 126, 129, 138, 141, 175, 178, 194, 212
pioneers, 93
placed, 55, 70, 86, 87, 89, 90, 108, 152
placement, 50, 54, 55, 117, 122, 207
plagiarism, 75
plane, 167, 170, 192, 203
planned, 48, 200
platform, 126, 161, 177, 193
pledges, 93
pm, 47
poised, 95, 125, 176
popular, 47
population, 84, 95
portfolios, 55
portion, 67
ports, 160
possess, 175
Possess, 140
possession, 76
posted, 73
poster, 127, 161, 177, 193
posting, 73
postponed, 66
postponement, 66
potential, 48, 78, 79, 167, 199, 202, 203
practical, 66, 67, 92, 95, 110, 112, 127, 128, 
140, 147, 151, 161, 162, 169, 175, 176, 
177, 178, 184, 188, 190, 191, 193, 200
practiced, 191
practicing, 108, 191
preceeding, 63
preceptor, 95, 108
precepts, 93
precision, 86, 192, 200, 204
predicated, 93, 185
prefers, 76
prejudiced, 74
Preparation, 48
prepared, 55, 94
prerequisites, 175
presence, 95, 108
presentation, 87, 106, 113, 127, 133, 135, 
137, 138, 161, 168, 177, 193
presentations, 55, 87, 128
presented, 69, 81, 108
preserved, 71, 72
president, 48
prevents, 77
previously, 70, 122
primarily, 160, 176
primary, 78, 107
Prince, 7, 9, 11, 13, 46, 78, 79
principle, 46, 93, 113, 168, 187
principles, 85, 86, 93, 107, 109, 110, 111, 
125, 133, 134, 135, 136, 139, 140, 146, 
151, 159, 168, 169, 171, 172, 173, 174, 
176, 182, 185, 189, 199, 203
privilege, 80, 81
probability, 88, 90, 107, 151, 175, 187
Probability, 90, 103, 130, 141, 144, 165, 180, 
196
probation, 66, 70, 81
procedure, 13, 69, 77
procedures, 13, 69, 76, 106, 133, 170, 173, 
174
processing, 133, 134, 135, 137, 138, 146, 
149, 152, 174, 183, 186, 190, 192, 200, 
201, 202
Processing, 48, 144, 146, 149, 152, 153, 186, 
190
Producing, 94
production, 107, 108, 109, 148, 189, 192
productive, 46
productivity, 112, 15
profession, 125, 133, 159, 160, 176
professional, 47, 48, 54, 75, 86, 87, 93, 94, 
95, 97, 106, 107, 108, 118, 120, 124, 125, 
126, 127, 128, 135, 136, 140, 147, 148, 
159, 160, 161, 169, 175, 177, 184, 191, 
193, 200
professionalism, 92
professionally, 48
professionals, 50, 115, 124, 125, 156
proficiency, 54, 55, 58, 87, 89, 117, 157
profile, 50
progress, 48, 55, 62, 184
prohibited, 75
prominent, 95
promising, 50, 79
promote, 79, 89, 95, 109, 113
promotes, 94
Promoting, 46
Promotion, 55
promotions, 118
promptly, 67, 77
properly, 55, 75
proposed, 13, 162
proposition, 80
Proquest, 47
prospective, 127, 128, 162, 177, 193
prosperity, 95, 159
protection, 74, 139, 171, 173, 189, 192
provider, 93
providers, 125
province, 94, 95, 125, 176, 192
provision, 77, 95
provisions, 71, 171
PSPICE, 176, 182, 185
psychological, 48
publications, 48
published, 47, 71
pursue, 47, 58, 77, 78, 94, 95, 97, 115, 117, 125, 128, 161, 176, 191, 192, 207
pursued, 77
pursuit, 13, 93, 124, 191
Putting, 75
qualifications, 96, 122
qualified, 80, 94, 160
qualify, 140
qualitative, 55, 86, 89, 108, 110, 111
quantitative, 97, 108, 110, 111, 172
quizzes, 55
raising, 207
rank, 73
ranking, 117
rating, 117, 120
reach, 48
readmission, 66
readmitted, 76
realistic, 140, 175
reality, 93
Realization, 191
reapplication, 66
reapply, 66
reasoned, 74
reasoning, 85, 87, 88, 92, 138
received, 50, 74, 76
receiving, 14, 64, 74, 191
recipients, 79
recognition, 140
recognized, 51, 71, 73, 74, 93, 117, 118
recommendation, 70, 71, 76
recommendations, 71, 72, 94
recommended, 66, 75, 76
recorded, 72, 75
recreation, 47
reevaluated, 66
references, 117
referred, 76
Refine, 97
reflecting, 69
reflects, 125, 176
refrigeration, 192, 203
refund, 66, 80
refundable, 50
refunded, 77
refunds, 78
regional, 107, 108, 125, 140, 175, 176, 191
register, 51, 62, 63, 72, 73, 151
registered, 48, 62, 63, 64, 65, 69, 71, 72, 77
registrar, 68
registration, 51, 62, 76, 77
Regularly, 64
regulation, 75
regulations, 13, 15, 75, 111, 174
reinforce, 55, 109, 134, 168
Reinforcement, 93, 124
related, 48, 87, 89, 94, 96, 98, 106, 107, 109, 112, 114, 125, 133, 157, 175, 184, 192
relationship, 85, 112, 135, 150, 159, 167, 198
relaxed, 63
release, 77
scholarships, 13, 78, 79, 80
scholastic, 71, 79, 80
scientific, 58, 59, 85, 138, 159
scientists, 125
scope, 125, 176
seamless, 58
search, 47, 135, 137, 138, 150, 174
secondary, 75, 78
sector, 94, 95, 172, 191
sectors, 46, 94, 95, 115, 118, 128
seek, 92, 93
seeks, 50, 58, 74, 93, 95, 148, 156, 201
segment, 95
select, 96, 98, 184
selected, 50, 79, 86, 89, 106, 138, 151, 157, 169, 185, 200, 205
semester, 47, 50, 51, 54, 55, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 77, 178, 184, 193, 207
semesters, 43, 51, 55, 58, 59, 62, 63, 66, 70, 71, 72, 73, 77, 79, 115, 116, 118, 207
seminar, 118
senior, 94, 112, 158, 162, 177, 178, 184, 193, 194, 201
sensitive, 48, 189
sensitivity, 118
separation, 70, 133, 187, 202
served, 46, 134
servers, 125, 152
session, 51, 62, 63, 64, 72, 73
sessions, 43, 47, 51, 73, 86
setting, 54
settings, 115, 175
sewage, 160
shapes, 46
shared, 14, 136, 161, 177
sharpen, 118
shortly, 70
shown, 158, 207
siblings, 80
signature, 64
signatures, 63, 65, 151
signed, 67, 71
significant, 86, 95, 136, 151, 177
Similarly, 95
simulation, 86, 109, 148, 149, 150, 172, 173, 176, 182, 185, 186, 202
simulations, 118, 183, 199, 201
simultaneously, 64, 93
sitting, 65
Situated, 95
situations, 75, 112, 114, 192
skill, 86, 92, 112, 148
skills, 13, 46, 47, 54, 55, 58, 84, 85, 86, 87, 89, 92, 93, 94, 95, 96, 97, 98, 107, 108, 113, 115, 118, 124, 125, 126, 127, 128, 140, 141, 156, 157, 159, 160, 161, 162, 175, 176, 177, 178, 182, 190, 191, 192, 193, 199, 207
skipped, 76
smoking, 75
smoothly, 128
societal, 140, 191
software, 109, 125, 135, 136, 137, 141, 146, 147, 149, 150, 151, 175, 176, 185, 186, 190
soil, 160, 171
solution, 67, 86, 88, 126, 161, 170, 177, 193, 203
solutions, 86, 88, 95, 97, 108, 110, 125, 128, 140, 159, 160, 175, 191
solve, 58, 112, 124, 140, 159, 175, 191, 202
solvers, 85
solving, 85, 88, 94, 118, 127, 133, 149, 159, 161, 177, 193, 199
sought, 58, 59
Tabuk, 9, 11, 13, 15, 46, 93, 94, 95, 115, 125, 161, 176, 192
tailored, 115
taken, 62, 63, 66, 71, 72, 73, 75, 109, 122
talent, 93
talented, 48
talents, 48
tallying, 69
tardiness, 65
target, 95
targets, 55
tasks, 96, 150, 160, 184, 186

teamwork, 118, 127, 136, 156, 159, 161, 175, 177, 193
technical, 13, 46, 58, 59, 93, 95, 97, 122, 126, 128, 129, 137, 140, 141, 157, 161, 162, 170, 175, 177, 178, 191, 192, 194, 207

technological, 125, 189

technology, 47, 112, 113, 114, 128, 135, 140, 156, 175
telecommunications, 125
tempered, 93
tentative, 48
termination, 63
testing, 106, 107, 127, 135, 137, 147, 148, 149, 150, 151, 167, 168, 177, 183, 186, 187, 193, 199
text, 47, 134, 135, 137

Thanauia, 78

theft, 76

theoretical, 92, 128, 151, 172, 175, 203
theories, 85, 108, 112, 135, 174, 199, 204


thinkers, 85, 124

thinking, 85, 93, 124, 126, 140, 161, 177, 191, 192

thorough, 113, 157, 175

threaten, 74
timely, 78
titles, 47

TOEFL, 117
tolerance, 47, 186, 198
tolerated, 65
tools, 95, 97, 107, 108, 110, 113, 125, 133, 134, 135, 140, 141, 146, 147, 150, 159, 169, 173, 175, 186, 189, 190, 191, 199, 200, 201, 202
topic, 87, 127, 138, 169, 177, 185, 193, 205
topics, 71, 109, 110, 112, 113, 133, 135, 146, 147, 149, 151, 152, 167, 171, 172, 184, 185, 186, 187
totally, 47

track, 89, 97, 107, 126, 152

tracks, 99

tracts, 207

traditional, 55, 96, 113, 159, 199

trained, 48, 86, 160

training, 86, 87, 94, 95, 127, 135, 136, 137, 147, 162, 169, 175, 177, 178, 184, 188, 193, 200, 201

transcript, 65, 70, 73, 74, 76, 98

transcripts, 72, 77

transfer, 51, 71, 72, 73, 118, 161, 177, 183, 200, 202

transferred, 71, 72, 207

transferring, 51, 71, 72, 73

transitional, 126, 161, 177, 193
writing, 48, 55, 67, 74, 75, 76, 77, 86, 87, 89,
126, 128, 129, 141, 157, 161, 162, 177,
178, 192, 194