جامعة الفيصل
Alfaisal University

Undergraduate Catalog

2016-2017

Student Affairs Deanship

26 April 2017

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Chairman's Message

A word from HRH Prince Khalid Al Faisal bin Abdulaziz

Within the framework of its caring for human development, which is the most important basic factor in total development, King Faisal Foundation extends its projects in serving education through King Faisal Schools, Prince Sultan College of Tourism and Management, Effat College, in addition to Scholarship Programs. Today it presents Alfaisal University as a contemporary Arab academic university that has international scientific affiliations with similar institutions. Alfaisal uses its expertise to develop educational techniques and provide appropriate mechanisms to mobilize the wisdom of the Creator of the human mind's abilities in order to innovate and upgrade life.

It is obvious that the main handicap that retards Arab societies, in general, is the low quality of education and the inability of its prevailing systems and means – such as prompting and keeping by heart – to qualify humans to be able to advance a society pursuant to a scientific rule that adopts contemporary means and technology, and to fulfill the urgent need for training the educated on thinking so as to reach the right decision.

It is illogical to confine the mission of upgrading education to the State alone. It is unfair to the State and to the investment in the human element that serves society as a whole. All of society must stand shoulder to shoulder to carry out this mission.

Therefore, the aim of this University is to provide the student with the educational level he seeks abroad, to be an example for voluntary work which the private sector can contribute to the development of our homeland, and, at the same time, to employ its abilities and research centers to serve society, and to build bridges to the most advanced international sites in educational techniques and tools.

President’s Message

Greetings from Alfaisal University,
I am very proud to be president of Alfaisal University, an institution increasingly recognized as one of the best in Saudi Arabia.

Since its founding by the King Faisal Foundation in 2002 as one of the first private nonprofit, research and student-centered universities in the Kingdom, Alfaisal University has been advancing at a confident and sustainable pace to serve the community as a quality education provider in Saudi Arabia. The University has strong relationships with international and local universities, business communities and works closely with organizations to stay at the forefront of advanced pedagogical practices. Alfaisal University capitalizes on these relationships for the benefit of its students. Research, as well as recent trends, indicates that we must move from theory-based curricula to task-based curricula, allowing students to be exposed to the most up-to-date practices.
English is the language of instruction in our four colleges: Business, Engineering, Science, and Medicine. Each offers world-class undergraduate and graduate programs for the finest male and female students in the Kingdom and the Region. Located in the heart of Riyadh, the center for commerce, industry, and research, with our solid reputation and affiliations with leading hospitals and ample access to our faculty, more students are looking to launch their medical career at Alfaisal University. Alfaisal offers its students the opportunity to develop their full potential with outstanding facilities, inspiring academics and research-led teaching that will enable them to graduate as highly skilled, well-developed individuals able to transition seamlessly into the workplace.

Alfaisal University is a highly diverse and welcoming community with a beautiful campus. Big enough to have an international presence and impact, yet small enough that students are able to develop a strong sense of community with lifelong connections to friends and mentors.

Alfaisal University's rise to prominence has been the result of many factors: the contributions of talented and dedicated faculty; the energy, enthusiasm, and inventiveness of graduate and undergraduate students; the dedication and support of excellent staff; the passion of our founders to make a difference in the Kingdom and the world; and the support of our donors and partners.

I invite you to explore what Alfaisal has to offer you through our website and to discover what sets us apart from other fine universities.

I believe you'll be impressed by what our University has achieved so far, and as confident as I am in its potential to accomplish even more great things in the near future.

Your prescription for success begins at Alfaisal.

Sincerely,

Mohammed Alhayaza
President, Alfaisal University

USING THE CATALOG

The statements in this catalog are for informational purposes only and should not be construed as the basis of a contract between a student and Alfaisal University. The course offerings and requirements of the University are continually under review and revision. This catalog presents those in effect at the time of publication. Courses listed in this publication are subject to revision without advance notice and are not necessarily offered each term or each year. Information regarding changes will be available in the Offices of Admissions, the Provost, the colleges, and major departments. It is especially important that each student note that it is his or her responsibility to be aware of current graduation requirements for a particular degree program.

Academic Terminology

Academic Affairs One of the four major divisions of the University, headed by the Vice President and Provost, that focuses on educational needs of students.

Academic Good Standing A minimum cumulative grade point average of 2.00, which is required for continued enrollment in the University.

Academic Year The period of time commencing with the fall semester (16 weeks + final exams) and continuing through the spring semester (16 weeks + final exams) and summer term (8 weeks).

Alumni Individuals who have attended or graduated from a particular college or university.

Board of Trustees The governing body for Alfaisal University.

Co-requisite indicates a course that you must have satisfactorily enrolled in at the same time as the listed course.

Credit Hour A standard unit of measuring course work; credit hours are assigned to a particular course and count toward graduation, except in remedial courses. Typically a course that meets for three hours a week is worth three credit hours.

Cross-listed Course offered by more than one department, but treated as one course for credit purposes.

Curriculum A program of study covering the entire undergraduate or graduate career and designed to satisfy the requirement for a degree.

Dean The highest administrative officer of a college.

Department Chairperson An administrative officer holding faculty rank; responsible for the primary unit of academic organization.

General Education Requirement Student must take foundation courses in general subjects to obtain a baccalaureate degree.

Grade Point Average (GPA) The total number of grade points divided by the total graded semester hours attempted at Alfaisal University.

Independent Study Intensive study in a special area of the student's interest under the direction of a faculty member. Each individual investigation is to culminate in a comprehensive written report and/or examination and/or artistic project. A maximum of 3 semester hours may be applied toward graduation.

Prerequisite indicates a course that you must have satisfactorily completed before enrolling in the course.

Professional Practice Professional Practice consists of academic/career related work experiences completed for credit either on campus or at a place of business. They may or may not be salaried.

Provost The Vice President for Academic Affairs who is responsible for all academic matters.

Recommendation knowledge, skills, and the completion of courses and other requirements that may assist in a course, but are not required, are recommendations.

Registrar An academic unit that maintains academic records, awards transfer credit, and provides enrollment verification, transcripts and course registration.

Requirement a mandatory criterion for enrolment in a course. For example, grade of C or higher in a beginning algebra course might be a requirement for a course.

Semester A semester at Alfaisal University is the 14-16-week offered each fall and spring.

Seminar A regular meeting of students, under the guidance of a faculty member, in which each conducts research and exchanges information, problems, and results through informal lectures, reports, and discussion.

Student Affairs One of the four major divisions of the University, headed by the Dean of Admission & Registration, Student Affairs that focuses on personal and nonacademic needs of students.

Syllabus A document describing the objectives, outcomes, assessment activities, and structure of a course.

Transcript The University's official record of credit or degrees awarded, including the courses taken by a student and the grades received in each course.

Programs and Course Explanations

UNITS OF INSTRUCTION

Major: A cohesive combination of courses, including introductory, intermediate, and advanced course work that designates a student's primary area of specialization. Majors are designated on university transcripts.

Minor: A combination of courses designed to provide a cohesive introduction to an area of study beyond the major. Minors are designated on university transcripts upon receipt of degree.

Concentration: A subdivision of a major without specific requirements that is provided for advisement only. Concentrations are not designated on university transcripts. All informal curricular recommendations made by departments and schools (such as emphases, tracks, areas of study,

specializations, etc.) should be considered concentrations. Concentrations are advisory only; no approval process is required.

COURSE OFFERINGS

Independent Study: Intensive study in a special area of the student's interest under the direction of a qualified member of the faculty. Each individual investigation is to culminate in a comprehensive written report and/or examination and/or artistic project. A maximum of six semester hours may be applied toward graduation.

Seminar: A regular meeting of students, under the guidance of a faculty member, in which each conducts research and exchanges information, problems, and results through informal lectures, reports, and discussion.

COURSE INFORMATION

The University operates on the semester plan. The credit value of all courses is stated in terms of semester hours. Ordinarily, a semester hour is assigned for a 50- minute class meeting per week for the semester; therefore, a course valued at three semester hours generally meets three periods weekly. In laboratory courses, at least two 50-minute periods per week are ordinarily required for each semester hour of credit.
Course Availability: Some courses listed in the *Undergraduate Catalog* may not be available each year. Students should consult the major department or school or the University website at http://www.alfaisal.edu/ for class availability. Questions concerning scheduling of courses should be referred to the department chairperson or college Dean.

Course prerequisites in effect at the time of publication are printed in this catalog. However, prerequisites may change over time and do not depend on catalog year. The registration system

COURSE NUMBERING

Each course bears a distinguishing number for identification and indication of its academic level. The numbering system is as follows:

100-199 Lower-division undergraduate courses, primarily for freshmen and sophomores.

200-299 Upper-division undergraduate courses, primarily for juniors and seniors. A student normally should have completed at least 45 semester hours before enrolling in a course at this level at the time of registration.

300-399 Advanced undergraduate courses. Open to juniors, seniors, and sometimes graduate students. A student normally should have completed at least 75 semester hours before enrolling in a course at this level.

400-499 Advanced undergraduate courses. Open to juniors, seniors, and sometimes graduate students. A student normally should have completed at least 75 semester hours before enrolling in a course at this level.

COURSE DESCRIPTIONS

The following information is given for each course: course number (three or five digits preceding the title); course title; and credit value in semester hours. The University may cancel or add course offerings

after publication of this *Undergraduate Catalog* depending upon the adequacy of enrollment and availability of faculty. Following the above information, any prerequisites, restrictions on enrollment, and any special considerations are noted. A course prerequisite is knowledge or experience a student is required or recommended to have prior to enrolling in a course.

Sample Course Listing

ME 421 Renewable Energy Systems

Cr Hr:3 Pre-requisites: ME 307

Co-requisites: none

The course gives an overview of renewable energy sources including biomass, hydroelectricity, geothermal, tidal, wave, wind and solar power. And it also presents the fundamentals of different renewable energy systems with a main focus on technologies with high development potential. Furthermore, it integrates math, engineering, climate studies and economics, and enabling students to gain a broad understanding of renewable energy technologies and their potential.

Prerequisites: ME 307 or **Thermal Fluids Engineering II**. The course number, "421," indicates that the course is primarily for senior. The "3 sem. hrs." following the title, indicates the credit value in semester hours. A brief description of the course is provided in the paragraph following the semester hours. The information after "Prerequisites" indicates the required background for enrolling in the course. In the example given, a student must have passed ME 307 or **Thermal Fluids Engineering II** prior to enrollment in ME 421. Course title revisions or a change in the course number are indicated by a "formerly" statement. Additional information about the course is available in the particular departmental or college office.

COLLEGES AND DEPARTMENTAL ABBREVIATIONS

The following abbreviations for departmental and college offerings are used both in the program requirement descriptions and in the course descriptions throughout the *Undergraduate Catalog*.

Course Code	Course Title
ACC	Accounting
AMB	Ambulatory Care
ANT	Anthropology
ARB	Arabic
ARE	Architecture
BEP	Basics of Biostatistics & Epidemiology
BHS	Behavior Science
BIO	Biology
CHM	Chemistry
COM	Primary Health Care & Rural Health
CVC	Cardiovascular Block

ECO	Economics
EE	Electrical Engineering
END	Endocrine Block
ENG	English
FIN	Finance
FMT	Forensic Medicine & Toxicology
FRE	French
GEN	Genetics
GER	Germany
GIT	Gastrointestinal Block
GYN	Obstetrics & Gynecology
HEM	Hem/Onc Block
HEN	Health economics and Hospital management
HIS	History
HLS	Hematopoietic & Lymphatic System
HNS	Head & Neck And Special Senses Block
HRM	Human Resources
IE	Industrial Engineering
IMD	Sub-Specialty Medicine
INS	Integrated Neuroscience
INT	Introductory Block
ISL	Islamic Studies
LST	Life Science
MAT	Mathematics
ME	Mechanical Engineering
MED	Medicine
MGT	Management
MIF	Medical Informatics
MKT	Marketing
MOL	Molecular Medicine
MSK	Musculoskeletal Block
NEU	Neuroscience Block
NTN	Nutrition
PED	Pediatrics
PHL	Philosophy
PHU	Physics
PMT	Project Management
POD	Pathogenesis of Diseases
POL	Political Science
PRO	Communications Skills
PSY	Psychology
RAD	Radiology
REN	Renal Block

REP	Reproductive Block
RES	Respiratory Block
SCI	Immunology
SE	Software Engineering
SKN	Skin Block
SPN	Spanish
SSP	Surgical Sub-Specialty
STA	Statistics
STS	Science, Technology, and Society
SUR	Surgery
TRM	Trauma

ABOUT ALFAISAL UNIVERSITY

ABOUT ALFAISAL

Alfaisal University was founded by the highly reputed King Faisal Foundation in 2002 as one of the first Private Non-Profit, research and teaching universities in the Kingdom committed to achieving international standards of excellence. It has the support of national and international co-founders and distinguished Board Members that have continually supported the university in its mission to remain a student –centered institution committed to research.

Alfaisal University is made up of four faculties, spanning from Business, Engineering, Medicine, Science and General Studies offering world-class marketable undergraduate and graduate programs to the finest male and female students in the Kingdom and the Region. Located in the heart of Riyadh, the center for commerce, industry and research, Alfaisal offers its students opportunities to develop their full potential with outstanding facilities, inspirational academics and research-led teaching that will enable our students to leave us as highly skilled, well-developed individuals able to make the transition into the workplace easily.

ALFAISAL UNIVERSITY VISSION STATEMET

Alfaisal University is a private non-profit institution which aspires to be a world-class research university committed to the creation, dissemination and application of knowledge in the fields of business, engineering, life sciences and medicine, and to the development of knowledge-based economies

ALFAISAL UNIVERSITY MISSION STATEMENT

Alfaisal University is a student-centered university which creates and disseminates knowledge through world-class undergraduate and graduate education programs, research and service that benefit the Kingdom of Saudi Arabia, the region and the world, and stimulate the development of knowledge-based economies.

ACCREDITATION

Alfaisal has received its initial accreditation from the Saudi Ministry of Education (MoE). Full accreditation will be conferred with the 1st graduating class. As with MoE, our programs will receive accreditation with our 1st graduating class. Our programs are designed and will be implemented with the practices and elements deemed essential for accreditation by the international professional organizations that grant accreditation. The Engineering programs will be accredited by ABET, the American Board of Engineering and Technology. Our Business programs will be accredited by AACSB, The Association to Advance Collegiate Schools of Business. The Medical and Science programs will be in line with the licensure exams of Canada and the United States.

GOVERNANCE

The University Council is the major internal governance body of the University. The Council acts in legislative and advisory roles with regard to University policies involving faculty and students, academic programs and planning, and University concerns.

UNDERGRADUATE MAJORS IN ALFAISAL

College of Business

Bachelor of Business (Business Administration with following Concentrations:

Accounting

Finance

Marketing

Human Resources

Project Management

College of Engineering

Bachelor of Architectural Engineering

Bachelor of Electrical Engineering

Bachelor of Industrial Engineering

Bachelor of in Mechanical Engineering

Bachelor of Software Engineering

College of Medicine

A six year program leading to an MBBS degree (Medical Bachelor and Bachelor of Surgery)

College of Science & General Studies

Bachelor of Science (B.Sc.) degree in Life Sciences

College of Pharmacy

Bachelor of Pharmacy degree (Pharm.D.),

ACADEMIC POLICIES AND PRACTICES

Admission Policies

Alfaisal University maintains a small university environment and values personal attention for every student, and our commitment to individuals ensures that admissions representatives will review every application carefully.

Alfaisal University seeks a highly motivated, academically well-prepared, and diverse student body. Admission to the University is competitive. Applying early is encouraged as the University has the right to limit enrollment due to space availability in major programs and overall student capacity. Please refer to the Admissions website for more information and detailed dates and deadlines. All prospective new students should apply for admission to Alfaisal University at http://admissions.alfaisal.edu/

VISIT AND CONTACT INFORMATION

The Office of Admissions encourages students and families to visit campus. Campus Information Sessions, Open Houses and appointments with an Admission Counselor are available.
For more information or to make a visit reservation, visit the Office of Admissions website or contact the Admissions Office.

Prospective students may contact the Office of Admissions through a variety of sources.

Office of Admissions
Alfaisal University
P.O. Box 50927
Riyadh 11533
Kingdom of Saudi Arabia
TOLL FREE: 920000570
Website http://admissions.alfaisal.edu/index.html

STUDENT RIGHTS AND RESPONSIBILITIES

Student Rights

Students at the University have the same rights and protections that are included in the constitution of the Kingdom of Saudi Arabia as citizens or non-citizens. In addition, students must adhere to the rules and regulations issued by the Ministry of Education (MoE):

1. Students have the right to be treated fairly and with dignity regardless of age, color, creed, disability, marital status, national origin or ancestry, race, religion or sex.
2. The teacher-student relationship within the classroom is confidential, and disclosure of a student's personal or political beliefs expressed in connection with coursework will not be made public without

explicit permission of the student. It is understood that the teacher may undertake the usual evaluation of knowledge and academic performance.

3. Students' records may be released to or examined by persons outside the University only upon request of the student or through compliance with applicable laws.
4. Students are free, individually or in association with other individuals, to engage in all campus activities as long as they do not in any way purport to represent the University.
5. Students are free to use campus facilities for meetings of student-chartered campus organizations, subject to regulations as to time and manner governing the facility.
6. Students may invite and hear speakers of their choice on subjects of their choice and approval will not be withheld by University officers for the purpose of censorship.
7. Students will have their views and welfare considered in the formation of the University policy and will be consulted by or may be represented on University committees that affect students as members of the University community on a case by case basis.
8. Individual's religious and spiritual beliefs are respected.
9. Students have freedom of research, of legitimate classroom discussion, and of the advocacy of opinions alternative to those presented in the classroom.
10. Students will be evaluated on knowledge and academic performance for purposes of granting academic credit and not on the basis of personal or political beliefs.
11. Students will be free from censorship in the publication and dissemination of their views as long as these are not represented as the views of Alfaisal University.
12. Students' publications are free from any official action controlling editorial policy. Publications shall not bear the name of the University or purport to issue from it without University approval.
13. Students are free, in abidance with University's regulations to form/join/participate in any group of intellectual, organizational, religious, social, economic, political, or cultural purposes.

Student Responsibilities

1. Remaining a member of Alfaisal community requires students to comply continuously with rules and regulations governing student's academic progress, social interactions and personal behavior.
2. Students must avoid and not get involved in any form of academic misconduct such as: cheating, plagiarism and other misappropriation of the work of another, falsification of data, improperly obtaining or representing laboratory or field data, dishonesty in publication, publication or attempted publication of collaborative work without the permission of the other participants, abuse of confidentiality, misuse of computer facilities, misuse of human subjects, illegally or carelessly obtaining or using dangerous substances or providing such substances to others, falsification or unauthorized modification of an academic record, obstruction of the academic activities of another, aiding or abetting academic misconduct, attempted academic misconduct.
3. Students must be on a level of courtesy, civility and consideration that prevents them from any form of personal misconduct. They are expected to adhere to ethical standards in a variety of work places (e.g. classrooms, laboratories) within the explicit standards set by the University. Being physically or verbally threatening, disruptive, abusive or hostile can make the workplace so unsafe or unpleasant that others cannot do their work.
4. Student must always present his/her Alfaisal Id at exams time
5. Students must not misuse or damage any of the University facilities and they should behave properly in the public areas inside campus.
6. Students will be exempt from disciplinary action or dismissal from the University except for academic failure, failure to pay a University debt or a violation of a student or University rule or regulation. Rules and regulations shall be fully and clearly promulgated in advance of the supposed

violation. The University has no legal authority over a student when outside University property, except where the student is on the property of a University-affiliated institution, where the student is engaged in a project, seminar, or class for academic credit or as otherwise provided in the University rules, regulations and procedure or on property that falls within the jurisdiction of University authority.

7. By the end of their final year of academic study, students should meet professional and legal practice requirements. They must value intellectual engagement, research-based practices and life-long learning.
8. Regular and punctual attendance is required of all students for all classes, labs, seminars and/or clinical experiences. A student who is constantly late and/or absent from classes, seminars and/or labs may be unable to meet the course requirements and may not be able to receive a credit for the course.
9. The use of cell phones or other electronic messaging devices during class or lab is not permitted. Text massaging or e-mailing in class is prohibited.
10. It is recognized that every member of the community has the responsibility to conduct him or herself in a manner that does not violate the rights and freedoms of others.
11. A student or group of students cannot organize events inside Alfaisal University campus without written approval from Student Affairs Deanship (SA). In case there is an event/activity to be conducted inside University's campus, SA personal must be notified in writing at least one week ahead of event/activity date and specified form(s) must be filled out and approved before proceeding in event/activity.
12. Also, a student or group of students cannot initiate and hold an event/activity outside campus by the name of Alfaisal University without having written approval from SA.
13. Segregation policy is applied on all the campus, male and female students are not permitted to gather in one place.

ADMISSION CLASSIFICATIONS

Admission General Information

1. Complete the online Admission Application Form, you need to sign up for a new account using a valid email address so you can be able to complete the process. All notifications will be communicated via email messages.
2. If all the requirements are completed, an e-mail will be sent to the student within 3 working days.
3. For college of Medicine prospected students, once all requirements are completed, an interview will be arranged and then the student should expect a reply within a week.
4. For other colleges apart from medicine, if all requirements are completed, an e-mail will be sent to the students within 3 working days.
5. If the requirements are not completed, then the student will be notified and will be given 2 weeks to complete all missing requirements before he/she got the final reply about the admission results.
6. Credit transfer must be approved initially by the prospective college in Alfaisal University, to which the student is joining & the total number of accepted credit hours must not exceed 48 Credit Hours.

In general, there are two types of admission in Alfaisal University; Direct Admission and Indirect Admission (University Preparatory Program - UPP)

Entry requirements are subject to change. Kindly, refer to admission website for current requirements.

DIRECT ADMISSION

Entry Requirements for Direct Admission for Saudi Curriculum

Students excellent in educational attainment and English proficiency can join the university directly and skip the UPP in accordance with the following criteria:

Direct Admission Criteria for Saudi Curriculum				
Certificate Type	**Entry Requirements Score**			
	Business	**Engineering**	**Science**	**Medicine**
High School	90/100	90/100	90/100	98/100
Qudurat	75/100	75/100	75/100	85/100
Tahseely	--	75/100	75/100	85/100
English Language Proficiency Test (One of)				
TOEFL IBT	61	61	61	79
OOPT	B2	B2	B2	C1
IELTS	6.0	6.0	6.0	6.5
Personal/(Technical) Interview	--	--	--	Pass

The University offers an English placement test.

Entry Requirements for Direct Admission for American Curriculum

Students excellent in educational attainment and English proficiency can join the university directly and skip the UPP in accordance with the following criteria:

Direct Admission Criteria for American Curriculum				
Certificate Type	**Entry Requirements Score**			
	Business	**Engineering**	**Science**	**Medicine**
High School	90/100	90/100	90/100	98/100
SAT I Test (before 2016)	1400/2400	1400/2400	1400/2400	1600/2400
SAT I Test (After 2016)	1000/1600	1000/1600	1000/1600	1200/1600
****SAT II ((In Two Subjects Related to Selected Major)**	--	450/800	400/800	650/800
English Language Proficiency Test (One of)				
TOEFL IBT	61	61	61	79
OOPT	B2	B2	B2	C1
IELTS	6.0	6.0	6.0	6.5
Personal/(Technical) Interview	--	--	--	Pass

Accepted SAT II Subjects Are: Biology, Chemistry, Physics, and Math II

The University offers an English placement test.

Entry Requirements for Direct Admission for British Curriculum

Students excellent in educational attainment and English proficiency can join the university directly and skip the UPP in accordance with the following criteria:

Direct Admission Criteria for British Curriculum				
Certificate Type	**Entry Requirements Score**			
	Business	**Engineering**	**Science**	**Medicine**
High School	**Applicant should obtain a 12th grade report card**			
Two Subjects in A2 Level Related to Selected Major	Not Required	Not Required	Not Required	A,A
Two Subjects in AS Level Related to Selected Major	B,B	B,B	B,B	A,A
Four Subjects in GCSE Level Related to Selected Major	A,A,BB	A,A,B,B	A,A,B,B	A,A,A,B
English Language Proficiency Test (One of)				
TOEFL IBT	61	61	61	79
OOPT	B2	B2	B2	C1
IELTS	6.0	6.0	6.0	6.5
Personal/(Technical) Interview	--	--	--	Pass

The University offers an English placement test.

Entry Requirements for Direct Admission for International Baccalaureate Curriculum

Students excellent in educational attainment and English proficiency can join the university directly and skip the UPP in accordance with the following criteria:

Direct Admission Criteria for International Baccalaureate Curriculum				
Certificate Type	**Entry Requirements Score**			
	Business	**Engineering**	**Science**	**Medicine**
High School	**Applicant should obtain a 12th grade report card**			
IB High Level (HL) in Three Subjects Related to Selected Major	4-4-4	4-4-4	4-4-4	5-6-6
IB Diploma Total	26	26	26	30
English Language Proficiency Test (One of)				
TOEFL IBT	61	61	61	79
OOPT	B2	B2	B2	C1
IELTS	6.0	6.0	6.0	6.5
Personal/(Technical) Interview	--	--	--	Pass

The University offers an English placement test.
**Qudrat and Tahsely grades are accepted as explicit in the Saudi system.

Entry Requirements for Direct Admission for Other Curriculum:

Direct Admission Criteria for other international system Curriculum				
Students from other international system Curriculum can take any of the above listed system entrance exams or submit their high school transcripts after the authentication by the Saudi Ministry of Education. Students will be evaluated based on their high school performance and interviews by perspective colleges. Students must also meet all the English requirements as specified below.				
Other international systems	**Entry Requirements Score**			
	Business	**Engineering**	**Science**	**Medicine**
English Language Proficiency Test (One of)				
TOEFL IBT	61	61	61	79
OOPT	B2	B2	B2	C1
IELTS	6.0	6.0	6.0	6.5
Personal/(Technical) Interview	--	--	--	Pass

Entry requirements are subject to change. Kindly, refer to admission website for current requirements.

Direct Admission (University Preparatory Program - UPP)
Entry Requirements for Indirect Admission (University Preparatory Program - UPP) Admission for Saudi Curriculum

Students who did not meet direct admission requirements can join UPP at Alfaisal University. This program will enable students to improve English language proficiency and academic skills. Students who successfully finish UPP will join Alfaisal University. To be accepted in UPP, a student needs to achieve the following criteria:

UPP Admission Criteria for Saudi Curriculum					
Certificate Type	**Entry Requirements Score**				
	Business	**Engineering**	**Science**	**Medicine**	**pharmacy**
High School	85/100	85/100	85/100	90/100	85/100
Qudurat	70/100	70	70	80/100	75
Tahseely	--	70	70	80/100	75
English Language Proficiency Test (One of)					
TOEFL IBT	45	45	45	45	45
OOPT	B1	B1	B1	B1	B1
IELTS	5.0	5.0	5.0	5.0	5.0
Personal/(Technical) Interview	--	--	--	Pass	--

*Applicants who do not have TOEFL or IELTS can sit for an English proficiency test offered at Alfaisal University once they apply.

Entry Requirements for Indirect Admission (University Preparatory Program - UPP) Admission for American Curriculum

Students who did not meet direct admission requirements can join UPP at Alfaisal University. This program will enable students to improve English language proficiency and academic skills. Students who successfully finish UPP will join Alfaisal University. To get accepted in UPP, a student needs to achieve the following criteria:

UPP Admission Criteria for American Curriculum					
Certificate Type	**Entry Requirements Score**				
	Business	**Engineering**	**Science**	**Medicine**	**pharmacy**
High School	85/100	85/100	85/100	90/100	85/100
SAT I Test (before 2016)	1200/2400	1200/2400	1200/2400	1400/2400	1300/2400
SAT I Test (After 2016)	800/1600	800/1600	800/1600	1000/1600	900/1600
****SAT II (In Two Subjects Related to Selected Major)**	--			550/800	500/800
English Language Proficiency Test (One of)					
TOEFL IBT	45	45	45	45	45
OOPT	B1	B1	B1	B1	B1
IELTS	5.0	5.0	5.0	5.0	5.0
Personal/(Technical) Interview	--	--	--	Pass	--

Accepted SAT II Subjects Are: Biology, Chemistry, Physics, and Math II
The University offers an English placement test.

Entry Requirements for Indirect Admission (University Preparatory Program - UPP) Admission for British Curriculum

Students who did not meet direct admission requirements can join UPP at Alfaisal University. This program will enable students to improve English language proficiency and academic skills. Students who successfully finish UPP will join Alfaisal University. To be accepted in UPP, a student needs to achieve the following criteria:

UPP Admission Criteria for British Curriculum					
Certificate Type	**Entry Requirements Score**				
	Business	**Engineering**	**Science**	**Medicine**	**pharmacy**
High School	**Applicant should obtain a 12th grade report card**				
Two Subjects in A2 Level Related to Selected Major	Not Required	Not Required	Not Required	B,B	Not Required
Two Subjects in AS Level Related to Selected Major	B,B	B,B	B,B	A,B	B,B
Four Subjects in GCSE Level Related to Selected Major	B,B	B,B	B,B	B,B	B,B
English Language Proficiency Test (One of)					
TOEFL IBT	45	45	45	45	45
OOPT	B1	B1	B1	B1	B1
IELTS	5.0	5.0	5.0	5.0	5.0
Personal/(Technical) Interview	--	--	--	Pass	--

The University offers an English placement test.

Entry Requirements for Indirect Admission (University Preparatory Program - UPP) Admission for the International Baccalaureate Curriculum

Students who did not meet direct admission requirements can join UPP at Alfaisal University. This program will enable students to improve English language proficiency and academic skills. Students who successfully finish UPP will join Alfaisal University. To get accepted in UPP, a student needs to achieve the following criteria:

UPP Admission Criteria for International Baccalaureate Curriculum					
Certificate Type	**Entry Requirements Score**				
	Business	**Engineering**	**Science**	**Medicine**	**pharmacy**
High School	**Applicant should obtain a 12th grade report card**				
IB High Level (HL) in Three Subjects Related to Selected Major	3,3,4	3,3,4	3,3,4	5,4,4	3,4,4
IB Diploma Total	24	24	24	26	24
English Language Proficiency Test (One of)					
TOEFL IBT	45	45	45	45	45
OOPT	B1	B1	B1	B1	B1
IELTS	5.0	5.0	5.0	5.0	5.0
Personal/(Technical) Interview	--	--	--	Pass	--

The University offers an English placement test.
**Qudrat and Tahsely grades are accepted as explicit in the Saudi system.

Entry Requirements for Indirect Admission (University Preparatory Program - UPP) Admission for Other Curriculum

UPP Admission Criteria for other international system Curriculum					
Students from other international system Curriculum can take any of the above listed system entrance exams or submit their high school transcripts after the authentication by the Saudi Ministry of Education. Students will be evaluated based on their high school performance and interviews by perspective colleges. Students must also meet all the English requirements as specified below.					
Other international systems	**Entry Requirements Score**				
	Business	**Engineering**	**Science**	**Medicine**	**pharmacy**
English Language Proficiency Test (One of)					
TOEFL IBT	45	45	45	45	45
OOPT	B1	B1	B1	B1	B1
IELTS	5.0	5.0	5.0	5.0	5.0
Personal/(Technical) Interview	--	--	--	Pass	--

The University offers an English placement test.

Transfer Students

Alfaisal University welcomes students who want to transfer from other colleges and universities. Transfer students who would like to join Alfaisal University should provide the following:

• Studied at recognized university or college in or out of the Kingdom.
• Meet the admission criteria of UPP.
• Submit original transcript(s).
• GPA should be 3/4 or 4/5 for Business, Engineering, and Science. For Medicine, GPA should be 3.5/4 or 4.5/5.
• Pass interview for College of Medicine.
• Get approved by Admission Committee.

Credits Transfers must be approved initially by the prospective college in Alfaisal University, to which the student is joining and the total number of Credit Hours must not exceed 48 credit hours. The process of credit transfer will begin after acceptance to the college.

Please Note:

* Students transferring to College of Medicine will not be allowed to transfer credits.
* Preparatory Year and Diploma courses will not be transferred to Alfaisal University courses.

Visiting Students

There are countless reasons to come to Alfaisal University as a Visiting Student or Non-Degree Student. No matter what brings you here, you will be surrounded by the kind of opportunities, experiences, and people that can only be found in the heart of the state of art campus of Alfaisal University.

Visiting Students Criteria

Alfaisal University welcomes visiting students for a maximum of two consecutive semesters. To apply as a visiting student you must fulfil the following requirements:

1. Letter of permission from your current university that includes the courses you plan to take at Alfaisal University.
2. Minimum of 30 credit hours attended in a recognized college or University.
3. Minimum GPA of 2.5 out of 4 or 3 out of 5.
4. Proof of English Proficiency Test.
5. Official Transcripts.
6. Advanced payment of full tuition fees.
7. For Non –Saudi students, a valid Iqama and health insurance.

Non-Degree Students Criteria

An undergraduate non-degree student takes credit bearing courses but does not pursue a baccalaureate degree. Non-degree students register for courses on a space available basis. Alfaisal University degree candidates have first priority for registration.

Non-degree students must demonstrate course pre-requisites and may need approval from the respective department of the College. As a non-degree student, you may take up to 24 credits in this status.Non-degree students are not eligible for financial aid.

Alfaisal University welcomes Non- degree students for a maximum of two consecutive semesters and must fulfil the following requirements:

1. Proof of English Proficiency Test.
2. Official High school transcript and Quadrat, Tahseely, or SAT.
3. Non-degree students cannot register for a course without fulfilling its pre-requisites.
4. Students who have college credits or have completed a college degree must submit an official college transcript.
5. A Non-Degree student is allowed to register for a maximum of 12 CHs in Fall or Spring semester, and 9 CHs in Summer semester, on the condition that the student does not exceed more than 24 CHs in both semesters.
6. Advanced payment of full tuition fees.
7. For Non –Saudi students, a valid Iqama and proof of health insurance

Application Fee

A 500 SR non-refundable application fee is required for all applicants. The application fee will be collected at the time of application

REGISTERATION

Office of the Registrar manages the registration of students and provides the following services:

- Verifying and issuing of official transcripts
- Certifying student enrollments
- Confirming the awarding of degrees and managing the registration of current students
- Maintaining and providing the timely and accurate official records of the academic progress and accomplishments of the university's students helping students through graduation process

Registration Policies

Students are responsible for registering on time after receiving an approval from the academic advisor. You may not attend classes without being properly registered for them, you cannot receive credit for courses in which you are not registered, and students may not register or add individual courses retroactively.

1. Pre-Registration

Student can personally register online for the courses which starts (2 months before Fall semester and one month before Spring and Summer semester). Pre-registration is required of all students enrolling in that semester. They also should confirm their registration at the beginning of each semester. If the student did not pass the prerequisite, he/she must drop it or it will be dropped automatically.

2. Actual Registration

Actual registration starts at the beginning of each academic or summer session, as specified in the academic calendar. Each student must complete his/her own registration by him/herself through the portal. Registration via mail or other means is not allowed.

3. Late Registration

Registration committee and the course instructor must approve the late registration, moreover, student must pay late penalty (500 SR) per course.

Changing Sections

Section assignments take into consideration the student's new schedule, as well as the equitable distribution of students across sections. If a student wishes to change a section, he/she must adhere to the following steps:

- He/ She may choose a section that will not create a time conflict with his/her current schedule.
- Applications for section change may be submitted only during the period determined by the Admission and Registration Deanship.

Adding and Dropping Courses

A student may change his/her schedule by adding or dropping courses during the approved time frame.

- He/ She may add courses during the first two weeks of the semester (during the first week for the summer session).
- The course load must not exceed the maximum allowed for registration.
- A student may add a course as long as it does not conflict with a course or examination in his/her schedule and if the course has a pre-requisite.
- A course may be dropped during the first 4 weeks of the semester (during the first and second week for the summer session) without affecting the student's academic record.
- The course load must not be less than the minimum required for registration.
  If the course to be dropped is a co requisite, the student either must drop both co requisite courses or complete both courses concurrently.

- Courses dropped during the first 4 weeks will not appear on the student's transcript. Classes dropped between the 4th and 8th week of the semester will appear with the grade of 'W' on the student's transcript. The student's grade point average (GPA) will not be affected.

Registration will be conducted through the Office of Registration or through the registration portal **Netclassroom** Admitted students can alter their schedule of classes during the drop/add time frame through the portal.

Course Substitution

A student qualifies for graduation when he/she has fulfilled all the requirements for the degree program in which he/she enrolled when admitted to the University. If he/she is unable to complete the requirements of any program (due to termination of a course, the changing of its content, or when accrediting new programs that comprise courses the student has not studied), he/she can substitute or compensate for these courses with other equivalent courses, in terms of level, content, and credit hours. The Admission and Registration Deanship must be informed of the substitution or compensation after the student has obtained the approval of the Vice Rector responsible for graduation requirements.

Repeating a Course

If a student fails a required course, he/she must repeat that course. The student also may repeat any course in which he/she obtained a "C, C-, D, or D+" grade for up to 18 credit hours for COM and 12 for other collages.
The most recent grade, however, will reflect the student's final grade in that course regardless of which grade is higher. That is, if a student repeats a course in which he/she previously earned a D, and he/she subsequently receives an F, his/her grade for the course is an F, and he/she must repeat that course (if it is required in his/her degree plan). All grades, however, will be included in his/her academic record.

The University assigns an academic advisor to each student for assistance in matters that relate to academic progress, such as:

1. Selecting the academic major that best suits the student's preferences and capabilities.
2. Understanding and interpreting the academic regulations.
3. Informing the student of the sequence of the required and elective courses and suggesting suitable elective courses.
4. Following up on the academic progress of the student.
5. Assisting in early registration and the various stages of registration.
6. Assisting in course substitution, if and when necessary.

The academic advisor is chosen from the faculty members of the department or the college. The academic advisor for the UPP students is the director of the UPP or someone appointed by him/her or acting on his/her behalf.

Auditing Courses

If a student wants to registers officially, the course may be scheduled as an audit. A student auditing a course may be required to participate fully in the class. Expectations should be clarified with the course instructor at the start of the semester.

Procedure

Student can register for a course through Ntcalssroom, and withdraw from a class through student support portal. If a student faces a problem, he/she can contact the registration office through student support portal.

A- Add Classes:

a. Student should register during registration period for each semester.
b. For more information about the credit hours see **Policy and Procedure of Full-time Undergraduate Student Course Load**.
c. A student may add a course as long as it's not full and does not conflict with a class or examination in his/her schedule and if he/she fulfilled its pre-requisite/s.
d. Student should check the academic calendar for add period.
e. Student can personally add classes online through NetClassroom

B- Drop Classes:

a. A course may be dropped during the first 4 weeks of the semester without affecting the student's academic record
b. If the course to be dropped is a co requisite, the student either must drop both co requisite courses or complete both courses concurrently
c. Student can personally drop classes online through NetClassroom

C- Withdraw from a Class or Program

a. Student can withdraw from a class or a semester without being considered as having failed in the classes.
b. Withdraw period starts by the end of 4th week until the end of 9th week.
c. Withdrawn courses will appear in the transcript but will not affect the GPA
d. Withdrawn courses will be counted financially.
e. Student can withdraw from a class by submitting a request via the student support portal (College of Medicine students must get the approval from their college).
f.

Impact of an Audit

1. Determining full time or part time enrollment status.
2. Calculating semester standing.
3. Determining financial assistance and scholarship standing (consult with the Office of Financial Assistance and Scholarship for further clarification). The University may make changes in policies, procedures, educational offerings, and requirements at any time. Please consult an Alfaisal University academic advisor for more detailed information.

Prerequisites for Courses

A prerequisite is a requirement that the student must fulfill prior to beginning a course for which there is a prerequisite. If there is an exceptional case in which the prerequisite might be waived, the instructor and the College Dean needs to send his/her approval to the registrar.

Registration in a course may be canceled if the student does not satisfy all published pre-requisites. Students should check course pre-requisites in their program guides and/or the University Catalog before registering for a course.

Students must check with their instructor to ensure that his/her name is on the class roster.

Transfer Credits

- Student must submit official transcript to the student affairs deanship.
- The department head, and/or college dean determine if and how credit transfer may be used to satisfy baccalaureate requirements.
- All courses that are approved and evaluated by the concerned college will be added to transfer database.
- New students should fill the transfer credit form and submit it with the admission form.
- A maximum of 40% of any program total credits may be applied toward the baccalaureate to be transferred.
- Credits Transfers must be approved initially by the prospective college in Alfaisal University, to which the student is joining and the total number of Credit Hours must not exceed 48 credit hours. The process of credit transfer will begin after the acceptance to the college.
- Undergraduate course work completed at regionally accredited degree-granting institutions that is comparable in character, content, and quality to courses offered by the University and in which a minimum grade of "C "has been earned (College of Medicine is exception as it accepts minimum B, will be considered for transfer credit.
- The student's quality point average at the University is calculated solely on the basis of work taken at Alfaisal University.
- Transfer credits are posted on the transcript and assigned the grade "CR"
- The number of transfer credits a student receives depends primarily on the educational quality of the work and the comparability of the courses taken in content, scope, and level to those offered by the University.
- Transfer course work is evaluated on an individual basis and assigned an equivalent University course number whenever possible. If no equivalent course can be designated, and the work is deemed to be comparable to University-level work, then general elective credits in the discipline may be awarded.
- If a student fails to indicate on the admission application that s/he has completed course work at another college or university and later requests to have that work evaluated for transfer, credit for such work will be denied. Students can also be subject to dismissal for failure to disclose postsecondary institution enrollment.
- The Registrar Office requests that departments review and/or re-evaluate courses offered by public and private institutions so that Transfer Courses Data base may be kept up-to-date with new offerings, content change, etc. Colleges might also request additional review of Transfer Courses Database in accordance with College regulations and standards. In this regard, the Registrar Office makes students aware of regulations through the university website.

Non-Transferable Credit

- Credit earned in colleges and universities that are not regionally accredited.
- Courses on a transcript where no credit or grade is given.
- Career, vocational, or technical courses.
- Distance learning courses.
- Pre-collegiate/remedial courses; e.g., reading improvement, English/Math skills courses, developmental courses, or courses classified by as below freshman level or not applicable to the degree, etc.
- Personal development/self-improvement courses; e.g., career counseling, interpersonal relationships, college success courses, etc.
- Courses not offered at the undergraduate level by the University.
- Credit given by another college for life/work experience.
- Co-op, internship, and practicum credit.

Transfer Credit Evaluation

Official transfer credit evaluations are prepared only for students who:

- Have been admitted to a degree program and have paid the advance deposit fee.
- Are continuing students taking school work away while still enrolled at the University Continuing students are request to receive prior approval for school work to be taken elsewhere.

Procedure

- Transfer credit is administered by the Registrar.
- The Registrar Office works on a close and continual basis with one faculty member in each department, designated by the department head or dean of the College, who acts as liaison with the Registrar Office.

AU current student

- Student must fill the transfer form and submit it with the syllabus to the college, he/she must be sure the course planned to take at the other university is on Alfaisal syllabus and approved by the college. Student must take a course approval letter from registrar office containing the courses that he/she will take.

I. University Policy

1. University policy regarding transfer credit is administered by the Registrar Office in coordination with the Vice Provost for Academic Affairs.
2. Periodically, the Registrar Office requests that departments review and/or re-evaluate courses offered by public and private institutions so that Transfer Courses Database may be kept up-to-date with new offerings, content change, etc. Colleges might also request additional review of Transfer Courses Database in accordance with College regulations and standards. In this regard, the Registrar Office makes students aware of regulations through their website.
3. A maximum of 40% of any program total credits may be applied toward the baccalaureate may be transferred.
4. If a student fails to indicate on the admission application that s/he has completed course work at another college or university and later requests to have that work evaluated for transfer, credit for

such work will be denied. Students can also be subject to dismissal for failure to disclose postsecondary institution enrollment.

II. Criteria for Course Transferability

1. Undergraduate course work completed at regionally accredited degree-granting institutions that is comparable in character, content, and quality to courses offered by the University and in which a minimum grade of "C" has been earned(College of Medicine is exception as it accepts minimum B), will be considered for transfer credit. The student's quality point average at the University however, is calculated solely on the basis of work taken at Alfaisal University.
2. Transfer credits are posted to the transcript and assigned the grad "CR"
3. The number of transfer credits a student receives depends primarily on the educational quality of the work and the comparability of the courses taken in content, scope, and level to those offered by the University.
4. Transfer course work is evaluated on an individual basis and assigned an equivalent University course number whenever possible. If no equivalent course can be designated, and the work is deemed to be comparable to University-level work, then general elective credits in the discipline may be awarded.

III. Non-Transferable Credit

1. Credit earned in colleges and universities that are not regionally accredited.
2. Courses on a transcript where no credit or grade is given.
3. Career, vocational, or technical courses.
4. Distance learning courses.
5. Pre-collegiate/remedial courses; e.g., reading improvement, English/Math skills courses, developmental courses, or courses classified by as below freshman level or not applicable to the degree, etc.
6. Personal development/self-improvement courses; e.g., career counseling, interpersonal relationships, college success courses, etc.
7. Courses not offered at the undergraduate level by the University.
8. Credit given by another college for life/work experience.
9. Co-op, internship, and practicum credit.

IV. Transfer Credit Evaluation

1. Official transfer credit evaluations are prepared only for students who:

   1.1 Have been admitted to a degree program and have paid the advance deposit fee.
   2.1 Are continuing students taking work away while still enrolled at the University Continuing students are request to receive prior approval for work to be taken elsewhere.

Independent and Directed Study (IDS)

Independent and Directed Studies allow students to initiate, develop and complete courses under the supervision of a faculty member. An IDS course must be undertaken with a view to specified learning outcomes. The course may be taken for variable credit and not more than twice and for no more than 6 credit hours each time. One, two or three credits of selected studies may be earned for each IDS course reported. IDS courses should not be taken to replace required courses.

The purpose of the IDS program is to allow students to:

1. Pursue learning outcomes that extend beyond those normally taught in the classroom.
2. Pursue studies independent of the classroom schedule.
3. Have prior learning recognized for a course they may not have completed.
4. A primary goal is to encourage independent study under the supervision of faculty members. In addition to research projects, internships and practicums, the different programs use individual study, case studies and directed readings as the basis for various independent study offerings.

The following requirements govern enrollment for credit in independent study:

1. The consent of the instructor must be obtained before enrollment.
2. The content of the study should differ from the content of the regular course offerings.
3. The contact hours between student and faculty member must be sufficient to ensure consistency with credit earned in regular course offerings.
4. Students must have at least junior standing (i.e., 3rd year), including transfer students, who have earned at least a 2.75 cumulative GPA at Alfaisal University and who give sufficient evidence of initiative, originality and intellectual maturity to warrant the expectation of distinction in the program. Students may do Independent Directed Studies in any discipline in which they obtain the required permission.

The student and the supervising faculty member develop the content and format of the Directed Study course. The program of reading, assignments and method of evaluation will be dependent on the subject under study. Supervision is also on an individual basis, and while there may not be regularly scheduled class sessions, the student is expected to schedule and maintain regular meetings with the IDS faculty member. Students wishing to take an independent directed study must complete the Directed Studies Application Form and have it approved by the faculty member most familiar with the topic of study and obtain further approved from the dean of the college in which the student is enrolled. The dean of the college may form a committee to recommend the approval at the college level. The faculty will work with the student to select a reading list, projects, and evaluations appropriate to the topic and the credit level chosen. All needed materials will be presented in a syllabus attached to the application form.

Guidance on Enrollment for Summer Courses

It is recognized that for various reasons, Alfaisal University students may wish to take academic courses over the summer. In such cases, the following conditions exist:

1. If a student wishes to improve an earlier grade by summer study, registration and payment of fees must be made by the first day of the summer session. One repeat is allowed if a passing grade was obtained on the first taking of the course. Attendance at all class meetings is compulsory, as is the completion of all course work if the student is to be allowed to sit the final examination for the course.
2. If a student wishes to take a course over the summer from another university, this will be allowed only if that course is not offered during the summer session at Alfaisal University. The dean of the college in which the course in normally offered may, with appropriate justification, grant exception to the foregoing rule. In such cases, the college dean must give permission which will be based on

information provided by the student. This information must demonstrate that at least 80% of the Alfaisal University course content and mode of evaluation is covered by the course at the university where summer study is proposed.

3. A student is allowed to register a maximum of 9 credit hours in Summer Semester.

End of Semester Deadlines

Official end of semester deadlines for coursework to be submitted for each course is determined by the faculty member. Students are to have all coursework completed and submitted for each course no later than the last day of class unless otherwise specified by their instructor. Late work will not be graded without a valid extension.

Extensions

Students are expected to complete all course work by the end of a semester. When this is not possible as a result of illness or other circumstances, an incomplete grade may be considered. The University distinguishes between two types of extensions--personal and academic. Only in the most unusual circumstances can an extension, either personal or academic, be granted.

Personal Extensions are appropriate for students coping with end-of-semester illness or other personal circumstances beyond their control. Request forms for these extensions are available from the Office of Registrar. The Dean of the College will be required to receive and judge the validity of these requests.

Documentation from a doctor, hospital or other appropriate institution is required in order to consider an extension. All documentation will be placed in the student's permanent academic record. This verification is required to document circumstances that have had an impact on a student's ability to finish course work or finals. Students must submit all requests before the last day of classes.

In certain cases, the student may not wish this documentation to be placed in his or her student file. In this case, the student should confer confidentially with the relevant faculty member, and with the agreement of the dean of the college, such material can be excluded from the student's file.

The due date for completed work will be set at the time the extension is granted. The Instructor, the College Dean, and the student must agree in writing on the due date. Faculty will submit extension grades no later than the fifth (5th) week following the last day of exams, unless special arrangements are made with the College Dean and the University Registrar.

Academic Extensions are appropriate when something non-personal interferes with a student's ability to complete work: the lab blows up; the frogs die; the research materials arrive late. "Normal" computer failures are not covered by this policy; it is expected that students will back up their files.

Only rarely will extensions be granted for academic reasons. If a student or faculty member wishes to request an extension on academic grounds, the instructor should submit a written request for approval to the Dean of the College, explaining the circumstances in full and the student will receive an (I) as a grade in that course.

The due date for completed work will be set at the time the extension is granted. The Instructor, the College Dean, and the student must agree in writing on the due date. The Instructor must submit a final grade for the course by the end of the fifth (5th) week of the following semester.

Enrollment in the Summer Internship Program

Depending on the major, a student may be required to spend a summer training.

The student should complete the summer training period prior to his/her last semester at the University. A student is qualified to enroll in this program, if he/she meets the following conditions:

1. Complete the required credit hours in the degree program in which he/she is registered. The program must be completed before the end of the last semester at the University.
2. Complete all the courses required by the department. Earn a major GPA of 2.00 or above.
3. Have not been suspended from the University.
4. Studying in some colleges may be on a full academic year basis, according to the rules and procedures approved by the University Council. An academic year comprises two levels.

Class Attendance Policy

Students expected to attend all classes. An excuse of absence is required for a student who does not attend in classes due to personal or family health reasons

Policy

- Students are expected to attend all classes. They are allowed 15% absence without excuses and 25% absence with excuses.
- An absence for a non-acute medical service does not constitute an excused absence.
- Among the reasons of absences that are considered excused by the university are the following:
    - Death or major illness in a student's immediate family. Immediate family may include: mother, father, sister, brother, grandparents, spouse, child, spouse's child, grandparents, legal guardian and should submit a death certificate.
    - Illness of a dependent family member.
    - Participation in legal proceedings or administrative procedures that require a student's presence.
    - Injury or Illness that is too severe or contagious for the student to attend class.
    - Injury or illness of three or more days. For injury or illness that requires a student to be absent from classes for three or more business days, the student should obtain a medical confirmation note from his or her medical provider. The medical confirmation note must contain the date and time of the illness and medical professional's confirmation of needed absence and it must be from a certified hospital.
- Mandatory admission interviews for professional or graduate school which cannot be rescheduled.
- The Vice dean for Student Affairs, counselor or the dean of the student's college may provide an email for the student to take to the instructor stating that the dean has verified the student's absence as excused.
- If needed, the student must provide additional documentation substantiating the reason for the absence with the filled form of absence that is satisfactory to the instructor, within one week of the last date of the absence.
- Each faculty member will refer to the attendance policy, which will be stated in the course syllabus and shared at the first class meeting. Certain courses may have more stringent attendance policies. Students should be aware of differences and plan accordingly.
- When the number of absences exceeds 15 % with no excuse of the scheduled classes, the faculty may issue a failing grade (DN) for the student.

Guidelines:

- Students are expected to attend all classes. They are allowed 15% absence without excuses and 25% absence with excuses.
- An absence for a non-acute medical service does not constitute an excused absence.
- Among the reasons of absences that are considered excused by the university are the following:
    - Death or major illness in a student's immediate family. Immediate family may include: mother, father, sister, brother, grandparents, spouse, child, spouse's child, grandparents, legal guardian and should submit a death certificate.
    - Illness of a dependent family member.
    - Participation in legal proceedings or administrative procedures that require a student's presence.
    - Injury or Illness that is too severe or contagious for the student to attend class.
    - Injury or illness of three or more days. For injury or illness that requires a student to be absent from classes for three or more business days, the student should obtain a medical confirmation note from his or her medical provider. The medical confirmation note must contain the date and time of the illness and medical professional's confirmation of needed absence and it must be from a certified hospital.
- Mandatory admission interviews for professional or graduate school which cannot be rescheduled.
- The Vice dean for Student Affairs, counselor or the dean of the student's college may provide an email for the student to take to the instructor stating that the dean has verified the student's absence as excused.
- If needed, the student must provide additional documentation substantiating the reason for the absence with the filled form of absence that is satisfactory to the instructor, within one week of the last date of the absence.
- Each faculty member will refer to the attendance policy, which will be stated in the course syllabus and shared at the first class meeting. Certain courses may have more stringent attendance policies. Students should be aware of differences and plan accordingly.

When the number of absences exceeds 15 % with no excuse of the scheduled classes, the faculty may issue a failing grade (DN) for the student

1. Alfaisal University expects students to attend all classes. They are allowed 15% absence without excuses and 25% absence with excuses.
2. Each faculty member will refer to the attendance policy, which will be stated in the course syllabus and shared at the first class meeting. Certain courses may have more stringent attendance policies. Students should be aware of differences and plan accordingly.
3. Faculty will keep a weekly record of attendance for each student.
4. When an absence is unavoidable, a student should contact the instructor or the College Dean. Documentation may be required. Students are liable for the work missed and must make arrangements to complete the incomplete work. Instructors are not required to make exceptional arrangements for students who have missed a class.
5. When the number of absences exceeds 15 percent of the scheduled classes, the faculty may issue a failing grade (DN) for the student.

Hold Status

Students' records will be placed on "Hold Status" if they incur any type of outstanding obligation (either financial or otherwise) to the university.

Some typical reasons for holds are:

1. Outstanding fees or other unpaid university fees
2. Outstanding library books and/or fines
3. Counselling.
4. Expired Iqama.
5. Outstanding transcripts or documents.
6. Students records pending disciplinary action.

No administrative or academic services will be provided to students on Hold Status until the specific obligations have been met.

Students who have not cleared their "Hold Status" from previous registrations will not be permitted to register again until the hold has been cleared.

Declaration of Majors

Students are encouraged to declare a major field of study (major) by the end of the second year. All declaration of majors must be received in the Office of the University Registrar during the last four weeks of the semester to be effective for the next semester. For procedures on how to declare a major, contact the Office of the University Registrar.

Registration Time Guidelines

<table>
<tr><th rowspan="2"></th><th colspan="3">Semester</th></tr>
<tr><th>Fall</th><th>Spring</th><th>Summer</th></tr>
<tr><td>Pre-registration</td><td>2 months before the beginning of the semester</td><td>One month before the beginning of the semester</td><td>One month before the beginning of the semester</td></tr>
<tr><td>Adding</td><td>The First 2 weeks of the semester</td><td>The First 2 weeks of the semester</td><td rowspan="2">The First 2 weeks Of the semester</td></tr>
<tr><td>Dropping</td><td>The First 4 weeks of the semester</td><td>The First 4 weeks of the semester</td></tr>
<tr><td>Withdrawal</td><td>The First 5 weeks after the dropping</td><td>The First 5 weeks after the dropping</td><td></td></tr>
</table>

EXAMINATION, GRADES, AND GRADES APPEAL

Students are expected to meet examination schedules as determined by registrar office. Retaking final exams is not permitted. For students who missed a final exam, however, the University recognizes that unforeseen circumstances do occur and have instituted the following policies for final exam make-ups, as well as for examinations scheduled during the semester.

Make-Up Exams

Make-up Final Examinations

Alfaisal University policies do not allow students who miss their final exam to request an alternate arrangement to make-up the exam except for one of the following reasons only – medical illness, or compassionate grounds. Alternate arrangements must be made prior to the scheduled examination date and time. Unless it is an extended illness, the missed final exam must be completed as soon as possible after the scheduled exam date. The following guidelines are to be followed:

1. The student makes the request in writing and in a timely manner before the scheduled exam, to request an opportunity to complete a makeup exam.
2. The student provides the Instructor with the required originally-signed documentation • regarding the reason he is not able to complete the test on the originally scheduled exam date. Without this documentation, the student will not be granted an accommodation to complete a makeup exam and will be assigned a zero grade for the exam. No incomplete (I) grade can be assigned in this situation.
3. The makeup exam does not have to be identical to the original final exam, but it must cover the same material.
4. All communications with the student must be via e-mail, with the University Registrar copied on each exchange.

It is the instructor's responsibility to:

- **VALIDATE** (approve or refuse) the student's request and include the final exam details if approving the student's request. The Instructor will copy the Registrar on all communication with students regarding their missed final exams.
- **RETAIN** documentation provided by the student with the course records.
- **E-MAIL** the University Registrar immediately, but no later than five business days prior to the date of the final exam, with the following information for each student approved for a final make-up exam:
- The student's name
- The student's Alfaisal University ID number
- The course and section number
- The duration of the final exam
- A list of all the aids/resources permitted the student during the taking of the final exam
- **COORDINATE** with the University Registrar the due date of submission of the student's final grade.
- **ASSIGN** an incomplete (IP) grade to the student if unable to grade the final exam before the final grade deadline and submit a Grade Change Authorization Form to the College Dean for approval and processing to the Office of the Registrar.

Make-up Examinations (Other than Finals)

Alfaisal University requires that students be permitted to make up examinations missed because of illness, other unavoidable circumstances or University activities. Therefore, instructors must offer reasonable options without penalty to students who have missed examinations for legitimate reasons.

It is the student's responsibility to contact the instructor as soon as possible before the exams about the reasons for a missed exam and, if the Instructor so wishes, to provide appropriate documentation.

Makeup examinations will be scheduled at a reasonable time and location. The makeup examination, if different, will be equivalent to the original in form, content, difficulty, and time limits, and the standards for scoring and grading will be equivalent to those used for the original examination.

Grade Reporting and Appeals

The student can appeal a negative decision of a faculty member; this policy is intended for students who believe that they have legitimate grounds for requesting a reassessment of their final grade on a course.

Procedure

- Present the appeal to the faculty member's College Dean who refers the appeal to a committee for hearing and decision.
- Based on committee decision, college dean will authorize a grade change, and must notify the involved individual of his action, i.e., the College Dean must notify the student, the faculty member and the registrar office of his decision.

To appeal an attendance related grade reduction, the appeal process that is part of the Attendance Policy must be followed.

The student can appeal a negative decision of a faculty member. The steps in the appeal process are as follows:

1. Present the appeal to the faculty member's College Dean who refer the appeal to a committee for hearing and decision.
2. Based on committee decision, college dean authorize a grade change, and must notify the involved individual of his action, i.e., the College Dean must notify the student and the faculty member of his decision.

To appeal an attendance-related grade reduction, the appeal process that is part of the Attendance Policy must be followed.

Grade Re-evaluation Based On Exceptions to University Policy

In those cases in which the grade received by the student is the result of the University policy (e.g., an "F" resulting from failure to remove an Incomplete grade in the time allowed or failure to officially withdraw from a course) rather than a faculty member's evaluation of performance in a course, the student's written appeal must be directed to the Office of the registrar. Such appeals will be considered by registration Committee. This process cannot be used for students appealing a failing grade (F) assigned due to academic dishonesty.

Academic Progress and Placement on Probation

The student is expected to maintain good academic standing throughout his studies by keeping his cumulative Grade Point Average (GPA) above 2.00 out of 4.00.

Academic Grades Appeal Process

The Alfaisal University Academic Appeals Process is designed to maintain the integrity and quality of each College's programs within the University and to ensure that a fair and equitable learning and teaching environment is upheld for all students and faculty. This process is intended for students who believe that they have legitimate grounds for requesting a reassessment of their final grade on a course.

The appeals process provides a standardized platform by which students may appeal a final academic evaluation (final grade). It is the responsibility of students to familiarize themselves with the guidelines of this appeals process which is found in **Student Affairs Policies and Procedures**.

Withdrawal from the University

- Withdrawal during a Semester

Apply the same process of withdraw from a course.

- Medical Withdrawal during a Semester

A student who cannot complete a semester due to illness may petition for a withdrawal (W) for medical reasons. A medical withdrawal during a semester will be recorded as a "W" and medical documentation is required from certified hospital. Medical documentation will be submitted to the University Registrar for consideration and approval or denial. If the University denies the medical approval, the student may appeal to the Provost. The Provost's decision will be final. No academic work completed at another institution during that semester can be transferred to Alfaisal University.

Dismissed Students Transferring Policy

Alfaisal University allows student who is on verge of dismissal to transfer to another college according to the below policy.

Policy:

Allowing dismissed students to transfer to other college if they meet below requirements:

• Studied three semesters or less.
• Having 1.70 CGPA or more.
• Approval of new college's dean.

Student will be given two semesters to raise his/her CGPA above 2.0 otherwise he/she will be finally dismissed. To achieve this, student also to maintain semester GPA above 2.5 otherwise he/she will be instantly finally dismissed by end of the first extra semester.

Procedure:

Student must fill the change college major form and have it signed by the dean of the college which the student wants to transfer to.

GRADING SYSTEM

Alfaisal University uses the 4.0 grade point average system. The following grades are approved for use in Alfaisal University and are included in the determination of the grade point average:

Grade Code	Grade Point	Percentile Range	Grade Points
A	**4.0**	**95%-100%**	**Excellent**
A-	**3.67**	**90%-94%**	
B+	**3.33**	**86%-89%**	**Very Good**
B	**3.00**	**83%-85%**	**Good**
B-	**2.67**	**80%-82%**	
C+	**2.33**	**76%-79%**	
C	**2.00**	**73%-75%**	**Fair**
C-	**1.67**	**70%-72%**	
D+	**1.33**	**66%69%**	
D	**1.00**	**60%-65%**	
F	**0.00**	**0%59%**	**Fail**

Other grades may be used in certain situations but are not included in the determination of the grade point average. These include **I/IC, W, AU, CR, R, CC/IP, and NC** which are explained in detail below.

I/IC-The student was doing satisfactory work but, for reasons beyond his control, he was unable to meet the full requirements of the course and as such is incomplete "I". Unless otherwise specified by the respective college, an "I" will be changed to the grade of "F" by the University Registrar. The course Instructor must submit the final grade no later than 7 weeks after the last day of final exams for the previous semester. If a student is assigned an "I", the Instructor must notify the student in writing of the requirements for removal of the "I" and of the deadline for removal of the "I" using an extension form. The student will be required to sign the extension form. A copy of the form must be submitted to the Office of the Registrar at the time the "I" is submitted.

W-The student was permitted to withdraw without penalty. Any student who withdraws on or before midterm will receive a W. Withdrawals without penalty will not be permitted after the 8th week of the semester. Students must complete the official withdrawal form provided by the Office of the Registrar.

AU-The student was given permission to audit this course. After the last day of late registration (last day of drop/add), students may not transfer from audit to credit status. Students may change from credit to audit up to the official withdrawal date.

CR-The student was given credit for a course.

NC-Units for courses which are graded with a "P" (Pass) or "NP" (No Pass) will not be included in the student's GPA calculation. Units for courses which are graded with a "P" will be counted toward the student's degree requirements; those with grades "NP" will not.

R-Any undergraduate student may retake a course for which he received a grade below a B. (A student may exercise this option for no more than four courses, totaling no more than 10% of the credits, for undergraduate student only). A student may use this option only once for a given course within two years. For the course retaken, the lower grade will show as "R" in the transcript. Only the higher grade shall be counted in the determination of the student's grade-point average (GPA). The course retake policy will not be applied automatically to a student's GPA. After completing the second attempt of a course, a student must submit a request to the University Registrar's Office. Retake course policy will apply for courses taken at Alfaisal University only. (Retake courses policy will not apply for courses taken outside AU). Student to benefit from the retake policy his/her new grade must not be F or DN.

CC/-A student who does not complete a course by the end of the semester and his/her project/work will require an extension to the next semester. The final grade will be reported to the student after he/she finishes all requirements of the course.

DN-Any undergraduate who fails in a course because of exceeding the permissible limit of absences or a disciplinary verdict. Conceder as F on GPA calculate. If he student repeat the course, the grade will not be change to the letter "R" on the transcript, it will be as a letter "DN" and the new grade will be added to the next semester GPA.

Example of Grade Point Average (GPA) Calculation

The following example illustrates the calculation of student GPA. Example:

Course	Credit Hours	Letter Grade	Grade Points	**Quality Points**
PHL 110	3	B+	3.33	10.00
PHY 105	4	A	4.00	16.00
MAT 110	4	B¬	2.67	10.67
MGT 105	2	C	2.0	4
Total			--	**40.67**

To calculate the semester GPA, for the student record shown above:

1. Multiply the Grade Points of the course by the credit hours for that course. The product of this multiplication will be the quality points.
2. Divide the sum of quality points of all courses by the total of credit hours for the semester.

Semester GPA = **Total Graduate Points (40.67) = 3.13**
Total Credit Hours (13)

The General grade Assigned to the Cumulative GPA at the Time of the Student's Graduation is based on the student's cumulative GPA and calculated as follows:

1. **Excellent**—if the cumulative GPA is no less than 3.50 out of 4.00.
2. **Very good**—if the cumulative GPA 2.75 or higher but less than 3.50 (out of 4.00).
3. **Good**—if the cumulative GPA is 1.75 or higher but less than 2.75 (out of 4.00).
4. **Pass**—if the cumulative GPA is 1.00 or higher but less than 1.75 (out of 4.00).

An annotation on the student's official transcript will indicate the achievement by semester.

GRADUATION REQUIREMENTS

A complete listing of graduation requirements will be available in the University catalogue. Students are responsible for fulfilling these requirements and are encouraged to consult with their academic advisors/faculty advisors in planning their course schedules. Students are encouraged to check their transcript, program evaluation, and degree audit each semester for completeness and accuracy.

General Education Requirements (GERs)

General Education Requirements (GER) are a set of courses designed to provide students with introductory level instruction in core disciplines that broaden a student's education and are intended to develop critical thinking abilities. A student should chick his/her major academic plan.

Major Field Requirements

A maximum number of designated hours will be required for individual majors, including the comprehensive examinations and/or projects and required courses offered by other departments. The requirements for majors are outlined in the University Catalogue. For established departmental majors, this authority resides with the Dean of the College. Substitutes in the general education portion of the degree requirements must be approved by the Vice Provost of Academic Programs.

Graduating with Honors

The transcripts of graduating students show honors categories based on the following scale:
First Honor 3.75 through 4.0 GPA
Second Honor 3.5 through 3.74 GPA
These honors categories are based on a student’s cumulative average at the end the graduation semester.

Student who are eligible for first or second honors also must meet the following criteria:

- He/she must not have failed any course completed at the University or any other university.

- He/she must have completed all graduation requirements within a specified period, the maximum of which is the average of the maximum and minimum limits for completing his/her degree program.
- He/she must have completed 60 percent or more of the graduation requirements at the university from which he/she is graduating.

Transcripts

Official transcripts will be released only with signed authorization of the individual student.
Requests for transcripts must be submitted in writing to the Office of the Registrar. The charge for each Official Transcript is SAR 100. Forms are available in the Office of the Registrar and online. Unofficial transcripts may be obtained through Netclassroom.

Tuition, Fees, & Scholarships

TUTION & FEES

1. Upon receiving an Acceptance letter the student must pay an amount of SAR 5,000 as part of his/her tuition fee before classes' starts to reserve his/her seat. If there is no payment made, the student's seat maybe allocated to another student or a late payment fee of SAR 1,000 will be charged after the 2nd week of classes.

2. The student must complete enrollment prior to the start of a semester.

3. The enrollment payment of SAR 5,000 will be adjusted to be part of the first installment of the tuition fee and it is non-refundable.

4. The student could benefit from the flexible payment plan as explained next when he/she completes his/her enrollment requirements within the 2nd week of classes.

5. The installment payment plan could be applied according to the following:

-1st installment within the 4th week of classes 25%
-2nd installment within the 8th week of classes 25 %
-3rd installment within the 12th week of classes 25 %
-4th installment within the 16th week of classes 25 %

1. Exact dates are available at the Students Financial Affairs Office.

A late processing payment will be charged for any outstanding balance on each installment after the above weeks of classes. Each late payment fee is SAR 1,000 per installment. Failure to pay within the due dates will cause any outstanding balance due immediately.

3. Due dates are not extended nor are late payment fees waived for any reason

4. Student is expected to meet all financial obligations to the University by the appropriate due dates. For student who fails to meet his/her financial obligations promptly, the University reserves the right to place a "HOLD" on the student's record that prevents registration for future semesters, sitting for exams and the release of transcripts and diplomas, as well as access to other university services. It is each student's responsibility to be informed of all registration and fee payment dates and deadlines.

PAYMENTS

1. Check payment on tuition and fees is acceptable and should be payable to the order of "Alfaisal University.
   2. Direct deposit payment is also accepted with the following bank details, and to state the full name of the student or student ID:

Bank Name:	Saudi British Bank (SABB)
Name of Account	Alfaisal University
Branch:	Al Faisaliah Branch
IBAN NO:	SA39 4500 0000 1540 0011 1002

3. Settlement of fees should be made in Saudi Riyals.
4. Up-to-date schedules for registration and payment of fees are available through the Office of the Registrar.

The following tuition refund schedule is applied

Refund schedule:

- During the 1st 4 weeks of classes	100% of full tuition
- After the 4th week of classes	0% of tuition

NOTES FOR PAYMENT

1. Only tuition is refundable, other fees are not refundable.
2. Transfer of classes or exchange of courses may impact tuition level if the course credit hours are different.
3. Students who experience an extreme hardship situation should contact the Office of Registrar for appealing the above refund schedule.
4. Fees are subject to change.
5. Schedule of tuition and other fees is shown below:

Basic Fees (For all Colleges)	**SAR**
Application fee for direct entry (non-refundable) (UPP graduates are exempted)	500
Seat Reservation (Part of the Tuition fee) (non-refundable)	5000
Tuition fee per semester (12-19 credit hours)	47,000
Or Part-time students enrolled in 11 or fewer credit hours will pay per credit hour fees	3,917
Tuition Discount for Sibling (All except first child)	15%
Other Fees	
Fee for late registration (after 1st day of classes) per course	500
Late tuition processing fee	1000

Unofficial transcript	Free
Student medical insurance (per academic year for expatriates)	2,322
Student visa (for expatriates) (Not applicable for 1st year)	To be specified when applying

For any queries concerning these policies or fees please contact the Office of Admission & Registration

SCHOLARSHIPS

Alfaisal has many scholarship programs available to students that are Merit-based (excellence in academic performance) and Financial need-based. The following outlines the scholarship opportunities available to new students applying to Alfaisal please note that scholarships are yearly based and being awarded by the beginning of each academic year.

At Alfaisal University, scholarships are an essential part of recruiting and supporting our finest students. The world's best universities recruit the world's finest students. We believe in supporting these students so they can focus and excel in their studies and research as this is vital to the success of both the students and the university.

Alfaisal has developed a comprehensive system of scholarships that will provide the opportunity for qualified students regardless of economic situation to attend the university, develop into excellent scholars and researchers, and significantly contribute to the well-being future of our kingdom and the region.

- **Scholarships Available at Alfaisal University:**

    1. **Need-based Scholarships (King Faisal Foundation Scholarships "Prince Sultan Program")**
    2. **Merit-based Scholarships (Alfaisal University Scholarships)**
    3. **Dean's List**
    4. **Sibling Discount**

Student Employment

Student Part-Time Employment represents an important and valuable experience for the student, in addition to other benefits for student and the university. Alfaisal University Program for student employment is implemented to encourage them to be effective and proactive in the university community, and provide them with the financial assistance that they may need; as well as give them the chance develop experience in the real work life.

Guidelines for Application

The Student should satisfy the following:

1. Be clearly identified by his/her Alfaisal Student ID card.
2. Be of good conduct and behavior.

3. Submit his/her application request to the Student Financial assistance office.
4. Submit the transcript, with a minimum CGPA of 2.0/4.0.
5. Student attendance must be acceptable.
6. Student schedule must be suitable for the position.

Applications for student employment will be screened according to the criteria above and if there are more applications than available posts, the students who rank better in the collective outcome of these criteria will be selected. It is well understood that such part-time commitment will not affect in any way the student academic achievement.

Support Services and Student Counseling

Student Counseling

Student counseling aims to help students overcome any difficulties that may face them in their life in the University. It provides a space where students can feel comfortable and relaxed while talking with an empathic listener and where the student has the opportunity to explore as much of his or her concerns as he or she chooses to bring. For counseling assistance, we urge you to visit the office of Student Affairs Located at the ground floor of the College of Science for men and on the second floor of the Student center for women.

Student Activities

The Student Activities Office seeks to foster a community where students complete their education and develop into leaders through involvement in purposeful and innovative experience. Student Activities provides co-curricular opportunities that sponsor and recognize leadership, learning, athletic training and development while promoting a powerful connection to Alfaisal University.

Student Associations

Students play instrumental role in the overall function of the University, and have a major influence in decisions that affect their experience in Alfaisal. Being an active member of the Student Government empowers students to effect change and to make a positive impact on campus. The election process is conducted once at the beginning of the second semester of each one and half academic year, in which all students in each college get the chance to vote for certain nominees to be the President for Alfaisal Student Association, as well as other office holders.

Student clubs

Alfaisal University is developing student organizations to choose from, and we hope to offer something for everyone. There are many benefits to joining and/or creating a student organization: making new friends, developing new skills and abilities, working as a part of a team, learning to set and achieve goals, and sharing your time and talents along with having fun. You can join one or more organizations, and you can start a new organization with a different idea and activities as long as a faculty member(s) agree(s) to supervise. For joining or starting organizations, please visit the office of Student Affairs Deanship located on the ground floor of Science Building for men and on the 3rd floor of the College of Business for women. The staff will start you off in the right direction. A copy of the Student Organization Form is located at the end of the Student Handbook.

MINISTRY OF EDUCATION (MoE) GENERAL EDUCATION REQUIREMENTS COURSE LIST

The following list of courses are required by the Ministry of Education for all majors

Arabic Language (ARB)

Course Code	Course Title	Credit Hour
ARB 101	Arabic Language I	(2 Credits)
ARB 112	Arabic Language II	(2 Credits)

Islamic Studies (ISL)

Course Code	Course Title	Credit Hour
ISL 101	Islamic Studies I	(2 Credits)
ISL 112	Islamic Studies II	(2 Credits)

English Language (ENG)

Course Code	Course Title	Credit Hour
ENG 101	Freshman English I	(3 Credits)
ENG 112	Freshman English II	(3 Credits)

Total 14 Credit Hours

University Preparatory Program (UPP)

Prof. Saad Mohammed Alshehri., Dean, College of Science & General Studies, Professor of Chemistry

Website http://cos.alfaisal.edu/about

Dr. Amjad Kayed Fataftah, Program Director, Assistant Professor of Chemistry

Website http://cos.alfaisal.edu/upp/index

College of Science and General Studies/ University Preparatory Program (UPP)
Alfaisal University, P.O. Box 50927, Takhasusi Road
Riyadh-Kingdom of Saudi Arabia
Tel: + 966 11 2158901
Email: cos@alfaisal.edu

Welcome Message:

Welcome to Alfaisal University Preparatory Program (AUPP). This program is the beginning of a new path in your academic life, your bridge to the future, and your second 'home' for the next year. Our academic program is rigorous and challenging and your success in the program will require hard work and determination.

The AUPP is a center of excellence in teaching sciences and English. Our experienced instructors, as teachers and mentors, are here to facilitate your learning and the transition to the college of your choice. They will challenge you, and demand your best efforts, and you are advised to take advantage of their expertise and wisdom.

We believe that the AUPP will give you lessons for life and the skills that will advance your career. We are confident that your experience here will be memorable and rewarding. Please know that your suggestions and positive input are always appreciated and valued.

We invite you to visit our website for valuable information about the course offerings, faculty, academic resources, and for guidance on the policies and procedures of the AUPP

Course Description

Mathematics and Science Courses

PAB101 Preparatory Algebra for Business I

Cr Hr: 3

This course reviews and develops basic and intermediate Algebra skills. The primary learning outcome for this course is quantitative reasoning, which will require students to read and analyze data, develop mathematical models, draw inferences and support conclusions based on mathematical reasoning. A graphical approach will be utilized throughout the course with an emphasis on solving application problems. Topics include properties of exponents, algebraic expressions, polynomials, functions, the graphs of functions, linear functions, linear equations and systems of linear equations.

PAB112 Preparatory Algebra for Business II

Cr Hr: 3 Prerequisite: PAB101

This course reviews and develops basic and intermediate Algebra skills. The primary learning outcome for this course is quantitative reasoning, which will require students to read and analyze data, develop mathematical models, draw inferences and support conclusions based on mathematical reasoning. A graphical approach will be utilized throughout the course with an emphasis on solving application problems. Topics include rational expressions, radical expressions, quadratic functions, exponential functions, logarithmic functions, graphs of functions and equations (rational, radical, quadratic, exponential and logarithmic).

PAM101 Preparatory Algebra for Medicine

Cr Hr: 3

This course reviews and develops basic and intermediate Algebra skills. The primary general learning outcome for this course is quantitative reasoning, which will require students to read and analyze data, develop mathematical models, draw inferences and support conclusions based on mathematical reasoning. A graphical approach will be utilized throughout the course with an emphasis on solving application problems. Topics include properties of exponents, algebraic expressions, polynomials, functions, the graphs of functions, linear functions, linear equations, systems of linear equations, rational expressions, radical expressions, quadratic functions, exponential functions, logarithmic functions, graphs of functions and equations (rational, radical, quadratic, exponential and logarithmic)

PPC101 Preparatory Pre-Calculus for Engineering and Science I

Cr Hr: 3

This course reviews and develops intermediate and advanced Algebra skills. The primary learning outcome for this course is quantitative reasoning, which will require students to read and analyze data, develop mathematical models, draw inferences and support conclusions based on mathematical reasoning. A graphical approach will be utilized throughout the course with an emphasis on solving application problems. Topics include algebraic expressions, mathematical models, polynomials, functions, graphs of functions, systems of linear and non-linear equations and equations (linear, absolute value, quadratic, polynomial, rational and radical).

PPC112 Preparatory Pre-Calculus for Engineering and Science II

Cr Hr: 3 Prerequisite: PPC101

This course reviews and develops intermediate and advanced Algebra skills. The primary learning outcome for this course is quantitative reasoning, which will require students to read and analyze data, develop mathematical models, draw inferences and support conclusions based on mathematical reasoning. A graphical approach will be utilized throughout the course with an emphasis on solving application problems. Topics include exponential functions, logarithmic functions, and trigonometric functions, analytic trigonometry, polar coordinates and graphs of polar equations.

PHSF101 Preparatory Human Structure and Function I

Cr Hr: 4

The field of medical science and medical education has accumulated vast amounts of information about human systems biology including anatomy, physiology and molecular medicine (biochemistry, immunology, microbiology etc.). This course will concentrate on different organ systems that make up the human organism, understanding physiological processes and concepts. The laboratory section of the course is designed to augment the lectures by providing demonstrations and hands-on experimental learning. Topics include cells, body tissues, skin, the skeletal system, the muscular system, the nervous system, the endocrine system, blood and the gastrointestinal tract.

PHSF112 Preparatory Human Structure and Function II

Cr Hr: 4 Prerequisite: PHSF101

The field of medical science and medical education has accumulated vast amounts of information about human systems biology including anatomy, physiology and molecular medicine (biochemistry, immunology, microbiology etc.). This course will concentrate on different organ systems that make up the human organism, understanding physiological

processes and concepts. The laboratory section of the course is designed to augment the lectures by providing demonstrations and hands-on experimental learning. Topics include the cardiovascular system, the lymphatic system, immunity, the respiratory system, the digestive system, the urinary system and the reproductive system.

PPHYM112 Preparatory Physics for Medicine

Cr Hr: 3 Prerequisite: PAM101

This course is designed to give students a solid foundation in basic physics, as it relates to the human body, as a preparation for undergraduate studies. The covered material will include the basics of mechanics, thermodynamics, electricity and electromagnetism, and modern physics covering basic concepts of quantum physics, atomic nucleus and radioactivity.

PPHYE101 Preparatory Physics for Engineering and Science I

Cr Hr: 3 Co-requisite: Pre-Calculus

This course is designed to give students a solid foundation in basic physics as a preparation for undergraduate studies. The course includes a mandatory laboratory that includes a set of experiments that run parallel to the theoretical materials covered in class. Topics include Newtonian mechanics, the physical concepts of force and motion, energy, energy transformation, conservation laws.

PPHYE112 Preparatory Physics for Engineering and Science II

Cr Hr: 3 Pre-requisites: PPC101 and PPHYE101

This course is designed to give students a solid foundation in basic physics as a preparation for undergraduate studies. The course includes a mandatory laboratory that includes a set of experiments that run parallel to the theoretical materials covered in class. Topics include the basics of electrostatics, simple circuits, magnetism, electrometric waves, and the electromagnetic spectrum.

PCHE101 Preparatory Chemistry I

Cr Hr: 3

This course designed to give students a solid foundation in basic chemistry as a preparation for undergraduate studies. Students will learn of the central role of chemistry in science, the history and development of simple models used to describe the material world, with an emphasis on structure of matter at the atomic and molecular level. Students will learn how major classes of compounds, with characteristic properties, can be identified by gaining an appreciation of how different atoms interact with each other. They will understand that structure determines physical and chemical properties. They will understand different types of chemical bonds; covalent,

metallic and ionic bonds. They will learn also, the structure of organic compounds and their relative properties depending on the functional groups.

PCHE112 Preparatory Chemistry II

Cr Hr: 3 Prerequisite: PCHE101

This course is designed to give students a solid foundation in basic chemistry as a preparation for undergraduate studies. Students will learn the arithmetic of chemical equations and to carry out calculations using balanced equations. They will apply kinetic theory to gases to explain their properties. Students will explore the gas laws experimentally and use these laws to carry out calculations. They will understand the thermochemical reactions and how to calculate the energy released or absorbed during a chemical change. The properties of acids and bases will be discusses along with measurement and calculation of pH. A basic appreciation of buffer action will be attained. Oxidation and reduction will be defined and reactions involving these processes will be carried out and their balanced equations deduced. Electrochemical reactions and electrochemical equations will be introduced to the students with the emphasis on the importance of the different applications of electrochemical reactions such as batteries, fuel cells and electrolytic cells.

PBIO112 Preparatory Biochemistry

Cr Hr: 3 Prerequisite: PCHE101

This introductory course is designed to provide a solid foundation in basic biochemistry for pre-medical students and students entering the allied health sciences. The course begins with a brief survey of the principles of organic chemistry including functional groups, acidity, basicity, stereochemistry, and chirality of organic molecules. This is followed by a comprehensive survey of biochemistry with emphasis on the structure and function of biomolecules including carbohydrates, lipids, proteins, enzymes, neurotransmitters, hormones, and nucleotides. The course also provides an introduction to metabolic pathways and bioenergetics.

PBUS101 Introduction to Business

Cr Hr: 4

This course provides students with the basic theoretical and practical skills needed to undertake business studies at the undergraduate level. It achieves this feat by introducing students to the contemporary business world, entrepreneurship, the business of managing, strategy, people in organizations, the principles of marketing, and accounting & finance. The course consists of textbook readings, lectures, interactive in-class discussions, and analyses of contemporary events relevant to business. Special attention is given to both the Saudi and U.S. business contexts.

PIE112 Introduction to Engineering Innovation

Cr Hr: 3

Engineering Innovation is an exciting UPP course level for motivated new students with an aptitude in math and science and an interest in engineering. In this course students will learn how to think like an engineer and develop the necessary problem-solving skills. The course will provide students with a hands on, experiential learning experience, which will provide: working knowledge of contemporary engineering practice, the problem solving process, and the tools and technologies engineers employ, as well as an understanding of the design process including competition, cost, quality, scheduling and manufacturability considerations. Numerous topics in various engineering disciplines will be covered with inspiring presentations, guest-speakers, team projects, and hands-on activities.

COLLEGE OF ENGINEERING

Dean Dr. Muhammad Anan, Acting Dean, College of Engineering

Website http://coe.alfaisal.edu/

College of Engineering
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Engineers design, operate and manage various forms of structures, machines and processes for the benefit of society. They solve real life problems in order to improve the lives of people everywhere and to ensure future sustainability. An engineering education is multi-disciplinary, very exciting and provides a tremendous edge in the job market; it is one of the best springboards to your future whether you are a man or a woman. It leads to careers characterized by fulfilling work, professional challenges, financial rewards, prestige, professional working environments, technological innovation and access to managerial positions.

An average day in the life of an engineer can involve working in a team that is designing or improving products or manufacturing processes as well as performing project management to ensure that tasks are accomplished on time and within budget. You get to be creative, which is the fun part, you get to solve challenging problems and it's a very people-oriented profession, much more than you might expect. And if you have an entrepreneurial mind, you too can start your own company. Don't look at engineering programs as being overly specialized – on the contrary, they are very broad and lead to endless opportunities. To conclude, following are some key benefits of Alfaisal University's engineering programs:

- The engineering programs were originally conceived by a joint MIT-Cambridge advisory committee to ensure that they meet the highest international accreditation standards such as ABET.
- The college maintains dynamic relations with several reputable universities abroad where students can study or do research.
- Small student to faculty ratio to provide more personalized attention for students.
- Adoption of student-centered pedagogy to ensure that students can freely access any faculty member.
- Highly qualified faculty from reputable universities worldwide.
- Summer internship placement with valuable hands-on experience and contacts in industry.
- Faculty-mentored undergraduate research projects and opportunities.
- Lab and teaching facilities are ultra-modern.
- Active student clubs and organizations with wide range of extracurricular activities.
- The placement rate of our graduates is very high.

College of Engineering Degree Programs

Bachelor of Science (B.Sc.) Degree Program in Architectural Engineering

Bachelor of Science (B.Sc.) Degree Program in Electrical Engineering

Bachelor of Science (B.Sc.) Degree Program in Industrial Engineering

Bachelor of Science (B.Sc.) Degree in Mechanical Engineering

Bachelor of Science (B.Sc.) Degree Program in Software Engineering

DEPARTMENT OF ARCHITECTURAL ENGINEERING

Degree Offered: Bachelor of Science (B.Sc.) Degree Program in Architectural Engineering

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Web address: http://coe.alfaisal.edu/programs/ae_home
Dr. Tarek Mokhtar, Chairman & Assistant Professor of Architectural Engineering

General Department Information

Architectural Engineering combines architecture and engineering to focus more on the links between design and construction. Professionals in this discipline work with both architects and other engineers to ensure the timely, effective design and construction of buildings and other structures and systems. With the enormous amount of construction taking place in Riyadh, it is obvious that Architectural Engineering is potentially a rich field here in the Kingdom. If you are interested in building things, thinking about how things work, drawing, model making, working with your hands, and working with others, Architectural Engineering may be the job for you.

The Architectural Engineering program at Alfaisal University prepares its graduates for a wide range of career paths in the construction industry, including design co-ordination and management, and project management. Architectural Engineering often encompasses elements of other engineering disciplines as architectural engineers actively work in the design and construction of buildings while managing and constructing mechanical, electrical, fire protection and structural systems.

There is much more engineering in modern buildings than architecture purists might care to admit! Architectural Engineering can be seen as a way to try to upgrade the traditional and historic role of architects in building design and construction. Prepared to apply the increasingly new and challenging technology of building construction, the new Architectural Engineer fulfills an important role in the field of architectural production and construction.

Study of Architectural Engineering at Alfaisal University will prepare you for employment in a number of different engineering and architectural fields. Not only will you learn draftsmanship and the use of Computer Aided Drafting and Design (CADD), but you will also study structural, mechanical and electrical design to gain knowledge of cooling/heating ventilation, air conditioning, plumbing, fire safety systems, elevators and power supply systems. To fulfill the engineering aspects of the course, you should prepare

for an intensive study of mathematics, physics and other sciences as well as the standard engineering and architecture courses. Once you have completed your degree studies, many career opportunities will be open to you in the construction industry, in architectural design firms, in manufacturing and in project management. Many architectural engineers move rapidly from design positions to administration and management. Who knows, you may find that you are soon starting your own firm with a long list of prestigious clients here in the Kingdom of Saudi Arabia and abroad.

Bachelor of Science in Architectural Engineering Suggested Study Plan

	Year 1 Fall			**Year 1 Spring**	
Code	**Course Name**	**Credit**	**Code**	**Course Name**	**Credit**
ENG 101	Freshman English I	3 (3-0-0)	ENG 112	Freshman English II	3 (3-0-0)
MAT 101	Calculus I	3 (3-0-2)	MAT 112	Calculus II	3 (3-0-2)
PHU 103	Mechanics and Waves for Engineers	3 (3-0-1)	PHU 124	Electromagnetism and Optics for Engineers	3 (3-0-1)
PHU 103 L	Mechanics and Waves for Engineers Lab	1 (0-2-0)	PHU 124 L	Electromagnetism and Optics for Engineers Lab	1 (0-2-0)
SE 100	Programming for Engineers	3 (3-0-0)	ARE 110	Architectural History and Theories	3 (3-0-0)
SE 100 L	Programming for Engineers Lab	1 (0-2-0)	ARE 120	Drafting and Drawing	1 (1-0-0)
CHM 102	Introduction to Chemistry	3 (3-0-1)	ARE 120 S	Drafting and Drawing Studio	2 (0-4-0)
CHM 102 L	Introduction to Chemistry Lab	1 (0-2-0)	ME 201	Materials Science and Engineering	3 (3-0-1)
			ME 201 L	Materials Science and Engineering Lab	1 (0-2-0)
	18			**20**	

	Year 2 Fall			**Year 2 Spring**	
MAT 211	Calculus III	3 (3-0-0)	ARE220	Construction Drawing (CAD)	2 (2-0-0)
EE 207	Foundations of Electrical Engineering	3 (3-2-1)	ARE220 S	Construction Drawing (CAD) Studio	2 (0-4-0)

EE 207 L	Foundations of Electrical Engineering LAB	1 (0-2-0)	ME 206	Thermal Fluids Engineering I	3 (3-0-1)
ARE 201 S	Architectural Design I Studio	3 (0-6-0)	ME 206 L	Thermal Fluids Engineering I LAB	1 (0-2-0)
ME 203	Applied Mechanics: Statics and Dynamics I	3 (3-0-1)	ARE 297	Architecture and Buildings	3 (3-0-0)
MAT 213	Differential Equations	3 (3-0-0)	ARE 231	Building Materials and Construction Technology	3 (3-0-0)
MAT 212	Linear Algebra	3 (3-0-0)	ARE 202 S	Architectural Design II Studio	3 (0-6-0)
			ARB 101	Arabic Language I	2 (2-0-0)
	19			**19**	

	Year 3 Fall			**Year 3 Spring**	
ISL 101	Islamic Studies I	2 (2-0-0)	ARE 311	Building Acoustics	3 (3-0-0)
ARE 303	Interior Design	2 (2-0-0)	ARE 321	Structural Mechanics	3 (3-0-0)
ARE 303 S	Interior Design Studio	1 (0-2-0)	ARE 321 L	Structural Mechanics Lab	1 (0-2-0)
Technical Elective I		3 (TBD per selected elective)	ARE 313	Electrical Installations	3 (3-0-0)
ARE 341	The Built Environment	3 (3-0-0)	ARE 315	Lighting Systems and Applications	3 (3-0-0)
ME 407	Heating, Ventilation, and Air-Conditioning	3 (3-0-0)	ARE 332	Building Services Engineering	3 (3-0-0)
ARE 355	Quantity Surveying	3 (3-0-0)	ARE 332 L	Building Services Engineering Lab	1 (0-2-0)
ARE 312	Environment, Economics and Policy	3 (3-0-0)	PHL 101A	Engineering Ethics	3 (3-0-0)
	20			**20**	
ARE 390	Architectural Engineering Summer Internship				0 (0-0-0)

Year 4 Fall			Year 4 Spring		
ARE 409	Project Management and Economics	3 (3-0-0)	ARE 465	Management Principles in Building Engineering	3 (3-0-0)
Technical Elective II		3 (TBD per selected elective)	Technical Elective III		3 (TBD per selected elective)
ARE 405	Structural Analysis	3 (3-0-0)	ISL 112	Islamic Studies II	2 (2-0-0)
ARE 450	Introduction to Geotechnical Engineering	3 (3-0-0)	ARE 490 S	Architectural Engineering Capstone Project	4 (0-8-0)
ARE 450 L	Introduction to Geotechnical Engineering Lab	1 (0-2-0)	ARB 102	Arabic Language II	2 (2-0-0)
ARE 410	Contracts and Liabilities for Buildings and Construction	3 (3-0-0)	MAT 224	Numerical Methods	3 (3-0-0)
ENG 222	Technical Writing	3 (3-0-0)			
	19			**17**	

Technical Electives <u>(9 CRHs) .</u> Select from the following courses:

Course Code	Course-Title	Credit Hours (CRHs)				Pre-Requisite Course Code
		Total-CRHs	Lect	Lab	Tut	
ARE 302	Indoor air quality Engineering	3	3	0	0	ME 206
ARE 460	Waste Management in Buildings	3	3	0	0	CHM 102
ARE 470	Building Automation and Control	3	3	0	0	EE 207
ARE 475	Building Energy Management	3	3	0	0	EE 207
ARE 455	Sustainable Buildings	3	3	0	0	ARE 312

ARE 314	Architectural Design III	2	2	0	0	ARE 202
ARE 314 S	Architectural Design III Studio	1	0	2	0	ARE 202
ARE 435	Undergraduate Research in Architectural Engineering	3	0	6	0	Dept. Approval
ARE 444	Reinforced Concrete Design	2	2	0	0	ARE 231, ME 203
ARE 444 L	Reinforced Concrete Design Lab	1	0	2	0	ARE 231, ME 203

Architectural Engineering Course Descriptions

In this section we give the course descriptions of Architectural Engineering courses of the program.

Core Courses

ARE 110 Architectural History and Theories

Cr Hr: 3

This course presents a survey of architectural styles of the past to the present time on the comparative methods. Emphasis includes the geographical, geological, climatic, religious, social and political influences.

ARE 120 Drafting and Drawing

Cr Hr: 1

The course is designed for students with little drafting background. Course content includes careers in drafting/engineering, use of drafting equipment, drafting techniques, lettering, geometric construction, multi-view and isometric drawings, sectional and auxiliary views, and basic dimensioning.

ARE 120 L Drafting and Drawing Lab

Cr Hr: 2 Lab Hr:4 Co-requisites: ARE 120

The course is designed for students with little drafting background. Course content includes careers in drafting/engineering, use of drafting equipment, drafting techniques, lettering, geometric construction, multi-view and isometric drawings, sectional and auxiliary views, and basic dimensioning.

ARE 201 S Architectural Design I Studio

Cr Hr: 3 Lab Hr:6 Pre-requisites: ARE 120

Students will study all the elements of architectural design and develop a sensitivity and awareness required for valid interpretations of design concepts. Students will design a small-scale architectural projects focusing on the notions of time and transformation in conceptual, structural, organizational and spatial terms. This distinct emphasis supports a unifying analytical and creative framework for increasingly complex architectural interventions. Analytical and experimental drawing techniques, including drawing plans, sections, elevations and perspectives, and model-making to inform and represent the transition from simple concepts into sophisticated and developed spatial designs.

ARE 202 S Architectural Design II Studio

Cr Hr: 3 Lab Hr:6 Pre-requisites: ARE 201

Students will complete commercial design study and advanced architectural design projects utilizing computer-aided design as well as traditional methods. Emphasis is placed on three-dimensional conceptualization, elements of design, site development, architectural history, color in design, computer generated 3D rendering, basic and advanced model building and time management skills.

ARE 220 Construction Drawing (CAD)

Cr Hr: 2 Pre-requisites: ARE 120

The course teaches drawing and drafting and computer-aided design of architectural systems, and includes the preliminary design, analysis, and documentation of these systems. This will include first and third angle projections, solid modeling and the use of commercially available CAD software.

ARE 220 S Construction Drawing (CAD) Studio

Cr Hr: 2 Lab Hr:4 Pre-requisites: ARE 120

Co-requisites: ARE 220

The course teaches drawing and drafting and computer-aided design of architectural systems, and includes the preliminary design, analysis, and documentation of these systems. This will include first and third angle projections, solid modeling and the use of commercially available CAD software.

ARE 231 Building Materials and Construction Technology

Cr Hr:3 Pre-requisites: ME 201 & ME 203

This course introduces construction materials and construction technology. Topics include construction terminology, materials and their properties, manufacturing processes, construction techniques and technologies, and other related topics. Upon completion, students should be able to detail construction assemblies and identify construction materials and properties.

ARE 297 Architecture and Buildings

Cr Hr:3 Pre-requisites: ARE 110

This course presents an introductory study of the theory, history, principles and practice of architecture. It includes the basic principles of architectural analysis, criticism and aesthetic principles. It discusses the roles and responsibilities of the design professions, including interior design, landscape architecture, urban planning and engineering and how they relate to each other.

ARE 303 Interior Design

Cr Hr: 2 Pre-requisites: ARE 202

The student will learn about design fundamentals as applied to the study and practice of interior design. Topics include color, space, form, light, furniture, windows, floors, and accessories. Class format includes illustrated lectures, discussions, and projects.

ARE 303 S Interior Design Studio

Cr Hr:1 Lab Hr:2 Pre-requisites: ARE 202

Co-requisites: ARE 303

The student will learn about design fundamentals as applied to the study and practice of interior design. Topics include color, space, form, light, furniture, windows, floors, and accessories. Class format includes illustrated lectures, discussions, and projects.

ARE 311 Building Acoustics

Cr Hr:3 Pre-requisites: ME 206

In this course, students will study the acoustical environment of buildings, including basic theory with an emphasis on room acoustics and mechanical system noise and vibration. Principles and their applications to sound insulation and testing will also be presented and discussed together with relevant standards and regulations.

ARE 312 Environment, Economics and Policy

Cr Hr:3 Pre-requisites: ARE 297

The objective of this course is to develop an understanding of rational analysis, as well as decision making in issues concerning environmental economics and policy, taking into account the environmental impacts. Concept of externality of environmental impacts, market failure, social cost and benefit analysis, concept of environmental protection and policy instruments related to energy supply and consumption,

environmental pollution control and abatement, case studies. Contemporary issues of environment at domestic, regional and international level: public participation and environmental concerns, acid rain, Montreal Protocol, UNFCCC and Kyoto Protocol.

ARE 313 Electrical Installations

Cr Hr:3 Pre-requisites: EE 207

Electrical Installations abound in any building. The Architecture Engineer is expected to have knowledge of the design, variety and maintenance of these Electrical Installations. This course will give the student a foundation course in power generation, distribution and control with respect to electrical installations in buildings.

ARE 315 Lighting Systems and Applications

Cr Hr: 3 Pre-requisites: PHU 124

This is an introductory course to lighting systems, their designs and applications in buildings, for students who aspire to be architects, interior designers and building service engineers. It covers day-lighting, electric lighting and introduces the use of color.

ARE321 Structural Mechanics

Cr Hr: 3 Pre-requisites: ARE 231

This course covers the analysis of construction materials and structural components in buildings: uniform and non-uniform torsion of structural shapes, analysis of determinate and indeterminate beams (including elastic foundation conditions) by classical methods, finite difference equations, numerical integrations, series approximation, elastic stability of beams and frames, lateral stability of beams, beams-columns, analysis of frames including the effect of axial compression. It also introduces the concepts, theories and methodologies for structural design for buildings.

ARE321 L Structural Mechanics Lab

Cr Hr: 1 Lab Hr:2 Pre-requisites: ARE 231

Co-requisites: ARE321

This course covers the analysis of construction materials and structural components in buildings: uniform and non-uniform torsion of structural shapes, analysis of determinate and indeterminate beams (including elastic foundation conditions) by classical methods, finite difference equations, numerical integrations, series approximation, elastic stability of beams and frames, lateral stability of beams, beams-columns, analysis of frames including the effect of axial compression. It also introduces the concepts, theories and methodologies for structural design for buildings.

ARE 332 Building Services Engineering

Cr Hr: 3 Pre-requisites: ME 206

This course will cover the principles of building services engineering, which consists of three major modules: fire safety engineering, piped and gas services engineering and vertical transportation systems in buildings.

ARE 332 L Building Services Engineering Lab

Cr Hr: 1 Lab Hr:2 Pre-requisites: ME 206

Co-requisites: ARE 332

This course will cover the principles of building services engineering, which consists of three major modules: fire safety engineering, piped and gas services engineering and vertical transportation systems in buildings.

ARE341 The Built Environment

Cr Hr: 3 Pre-requisites: ARE 110

Through a series of modules dealing with different architectural issues and building types (Representation; Landscape; Dwelling; Commerce and Industry; Public Institutions; Sacred Spaces), students will be introduced to ideas and problems that affect the way in which the built environment has been and continues to be shaped in a variety of historical and cultural contexts. We will think broadly about how the spaces that people move through and inhabit in their daily lives shape and are shaped by human behavior, cultural identity, political experience, and the currents of historical circumstance. Contemporary buildings and projects will figure prominently as examples of how designers currently approach architectural, structural and urban problems. Local sites will serve as case-studies for the analysis of different aspects of the built environment. This class is taught in a seminar format with students evaluated on their class participation and assigned projects. Readings and projects will introduce students to a variety of techniques for analyzing and representing the built environment, providing the basic tools for subsequent architectural research and studies.

ARE 355 Quantity Surveying

Cr Hr:3 Pre-requisites: ARE 220

Students will acquire knowledge of and understand basic concepts of: accepted drawing conventions and formats; how to read and interpret architectural and engineering drawings; what constitutes a set of drawings and how to locate cross-references, etc; how building specifications are prepared and structured; the purpose of measurement and estimating in the construction industry; how to measure simple architectural and engineering structures using basic measurement techniques; how to effectively describe

items that have been measured; what the purpose of Standard Method of Measurement of Building Work is and how to use it; what are the standard building trades and why they have been identified; the definitions of building elements; how common construction rates are built-up including the constituents of material, labor, plant, overheads and profit; the inclusiveness and/or exclusiveness of rates and prices.

ARE 405 Structural Analysis

Cr Hr: 3 Pre-requisites: ARE 321

In this course students will study the methods of analysis for determinate and indeterminate structures under stationary and moving loads which include stability and determinacy of structures. They will also apply the basics of structural mechanics and design to analyze and optimize practical building structures using finite element analysis (FEA) software under various loading conditions.

ARE 409 Project Management and Economics

Cr Hr: 3 Pre-requisites: ARE 355

In this course students will learn to solve economic problems related to construction and engineering, through studying construction project management theories and techniques, characteristics of construction organizations, equipment, and methods. Using project management software and the project life-cycle model from construction project simulations, or real life projects, students will organize, plan, monitor and control a construction project. Students learn to delineate the unique cost control methods for construction productivity, job cost, labor records, and material and equipment purchases. Construction site safety is emphasized throughout the course.

ARE 410 Contracts and Liabilities for Buildings and Construction

Cr Hr: 3 Pre-requisites: ARE 355

This course presents and discusses the legal aspects of engineering and construction contracts; contract formation, interpretation, rights and duties, and changes; legal liabilities and professional ethics of architects, engineers, and contractors. Upon completion of this course, students will be able to: (1) identify the elements of contract formation; (2) interpret contract clauses; (3) explain the rights and duties of the parties involved in design and construction; and (4) evaluate changes and their root causes. Students will also be able to objectively identify and analyze legal liabilities, ethical dilemmas, and the expected professional standard of architects, engineers, and contractors.

ARE 450 Introduction to Geotechnical Engineering

Cr Hr: 3 Pre-requisites: ME201 & ARE 231

The main objective of the course is to introduce students to the basic concepts of design and engineering of earth materials. After completion of the course, students should have a fundamental conceptual understanding of the mechanical behaviors of soils and rocks, which will provide them with the basic tools required in the solution of most geotechnical engineering problems.

ARE 450 L Introduction to Geotechnical Engineering Lab

Cr Hr: 1 Lab Hr:2 Pre-requisites: ME201 & ARE 231

Co-requisites: ARE 450

The main objective of the course is to introduce students to the basic concepts of design and engineering of earth materials. After completion of the course, students should have a fundamental conceptual understanding of the mechanical behaviors of soils and rocks, which will provide them with the basic tools required in the solution of most geotechnical engineering problems.

ARE 465 Management Principles in Building Engineering

Cr Hr: 3 Pre-requisites: ARE 409

This course presents the management principles for building engineering, which include financial management, human resources management and organization of business.

ARE 490 Studio Architectural Engineering Capstone Project

Cr Hr:4 Lab Hr:8 Pre-requisites: Dept. Approval

The Capstone project is a semester-long design project, undertaken individually or in a small team, under a staff mentor. The project involves an introduction to the life cycle of a project from a technical and management perspective, and is based on extensive oral and written communication. The capstone project is typically the foundation of the student's engineering portfolio for application to industry or graduate school. Students will apply the engineering concepts covered in the courses learned so far to architectural engineering problems, including the design of building structural and services systems, with an emphasis on teamwork. The projects are also used to introduce the students to various practical aspects of construction and professional ethics.

Elective Courses

ARE 302 Indoor Air Quality Engineering

Cr Hr: 3 Pre-requisites: ME 206

This course is designed to provide a fundamental knowledge about Indoor Air Quality (IAQ) and provide information about IAQ standards and laws. Participants will also learn the basics about how to implement the IAQ solution and perform IAQ audit in buildings.

ARE 314 Architectural Design III

Cr Hr: 2 Pre-requisites: ARE 202

In Architectural Design III, students will be introduced to the dynamic relationship between buildings, streets, and public open spaces, which can create a functional, attractive and sustainable built environment. This course emphasizes sustainability through forms and functions, the integration between various arrangement of buildings and spaces, and the utilization of new technologies and systems in designing and constructing buildings. It is an interactive course that accentuates evidence-based design and research. Students will complete design proposals and schemes to redevelop an urban site in the city of Riyadh; involving different factors: economic, social, and environmental. The emphasis will be placed on fitting architectural forms into historical, and cultural contexts; enabling desirable activity patterns; conceptualizing built form; providing necessary infrastructure and service systems.

ARE 314 S Architectural Design III Studio

Cr Hr: 1 Lab Hr:2 Pre-requisites: ARE 202

Co-requisites: ARE 31

The emphasis of this design component is to utilize hands-on analysis and problem solving techniques to create a better arrangement and design of the site under investigation. You will have the opportunity to apply what you have learned through lectures and field research into your design. The design of your final project should meet the requirements of the site, and the aspirations of its users.

ARE 435 S Undergraduate Research in Architectural Engineering Studio

Cr Hr: 3 Lab Hr:6 Pre-Requisites: Dep. Approval

Co-requisites: ARE 435

In this course students will learn how to produce highly quality research about a novel topic mutually agreed between the instructor and the student related to the broad field of Architectural Engineering. The student and the faculty supervisor will complete and sign a research contract which includes a plan for the semester

before the research begins. Students receive guidance and are mentored throughout the whole process. Students' progress is periodically assessed by the instructor and ultimately the students will produce a final report detailing their research results.

ARE444 Reinforced Concrete Design

Cr Hr:2 Pre-Requisites: ARE 231; ME 203

Co-Requisites: ARE 405

In this course, students will gain the ability to design and proportion structural concrete members including slabs, beams, and columns for strength as well as serviceability and economy. A practical understanding of the structural design process will be developed along with a theoretical understanding of the mechanics and behavior of reinforced concrete. Additionally, different types of reinforced concrete systems will be introduced. Students will develop a thorough understanding of the behavior and design of reinforced concrete members and systems and will be able to apply and effectively use the latest industry standard of formulas, tables, design aids, and/or computer software in the design of reinforced concrete members.

ARE 444 L Reinforced Concrete Design Lab

Cr Hr: 1 Lab Hr:2 Pre-Requisites: ARE 231; ME 203

Co-Requisites: ARE 405; ARE 444

In this course, students will gain the ability to design and proportion structural concrete members including slabs, beams, and columns for strength as well as serviceability and economy. A practical understanding of the structural design process will be developed along with a theoretical understanding of the mechanics and behavior of reinforced concrete. Additionally, different types of reinforced concrete systems will be introduced. Students will develop a thorough understanding of the behavior and design of reinforced concrete members and systems and will be able to apply and effectively use the latest industry standard of formulas, tables, design aids, and/or computer software in the design of reinforced concrete members.

ARE 455 Sustainable Buildings

Cr Hr: 3 Pre-requisites: ARE 312

This course presents the practice of creating building structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. It addresses the full range of issues associated with sustainable buildings, including energy consumption, use of materials, health, assessment methods and environment concerns. It discusses the issues through lectures, tutorials and case study reviews that identify how they are integrated into the design of buildings.

ARE 460 Waste Management in Buildings

Cr Hr: 3 Pre-requisites: CHM 102

The course is designed to furnish the technical skills of future engineers responsible for the design, installation, operation and monitoring of public health and waste management systems required for the safe, comfortable and environmentally friendly operation of modern buildings.

ARE 470 Building Automation and Control

Cr Hr:3 Pre-requisites: EE 207

This course provides an integrated system approach to understanding building automation and control systems and their applications to building services. It covers the architecture, communication methods, and application software of modern building automation and control systems, and provides good working knowledge of how to specify, design, install, commission, operate, and maintain building automation and control systems. Application areas will include air-conditioning systems, fire detection and suppression systems, security systems, lighting systems, vertical transport systems and other essential building services. The lectures will be complemented by hands-on training sessions in labs.

ARE 475 Building Energy Management

Cr Hr: 3 Pre-requisites: EE 207

This course gives a rigorous treatment of issues related to the judicious use of energy in the design and use of buildings is provided. Energy-efficient building services systems and system control, energy-conscious building design, building energy analysis, auditing, building envelope, energy-efficient lighting design, energy management programs, energy sources and conservation, rate schedules, waste-heat recovery, passive solar heating/cooling and day-lighting.

DEPARTMENT OF ELECTRICAL ENGINEERING

Degree Offered: Bachelor of Science (B.Sc.) Degree Program in Electrical Engineering

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General Department Information

Today, in Saudi Arabia and the world, there is a great demand for electrical engineers. Local companies like Aramco, SCECO, SABIC, Inara and STC, in addition to multinationals such as BAE, Boeing, Schneider, Schlumberger, Siemens and Telus – all have constant interest in electrical engineers across all branches. Here, at Alfaisal University, we have a world-class EE program that helps prepare you for the international job market, and that makes you able to take part in powering up the world.

Electricity does more than lighting the world up at night. If you look around you, night or day, you will find little that functions without electricity. Just imagine what life would be without it! Electricity is, therefore, a very serious business that a lot of people depend on in their livelihood. Because of this importance, it requires care and dedication in producing it, distributing it and using it in the many devices and machines that surround this. This care and dedication is what Electrical Engineering (EE) is all about.

As an Electrical Engineer, there are many things that you can get involved in. For example, if you are interested in learning about how electricity is generated and distributed, you would specialize in a branch of EE called Power. In the Kingdom, much of the electricity is produced using oil. Because of oil's scarcity, engineers are always trying to find better ways to utilize it, in addition to finding ways to substitute solar, wind or hydropower. Once electricity arrives at our homes and offices, there are many ways it can be used. Appliances at home, for example, such as the TV, the DVD, the gaming console, the PC, the washing machine, the fridge and many others all depend on electricity. But how do they actually work? Very often, these appliances depend on very small components called chips that take care of their operation. Studying how these chips, which can hold more than 2.6 billion components, are designed and manufactured can found in the Electronics branch. But electronics is about more than chips. The screen on the LED TV or the eye that captures images in your camera – this is all electronics. There are two other branches in EE: Communications and Control. More than ever, communications is playing a great role in our live, starting from enabling you to make simple voice and video calls with anybody in this world, to making it possible to deliver news and to trade across very long distances. It is in communications that you learn about how the Internet works, how your cellphone connects, and how your radio and TV receive their information. As for the Control branch, this is where you get to know how many things such as robots and smart buildings and cars keep working efficiently. Robots around the world are involved in many aspects from building cars and operating storage warehouses, to helping out in difficult medical surgeries. Robots have also travelled very far (all the way to Mars), going where it can be difficult or dangerous for humans to go. Smart buildings use control, too. Using sensors, a building can automatically adjust room temperatures, monitor water and electricity usage, and warn in case of fire or smoke. Cars, too, have now more intelligence than ever, with some cars having almost 300 sensors, all being used to give you a safer and more pleasurable driving experience.

Bachelor of Science in Electrical Engineering Suggested Study Plan

Year 1 Fall			Year 1 Spring		
Code	**Course Name**	**Credit**	**Code**	**Course Name**	**Credit**
CHM 102	Introduction to Chemistry	3 (3-0-1)	EE 101	Programming for Electrical Engineers	3 (3-0-0)
CHM 102 L	Introduction to Chemistry Lab	1(0-2-0)	EE 101 L	Programming for Electrical Engineers Lab	1(0-2-0)
MAT 101	Calculus I	3 (3-0-2)	MAT 112	Calculus II	3 (3-0-2)
PHU 103	Mechanics and Waves for Engineers	3 (3-0-1)	PHU 124	Electromagnetism and Optics for Engineers	3 (3-0-1)
PHU 103 L	Mechanics and Waves for Engineers Lab	1(0-2-0)	PHU 124 L	Electromagnetism and Optics for Engineers Lab	1(0-2-0)
ENG 101	Freshman English I	3 (3-0-0)	ENG 112	Freshman English II	3 (3-0-0)
ISL 101	Islamic Studies I	2 (2-0-0)			
	Total Credits	**16**		**Total Credits**	**14**
	Year 2 Fall			**Year 2 Spring**	
EE 207	Foundations of Electrical Engineering	3 (3-0-1)	EE 309	Electromagnetics	3 (3-0-0)
EE 207 L	Foundations of Electrical Engineering Lab	1 (0-2-0)	EE 208	Electric Circuits	3 (3-0-0)
MAT 211	Calculus III	3 (3-0-0)	EE 210	Digital Logic Systems	3 (3-0-0)
MAT 212	Linear Algebra	3 (3-0-0)	EE 210 L	Digital Logic Systems Lab	1 (0-2-0)
MAT 213	Differential Equations	3 (3-0-0)	MAT 224	Numerical Methods	3 (3-0-0)
ENG 222	Technical Writing	3 (3-0-0)	STA 212	Probability and Statistics	3 (3-0-0)
ARB 101	Arabic Language I	2 (2-0-0)			
	Total Credits	**18**		**Total Credits**	**16**
	Year 3 Fall			**Year 3 Spring**	
EE 202	Electronics I	3 (3-0-0)	EE 302	Communications Theory	3 (3-0-0)

EE 202 L	Electronics I Lab	1(0-2-0)	EE 302 L	Communications Theory Lab	1(0-2-0)
EE 301	Signals and Systems	3 (3-0-0)	EE 304	Microelectronics	3 (3-0-0)
EE 305	Computer Networks	3 (3-0-0)	EE 304 L	Microelectronics Lab	1(0-2-0)
EE 305 L	Computer Networks Lab	1(0-2-0)	EE 306	Control and Feedback System Design	3 (3-0-0)
EE 307	Computer Architecture	3 (3-0-0)	EE 306 L	Control and Feedback System Design Lab	1(0-2-0)
EE 307 L	Computer Architecture Lab	1(0-2-0)	EE 308	Electrical Energy Conversion	3 (3-0-0)
IE 315	Engineering Economy and Cost Analysis	3 (3-0-0)	EE 308 L	Electrical Energy Conversion Lab	1 (0-2-0)
			ISL 112	Islamic Studies II	2 (2-0-0)
	Total Credits	**18**		**Total Credits**	**18**
EE 390	Electrical Engineering Summer Internship				0
	Year 4 Fall			**Year 4 Spring**	
EE 405	Electric Power Systems	3(3-0-0)	EE 492	Capstone Project II	2 (0-4-0)
EE 410	Contemporary System Design	3(3-0-0)	4**TE	EE Elective	3 (3-0-0)
EE 410 L	Contemporary System Design Lab	1(0-2-0)	4**TE	EE Elective	3 (3-0-0)
4**TE	EE Elective	3 (3-0-0)	4**TE L	EE Elective Lab	1(0-2-0)
4**TE	EE Elective	3 (3-0-0)	4**TE	EE Elective	3(3-0-0)
4**TE L	EE Elective Lab	1(0-2-0)	4**TE L	EE Elective Lab	1(0-2-0)
EE 490	Capstone Project I	2 (0-4-0)			
ARB 112	Arabic Language II	2 (2-0-0)			
	Total Credits	**18**		**Total Credits**	**13**

Technical Electives

Course Code	Course Title	Credit Hours (CRHs)				Pre-Requisite Course Code	Co-Requisite Course Code
		Total CRHs	Lect.	Lab	Tut.		
EE 401	Special Topics in Electrical Engineering	3	3	0	0	100 CRHs passed	
EE 401 L	Special Topics in Electrical Engineering Lab	1	0	2	0		EE 401
EE 402	Introduction to Wireless Networks	3	3	0	0	100 CRHs passed	
EE 403	Wireless Communications	3	3	0	0	100 CRHs & EE413	
EE 403 L	Wireless Communications Lab	1	0	2	0		EE 403
EE 404	Data Engineering in Electrical Systems	3	3	0	0	100 CRHs passed	
EE 404 L	Data Engineering in Electrical Systems Lab	1	0	2	0		EE 404
EE 406	Digital Electronics	3	3	0	0	100 CRHs passed	
EE 406 L	Digital Electronics Lab	1	0	2	0		EE 406
EE 408	Communication Electronics	3	3	0	0	100 CRHs passed	
EE 412	Nanoelectronics	3	3	0	0	100 CRHs passed	
EE 412 L	Nanoelectronics Lab	1	0	2	0		EE 412
EE 413	Digital Communications	3	3	0	0	100 CRHs passed	
EE 413 L	Digital Communications Lab	1	0	2	0		EE 413
EE 417	Digital Signal Processing	3	3	0	0	100 CRHs passed	
EE 417 L	Digital Signal Processing Lab	1	0	2	0		EE 417
EE 418	Digital Image Processing	3	3	0	0	100 CRHs passed	
EE 418 L	Digital Image Processing Lab	1	0	2	0		EE 418
EE 420	Power Electronics	3	3	0	0	100 CRHs passed	
EE 420 L	Power Electronics Lab	1	0	2	0		EE 420
EE 422	Antennas and Wave Propagation	3	3	0	0	100 CRHs passed	
EE 423	Optical Fiber Communication Systems	3	3	0	0	100 CRHs & EE422	
EE 424	Optoelectronics	3	3	0	0	100 CRHs passed	
EE 424 L	Optoelectronics Lab	1	0	2	0		EE 424
EE 425	Microwave Engineering	3	3	0	0	100 CRHs & EE422	
EE 426	Renewable Energy	3	3	0	0	100 CRHs passed	
EE 426 L	Renewable Energy Lab	1	0	2	0		EE 426
EE 427	Digital Control	3	3	0	0	100 CRHs passed	
EE 428	Modern Control Theory	3	3	0	0	100 CRHs passed	
EE 435	Undergraduate Research in Electrical Engineering	3	0	6	0	Department Chair approval, a min. 3.0 GPA, & a signed research contract.	

Electrical Engineering Course Descriptions

In this section we give the course descriptions of Electrical Engineering courses of the program.

Core Courses

EE 101 Programming for Electrical Engineers

Cr Hr: 3

The course introduces programming for electrical engineers. The implementation of algorithms using if statements, while loops, for loops is covered. The use of functions, strings, arrays, and basic data types is also addressed. More advanced topics such as the management of input and output data streams and files, and memory allocation are undertaken.

EE 101 L Programming for Electrical Engineers Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 101

Laboratory experiments dealing with Programming for Electrical Engineers.

EE 202 Electronics I

Cr Hr:3 Pre-requisites: EE 207 Co-requisites: EE 208

The course teaches the fundamentals of electronic circuits, including diode characteristics and diode circuits, transistors and applications, switches and MOS transistors, amplifiers, energy storage elements, digital circuits and applications. Design and laboratory exercises are also significant components of the course.

EE 202 L Electronics I Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 208

Laboratory experiments dealing with Electronics I.

EE 207 Foundation of Electrical Engineering

Cr Hr: 3 Tutorial Hr:1 Pre-requisites:PHU124

Co-requisites: MAT 213

The course teaches fundamental concepts of electrical circuits, students will be familiarized with the essential principles of electrical circuit analysis composition of components into systems and networks, and

understanding the trade-offs and limits imposed by energy and noise. Students learn to apply the concepts during laboratory design.

EE 207 L Foundation of Electrical Engineering Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 207

Laboratory experiments dealing with Foundation of Electrical Engineering.

EE 208 Electric Circuits

Cr Hr:3 Pre-requisites: EE 207

The course teaches the design and analysis of interconnected networks of lumped circuit elements.

EE 210 Digital Logic Systems

Cr Hr:3 Pre-requisites: EE 207

The course teaches theoretical foundations and concepts of digital systems and applies these concepts with design problems and projects. Students are exposed to the design and engineering of digital computers and subsystems.

EE 210 L Digital Logic Systems Lab

Cr Hr: 1 Lab Hr:2 Co-requisites: EE 210

Laboratory experiments dealing with Digital Logic Systems.

EE 301 Signals and Systems

Cr Hr: 3 Pre-requisites: EE 208, MAT 224

The course teaches fundamental concepts of signals and systems analysis, with applications drawn from filtering, audio and image processing, communications, and automatic control. The objective of the course is to allow students to develop a thorough understanding of time-domain and frequency domain approaches to the analysis of continuous and discrete systems. To provide students with necessary tools and techniques to analyze electrical networks and systems.

EE 302 Communications Systems

Cr Hr:3 Pre-requisites: EE 301, STA 212

The course teaches communication systems and information theory. Topics covered include the classification of signals and systems, Fourier series and transform applications, power spectra and spectral density, band-limited signals and noise, sampling theory and digital transmission, modulation techniques and pulse code modulation.

EE 302 L Communications Systems Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 302

Laboratory experiments dealing with Communications Systems.

EE 304 Electronics II

Cr Hr:3 Pre-requisites: EE 202

This course teaches analog circuit analysis and design, including an introduction to the tools and methods necessary for the creative design of practical circuits using active devices.

EE 304 L Electronics II Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 304

Laboratory experiments dealing with Electronics II.

EE 305 Computer Networks

Cr Hr: 3 Pre-requisites: EE 210, SE 100, STA 212

The course teaches the fundamental concepts of communication networks, and is concerned specifically with network architectures and protocols. The objective of the course is to allow students to develop a thorough understanding of the architectures of networks and the basic principles that allow the transmission of data over networks.

EE 305 L Computer Networks Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 305

Laboratory experiments dealing with Computer Networks.

EE 306 Control and Feedback Systems

Cr Hr:3 Pre-requisites: EE 301

The course teaches the analysis and synthesis of continuous and sampled-data linear feedback control systems, and its application to a variety of physical systems.

EE 306 L Control and Feedback Systems Lab

Cr Hr:1 Lab Hr: 2 Co-requisites: EE 306

Laboratory experiments dealing with Control and Feedback Systems.

EE 307 Computer Architecture

Cr Hr:3 Pre-requisites: SE 100, EE 210

The course introduces the architecture of digital systems, with an emphasis on the structural principles common to a wide range of computer technologies. Multilevel implementation strategies, the definition of new primitives (e.g., gates, instructions, procedures, and processes) and their mechanization using lower-level elements, the organization and operation of digital computers and the hardware/software interface are addressed.

EE 307 L Computer Architecture Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 307

Laboratory experiments dealing with Computer Architecture.

EE 308 Electrical Energy Conversion

Cr Hr:3 Pre-requisites: EE 202, EE 309

The course teaches the basic concepts of electrical machines and power semiconductor converters and their application within modern power systems.

EE 308 L Electrical Energy Conversion Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 308

Laboratory experiments dealing with Electrical Energy Conversion.

EE 309 Electromagnetics

Cr Hr:3 Pre-requisites: EE 208, MAT 211

The course teaches the application of electromagnetic principles to classical and modern devices. The concepts of work and energy and electromagnetic fields are addressed.

EE405 Electric Power Systems

Cr Hr: 3 Pre-requisites: EE308, MAT 224

The course teaches the components, analysis, and modeling of large scale electric power systems. This includes the review of single and three phase circuit variables and parameters and the per unit system. The components of the system are studied including the transformers and the transmission line parameters. In addition, the operation in terms of modeling and analysis of electric power systems is studied in steady state and transient state, with a particular focus on power flow solution methods. Case studies are introduced to prepare for more advanced topics. A project accompanies the course to introduce practical aspects of measurements and operation, with simulations addressing large scale problems.

EE 410 Contemporary System Design

Cr Hr:3 Pre-requisites: 100 CRHs passed

This course introduces a holistic view of electric engineering system design based on contemporary approaches and tools. The course elements are to be updated on a biannual basis to adopt to state-of-the-art EE design methods. Initial emphasis will be made on real-time monitoring and control, system modelling and data acquisition.

EE 410 L Contemporary System Design Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 410

Laboratory experiments dealing with Contemporary System Design.

EE 490 Capstone Project I

Cr Hr:2 Lab Hr:4 Pre-requisites: 100 CRHs passed

Students work in teams as professional engineering consultants on an independent engineering project under the supervision of a project advisor. The design process is emphasized, encompassing project definition, feasibility analysis, evaluation of alternative designs, and design computations. For each project, the scope of work is developed and negotiated between client and student consultants. The scope of work may also include fabrication, device testing, and field-testing. Projects are arranged by the students with approval of the instructor. The design and methodology are emphasized in part 1. Progress reports and an end of term report are submitted to the student's project advisor with an oral presentation of the design and methodology of the project.

EE 492 Capstone Project II

Cr Hr:2 Lab Hr:4 Pre-requisites: EE490

The students work on the implementation and validation of the designs developed in part 1. A demonstration is presented and a final written report are submitted to the student's project advisor. Oral presentations of reports are made before the faculty and students. A student who selects a project suggested by industry has the opportunity of working with an industry sponsor in an actual engineering experience.

Elective Courses

EE401 Special Topics in Electrical Engineering

Cr Hr:3 Pre-requisites: 100 CRHs passed

This course provides instruction and experience in timely topics related to Electrical Engineering major.

EE401 Special Topics in Electrical Engineering Lab

Cr Hr:1 Lab Hr 2 Co-requisites: EE 401

Laboratory experiments dealing with the special topics course. This will be offered if the special topics course has an applied side and is scheduled to be offered with a lab.

EE 402 Introduction to Wireless Networks

Cr Hr:3 Pre-requisites: 100 CRHs passed

The course surveys the various types of wireless communications, the protocols involved and the design issues that nature and engineering impose upon the telecommunications engineer. Specifically, the course covers wireless network architectures including cellular networks, local area networks, multi-hop wireless networks such as ad hoc networks, mesh networks, and sensor networks; capacity of wireless networks; medium access control, routing protocols, and transport protocols for wireless networks; mechanisms to improve performance and security in wireless networks; energy-efficient protocols for sensor networks.

EE 403 Wireless Communications

Cr Hr:3 Pre-requisites: 100 CRHs passed, EE413

The course teaches wireless communications for voice, data, and multimedia. Topics include wireless systems and standards, characteristics of the wireless channel, including path loss for different environments, random log-normal shadowing due to signal attenuation, and the flat and frequency-selective properties of multipath fading.

EE 403 L Wireless Communications Lab

Cr Hr: 1 Lab Hr:2 Co-requisites: EE 403

Laboratory experiments dealing with Wireless Communications.

EE 404 Data Engineering in Electrical Systems

Cr Hr:3 Pre-requisites: 100 CRHs passed

The course introduce students to data engineering and science (DES) techniques, with a focus on application to substantive (i.e. "applied") engineering problems. Students will gain experience in identifying which problems can be tackled by DES methods, and learn to identify which specific DES methods are applicable to a problem at hand.

EE 404 L Data Engineering in Electrical Systems Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 404

Laboratory experiments dealing with Data Engineering in Electrical Systems.

EE 406 Digital Electronics

Cr Hr:3 Pre-requisites: 100 CRHs passed

This course aims to familiarize students with the basic concepts and mechanisms of operation and design of digital electronic circuits, both discrete and integrated. Topics covered include an overview of MOS and BJT types, structures and operation, digital logic inverters (voltage transfer characteristic, digital integrated circuit technologies and logic-circuit families), CMOS inverters (dynamic operation of the CMOS inverter, inverter sizing, power dissipation), logic-gate circuits (NOR, NAND, XOR), propagation delay analysis, pseudo-NMOS logic circuits, gate circuits, pass-transistor logic circuits (NMOS transistors as switches, CMOS transmission gates as switches), dynamic MOS logic circuits (Emitter-coupled logic (ECL) and families), BiCMOS inverters and logic gates, latches, flip-flop circuits, multivibrators, and an overview of memory circuits types and architectures, and A/D and D/A converters.

EE 406 L Digital Electronics Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 406

Laboratory experiments dealing with Digital Electronics.

EE 408 Communication Electronics

Cr Hr:3 Pre-requisites: 100 CRHs passed

This course is designed for senior-level undergraduate students in Electrical Engineering. It builds upon perquisite courses on signal and systems, communications, control systems, and electronics to further enhance the understanding of communication circuits operation and physical implementation. The course focuses on the field of communication electronics at levels from block diagram to circuit analysis for physical implementation. It aims to cover topics as radio frequency amplifiers, oscillators, signal spectra, noise, modulation and AM systems, transmitter and receiver circuits, sideband systems, frequency and phase modulation, phase-locked loops, and pulse and digital modulation.

EE 412 Nanoelectronics

Cr Hr:3 Pre-requisites: 100 CRHs passed

The course teaches an introduction to the electronic properties of molecules, carbon nanotubes, crystals and other nanodevices.

EE 412 L Nanoelectronics Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 412

Laboratory experiments dealing with Nanoelectronics.

EE 413 Digital Communications

Cr Hr:3 Pre-requisites: 100 CRHs passed, EE302

The course teaches the principles of digital communication systems. Topics include sampling, quantization and encoding of analog signals, pulse code modulation (PCM), delta modulation (DM), noise analysis in PCM and DM systems, base-band digital systems (matched filter, probability of error, inter-symbol interference, equalization, distortionless transmission, and M-ary transmission), line codes and their power spectra, pass-band digital systems (ASK, FSK PSK, DPSK, and M-ary), bandwidth and power requirements of modulation schemes, coherent and non-coherent detection, error rate analysis, and introduction to information theory.

EE 413 L Digital Communications Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 413

Laboratory experiments dealing with Digital Communications.

EE 417 Digital Signal Processing

Cr Hr:3 Pre-requisites: 100 CRHs passed

This course presents an introduction to the techniques and algorithms of digital processing for signals and information data. It is designed for senior-level undergraduate students in electrical and computer engineering. The theory and practice covered in this course can be applied in wide range of science fields, such as image processing, communications, satellite systems, biomedical, power and electronic devices, and programmable units. The proposed content covers a review of discrete-time sequences and systems, sampling of continuous-time signals and aliasing effect, discrete Fourier transform: properties and applications; fast Fourier transform (FFT): implementation and computations, finite impulse response (FIR) filters design and analysis: low-pass, band pass, high pass, phase response etc., and infinite impulse response (IIR) filters design methods and cascaded structures. The course involves extensive software and programming experience to enrich the understanding of the covered material.

EE 417 L Digital Signal Processing Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 417

Laboratory experiments dealing with Digital Signal Processing.

EE 418 Digital Image Processing

Cr Hr:3 Pre-requisites: 100 CRHs passed

The course teaches an introduction to image processing and its applications, including the fundamental concepts of visual perception and image acquisition, the basic techniques of image manipulation, segmentation and coding, and a preliminary understanding of pattern recognition and computer vision.

EE 418 L Digital Image Processing Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 418

Laboratory experiments dealing with Digital Image Processing.

EE 420 Power Electronics

Cr Hr:3 Pre-requisites: 100 CRHs passed

The course teaches the principles of designing power electronic circuits. Power electronics design has applications in several fields from motor drives to consumer electronics to electric power transmission over HVDC lines. Therefore, the course reviews the fundamentals before covering generic power electronic circuit topologies. This entails a review of the switching devices, e.g., diodes, thyristors, BJTs, and the review of the fundamentals of electric circuit design and magnetism. Building on the fundamentals, the course covers AC to DC, DC to DC, DC to AC, and AC to AC electric power conversion topologies. The lab component is simultaneously administered to offer a practical perspective including the selection of components vis-à-vis the application, the instrumentation. In addition, the lab goes over the prototyping and testing aspects of power electronic circuit design.

EE 420 L Power Electronics Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 420

Laboratory experiments dealing with Power Electronics.

EE 422 Antennas and Wave Propagation

Cr Hr:3 Pre-requisites: 100 CRHs passed

This course introduces the characteristics of electromagnetic waves and their behavior during the propagation through different media. The wave equation is derived using the Maxwell's equations for time varying fields. The electromagnetic wave propagation in different media as well as their reflection at normal and oblique angle of incidence is discussed. The concept of transmission line theory and its parameters, smith chart and its application are introduced. Waveguide and TM & TE modes are discussed. In addition the course includes Antenna characteristics, antenna types such as dipole, loop and antenna array.

EE 423 Optical Fiber Communication Systems

Cr Hr:3 Pre-requisites: 100 CRHs passed , EE 422

The course teaches the introduction to the optical fiber communications. Topics discusses dielectric slab waveguide, step-index and graded-index optical fibers, single mode and multimode fiber, attenuation and dispersion, light sources (LED and Laser diode), optical modulation and detection, noise modeling in optical receivers, and error rate analysis.

EE 424 Optoelectronics

Cr Hr:3 Pre-requisites: 100 CRHs passed

The course teaches semiconductor light sources, such as different types of LEDs, Lasers (both gas and solid states), modulation techniques, photodetectors, PIN diode, avalanche Photo Diode (APD), the basics of optical waveguides and the principles of fiber optics

EE 424 L Optoelectronics Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 424

Laboratory experiments dealing with Optoelectronics.

EE 425 Microwave Engineering

Cr Hr:3 Pre-requisites: 100 CRHs passed , EE 422

The course teaches the fundamentals of Microwave Engineering. Topics include a review of electromagnetics theory, and discuss transmission lines and waveguides, microwave network analysis, impedance matching, passive microwave devices (power dividers and directional couplers), strip-line and micro-strip line circuits, microwave filters, and introduction to ferrimagnetic materials and components.

EE 426 Renewable Energy

Cr Hr:3 Pre-requisites: 100 CRHs passed

This course covers fundamentals of renewable energy systems, Solar energy, Bio-energy, Wind energy, Hydro-power, Tidal power, Wave energy and Geothermal energy. Also integration of renewable energy systems will be covered in the course. The students will be exposed to technical aspects of mentioned topics; How to utilize renewable energy for domestic and industrial applications; requirements and obstacles of applications; how to integrated renewable energy systems.

EE 426 L Renewable Energy Lab

Cr Hr:1 Lab Hr:2 Co-requisites: EE 426

Laboratory experiments dealing with Renewable Energy.

EE 427 Digital Control

Cr Hr:3 Pre-requisites: 100 CRHs passed

The course discusses digital control designs and methodologies for dynamic systems. It describes classical and state-space control methods, and applies them to selected applications. The course explores the advantages and limitations of each method, offers an overview of feedback control systems, and proposes to cover selected topics on multivariable and optimal control methods. The course involves Matlab experience to improve the understanding of the covered design methods.
The topics include a review of continuous control (feedback, root locus, frequency response design, compensation, state-space design), basic digital control (digitization, sampling, PID), discrete systems (linear difference equations, z-transform, spectrum, block diagrams), discrete equivalents (design via numerical integration, zero-pole matching), transform techniques (root locus in z-plane, frequency response), state-space approaches (regulator design, integral control and disturbance estimation, controllability and observability), and an introduction to multivariable and optimal control (time-varying and LQR steady-state optimal control, multivariable design)

EE 428 Modern Control Theory

Cr Hr:3 Pre-requisites: 100 CRHs passed

The course covers the fundamentals of Matrix Theory including eigenvalues and eigenvectors, and the matrix representations of the Diagonal, Jordan, Controllable, and Observable forms. The student learns to represent systems in terms of their state variables and state diagrams, and then solve for their response in the time domain. The focus of the course is on linear time invariant or LTI systems. Furthermore, the controllability and observability of the LTI system is studied, before covering the design of state feedback and output feedback control techniques. In addition, observer design is covered, with the separation principle, to construct observer-based control systems.

EE 435 Undergraduate Research in Electrical Engineering
Cr Hr:3 Lab Hr:6 Pre-requisites: Department Chair approval, a GPA of at least 3.0/4.0, and a signed research contract

Students participate in supervised research with a faculty member. Supervised research can be: 1) independent research undertaken by the student (thesis, independent study), or 2) assistance on a faculty member's research project. Students must find a faculty member who is willing to supervise him/her as an assistant on an existing project or as the author of an individual project. The student and the faculty supervisor will complete and sign a research contract which will be turned in to the chair of the Electrical Engineering Department. Drafting the contract will allow the student to develop ideas about what should be accomplished and what the faculty supervisor's expectations are. All academic requirements are at the discretion of the supervising faculty member. Students should agree on a plan for the semester with the faculty mentor before the research begins. The plan should include academic requirements, the basis for grading the experience, and a plan for student/professor meetings for the semester. It is the student's responsibility to report progress and seek guidance when needed. Students are expected to be active and reliable participants in the research experience.

DEPARTMENT OF INDUSTRIAL ENGINEERING

Degree Offered: Bachelor of Science (B.Sc.) Degree Program in Industrial Engineering

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General Department Information

Industrial engineering is about choices. Other engineering disciplines apply skills to very specific areas. An industrial engineering education offers the best of both worlds: an education in both engineering and management.

The most distinctive aspect of industrial engineering is the flexibility it offers. Whether it's shortening a rollercoaster line in an amusement park, streamlining an operating room in a hospital, distributing products worldwide, or manufacturing superior automobiles, these challenges share the common goal of saving money and increasing efficiencies. As companies adopt management philosophies of continuous productivity and quality improvement to survive in the increasingly competitive world market, the need for industrial engineers is growing. Why? Industrial engineers are the only engineering professionals trained specifically to be productivity and quality improvement specialists. Industrial engineers figure out how to do things better. They work to eliminate waste of time, money, materials, energy and other commodities. This is why many industrial engineers end up being promoted into management positions.

Many people are misled by the term industrial engineer. It's not just about manufacturing. It also encompasses service industries, with many industrial engineers employed in entertainment industries, shipping and logistics businesses, and health care organizations. Industrial engineers make processes better in the following ways:

- More efficient and more profitable business practices
- Better customer service and product quality
- Improved efficiency
- Increased ability to do more with less
- Making work safer, faster, easier, and more rewarding
- Helping companies produce more products quickly
- Making the world safer through better designed products
- Reducing costs associated with new technologies

Bachelor of Science in Industrial Engineering Suggested Study Plan

Year 1 Fall			**Year 1 Spring**		
Code	Course Name	Credit	Code	Course Name	Credit
ENG 101	Freshman English I	3 (3-0-0)	PHL 101 A	Engineering Ethics	3 (3-0-0)
MAT 101	Calculus I	3 (3-0-2)	ENG 112	Freshman English II	3 (3-0-0)
PHU 103	Mechanics and Waves for Engineers	3 (3-0-1)	MAT 112	Calculus II	3 (3-0-2)
PHU 103L	Mechanics and Waves for Engineers Lab.	1 (0-2-0)	PHU 124	Electromagnetism and Optics for Engineers	3 (3-2-1)
SE 100	Programming for Engineers	3 (3-0-0)	PHU 124L	Electromagnetism and Optics for Engineers Lab.	1 (0-2-0)
SE 100L	Programming for Engineers Lab.	1 (0-2-0)	ME 201	Materials Science and Engineering	4 (3-2-1)
CHM 102	Introduction to Chemistry	3 (3-0-1)	ME 201L	Materials Science and Engineering Lab.	1 (0-2-0)
CHM 102L	Introduction to Chemistry Lab.	1 (0-2-0)			
	18			**17**	

Year 2 Fall			**Year 2 Spring**		
MAT 212	Linear Algebra	3 (3-0-0)	MAT 224	Numerical Methods	3 (3-0-0)
MAT 211	Calculus III	3 (3-0-0)	STA 212	Probability and Statistics for Engineers	3 (3-0-0)
EE 207	Foundations of Electrical Engineering	3 (3-0-1)	ME 305	Manufacturing and Workshop Training	3 (3-0-0)
EE 207L	Foundations of Electrical Engineering Lab.	1 (0-2-0)	ME 305	Manufacturing and Workshop Training Lab.	1 (0-2-0)
MAT 213	Differential Equations	3 (3-0-0)	ME 208	Mechanics of Materials I	3 (3-0-1)
ME 203	Applied Mechanics: Statics and Dynamics I	3 (3-0-1)	ME 208 L	Mechanics of Materials I Lab.	1 (0-2-0)
			ME 205	Introduction to Computer Aided Design	3 (3-0-0)
			ME 206	Thermal Fluids Engineering I	3 (3-0-1)
			ME 206 L	Thermal Fluids Engineering I Lab.	1 (0-2-0)
	16			**21**	
	Year 3 Fall			**Year 3 Spring**	
ISL 101	Islamic Studies I	2 (2-0-0)	ARB 101	Arabic Language I	2 (2-0-0)
IE 301	Operations Research I	3 (3-0-1)	IE 302	Operations Research II	3 (3-0-1)
ECO 110	Economic Principles	3 (3-0-0)	ME 308	Advanced Manufacturing Processes	3 (3-0-0)
IE 309	Human Factors and Ergonomics	3 (3-0-1)	ME 308 L	Advanced Manufacturing Processes Lab.	1 (0-2-0)

IE 309L	Human Factors and Ergonomics	1 (0-2-0)	IE 330	Simulation	3 (3-0-0)
IE 307	Work Systems Analysis & Design	3 (3-0-1)	IE 330L	Simulation Lab.	1 (0-2-0)
IE 307L	Work Systems Analysis & Design Lab.	1 (0-2-0)	ME 306	Instrumentation and Control Engineering	3 (3-0-0)
IE 304	Production and Service Systems Planning I	3 (3-0-1)	ME 306	Instrumentation and Control Engineering Lab.	1 (0-2-0)
			IE 305	Production and Service Systems Planning II	3 (3-0-1)
	19			**20**	
IE 390	Industrial Engineering Summer Internship				0
	Year 4 Fall			**Year 4 Spring**	
ISL 112	Islamic Studies II	2 (2-0-0)	ARB 112	Arabic Language II	2 (2-0-0)
ENG 222	Technical Writing	3 (3-0-0)	IE 4xx	Industrial Engineering Technical Elective	3 (3-0-0)
IE 401	Network Models and Project Management	3 (3-0-1)	IE 450	Management for Engineers	3 (3-0-0)
IE 415	Production Information Systems	3 (3-0-0)	IE 315	Engineering Economy and Cost Analysis	3 (3-0-1)
ME 405	Engineering Safety and Risk Analysis	3 (3-0-0)	IE 406	Quality Engineering	3 (3-0-1)
			IE 490	Industrial Engineering Capstone Project	4 (0-8-0)
	14			**18**	

Technical Electives

Course Code	Course Name	Credit Hours (CRHs)				Pre-Requisite Course Code
		Total-CRHS	Lect	Lab	Tut	
IE 400	Special Topics in Industrial Engineering	3(3,0,0)	3	0	1	Department Approval
IE 420	Reliability and Maintenance Engineering	3 (3,0,0)	3	0	0	IE 305
IE 430	New Product Development	3 (3,0,0)	3	0	0	IE 309
IE 435	Undergraduate Research in Industrial Engineering	3 (0,6,0)	3	0	0	Department Approval

Industrial Engineering Course Descriptions

This section presents brief descriptions of the program's core and elective industrial engineering courses.

Core Courses

IE 301 Operations Research I

Cr Hr:3 Pre-requisites: MAT 212

The course includes deterministic operations research modelling concepts; linear programming modelling, simplex theory, duality and sensitivity analysis with economic interpretation; transportation and assignment problems; integer programming; branch and bound techniques; nonlinear optimization problems; multi-criteria decision making.

IE 302 Operations Research II

Cr Hr:3 Pre-requisites: IE 301, STA 212

This course introduces probability models used to investigate the behavior of industrial systems. It teaches decision making under uncertainty, elementary counting processes, Markov chains and Markov processes. Stochastic programming and applications. Stochastic models in queuing systems, inventories, and equipment reliability are also addressed.

IE 304 Production and Service Systems Planning I

Cr Hr:3 Co-requisites: IE 301

The course teaches theory and concepts involved in model formulation for the analysis and control of production processes, including systems for planning and controlling production and service systems to achieve productivity and efficiency. The course addresses the basic issues in production planning, including aggregate production planning, master production schedule, materials requirement planning, and capacity planning. Flexible manufacturing systems, lean manufacturing, Just-in-time (JIT), and new concepts in manufacturing are addressed. Various production systems are described, including job shops, flow shop, cellular manufacturing covering scheduling and optimization.

IE 305 Production and Service Systems Planning II

Cr Hr:3 Pre-requisites: IE 304

The course teaches aspects of planning and design of logistics and inventory management in production and service systems. Optimization issues in supply chain management, distribution systems and routing, inventory control and warehousing, distributed networks, centralized and decentralized networks, facility location and layout, supply chain and strategic partnerships are addressed.

IE 307 Work Systems Analysis and Design

Cr Hr:3 Pre-requisites: STA 212

The course teaches survey of methods for assessing and improving performance of individuals and groups in organizations. Techniques include various basic industrial engineering tools, work analysis, data acquisition and application, performance evaluation and appraisal, work measurement procedures and motion study. Layout design of work environments will include material handling systems and warehousing.

IE 307L Work Systems Analysis and Design Lab

Cr Hr:1 Lab Hr:2 Co-requisites: IE 307

Laboratory experiments dealing with work systems analysis and design.

IE 309 Human Factors and Ergonomics

Cr Hr:3 Pre-requisites: STA 212 Co-requisites: IE 307

The course teaches analysis of tools, work spaces and activities to achieve efficiency in modern work environments are introduced. The effects of vibration, noise, illumination, and control display design, age and shift work on the performance of workers are discussed. Physiological and psychological capabilities and limitations in human factors, ergonomic measurement methods and analytical techniques, design of tools and the working ergonomic environment are addressed.

IE 309L Human Factors and Ergonomics Lab

Cr Hr:1 Lab Hr:2 Co-requisites: IE 309

Laboratory experiments dealing with human factors and ergonomics.

IE 315 Engineering Economy and Cost Analysis

Cr Hr:3 Pre-requisites: Department Approval

The course teaches economic analysis in an engineering environment considering the time value of money. Methods for evaluation of alternatives: present worth, annual equivalent worth, rate of return, payback method and benefit-cost ratio method. Replacement analysis, depreciation, inflation and cost estimation. Sensitivity and risk analysis are also considered.

IE 330 Simulation

Cr Hr:3 Pre-requisites: SE 100, STA 21

This course teaches simulation modelling and analysis of production and service systems, including simulation methodology, model building in a computer environment, analyzing performance measures and assessment of different policies. It also teaches simulation languages, basic and advanced modules, and statistical aspects of simulation such as fitting of input and output distributions. Validation and verification of simulation models are also covered.

IE 330L Simulation Lab.

Cr Hr:1 Lab Hr:2 Co-requisites: IE 330

Laboratory experiments dealing with the implantation of discrete-event simulation models.

IE 401 Network Models and Project Management

Cr Hr:3 Pre-requisites: IE 301

The course teaches the terminology of graphs and networks, network flow problems, algorithms and solutions. Project management, defining the project, scheduling issues in projects, project duration optimization, resources planning, evaluation and progress, estimating times and costs, critical processes in the projects, applications of project-planning and software in the strategy of projects, integration of organization with projects and probability issues in project planning are addressed.

IE406 Quality Engineering

Cr Hr:3 Pre-requisites: IE 305

The course teaches Quality Assurance in an industrial system and compares it with the existing standards and protocols, including an introduction to quality engineering, quality standards ISO 9000 and QS 9000, TQM, quality cost analysis, process modeling and hypothesis testing, statistical process control for long and short production runs, process capability analysis, capability indexes, Weibull analysis, Six sigma acceptance sampling and design of experiments.

IE415 Production Information Systems

Cr Hr:3 Pre-requisites: IE 305

The course teaches the design and analysis of production information systems, critical success factors for companies, effectiveness and efficiency through information systems usage in production and service systems, success cases in industry. Investigation of data modelling, storage, acquisition and utilization in Industrial Engineering via manual and computerized methods. Development of effective spreadsheet applications, design and implementation of relational databases via E-R modelling, relational schema, normalization, SQL (Standard Query Language), web-based database applications, interface design, the system development life cycle applied to data management applications, ERP (Enterprise Resource Planning) software and decision support systems are addressed..

IE450 Management for Engineers

Cr Hr:3 Pre-requisites: Departmental Approval

The course focuses on learning to see and understand the fundamental activities of businesses as practiced worldwide and how to manage them. Successfully performing these activities requires vision, passion, leadership, teamwork, and integrating the many functional disciplines of business.

IE490 Industrial Engineering Capstone Project

Cr Hr:4 Lab Hr:8 Pre-requisites: Departmental Approval

Students work in teams as professional engineering consultants on an independent engineering project under the supervision of a project advisor. The design process is emphasized, encompassing project definition, feasibility analysis, evaluation of alternative designs, and design computations. For each project, the scope of work is developed and negotiated between client and student consultants. The scope of work may also include fabrication, device testing, and field-testing. Projects are arranged by the students with approval of the instructor. Progress reports and a final written report are submitted to the student's project advisor. Oral presentations of reports

are made before the faculty and students. A student who selects a project suggested by industry has the opportunity of working with an industry sponsor in an actual engineering experience.

Elective Courses

IE400 Special Topics in Industrial Engineering

Cr Hr:3 Pre-requisites: Department Approval

This course provides instruction and experience in timely topics related to Industrial Engineering major.

IE420 Reliability and Maintenance Engineering

Cr Hr:3 Pre-requisites: IE 305

This course provides an introduction to the life-cycle costing concept for equipment maintenance and replacement. Emphasis will be on the development of mathematical and simulation models for determining optimal maintenance and replacement policies for both capital equipment and components.

IE430 New Product Development

Cr Hr:3 Pre-requisites: IE 309

This course presents state-of-the-art Product Development techniques focusing on the interdisciplinary nature of the product design activities.

IE435 Undergraduate Research in Industrial Engineering

Cr Hr:3 Pre-requisites: Departmental Approval

Students participate in supervised research with a faculty member. Supervised research can be: 1) independent research undertaken by the student (thesis, independent study), or 2) assistance on a faculty member's research project. Students must find a faculty member who is willing to supervise him/her as an assistant on an existing project or as the author of an individual project. The student and the faculty supervisor will complete and sign a research contract which will be turned in to the chair of the Industrial and Mechanical Engineering Department. Drafting the contract will allow the student to develop ideas about what should be accomplished and what the faculty supervisor's expectations are. All academic requirements are at the discretion of the supervising faculty member. Students should agree on a plan for the semester with the faculty

mentor before the research begins. The plan should include academic requirements, the basis for grading the experience, and a plan for student/professor meetings for the semester. It is the student's responsibility to report progress and seek guidance when needed. Students are expected to be active and reliable participants in the research experience.

DEPARTMENT OF MECHANICAL ENGINEERING

Degree Offered: Bachelor of Science (B.Sc.) Degree Program in Mechanical Engineering

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Dr. Abdulmajeed Mohammed, Chairman & Professor of Mechanical Engineering

General Department Information

Mechanical engineers are concerned with the design, development and manufacture of machines and mechanical parts and components. In modern times, good mechanical engineers are trained on a strong foundation of theory, practice and interdisciplinary innovation. Subjects in mechanical engineering overlap with various other engineering branches such as aerospace, architecture, biomedical, civil, chemical, computer, electrical, electronic and communication, industrial, instrumentation, materials, metallurgical, nuclear and petroleum engineering to varying amounts. But mechanical engineers do more than just work in these core engineering sectors. The field has continually evolved and in recent times mechanical engineers have been heavily involved in numerous advanced fields such as acoustics, automatic control, biomedical, chemical processing, combustion, computer-aided design, condition monitoring, environmental control, food processing, renewable and nuclear energy, mechatronics, manufacturing, maritime industry, nanotechnology, power generation, plant layout, process simulation, water desalination, quality control, consultancy and human resource management.

A mechanical engineer should have a strong interest and academic background in mathematics and physical sciences, concern about the quality of life and products, a desire to put ideas into action, curiosity about how things work and how to improve their performance, and good communication skills. Engineering design is the backbone of Alfaisal University's mechanical engineering (ME) program which is reinforced with the fundamental physical sciences, including engineering mathematics, physics, chemistry, materials, applied mechanics, mechanics of materials, structural analysis, fluid mechanics, automatic control, thermodynamics, fluids mechanics, fundamentals of electrical and electronic engineering, manufacturing processes, mechatronics, machine design, engineering management, instrumentation, safety and risk analysis, vibration and damping, computer-aided engineering and several computational techniques. Experimental work is carried out in laboratories and through small projects work at all levels of the program. The program also includes industry and University-based summer

research projects at different levels. This is not to say that your mechanical engineering education is over, the main aim of the ME program being to provide graduates with the ability and confidence to continue lifelong education within their chosen profession. Mechanical engineers have always been in good demand worldwide. In the Kingdom of Saudi Arabia and the world over, there is a great demand for mechanical engineers. National public and private sector companies like Saudi Aramco, SABIC, Saudi Railways Organization, KACST, universities in addition to multinational companies such as BAE Systems, Boeing, General Electric, IBM, Microsoft, Google, Schneider, Schlumberger, Siemens, Thales International, and United Technologies, etc., all have constant interest in Mechanical Engineers across all specializations.

A degree in mechanical engineering at Alfaisal University will give you the knowledge and advanced interdisciplinary skills to work in the design, development and manufacture of products in Saudi Arabia and worldwide.

Bachelor of Science in Mechanical Engineering Suggested Study Plan

	Year 1 Fall			**Year 1 Spring**	
Code	**Course Name**	**Credit**	**Code**	**Course Name**	**Credit**
ENG 101	Freshman English I	3 (3-0-0)	PHL 101A	Engineering Ethics	3 (3-0-0)
MAT 101	Calculus I	4 (3-0-2)	ENG 112	Freshman English II	3 (3-0-0)
PHU 103	Mechanics and Waves for Engineers	3 (3-0-1)	MAT 112	Calculus II	4 (3-0-2)
PHU 103L	Mechanics and Waves for Engineers Lab	1 (0-2-0)	PHU 124	Electromagnetism and Waves for Engineers	3 (3-0-1)
SE 100	Programming for Engineers	3 (3-0-0)	PHU 124L	Electromagnetism and Waves for Engineers Lab	1 (0-2-0)
SE 100L	Programming for Engineers Lab	1 (0-2-0)			
CHM 102	Introduction to Chemistry	3 (3-0-1)	ME 201	Materials Science and Engineering	3 (3-0-1)
CHM 102L	Introduction to Chemistry Lab	1 (0-2-0)	ME 201L	Materials Science and Engineering Lab	1 (0-2-0)
	19			**18**	
	Year 2 Fall			**Year 2 Spring**	

MAT 212	Linear Algebra	3 (3-0-0)	STA 212	Probability and Statistics for Engineers	3 (3-0-0)
MAT 211	Calculus III	3 (3-0-0)	ME 305	Manufacturing and Workshop Training	3 (3-0-0)
			ME 305L	Manufacturing and Workshop Training Lab	1 (0-2-0)
EE 207	Foundations of Electrical Engineering	3 (3-0-1)	ME 208	Mechanics of Materials I	3 (3-0-1)
EE 207L	Foundations of Electrical Engineering Lab	1 (0-2-0)	ME 208L	Mechanics of Materials I Lab	1 (0-2-0)
MAT 213	Differential Equations	3 (3-0-0)	ME 205	Introduction to Computer Aided Design	3 (3-0-0)
ME 203	Applied Mechanics: Statics and Dynamics I	3 (3-0-1)	ME 206	Thermal Fluids Engineering I	3 (3-0-1)
			ME 206L	Thermal Fluids Engineering I Lab	1 (0-2-0)
	17			**18**	
	Year 3 Fall			**Year 3 Spring**	
ISL 101	Islamic Studies I	2 (2-0-0)	ARB 101	Arabic Language I	2 (2-0-0)
ME 311	Applied Mechanics: Statics and Dynamics II	3 (3-0-1)	ME 308	Advanced Manufacturing Processes	3 (3-0-0)
			ME 308L	Advanced Manufacturing Processes Lab	1 (0-2-0)
ME 315	Machine Design	3 (3-0-1)	ME 310	Aircraft /Machine Design with Project	3 (3-0-0)
			ME 310L	Aircraft /Machine Design with Project Lab	1 (0-2-0)

ME 312	Mechanics of Materials II /Aircraft Structures	3 (3-0-1)	ME 306	Instrumentation and Control Engineering	3 (3-0-0)
			ME 306L	Instrumentation and Control Engineering Lab	1 (0-2-0)
ME 312L	Mechanics of Materials II /Aircraft Structures Lab	1 (0-2-0)			
ME 307	Thermal Fluids Engineering II	3 (3-0-1)	MAT 224	Numerical Methods	3 (3-0-0)
ME 307L	Thermal Fluids Engineering II Lab	1 (0-2-0)			
	16			**17**	

ME 390	Mechanical Engineering Summer Internship	0

Year 4 Fall			**Year 4 Spring**		
ISL 112	Islamic Studies II	2 (2-0-0)	ARB 112	Arabic Language II	2 (2-0-0)
ENG 222	Technical Writing	3 (3-0-0)	ME 407	Heating, Ventilation, and Air-Conditioning	3 (3-0-1)
ME 314	Vibration and Damping	3 (3-0-1)	GE 203	Economics and Management for Engineers	3 (3-0-0)
ME 403	Finite Element Modelling for Dynamic and Structural Analysis (FEA Modelling)	3 (3-0-1)	Technical Elective I		3 (3-0-0)
ME 403L	Finite Element Modelling for Dynamic and Structural Analysis (FEA Modelling)Lab	1 (0-2-0)			
ME 405	Engineering Safety and Risk Analysis	3 (3-0-1)	Technical Elective II		3 (3-0-0)
ME 490	Mechanical Engineering Capstone Project				4 (0-8-0)

Technical Electives

Course Code	Course Name	Credit Hours (CRHs)				Pre-Requisite Course Code
		Total-CRHS	Lect	Lab	Tut	
ME 401	Computational Fluid Dynamics and Heat Transfer (CFD Modelling)	3	3	0	1	Department chair approval. A GPA of at least 3.0/4.0, and a signed research contract
ME 406	Mechatronics	3	3	0	0	101 CRHs Passed
ME 410	Energy Conversion and Cogeneration Systems	3	3	0	0	101 CRHs Passed
ME 412	Renewable Energy Systems	3	3	0	0	101 CRHs Passed
ME 414	Introduction to Turbomachinery	3	3	0	0	101 CRHs Passed
ME 416	Automotive Engineering	3	3	0	0	101 CRHs Passed
ME 418	Water Desalination	3	3	0	0	101 CRHs Passed
ME 435	Undergraduate Research in Mechanical Engineering	3	0	6	0	Department Approval

Mechanical Engineering Course Descriptions

This section presents brief descriptions of the program's core and elective mechanical engineering courses.

Core Courses

ME201 Materials Science and Engineering

Cr Hr:3 Pre-requisites: CHM 102

The course teaches an introduction to fundamental underlying concepts of atomic bonding, crystal structure, structure-property relationships, mechanical properties, phase diagrams, and time-temperature diagrams.

ME 201L Materials Science and Engineering Lab

Lab Hr:2 Pre-requisites: CHM 102 Co-requisites: ME 201

Laboratory experiments dealing with Materials Science and Engineering, crystal structure, structure-property relationships, and mechanical properties.

ME203 Applied Mechanics: Statics and Dynamics I

Cr Hr:3 Pre-requisites: PHU 103 & MAT 112

The course teaches the equilibrium of systems of forces in statically determinate structures, including deformation and displacement diagrams, work and potential energy and the principle of virtual work. The course reviews momentum and energy principles, covering Newtonian mechanics.

ME205 Introduction to Computer Aided Design

Cr Hr:3

The course teaches computer-aided design of mechanical systems, and includes the preliminary design, analysis, and documentation of a mechanical system. This will include first and third angle projections, solid modeling and the use of commercially available CAD software.

ME206 Thermal Fluids Engineering I

Cr Hr:3 Pre-requisites: PHU 103

The course teaches thermodynamics, pressure, temperature, heat and work, properties of pure materials, first law, closed and open system, second law, heat engines and cycles, including fluid mechanics, conservation laws, boundary layers, laminar and turbulent flows, pipe flows, incompressible one-dimensional flow, external flows, ideal flows, compressible flows, heat transfer, conduction, convection and radiation.

ME206L Thermal Fluids Engineering I Lab

Lab Hr:2 Pre-requisites: PHU 103 Co-requisites: ME 206

Laboratory experiments dealing with thermodynamics, pressure, temperature, heat and work, properties of pure materials, first law, closed and open system, second law, heat engines and cycles, including fluid mechanics, conservation laws, boundary layers, laminar and turbulent flows, pipe

flows, incompressible one-dimensional flow, external flows, ideal flows, compressible flows, heat transfer, conduction, convection and radiation.

ME208 Mechanics of Materials I

Cr Hr:3 Pre-requisites: ME 201

The course teaches materials and structures, including analysis of beam bending, buckling and torsion, material and structural failure, structural design considerations, stress, strain, heating effects, two-dimensional plane stress and plane strain problems, torsion theory for arbitrary sections.

ME208L Mechanics of Materials I Lab

Lab Hr:2 Pre-requisites: ME 201 Co-requisites: ME 208

Laboratory experiments dealing with materials and structures, beam bending, buckling and torsion, material and structural failure, stress, strain, and heating effects.

ME305 Manufacturing and Workshop Training

Cr Hr:3 Pre-requisites: ME 201

The course teaches an overview of modern manufacturing technology, materials and their manufacturing characteristics, Casting, Mould design Tools and fixtures, Cutting machine tools (turning, milling, drilling, broaching etc., abrasive machining processes), Joining, assembly, Manufacturing costs, design for manufacturing, Welding, EDM, Laser Machining, Industrial Manufacturing processes (metal forming, forging, extrusion, rolling), Metrology, Inspection methods and quality control.

ME305L Manufacturing and Workshop Training Lab

Lab Hr:2 Pre-requisites: ME 201 Co-requisites: ME 305

Laboratory experiments dealing with modern manufacturing technology, materials and their manufacturing characteristics, Casting, Mould design Tools and fixtures, Cutting machine tools (turning, milling, drilling, broaching etc., abrasive machining processes), Joining, assembly, Manufacturing costs, design for manufacturing, Welding, EDM, Laser Machining, Industrial Manufacturing processes (metal forming, forging, extrusion, rolling), Metrology, Inspection methods and quality control.

ME306 Instrumentation and Control Engineering

Cr Hr:3 Pre-requisites: EE207

The course teaches an introduction to the design of feedback control systems. Topics include the properties of feedback systems, time-domain and frequency-domain performance measures, stability and degree of stability, the root locus method, Nyquist criterion, frequency-domain design, and state space methods. These concepts will be applied to a variety of mechanical and aerospace systems throughout the course.

ME306L Instrumentation and Control Engineering Lab

Lab Hr:2 Pre-requisites: EE207 Co-requisites: ME 306

Laboratory experiments dealing with feedback control systems, time-domain and frequency-domain performance measures, stability and degree of stability, the root locus method, Nyquist criterion, frequency-domain design, and state space methods.

ME307 Thermal Fluids Engineering II

Cr Hr:3 Pre-requisites: ME 207

The course teaches applications of thermodynamics, heat transfer and fluid mechanics to the design and analysis of energy systems. Topics include energy analysis, power and refrigeration cycles, studies of laminar and turbulent flow including heat transfer in free and forced convection, in channels, and over surfaces, heat transfer, including fins, forced and free convection, boiling and condensation, radiation heat transfer, heat exchangers, multi-mode heat transfer, compressible flows in pipes, ducts, divergent and convergent flows, sonic and supersonic flows.

ME307L Thermal Fluids Engineering II Lab

Lab Hr:2 Pre-requisites: ME 207 Co-requisites: ME 307

Laboratory experiments dealing with applications of thermodynamics, heat transfer and fluid mechanics to the design and analysis of energy systems. This includes energy analysis, studies of laminar and turbulent flow, heat transfer in free and forced convection, in channels, and over surfaces, fins, forced and free convection, boiling and condensation, radiation heat transfer, heat exchangers, compressible flows in pipes, ducts, divergent and convergent flows, sonic and supersonic flows.

ME312 Mechanics of Materials II

Cr Hr:3 Pre-requisites: ME 208

The course teaches an introduction to mechanical behavior of engineering materials and the use of materials in mechanical design. The course emphasizes the fundamentals of mechanical behavior of isotropic and anisotropic materials, as well as design with materials, including elasticity, plasticity, limit analysis, fatigue, fracture, creep, three-dimensional stress and strain problems and the selection of materials for engineering design.

ME 312L Mechanics of Materials II Lab

Lab Hr:2 Pre-requisites: ME 208 Co-requisites: ME 312

Laboratory experiments dealing with mechanical behaviour of engineering materials and the use of materials in mechanical design. The course emphasizes the fundamentals of mechanical behaviour of isotropic and anisotropic materials, as well as design with materials, including elasticity, plasticity, limit analysis, fatigue, fracture, creep, three-dimensional stress and strain problems and the selection of materials for engineering design.

ME 308 Advanced Manufacturing Processes

Cr Hr:3 Pre-requisites: ME 305

The course teaches the integration of design, engineering and management disciplines and practices for analysis and design of manufacturing enterprises. The course emphasizes the physics and stochastic nature of manufacturing processes and systems, and their effects on quality, rate, cost and flexibility. Topics include process physics and control, design for manufacturing and manufacturing systems and a team project where the students design and build elements using mass-production methods to produce a product in quantity.

ME 308L Advanced Manufacturing Processes Lab

Lab Hr:2 Pre-requisites: ME 305 Co-requisites: ME 308

Laboratory experiments dealing with integration of design, engineering and management disciplines and practices for analysis and design of manufacturing enterprises, the physics and stochastic nature of manufacturing processes and systems, and their effects on quality, rate, cost and flexibility, process physics and control, design for manufacturing and manufacturing systems and a team project where the students design and build elements using mass-production methods to produce a product in quantity.

ME 310 Aircraft /Machine Design with Project

Cr Hr:3 Pre-requisites: ME 312 & ME 311

The course teaches the creative design process via the application of physical laws and learning to complete projects on schedule. Topics include synthesis, analysis, design robustness, machine elements, manufacturability, idea generation, estimation, concept selection, visual thinking, communication, design and analysis, design for manufacturing, professional responsibilities and ethics. The students are expected to build a working model of an aircraft (or any other product for mechanical engineering students) as part of a team.

ME 310L Aircraft /Machine Design with Project Lab

Lab Hr:2 Pre-requisites: ME 312 & ME 311 Co-requisites: ME 310

Laboratory experiments dealing with the creative design process via the application of phy-sical laws and learning to complete projects on schedule, synthesis, analysis, design robustness, machine elements, manufacturability, idea generation, estimation, concept selection, visual thinking, communication, design and analysis, design for manufacturing, professional responsibilities and ethics. The students are expected to build a working model of an aircraft (or any other product for mechanical engineering students) as part of a team.

ME 311 Applied Mechanics: Statics and Dynamics II

Cr Hr:3 Pre-requisites: ME 203

The course teaches force-momentum formulation for systems of particles and rigid bodies in planar motion. Topics include work-energy concepts, linearization of equations of motion, the use of various systems of coordinates, including Cartesian, polar and intrinsic coordinate systems, a review of Newton's Laws, applications to orbit calculations and rocket equations, linear stability analysis of mechanical systems, including introduction to natural modes, eigenvalues, damping effects and the use of Bode plots.

ME 314 Vibration and Damping

Cr Hr:3 Pre-requisites: ME 311

The course teaches the modelling techniques for degree of freedom systems, including the application of Newton's second law to vibrating systems, the concept of damping and the response of systems to harmonic inputs.

ME 315 Machine Design

Cr Hr:3 Pre-requisites: ME 208

This course teaches the function, design and performance of mechanical elements commonly used by mechanical engineers, including sets of elements, such as bearings, pumps, gears and transmissions, Students will develop skills in designing and analyzing performance capabilities of these elements as they relate to part geometry, material choice, and loading and environmental conditions, and the lifecycle for representative elements will be derived. A term project will involve synthesizing a mechanical system for the creative design process, both in terms of its functionality and manufacturability.

ME 403 Finite Element Modelling for Dynamic and Structural Analysis (FEA Modelling)

Cr Hr:3 Pre-requisites: ME 312 & ME 311

The course teaches the working principles of the non-linear finite element method (FEM) and applies the concepts involved using commercially available software packages used in industry. Topics include the application, analysis and limitations of design evaluation using FEM approach. The course will equip students to model real engineering problems and correlate the working principles of Mechanics and Dynamics using numerical methods.

ME 403L Finite Element Modelling for Dynamic and Structural Analysis (FEA Modelling) Lab

Lab Hr:2 Pre-requisites: ME 312 & ME 311 Co-requisites: ME 403

Laboratory experiments dealing with the working principles of the non-linear finite element method (FEM) and applies the concepts involved using commercially available software packages used in industry, the application, analysis and limitations of design evaluation using FEM approach. The course will equip students to model real engineering problems and correlate the working principles of Mechanics and Dynamics using numerical methods.

ME405 Engineering Safety and Risk Analysis

Cr Hr:3 Pre-requisites: STA 212

The course will develop the understanding of the underlying causes of engineering disasters, their consequences and modern systems and safety procedures to prevent their recurrence. The course will emphasize the role engineering ethics in modern engineering

ME 407 Heating, Ventilation, and Air-Conditioning

Cr Hr:3 Pre-requisites: ME 206

The course teaches refrigeration and air conditioning, thermodynamics, psychrometry, fluid flow and heat transfer, refrigeration cycles, single and multi-stage refrigeration systems, vapour compression, adsorption and desorption systems, evaporative cooling systems, solar radiation, cooling and heating load calculation, air distribution and duct design, piping, ventilation and equipment selection.

ME 490 Mechanical Engineering Capstone Project

Lab Hr:8 Pre-requisites: Department Approval

The Capstone project is a semester-long design project, undertaken individually or in a small team, under a staff mentor. The project involves an introduction to the life cycle of a project from a technical and management perspective, and is based on extensive oral and written communication. The capstone project is typically the foundation of the student's engineering portfolio for application to industry or graduate school.

Elective Courses

ME 401 Computational Fluid Dynamics and Heat Transfer (CFD Modelling)

Cr Hr:3 Pre-requisites: ME 307

The course teaches the working principles of computational fluid dynamics and heat transfer and applies these concepts using commercially available software packages used in industry. Topics include the application, analysis and limitations of design evaluation using CFD approach. The course will equip students to model real engineering problems and correlate the working principles of fluid dynamics and heat transfer using numerical techniques.

ME 401L Computational Fluid Dynamics and Heat Transfer (CFD Modelling) Lab

Lab Hr:2 Pre-requisites: ME 307 Co-requisites: ME 401

Laboratory experiments dealing with working principles of computational fluid dynamics and heat transfer and applies these concepts using commercially available software packages used in industry, the application, analysis and limitations of design evaluation using CFD approach. The course will equip students to model real engineering problems and correlate the working principles of fluid dynamics and heat transfer using numerical techniques.

ME 406 Mechatronics

Cr Hr:3 Pre-requisites: ME 306

The course teaches the acquisition of the knowledge and skills required to design and control electromechanical systems. The basic material will be covered in classroom lectures and discussions. Much of the learning will take place in the laboratory where students will learn to build and operate representative electromechanical systems. The class includes a final project.

ME 410 Energy Conversion

Cr Hr:3 Pre-requisites: ME 307

The course introduces various types of energy conversion and cogeneration systems. These include; advanced steam power plants, gas turbine power plants, nuclear power plants, co-generation and tri-generation, internal combustion engine, and renewable energy conversion systems. The student will learn how to do an analysis for any energy conversion system. Moreover, students will learn about the regeneration, binary, supercritical, and other advanced steam power cycles. In addition, this course teaches student how to design components of the power conversion system such as boilers, condensers, steam turbines, compressors, combustors, gas turbines, and others. The knowledge about the nuclear power plants and recent technologies is covered as well in this course. Furthermore, the course gives an introduction to the power generation using the new and renewable energy sources as well as energy storage and economy of energy.

ME 412 Renewable Energy Systems

Cr Hr:3 Pre-requisites: ME 307

The course gives an overview of renewable energy sources including biomass, hydroelectricity, geothermal, tidal, wave, wind and solar power. And it also presents the fundamentals of different renewable energy systems with a main focus on technologies with high development potential. Furthermore, it integrates maths, engineering, climate studies and economics, and enabling students to gain a broad understanding of renewable energy technologies and their potential.

ME 414 Turbomachinery

Cr Hr:3 Pre-requisites: ME 307

The course introduces various types of compressible and incompressible flow turbomachineries and describes their fundamental concepts. This includes; turbomachinery classification, apply dimensional analysis and similitude to turbomachines, basic governing equations for turbomachines, cascades, Euler equation and head losses, centrifugal pumps and piping systems, net positive displacement machines, hydraulic turbines, compressible flow turbomachineries (compressors, fans and turbines), and matching between system components.

ME 416 Automotive Engineering

Cr Hr:3 Pre-requisites: ME 307

This course teaches the fundamentals of Internal Combustion engines, its classifications and applications, as well as deign and operating parameters. Topics include the thermodynamic analysis of fuel-air cycle, firing order, concept of combustion process in SI engines, Scavenging and design aspects of SI engines, supercharging and turbocharging, lubrication system, engine cooling system and engine heat transfer, fuel injection system in SI engines, Compression Ignition (CI) engines, conventional and non-conventional fuels in SI and CI engines.

ME 418 Water Desalination

Cr Hr:3 Pre-requisites: ME 307

Resources and need for desalination, Fundamentals of desalination, Overview and classification of desalination techniques, Single and multiple effect evaporation, Vapor compression, Single and Multi-stage flash distillation, Reverse Osmosis, Hybrid processes, Dual Purpose Power and Desalination plants, Desalination powered by renewable energy sources, Economic analysis, Brine discharge management.

ME 435 Undergraduate Research in Mechanical Engineering

Cr Hr:3 Pre-requisites: Department Approval

Students participate in supervised research with a faculty member. Supervised research can be: 1) independent research undertaken by the student (thesis, independent study), or 2) assistance on a faculty member's research project. Students must find a faculty member who is willing to supervise him/her as an assistant on an existing project or as the author of an individual project. The student and the faculty supervisor will complete and sign a research contract which will be turned in to the chair of the Industrial and Mechanical Engineering Department. Drafting the contract will allow the student to develop ideas about what should be accomplished and what the faculty supervisor's expectations are. All academic requirements are at the discretion of the supervising faculty member. Students should agree on a plan for the semester with the faculty mentor before the research begins. The plan should include academic requirements, the basis for grading the experience, and a plan for student/professor meetings for the

semester. It is the student's responsibility to report progress and seek guidance when needed. Students are expected to be active and reliable participants in the research experience.

DEPARTMENT OF SOFTWARE ENGINEERING

Degree Offered: Bachelor of Science (B.Sc.) Degree Program in Software Engineering

College of Engineering
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Riyadh-Kingdom of Saudi Arabia
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Email: coe@alfaisal.edu
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Dr. Muhammad Anan, Acting Chairman & Associate Professor of Software Engineering

General Department Information

Anywhere you look certainly you will find software taking care of business: on your computer and in your smartphone, in your dishwasher and in your car, in the bank, supermarket, or mall, on the streets or in your house. Software makes things run smarter and cheaper, generally providing a better quality of life. And since software has become a main and important part of life, it needs professionals to take care of how it is designed, implemented and installed, and to make sure that it stays working correctly after it is installed. This is what Software Engineers do.

There are many things a Software Engineer can be a part of that mainly involve developing software. A sophisticated software, like any other man-made complex system, needs to be engineered based on very well-defined laws and techniques. The development must follow well-defined software development processes. A software engineer must learn various programming and software development techniques, and must acquire a fair understanding of different software platforms in order to be able to design software that runs on those different platforms (desktops, laptops, pads, smartphones, game consoles …) But for a software developer to know what to develop, he or she needs to know what all the requirements for the software are. These requirements may be broadly separated into what the software system must do (functional requirements), and how it is supposed to do it (non-functional requirements). Consider, for instance reliability as a non-functional requirement. In the case of software running a fighter jet or a pacemaker, both the equipment and the software running it must be absolutely reliable with no room for failure. However, lesser reliability can be tolerated in a game running on your Android. Accuracy, is another non-functional requirement. Would you consider what could go wrong if the software running your bank made a mistake in its calculations? For these and for other reasons, it is vital that a software engineer regularly interacts with the client to make sure that the developers know what the expectations from the software exactly are before it is designed and implemented. You may also know that it is important that a software is extensively tested before it is delivered to the client or made available to the public. Testing and validation is a major phase in the software engineering process. It achieves a main objective, which is making sure that the software meets the clients' requirements. And due to the complexity and the size of the software, oftentimes a software engineer is not directly involved in these different stages, but in managing how the software evolves from one stage to another. Crafting a process

for developing a software is not an easy task, as sometimes many people can participate in the software, and they may not necessarily be in the same room, building or country. Engineering a software development process has hence become one of the important disciplines that a software engineer can excel at.

Today, in Saudi Arabia and the world, there is a great demand for software engineers. Local companies like Microsoft, IBM, Cisco Systems, Oracle, Aramco, SCECO, SABIC, banks, telecommunications providers and carriers such as STC, Mobily and Zain, in addition to multinationals such as Google, Apple, Microsoft, Siemens and Telus – all have constant interest in software engineers across all branches. Here, at Alfaisal University, we have a world class SE program that helps prepare you for the international job market, and that makes you able to take part in powering up the world.

Bachelor of Science in Software Engineering Suggested Study Plan

Year 1 Fall			**Year 1 Spring**		
Code	**Course Name**	**Credit**	**Code**	**Course Name**	**Credit**
ENG 101	Freshman English I	3 (3-0-0)	ENG 112	Freshman English II	3 (3-0-0)
MAT 101	Calculus I	3 (3-0-2)	MAT 112	Calculus II	3 (3-0-2)
PHU 103	Mechanics and Waves for Engineers	3 (3-0-1)	PHL 101A	Engineering Ethics	3 (3-0-0)
PHU 103 L	Mechanics and Waves for Engineers Lab	1 (0-2-0)	PHU 124	Electromagnetism and Optics for Engineers	3 (3-0-1)
SE 100	Programming for Engineers	3 (3-0-0)	PHU 124 L	Electromagnetism and Optics for Engineers Lab	1 (0-2-0)
SE 100 L	Programming for Engineers Lab	1 (0-2-0)	SE 120	Object-Oriented Programming	4 (3-2-0)
			SE 120 L	Object-Oriented Programming Lab	1 (0-2-0)
CHM 102	Introduction to Chemistry	3 (3-0-1)			
CHM 102 L	Introduction to Chemistry Lab	1 (0-2-0)			
	18			**17**	

Year 2 Fall			Year 2 Spring		
ENG 222	Technical Writing	3 (3-0-0)	MAT 224	Numerical Methods	3 (3-0-0)
MAT 212	Linear Algebra	3 (3-0-0)	STA 212	Probability and Statistics for Engineers	3 (3-0-0)
SE 201	Introduction to Software Engineering	3 (3-0-0)	SE 217	Software and Society	3 (3-0-0)
SE 201 L	Introduction to Software Engineering Lab	1 (0-2-0)	SE 221	Software Requirements and Design	3 (3-0-0)
SE 212	Discrete Structures for Software Engineers	3 (3-0-0)	SE 221 L	Software Requirements and Design Lab	1 (0-2-0)
SE 214	Algorithms and Data Structures	4 (3-2-0)	SE 223	Digital Logic Design	3 (3-0-0)
SE 214 L	Algorithms and Data Structures Lab	1 (0-2-0)	SE 223 L	Digital Logic Design Lab	1 (0-2-0)
	17			**17**	

Year 3 Fall			Year 3 Spring		
ISL 101	Islamic Studies I	2 (2-0-0)	ARB 101	Arabic Language and Literature I	2 (2-0-0)
EE 305	Computer Networks	3 (3-0-0)	SE 323	Software Project and Process Management	3 (3-0-0)
EE 305 L	Computer Networks Lab	1 (0-2-0)	SE 324	Web Application Development	3 (3-0-0)
EE 307	Computer Architecture	3 (3-0-0)	SE 324 L	Web Application Development Lab	1 (3-0-0)
EE 307 L	Computer Architecture Lab	1 (0-2-0)	SE 327	Embedded Systems	3 (3-0-0)
SE 312	Database Management Systems	3 (3-0-0)	SE 329	Human-Computer Interface Design	3 (3-0-0)
SE 312 L	Database Management Systems Lab	1 (0-2-0)			

SE 314	Operating Systems	3 (3-0-0)			
	17			**15**	
SE 390		Software Engineering Summer Internship			**0**
	Year 4 Fall			**Year 4 Spring**	
ISL 112	Islamic Studies II	2 (2-0-0)	ARB 112	Arabic Language II	2 (2-0-0)
SE 410	Software Architecture	3 (3-0-0)	SE 415	Professional Practice and Software Documentation	3 (3-0-0)
SE 412	Software Testing and Quality Assurance	3 (3-0-0)	SE 421	Software Maintenance, Configuration Management and Evolution	3 (3-0-0)
SE 416	Mobile Application Development	3 (3-0-0)	SE 44*	Technical Elective	3 (3-0-0)
SE 416 L	Mobile Application Development Lab	1 (0-2-0)			
SE 44*	Technical Elective	3 (3-0-0)			
SE 490	Software Engineering Capstone Project I	2 (1-3-0)	SE 491	Software Engineering Capstone Project II	2 (1-3-0)
	17			**16**	

Technical Electives

Course Code	Course Name	Credit Hours (CRHs)				Pre-Requisite Course Code
		Total-CRHS	Lect	Lab	Tut	
SE 435	Undergraduate Research in Software Engineering	3	0	6	0	Department chair approval. A GPA of at least 3.0/4.0, and a signed research contract
SE 440	Special Topics in Software Engineering	3	3	0	0	101 CRHs Passed
SE 441	Telecommunications Software Design	3	3	0	0	101 CRHs Passed
SE 442	Social Networks for Software Engineers	3	3	0	0	101 CRHs Passed
SE 443	Cloud Computing for Software Engineers	3	3	0	0	101 CRHs Passed
SE 444	Artificial Intelligence	3	3	0	0	101 CRHs Passed
SE 445	Information and Software Security	3	3	0	0	101 CRHs Passed

Software Engineering Course Descriptions

This section presents brief descriptions of the program's core and elective software engineering courses.

Core Courses

SE 100 Programming for Engineers

Cr Hr:3

Fundamentals of computers and computing. Introduction to a typical object-oriented programming language. Basic data types and operators. Console input/output. Logical expressions and control structures. Methods and arrays. Introduction to Classes.

SE 100 L Programming for Engineers Lab

Lab Hr: 2 Co-requisites: SE 100

Laboratory experiments dealing with Object Oriented Programming.

SE 120 Object-Oriented Programming

Cr Hr:3 Pre-requisites: SE 100

Students enrolled in this course will study advanced object-oriented programming; inheritance; polymorphism; abstract classes and interfaces, packages, object-oriented design, software modeling, exceptions and file I/O. Design and implement simple GUI applications.

SE 120 L Object-Oriented Programming Lab

Lab Hr:2 Pre-requisites: SE 100 Co-requisites: SE 120

Laboratory experiments dealing with advanced Object Oriented Programming.

SE 201 Introduction to Software Engineering

Cr Hr:3 Pre-requisites: SE 120

Introduction to Software Engineering through programming with particular focus on the fundamentals of computing & programming, using an exploratory problem-based approach. Building abstractions with procedures, data & objects; data modelling; designing, coding & debugging programs of increasing complexity. Introduction to life cycle models from requirements specification, design, construction, testing and deployment. Software engineering standards. Code of ethics for software engineers.

SE 201 L Introduction to Software Engineering Lab

Lab Hr:2 Pre-requisites: SE 120 Co-requisites: SE 201

Laboratory experiments dealing with fundamental concepts in software engineering.

SE 212 Discrete Structures for Software Engineers

Cr Hr:3 Pre-requisites: SE 120

This course covers the mathematical elements of computer science including formal logic, propositional logic, predicate logic, logic in mathematics, sets, functions and relations, recursive thinking, mathematical induction, counting, combinatorics, algorithms, matrices, graphs, trees, and Boolean logic. Students will learn to recognize and express the mathematical ideas graphically, numerically, symbolically, and in writing.

SE 214 Algorithms and Data Structures

Cr Hr:3 Pre-requisites: SE 120

The course involves the study of important data structures and sorting methods commonly encountered in object-oriented software engineering. It covers the design, performance analysis, and implementation of the related algorithms, stressing their practical use and performance.

SE 210 L Algorithms and Data Structures Lab

Lab Hr:2 Pre-requisites: SE 120 Co-requisites: SE 210

Laboratory experiments dealing with algorithms and data structures.

SE 217 Software and Society

Cr Hr:3

This course examines the role of computers and software and their impact on Society. It discusses: Ethical Foundations for IT professional and IT users; Governance, Regulations, and Computer and Internet Crimes; Intellectual Property; Privacy; Security; Professional Responsibility from the perspective of software engineering and Saudi laws and regulations.

SE 221 Software Requirements and Design

Cr Hr:3 Pre-requisites: SE 201 & SE 214

Basics of the software requirements process are introduced: elicitation and analysis techniques, classification of requirements, requirements engineering and management, and requirements validation. Use case modelling. Unified Modelling Language (UML) tools for requirements. The major part will be dedicated to Object Oriented Design (OOD) using the UML. Definition and goals of software design. Relationships between classes. UML diagrams for requirements and design: class, activity, sequence, and data flow. Reusability: design patterns, frameworks. High level design: software architectures. Detailed design.

SE 221 L Software Requirements and Design Lab

Lab Hr:2 Pre-requisites: SE 201 & SE 214 Co-requisites: SE 221

Laboratory experiments dealing with software requirements and design.

SE 223 Digital Logic Design

Cr Hr:3 Pre-requisites: PHU 124

The course teaches theoretical foundations and concepts of digital systems and applies these concepts with design problems and projects. Students are exposed to the design and engineering of digital computers and subsystems.

SE 223 L Digital Logic Design Lab

Lab Hr:2 Pre-requisites: PHU 124 Co-requisites: SE 223

Laboratory experiments dealing with digital logic design.

SE 312 Database Management Systems

Cr Hr:3 Pre-requisites: SE 214

This course covers basic database concepts, conceptual data modelling, relational data model, relational theory and languages, database design, SQL, and introduction to query processing and optimization.

SE 312 L Database Management Systems Lab

Lab Hr:2 Pre-requisites: SE 214 Co-requisites: SE 312

Laboratory experiments dealing with database management systems.

SE 314 Operating Systems

Cr Hr:3 Pre-requisites: SE 214

Theory and construction of operating systems, including real-time and embedded systems aspect from an engineering point of view, stressing performance measurement and metrics. Quality of Service issues leading to certification that an operating system will satisfy hard real-time constraints.

SE 323 Software Project and Process Management

Cr Hr:3 Pre-requisites: SE 221

This course introduces project management concepts, tools, and techniques. It covers the five process groups of project management namely; Initiating, Planning, Executing, Monitoring & Controlling, and Closing. In addition, it describes how these process groups interact with the different knowledge areas of project management: integration management and project planning, scope management, scheduling, budget control, human resource management, communication management, risk analysis and management, project quality management, and procurement management.

SE 324 Web Application Development

Cr Hr:3 Pre-requisites: SE 312

The course focuses on learning the basic concepts and general principles of web applications development. It covers the most important core protocols and technologies associated with writing web applications: Internet basics, fundamentals of HTTP, client/server paradigm, basics of Web servers, dynamic vs. static web content, markup languages (e.g. HTML, XHTML, Dynamic HTML, XML…), styling, client-side scripting (JavaScript) and server-side scripting (e.g. ASP.NET, Java, ColdFusion etc), web applications connectivity to database management systems. A technology for developing web applications is chosen, at the discretion of the course instructor, to be introduced and to be used in the labs and the project (ASP.NET is recommended). A survey of any newly emerging web technologies may be provided if time allows.

SE 324 L Web Application Development Lab

Lab Hr:2 Pre-requisites: SE 312 Co-requisites: SE 324

Laboratory experiments dealing with web application development.

SE 327 Embedded Systems

Cr Hr:3 Pre-requisites: SE 314

This course is a hands-on introduction to microcontrollers using the Arduino platform. Fundamentals of computer programming will be covered, as students will learn to program the Arduino microcontroller platform. Students will be able to create a variety of projects by using analog and digital I/O, and interfacing electronics and computers. Course experiments are designed to explore microcontroller basics, covering LEDs, transistors, motors, integrated circuits, pushbuttons, variable resistors, photo resistors, temperature sensors and relays. In addition, the course explains the concept of real-time system and why such systems are usually implemented as concurrent processes. The course describes the process for real-time systems, and overviews the role of a real-time OS. It introduces the generic process architectures for monitoring and control and data acquisition systems.

SE 329 Human-Computer Interface Design

Cr Hr:3 Pre-requisites: SE 221

This course introduces the theory and art of human computer interface (HCI) design. Students focus on theoretical research in the area of HCT and on designing interfaces and interface components. Emphasis is placed on designing and evaluating effective and usable interfaces for multimedia and hypermedia products. Design of user interface components including windows, menus, and commands. Usability engineering. Task analysis, user-centered design, and prototyping. Response time and feedback. Color, icons, and sound.

SE 390 Software Engineering Summer Internship

Lab Hr:2 Pre-requisites: 103 credit hours passed and department approval

An internship it is an important aspect of Software Engineering curriculum that provides the student with hands-on experience and a good sense of what an actual job in an organization will be like. Students are required to join an IT department in a government or private organization for a summer period of at least 8 weeks in the last summer prior to student graduation. Students should be able to relate the internship experience to the knowledge that he or she has gained through the Software Engineering program courses.

SE 410 Software Architecture

Cr Hr:3 Pre-requisites: SE 221

The course gives students an understanding of the concept of software architecture and how this phase in the development between requirement specification and detailed design plays a central role for the success of a software system. The students will get knowledge of some well-known architecture patterns, and be able to design, construct and evaluate architectures for software systems. In addition, the students should get some understanding of how the developers' experiences and the technical and organizational environment will influence on the choice of architecture.

SE 412 Software Testing and Quality Assurance

Cr Hr:3 Pre-requisites: SE 221

The course focuses on software verification and validation throughout the software life cycle, including reviews (inspections and walkthroughs), testing techniques (functional and structural – black box and white box), levels of testing (unit, integration, system, and acceptance), and testing tools (static and dynamic). Testing and quality assurance standards.

SE 415 Professional Practice and Software Documentation

Cr Hr:3 Pre-requisites: SE 412

This course consists of two parts. The first part provides students with an awareness of the professional practice they will encounter in private and public organizations. The course introduces topics of communication, professional ethics, professional judgment, and social intelligence. The second part covers an overview of the methods and practices that software engineering professionals use to create software documentation. This part is concerned with questions about the suitability of documentation, its content, format, and interaction style.

SE 416 Mobile Application Development

Cr Hr:3 Pre-requisites: SE 221 and SE 312

This project-oriented course examines the principles of mobile application design and development. Students will learn application development on the Android platform. Topics will include memory management; user interface design; user interface building; input methods; data handling; network techniques and URL loading; and, finally, specifics such as GPS and motion sensing. Students are expected to work on a project that produces a professional-quality mobile application. Projects will be deployed in real-world applications.

SE 416 L Mobile Application Development Lab

Cr Hr:2 Pre-requisites: SE 221 and SE 312 Co-requisites: SE 416

Laboratory experiments dealing with mobile application development.

SE421 Software Maintenance, Configuration Management and Evolution

Cr Hr:3 Pre-requisites: SE 412

Students enrolled in this course will be equipped with a solid understanding of the laws of software engineering, evolution and maintenance models, reengineering techniques, legacy information systems, impact analysis, refactoring, program comprehension, and reuse.

SE 490 Software Engineering Capstone Project I

Cr Hr:1 Lab Hr:3 Pre-requisites: 104 credit hours passed

This is the first part of a two-semester senior-year capstone project. Students work in teams. They employ knowledge gained from courses throughout the program such as development of requirements, design, implementation, and quality assurance to develop a software solution to a real-world problem from conception to completion. In this part students give project plan, provide software requirement specification document and develop software high-level design.

SE 491 Software Engineering Capstone Project II

Cr Hr:1 Lab Hr:3 Pre-requisites: SE 490

This is the second part of the capstone project started in SE 490 course. In this part, students provide software low-level design produced in SE 490, implement the design, test their code, and manage and evaluate their final product. Student teams must deliver the code, a final report and a do a presentation and demonstration for their implemented software.

Elective Courses

SE 435 Undergraduate Research in Software Engineering

Cr Hr:3 Pre-requisites: GPA of at least 3.0/4.0, signed research contract, and consent of the departmental chair

Students participate in supervised research with a faculty member. Supervised research can be: 1) independent research undertaken by the student (thesis, independent study), or 2) assistance on a faculty member's research project. Students must find a faculty member who is willing to supervise him/her as an assistant on an existing project or as the author of an individual project. The student and the faculty supervisor will complete and sign a research contract which will be turned in to the chair of the Electrical and Software Engineering Department. Drafting the contract will allow the student to develop ideas about what should be accomplished and what the faculty supervisor's expectations are. All academic requirements are at the discretion of the supervising faculty member. Students should agree on a plan for the semester with the faculty mentor before the research begins. The plan should include academic requirements, the basis for grading the experience, and a plan for student/professor meetings for the semester. It is the student's responsibility to report progress and seek guidance when needed. Students are expected to be active and reliable participants in the research experience.

SE 440 Special Topics in Software Engineering

Cr Hr:3 Pre-requisites: 104 credit hours passed

This course provides instruction and experience in timely topics related to the design and development of quality-engineered software.

SE 441 Telecommunications Software Design

Cr Hr:3 Pre-requisites: 104 credit hours passed

Formal models for telecommunications software design and analysis. Protocol specification, design and validation. Protocol verification and testing. Conformance testing. Protocol synthesis. Protocol conversion.

SE 442 Social Networks for Software Engineers

Cr Hr:3 Pre-requisites: 104 credit hours passed

Student will learn the fundamental interface, systems, and algorithms concepts in designing social software. The case-based syllabus will cover insights from both research and industry. As a student, the student will contribute to this burgeoning field through a quarter-long, team-based project. Students are required to enter the class with an initial project idea.

SE 443 Cloud Computing for Software Engineers

Cr Hr:3 Pre-requisites: EE 305 or 104 credit hours passed

This course will leverages the World Wide Web to fulfil computing needs. It packages applications, computing power, and storage as a metered service similar to a utility. This model is designed to supplant the traditional mechanism of desktop computing in many cases. This course will cover the origin, theory, enabling technology, and hands-on labs for key concepts in cloud computing.

SE 444 Artificial Intelligence

Cr Hr:3 Pre-requisites: 104 credit hours passed

This course aims to develop computer applications, which encompass perception, reasoning and learning and to provide an in-depth understanding of major techniques used to simulate intelligence.

SE 445 Information and Software Security

Cr Hr:3 Pre-requisites: 104 credit hours passed

Software Security or Language-Based Security studies how to enforce application-level security using programming-language and program-analysis techniques. The purpose of this course is to study techniques that are used to automate the detection of security vulnerabilities, such as access-control and information-flow vulnerabilities in software, due to coding malpractice or security-policy misconfigurations; to study the design and implementation of secure programming languages; and promote the correct usage of security Application Programming Interfaces (APIs).

COLLEGE OF BUSINESS (CoB)

Dean Dr. Bajis Mohammad Dodin, Ph.D., Interim Dean, College of Business

Website http://cob.alfaisal.edu/

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College of Business Vision

We aspire to become the leader in business research and education in the Kingdom of Saudi Arabia and the MENA region.

College of Business Mission

Our mission is to develop business leaders through research excellence, quality education, and fostering partnerships with local and international communities.

In this context, quality education means

1. Providing our students with the necessary knowledge and skills to succeed in a highly competitive global marketplace.
2. Pushing the frontiers of business knowledge, creating new opportunities, promoting economic growth and business sustainability.
3. Educating the next generation of business leaders and pioneers that dream big, take risk, and shape the future of the ever-changing business landscape.
4. Promoting entrepreneurship and innovation

College of Business Values

- **Excellence:** our commitment to excellence reflects our passion for high quality and for always going beyond expectations.
- **Integrity:** personal integrity, holding ourselves to the highest ethical standards, and taking responsibility for our actions.
- **Gender diversity:** we take tremendous pride in our College culture that promotes inclusiveness and gender diversity through preparing young men and women alike regardless of their background and economic status to be the next generation of business and community leaders.
- **Collegiality and self-governance:** we are committed to a collegial, self-governance system in which proposed new policies and changes are institutionalized, principle- based driven, well-informed by our vision and consistent with our values and strategic objectives.
- **Transparency and accountability:** we conduct ourselves with full disclosure, openness, and candour. We seek feedback and wisdom from all directions and take responsibility for our actions and decisions.

- **Engagement:** Building strong relationships with our alumni, business and professional communities, and other stakeholders and taking leadership in issues that matter to them

About CoB

College of Business at Alfaisal University is a young and fast growing institution. It started in the fall of 2008 with 24 freshman male and female students; and with its first cohort of male and female MBA students in the fall of 2010. It offers a vibrant undergraduate business administration degree that is grounded in liberal arts with five concentrations (Accounting, Finance, Human Resource Management, Marketing, and Operations and Project management). The college also offers an MBA program that is directed toward middle managers with three trackc: MBA- General, MBA-Finance, and MBA-Health care Management.The College, as part of its commitment to serving the community, provides an active Executive Education program.

The college's pioneering curriculum and its diverse faculty are attracting the best and the brightest students in the Kingdom of Saudi Arabia. Students learn from distinguished scholars and practitioners who have very good academic credentials. At the College of Business, students learn the skills necessary to confront and manage the challenges of modern businesses. They are well trained to recognize change and growth and deal with them. In-class and internship experiences with real-world business problems it gives students the edge needed to help companies compete in today's global marketplace. It graduates leaders with exceptional abilities to manage and sustain growth in the public and private organizations through critical thinking, analytical decision-making, information technology and collaborative execution. Through such a well-rounded education, Alfaisal business students become not only leaders of profitable family enterprises and public corporations but, also, capable societal leaders contributing to the growth and development of the Kingdom of Saudi Arabia and the region.

College of Business Approach

- Maintaining a small class size in order to maximize student participation inside the classroom and faculty/student interaction.
- Using problem-based pedagogy including case studies and experiential learning activities.
- Encouraging student participation in service learning outside the classroom through Business Club activities, internships, research projects, and so on.
- Helping students to develop quantitative, technological, and leadership competencies.
- Working closely with the local business community to ensure the relevance of student learning opportunities.
- Conducting high quality research with applicability to the Kingdom of Saudi Arabia and the global business community.
- Engaging in selective consulting projects to increase faculty and student exposure to significant business and development issues inside the Kingdom of Saudi Arabia.

National and International Recognition

The College of Business (CoB) programs are approved and well recognized by the Ministry of Education (formerly MOHE) in Saudi Arabia; and these programs are recognized internationally. In fact Alfaisal University (AU) is being recognized, in spite of its young age (as it opened its doors for instructions in 2008), as one of the best universities in the Kingdom of Saudi Arabia (KSA). Many of our students, including graduates of CoB, have been accepted in top international universities around the world and are currently pursuing their graduate degrees: Masters and PhD. Also, CoB is an active member of Association to Advance Collegiate Schools of Business (AACSB) and the college is currently working toward achieving

AACSB accreditation within the next few years. Only 6% of business schools worldwide hold AACSB accreditation.

College of Business Degree Programs

CoB offers two dynamic programs: MBA program, and an undergraduate business administration degree with several concentrations. Following are details about both programs.

The Bachelor of Business Administration (BBA) program

BBA program director: Dr. Abdelmonin Shaltoni

BBA vision and mission

BBA Vision: We aim to be the first choice for students who strive to be business leaders.

BBA Mission: The mission of the Bachelor of Business Administration is to develop the intellectual, professional and personal competencies of the students through principled business education and commitment to excellence. The BBA program mission is translated to the following goals:

- Providing a student-centered environment that is committed to CoB core values of excellence, integrity, gender diversity, transparency, accountability, engagement, collegiality and self-governance,
- Offering modern curriculum and course delivery using innovative methods to enhance student learning experience.
- Engaging our students in extracurricular activities blended with work experience in local and international markets.
- Attracting well-qualified and research-oriented faculty from diverse backgrounds.
- Support learning activities that focus on the applying business theory to real practices.

In brief, the BBA program offers five concentrations for the students to choose from which are:

Bachelor of Business Administration (BBA) with Concentration in Accounting
Bachelor of Business Administration (BBA) with Concentration in Finance
Bachelor of Business Administration (BBA) with Concentration in Human Resources
Bachelor of Business Administration (BBA) with Concentration in Marketing
Bachelor of Business Administration (BBA) with Concentration in Project Management

BBA Degree Requirements (126 hours)

To obtain a Bachelor of Business Administration degree with a Concentration, the student must complete a total of ***126 credit hours*** as distributed as follow:

A. General Education Requirement Courses ***(44 hours) (GER)***
B. Business Core Courses ***(55 hours) (BCC)***
C. Concentration Core Courses ***(18 hours) (CCC)***
D. Business Electives Courses ***(9 hours) (BEC)***

A. General Education Requirement Courses (44 hours)

Course Code	Course-Title	Credits	Pre-Requisite Course Code
1. Ministry of Education Required courses (14 hours)			
ARB 101	Arabic Language I	2	--
ARB 112	Arabic Language II	2	ARB 101
ISL 101	Islamic Studies I	2	--
ISL 112	Islamic Studies II	2	ISL 101
ENG 101	Freshman English I	3	--
ENG 112	Freshman English I	3	ENG 101
2. The Mathematics and Computing courses (12 credits)			
MAT 100	Pre – Calculus	3	--
MAT 111	Business Calculus	3	MAT 100
OPM 211	Business Statistics	3	MAT 111
OPM 101	Introduction to Computing	3	--
3. The Natural Sciences courses (6 credits)			
BIO 103	Introduction to Biology	3	--
CHM 107	Chemistry in the Living Environment	3	--
PHU 101	Astronomy	3	--
PHU 102	Science of Energy and Environment	3	--
4. The Social Sciences courses (6 credits)			
POL 101	Introduction to Political Science	3	--
PSY 101	Introduction to Psychology	3	--
SOC 101	Introduction to Sociology	3	--
ANT 105	Introduction to Globalization Studies	3	--
HIS 101	Islamic Civilization and Medieval Europe	3	--
ANT 101	Introduction to Sociocultural Anthropology	3	--

5. The General Electives Courses (6 credits)

6 credit hours from any of the following courses:

- *Any courses offered by the CoSGS but not taken as part of the GER (as listed above).*
- *Any non-business courses offered at the AU.*
- *Non-business courses offered by other accepted educational institutions (pre-approvals by the CoB and SA are required).*

B. Business Core Courses (55 hours)

All CoB students must complete the following courses

B. Business Core Courses (55 hours)

Course Code	Course-Title	Credits	Prerequisite Course Code
ECO 101	Microeconomics	3	
ECO 102	Macroeconomics	3	ECO 101
ACC 201	Introduction to Financial Accounting	3	ECO 102, MAT 111
FIN 201	Principles of Finance	3	ECO 102
MKT 201	Principles of Marketing	3	ECO 102
ACC 202	Introduction to Management Accounting	3	ACC 201
OPM 230	Management Information Systems	3	OPM 101, ECO 102
OPM 330	Quantitative Methods for Business	3	OPM 211
OPM 340	Operations Management	3	OPM 330
MGT 201	Business Communications	3	ENG 112
MGT 210	Business Ethics	3	ISL 112
MGT 300	Executive Lecture	1	ACC 202
MGT 301	Business Law	3	MGT 230
MGT 230	Organizational Behavior	3	MGT 210
MGT 490	Strategic Management (capstone)	3	MGT 230 & one of ACC 302,FIN 350, MKT 330, OPM 380
MGT 499	COOP Training Internship	12	one of the following: ACC 302,FIN 350, MKT 330, OPM 380, MGT 380

C. Concentration Core Courses (18 hours)

Single concentration students, must complete all courses of selected concentration which is 18 credit hours. For double concentration, see general notes. Details of concentration core courses are provided in each department section.

D. Business Electives Courses (9 hours): Selected from the below set of courses or from the courses of the other concentrations.

Business Electives Courses (9 hours)

Course Code	Course-Title	Credits	Prerequisite Course Code
	All CoB students must complete 9 credits from the following courses		
ACC 490	Financial Statement Analysis and Equity Valuation	3	ACC 302
ACC 495	Accounting Theory and Contemporary Issues in Accounting	3	ACC 302
ECO 310	International Economics	3	FIN 201
ECO 320	Islamic Economic and Finance	3	FIN 201

FIN 340	Contemporary Financial Issues	3	FIN 201
FIN 377	Fixed Income Securities	3	FIN 201
FIN 376	Entrepreneurial Finance	3	FIN 201
FIN 450	Financial Trading Strategies (under approval)	3	FIN 201
MGT 373	Negotiation	3	MGT 230
MGT 374	Real Estate	3	FIN 201
MGT 375	Introduction to Entrepreneurship	3	FIN 201
MGT 376	Entrepreneurial Finance	3	FIN 201
MGT 420	Human Performance Improvement	3	MGT 230
MKT 320	International Marketing	3	MKT 201
OPM 315	E-Commerce	3	FIN 201

The Internship

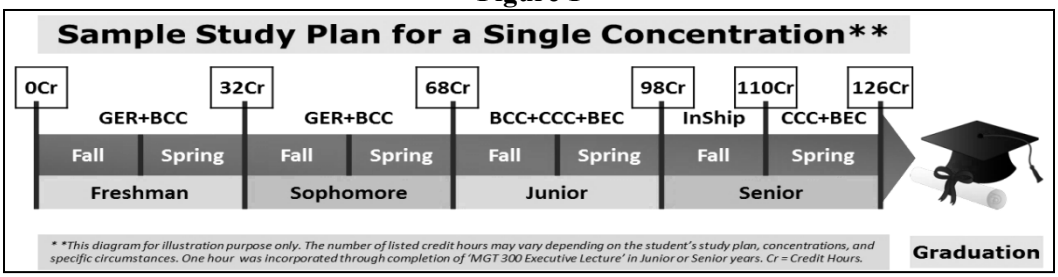
The Internship Program is designed to the provide College of Business students with practical, on-the-job experience which can contribute to their academic and career development. The internship program is mandatory for all undergraduate students. The duration of the internship program is four (4) months and students can earn twelve (12) credits towards their final degree qualification. It is normally conducted in the seventh semester (one semester before graduation).

Students will gain practical skills and experience to reinforce and expand what they learned in the classroom and increase student's employability in an ever competitive job market. Due to the growing reputation of Alfaisal University, several organizations are approaching the College of Business to send its students to participate in their internship programs, and introduce them for jobs in these organizations. The College of Business has worked with over 100 national and international organizations to hire College of Business student interns.

General Notes about College of Business Degree Requirements

- A minimum of 126 Credit hours are required to graduate with one concentration.
- All students must consult their respective advisor/s throughout their full study cycle with due approval at specific milestones.
- The policies listed in 'CoB Academic Policies' are strictly applied to all study plans and in related management activities; e.g. concentration selection, double concentration, internship, etc.
- All courses are 3 credits unless stated otherwise.
- GER courses must be completed during the first two years (Freshman & Sophomore) with limited spill over. The diagram below (figure 1) presented as example for illustration purposes only.
- Double Concentration: Students completed 60 credits with cumulative GPA of 3.2, can select two concentrations. These students must complete a minimum of 144 Credits to graduate, which covers 36 credits of the two concentrations, 9 credits as BEC's, plus all required GER and BCC. For more information, please see the double concentration policy.

Figure 1



College of Business Academic Departments

DEPARTMENT OF ACCOUNTING

Dr. Abdulaziz M. Alwathainani, Chair
Degree Offered: Bachelor of Business Administration (BBA) with Concentration in Accounting
Web address: http://cob.alfaisal.edu/programs/accounting

General Department Information

Accounting is one of the most rewarding careers in business and the one that offers the most opportunities with the lowest risk. The American Institute of Certified Public Accountants (AICPA) describes accounting as "The One Degree with 360 Degrees of Possibilities." Your accounting degree prepares you to become a successful certified public accountant (CPA), entrepreneur, chief financial officer (CFO) or chief executive officer (CEO), among a number of high-level positions in both the corporate and banking world. It is also a great background if you are preparing to work in a family business.

No matter what you decide to do, accountants have access to top jobs. Today, more CEOs come from accounting backgrounds than any other business functions. Why? There are three main reasons that make accountants indispensable in the business world. First, accountants are known for their trustworthiness and high degrees of integrity. Second, accountants have the financial acumen necessary to diagnose the financial health of their companies and determine activities that maximize the outcome of decisions. Third, the path from the CFO (the top accounting job) to the CEO position is increasingly seen as a natural transition. In recent years, the CFO position has become a training ground and stepping stone for the top job. In the UK for example, 84 percent of the FTSE (UK) 100 firms have a CPA on their board of directors and 58 percent have a CPA as Chairman of the Board of Directors, CEO or CFO. These numbers speak for themselves. Graduates of accounting programs are highly sought after by world-class accounting and financial consulting firms and leading companies, across all industries. An accounting degree opens doors of opportunities!

Concentration Core Courses (18 hours)

Accounting concentration must complete all the courses below. For double concentration, see general notes above.

C. Concentration Core Courses (18 hours)

Course Code	Course-Title	Credits	Prerequisite Course Code
ACC 301	Intermediate Financial Accounting I	3	ACC 201
ACC 302	Intermediate Financial Accounting II	3	ACC 301
ACC 320	Cost Accounting	3	ACC 202
ACC 330	Zakat and Income Taxes	3	ACC 202
ACC 410	Advanced Financial Accounting	3	ACC 302
ACC 420	Auditing and Assurance Services	3	ACC 302

Accounting Course Descriptions

ACC 201 Introduction to Financial accounting

Cr Hr: 3 Prerequisite: ECO 102 and MAT 111

This course is an Introduction to Financial Accounting. The course introduces students to the accounting equation, accounting cycle and preparation of financial statements, the framework within which financial statements are prepared, Generally Accepted Accounting Principles (GAAP) and users of such financial statements. As well, the course will cover inventory and accounts receivables.
Prerequisite: ECO 102 and MAT 111

ACC 202 Introduction to Management accounting

Cr Hr: 3 Prerequisite: ACC 201

This course is an Introduction to Management Accounting. It introduces students to the role of accounting information in business and investment decisions. The course will cover Job Order Costing, Process Costing, and Activity Based Costing methods used in manufacturing operations as well as service industry. As well, the course will explore the cost volume profit relationship, cost classifications: variable and fixes costs, standard costing and budgeting. Furthermore, the course will introduce the Balance Scorecard as a tool for measuring and managing performance.

ACC 301 Intermediate Financial Accounting I

Cr Hr: 3 Prerequisite: ACC 201

The objective of this course is to provide students with depth knowledge and applied skills about the fundamentals of financial reporting, financial statements and their components, revenue recognition, cash control, recognition and measurement of accounts receivable, accounting for perpetual and periodic inventory systems, inventory costing methods, investments in equity and debt securities, long-term asset recognition and measurement and their depreciation/amortization.

ACC 302 Intermediate Financial Accounting II

Cr Hr: 3 Prerequisite: ACC 301

This course is the second half of intermediate accounting. While the first half, i.e., the Intermediate Accounting covers the asset side of the balance sheet, this course will focus on the liability and equity side of the balance sheet. The topics covered in this course include liabilities, contingencies, stockholders' equity, earnings per share: both basic and dilutive EPS (dilutive securities), complex financial instruments such as derivatives and hedge accounting, income taxes, pensions, postretirement benefits, leases, accounting changes and error correction, and statement of cash flows.

ACC 320 Cost accounting

Cr Hr: 3 Prerequisite: ACC 202

This course is cost accounting. It provides students with a practical set of tools relating to the use of accounting information in making business and investment decisions. The course will focus on the

managerial issues that animate modern management accounting such as master budgets, inventory costing and capacity analysis, pricing decisions and cost Management, cost allocation and customer profitability, spoilage & scrap, balanced scorecard, inventory management (JIT), and capital budgeting and cost Analysis.

ACC 330 Zakat and Income Taxes

Cr Hr: 3 Prerequisite: ACC 202

The objective of this course is to provide students with knowledge, skills and theory of Zakat and Income Taxes. The course will introduce students to rules and regulations governing Zakat and Income Taxes in Saudi Arabia. In this course, students will learn income that is subjected to Zakat and Income Taxes. As well, students will learn how to determine taxable and Zakatable income and how to income components that should be included in both income taxes and zakat.

ACC 410 Advanced Financial accounting

Cr Hr: 3 Prerequisite: ACC 302

The objective of this course is to provide students with knowledge, skills and theory of advanced financial accounting in public companies such as accounting for mergers and acquisitions and consolidation of financial statements. This course involves a detailed examination of investments in equity securities, business combinations, consolidated financial statements on date of acquisition, consolidation of financial statements subsequent to the acquisition date, intercompany transactions of non-depreciable assets such as inventory and land, intercompany profits in depreciable assets, intercompany bondholding, consolidated cash flow statement and ownership issues, other consolidation reporting issues, foreign currency transactions, and translation and consolidation of the financial statements of foreign operations.

ACC 420 Auditing and Assurance Services

Cr Hr: 3 Prerequisite: ACC 302

This course is designed to provide an introduction to auditing. The objectives include principles and practices used by public accountants and internal auditors in examining financial statements and supporting data. The course provides students with an understanding of the theory, concepts, professional and legal standards and procedures underlying audits of financial statements by independent public accountants. Special emphasis is given to assets and liabilities. This course is a study of techniques available for gathering, summarizing, analyzing and interpreting the data presented in financial statements and procedures used in verifying the fairness of the information. Also emphasizes ethical and legal aspects and consideration. In this course, students will learn how to assess the effectiveness of a company's accounting and internal control system as well as the company's risk management.

ACC 490 Financial Statement Analysis and Equity Valuation

Cr Hr: 3 Prerequisite: ACC 302

This course provides students with a comprehensive understanding of financial statement analysis fundamentals and equity valuation. In this course, student will learn how to use financial statement analysis to evaluate a firm's past performance, make judgment about its earnings quality, determine its current financial position, examine the underlying accounting assumptions of its major assets and liabilities, forecast its future prospect and estimate its fundamental value. The core emphasis of this course is on using financial statement analysis for the purposes of equity valuation. An understanding of a firm's past and current performance is essential for forecasting its future prospect, which in turn is the determinant factor in estimating its intrinsic value.

ACC 495 Accounting Theory and contemporary Issues

Cr Hr: 3 Prerequisite: ACC 302

Introduces students to the general nature of accounting theory and its function in relation to problems confronting the accounting profession. Accounting practices including accounting rules, principles and process are examined within the context of contemporary theoretical perspectives and socio-political behaviors of market participants.

DEPARTMENT OF FINANCE

Dr. Ahmed Sair Alanazi, Chair.
Degree Offered: Bachelor of Business Administration (BBA) with Concentration in Finance
Web address: http://cob.alfaisal.edu/programs/finance

General Department Information

Never has there been a more appropriate time to study finance. Alfaisal University, College of Business offers a concentration in Finance which aims to provide students with a theoretical and practical understanding of the fundamental principles of finance. It introduces students to evaluation models that are used by finance practitioners to evaluate assets and investments. Students will start with the basic principles of time value of money. This will lead to valuing bonds and shares and understanding the role they play both in the firm and in the market place.

Students will learn how a financial manager evaluates a project taking into consideration the cost of funding the project and the risk associated with the project. Students will also develop an understanding of the nature of the firm, its objectives and the ethical implications of these objectives. The concentration covers six core units: Principles of Finance, Managerial Finance, Corporate Finance, Financial Markets and Institutions, Investments, and Islamic Banking and Finance.

Concentration Core Courses (18 hours)

Finance concentration must complete all the courses below. For double concentration, see general notes above.

C. Concentration Core Courses (18 hours)

Course Code	Course-Title	Credits	Prerequisite Course Code
FIN 308	Managerial Finance	3	FIN 201
FIN 310	Computer Applications in Accounting & Finance	3	ACC 202
FIN 320	Corporate Finance	3	FIN 308
FIN 350	Financial Markets & Institutions	3	FIN 201
FIN 410	Investments	3	FIN 201
FIN 420	International Finance	3	FIN 308

Finance Course Descriptions

FIN 201 Principles of Finance

Cr Hr: 3 Prerequisite: ECO 102

FIN 201 is a core second year course for all students in the College of Business. The course introduces students to the role of financial markets and institutions in facilitating the flow of funds between the deficit and surplus sectors in an economy. Basic principles of the allocation of financial resources and time value of money are explained, together with risk and return fundamentals and the valuation techniques of debt and equity securities.

FIN 308 Managerial Finance

Cr Hr: 3 Prerequisite: FIN 201

This is a third year course for all students concentrating in Finance. The unit is concerned with the duties of the financial manager in the business firm. These duties involve the financial tasks of planning, extending credit to customers, evaluating large expenditures, and raising money to fund the firm's expenditures.

FIN 310 Computer Applications in Accounting & Finance

Cr Hr: 3 Prerequisite: ACC 202

This is a third year core unit for the Finance concentration students. This course uses spreadsheets for financial analysis, risk analysis, valuations, investment management, credit analysis, scenario analysis, budgeting, sales forecast, financial projections, project evaluation, etc. The use of Excel as a tool for modeling, basics skills in recording, writing and using Macros in Excel is also covered. Prior basic accounting knowledge of debits/credits, account classifications, and the accounting cycle for businesses in service and merchandising, industries is required.

FIN 340 Contemporary Financial Issues

Cr Hr: 3 Prerequisite: FIN 201

This course examines current financial issues that are shaping the global financial environment. This course discusses and debates the relevance of traditional financial models in contemporary financial events. The unit further includes the analysis of business cycles from a finance perspective i.e. the stock markets and their systemic impact.

FIN 410 Investments

Cr Hr: 3 Prerequisite: FIN201

This is a final year support class for students majoring in Finance. The course examines the theory and practice of portfolio management and security analysis through the implementation of advanced regression and Excel tools for empirical research and quantitative problem solving. Students are required to develop an automated trading model in MS Excel as well as actively manage a diversified portfolio of financial assets using a range of local and international trading platforms.

FIN 350 Financial Markets and Institutions

Cr Hr: 3 Prerequisite: FIN 201

This course is a final year core class for students concentrating in Finance. The course explores the structure and activities of various financial institutions in the global financial system. The course examines the growing importance of Central Banking actions and policies on achieving macroeconomic objectives. The changing regulatory environment facing commercial banks since the global financial crisis of 2008 as well as the Saudi Mortgage Law are also covered in detail.

FIN 320 Corporate Finance

Cr Hr: 3 Prerequisite: FIN 308

Corporate finance involves the financial management and value of business entities. In this unit we investigate how managers make investment, financing, and dividend decisions. Investment decisions are based on discounted cash flow techniques and their extensions. These extensions enable us to study a wide range of problems including: new investments, investments with unequal terms, optimal replacement, and project abandonment.

FIN 377 Fixed Income Securities

Cr Hr: 3 Prerequisite: FIN 201

This is a basic course in the analysis of fixed income securities. This course focuses on the modern valuation techniques for a variety of fixed income securities based on an observed term structure of interest rates. Recognized topics include bond pricing, the Treasury Market, bond portfolio and risk management based on duration and convexity, yield-curve trading strategies, term structure estimation, and credit risk modelling. Part of the course, time permit, will be devoted to introduce basic stochastic interest rate models.

FIN 420 International Finance

Cr Hr: 3 Prerequisite: FIN 308

This course examines international financial markets, and the opportunities they present for achieving risk management and asset allocation objectives. The principle focus will be on assets traded in liquid markets: currencies, equities, bonds, swaps, and other derivatives. Analytical tools for risk and return measurement, portfolio management, hedging, and implementing dynamic investment strategies in an international context will be examined

ECO 101 Microeconomics

Cr Hr: 3

This course provides an introduction to essential concepts, principles, theories, and models of microeconomics. It approaches the core economic questions of "what", "how", and "for whom" to produce from free market perspective. It covers basic principles of microeconomics including price system, behaviors of consumers and producers, market structures, public policy, and income distribution. The exposition will consist of simple algebra with frequent recourse to graphs.

ECO 102 Macroeconomics

Cr Hr: 3 Prerequisite: ECO 101

Macroeconomics is about understanding how economy functions as a whole covering issues such as aggregate economic production of goods and services, economic growth and unemployment, money supply and interest rates, inflation, unemployment, fiscal and monetary policies and foreign exchange markets. In addition to building theoretical foundation, real world applications and examples relevant to Saudi and world economies will be provided through various in-class and online activities and assignments.

ECO 310 International Economics

Cr Hr: 3 Prerequisite: FIN 201

This course will introduce both Micro-economics and Macro-economic issues relevant to the economics relations among countries. The first half of the course explores the theoretical microeconomics foundations of international trade.

ECO 320 Islamic Economics & Finance

Cr Hr: 3 Prerequisite: FIN 201

This course is designed to introduce foundations and instruments of Islamic economics and finance. The course consists of two main parts. The first part will cover Islamic economics while the second part will cover Islamic finance and banking. In the first part, the course will define Islamic economics and review its fundamental economic principles. It will provide historical development of Islamic economic thought. It will also compare and contrast Islamic economics with conventional one in terms its theoretical foundations and economic policy implications. In the second part, the course will provide relationship between Islamic economics and finance. It will provide foundations of Islamic finance and its historical development. It will introduce key Islamic financial instruments and compare them with conventional instruments.

FIN 440 Strategic Entrepreneurial Finance

Cr Hr: 3 Prerequisite: FIN 201

Strategic Entrepreneurial Finance is a course that studies financial resources mobilization, resource allocation, risk moderation, optimization in financial contracting, value creation, and value monetization within the context of entrepreneurship. This course examines how activity of entrepreneurial finance can be enhanced via a concentration on value creation and through improved strategic decision-making.

FIN 450 Financial Trading Strategies

Cr Hr: 3 Prerequisite: FIN 201

This course aims to introduce students to the global markets including international stock markets and indices, commodities and currencies in the spot market. Student will learn the difference between fundamental and technical analysis and be able to make a trading decisions. Moreover, the course provides the students with the basic chart reading and analysis including support and resistance points, moving averages, Bollinger bands and various indicators. During the course students have a practical experience buying and selling several financial instruments

FIN 374 Real Estate

Cr Hr: 3 Prerequisite: FIN 201

The course will provide an introduction to real estate with broad overview of real property concepts and characteristics, legal considerations, influences on real estate values, types of value, economic principles, market area analysis, investment and financing issues, brokerage, development, and management. Special emphasis will be given to the changing roles of real estate executives and professionals, methods of creating economic and social value, the dynamics of emerging markets, and opportunities for careers in real estate.

FIN 376 Entrepreneurial Finance

Cr Hr: 3 Prerequisite: FIN 201

This course is intended to empower students to be successful in developing and financing the ideas they bring to market. The overriding orientation is to apply theory and methods of finance and economics to incubating and growing new ventures. The course focuses on value creation as the objective for all entrepreneurial strategic and financial decisions.

DEPARTMENT OF MANAGEMENT

Dr. Hayfaa Tlaiss, Cahir
Degree Offered: Bachelor of Business Administration (BBA) with Concentration in Human Resources Management
Web address: http://cob.alfaisal.edu/programs/human_resource

General Department Information

People are recognized as key to strategic competitive advantage – IF the human resources are managed effectively. Challenges related to people are often the most complex area of decision-making for managers. With the introduction of Saudization, decisions about people and organizational competitiveness are becoming more challenging for many organizations. Expert knowledge and skills about Human Resource Management are therefore critical to organizations in KSA. Offering an undergraduate concentration in HRM aims to meet a crucial need in the KSA business community, while makinga direct contribution to Saudization.

Human Resource Management is a dynamic discipline that aligns people management with organizational strategies and supports line management throughout the employment life-cycle. The different courses in the concentration mirrors this sequential process: HRM (an overview); HR planning, recruitment & selection; Employee learning & development; Employee relations & engagement; Total reward management (compensation); Improving human performance; and Comparative HRM.
The HRM concentration in the College of Business aims to provide students with the essential body of knowledge and skills to support the development and practice of responsible people policy and people management practices in KSA organizations, while considering international best practices.

Concentration Core Courses (18 hours)

Human Resource Management concentration must complete all the courses below. For double concentration, see general notes above.

C. Concentration Core Courses (18 hours)

Course Code	Course-Title	Credits	Prerequisite Course Code
MGT 350	Human Resource Management	3	MGT 230
MGT 360	Employee Learning & Development	3	MGT 230
MGT 370	HR Planning, Recruitment & Selection	3	MGT 350
MGT 380	Employee Relations & Engagement	3	MGT 350
MGT 390	Total Reward Management	3	MGT 350
MGT 440	Comparative HRM	3	MGT 350 + MGT 360

Human Resources Management Course Descriptions

MGT 201 Business Communication

Cr Hr: 3 Prerequisite: ENG 112

This course covers basic communication theory and its application to business functions. It covers business correspondence, presentations, report writing, messaging and emails, providing and receiving feedback, international business etiquette, effective use of the English language, and communicating across languages and cultures. Students are also introduced to the notion of communication as a two way process where both sender and receiver play an integral role in reducing communication barriers.

MGT 210 Business Ethics

Cr Hr: 3 Prerequisite: ISL 112

This course introduce the students to ethical concepts and imparts the necessary analytical skills needed to solve moral dilemmas in business. Review of the local and global trends within the area of corporate social responsibility, an introduction to the moral principles (i.e. utilitarianism, rights and duties, justice, and caring) guiding Islamic and Western business practice, and an introduction to the Saudi Arabia General Investment Authority's (SAGIA) responsible competitiveness campaign.

MGT 230 Organizational Behavior

Cr Hr: 3 Prerequisite: MGT 210

This course provides an introduction and overview of how people are influenced by organizations and, in turn, how people influence organizations. Four levels of analysis are introduced, namely, the individual, interpersonal, small group(s), and the whole organization. The topics covered in this course includes cognitive (thinking), affective (emotional), Behavioral content areas of Organizational Behavior, individual effectiveness, social interactions, leadership and organizational change.

MGT 300 Executive Lecture

Cr Hr: 1 Prerequisite: OPM 330

Aims to provide real-life management seminars delivered by some of country's leading executives discussing their careers and leadership experiences. These seminars are intended to bridge the gap between the world of leadership and the college-based business education. The students are enrolled as part of their business core course and mostly in the junior or senior years. All lectures are free and open to the public. The students will have the opportunity to network with the invited executives for potential internship and career advancement.

MGT 301 Business Law

Cr Hr: 3 Prerequisite: MGT 230

This course focuses on basic and essential international principles of law relating to business, including contracts, negotiable instruments, banking law, insurance, agency and powers of attorney, forms of business organization, employment, criminal law and torts, intellectual property, and tax. These concepts will be introduced in assigned readings and in brief lectures by the instructor, and then explored by students in general discussion and other formats.

MGT 373 Negotiation

Cr Hr: 3 Prerequisite: MGT 230

The course introduce the students to the negotiation practices with role-playing simulations that cover a range of topics, including difficult situations such as cross-cultural mentoring and an emergency. Special cases will be discussed in the course including abrasiveness, dangerousness and ethics. The course covers conflict management as a first party and as a third party: third-party skills include helping others deal directly with their conflicts, mediation, investigation, arbitration, and helping the system change as a result of a dispute.

MGT 375 Introduction to Entrepreneurship

Cr Hr: 3 Prerequisite: FIN 201

This course is intended to provide deeper insights into entrepreneurship and establish entrepreneurial links with innovation. The concept of innovation is presented as the means by which entrepreneurs execute their pursuit of challenging the unknown. The students are expected to focus on various themes including: entrepreneurial perspectives; launching entrepreneurial ventures; and formulation of entrepreneurial plan.

MGT 350 Human Resources Management

Cr Hr: 3 Prerequisite: MGT 230

This course overviews the functions carried out by the Human Resource Management (HRM) departments and specialists. It aims at support the development of a strategic approach to HRM departments to increase organizational competitiveness. The course addresses a wide range of topics such as personnel planning, recruitment and selection, and ethics in HRM.

MGT 360 Employee learning and development

Cr Hr: 3 Prerequisite: MGT 230

How can a line manager and an HRM practitioner facilitate employees learning and development? Topics in this course may include the training and development cycle, learning theories and principles, coaching, e-learning, and on-the-job training techniques.

MGT 370 Human Resource Planning, Recruitment and Selection

Cr Hr: 3 Prerequisite: MGT 350

HR planning is the starting point of effective people management practices and it has an immediate impact on recruitment and selection. This course presents the key organizational and managerial practices in its title. Topics may include HR strategy, people demand and supply, job analysis, methods and processes of recruitment, valid and reliable selection methods and processes.

MGT 380 Employee Relations & Engagement

Cr Hr: 3 Prerequisite: MGT 350

This course introduces students to the various issues involved in the creation of productive and meaningful employee-employer relationships. It covers a wide range of concepts including employee relationship principles and models, local and regional labour law, employee engagement and participation, conflict management, grievance handling, and disciplinary procedures.

MGT 390 Total Reward Management

Cr Hr: 3 Prerequisite: MGT 350

This senior course in the HRM portfolio explores the principles and practices of compensation and benefits in organizations from the holistic and comprehensive view of total reward management. Topics may include total reward strategy, job evaluation, reward systems, pay and grade structures, benefits management, reward system auditing.

MGT 420 Human Performance Improvement

Cr Hr: 3 Prerequisite: MGT 350

This is a senior course focuses on managing people's performance in the workplace, to contribute to organizational performance and the essential skills that HRM practitioners and line managers need for internal consulting to design, facilitate, implement and evaluate performance interventions at a group (e.g. departmental) and organizational level.

MGT 440 Comparative HRM

Cr Hr: 3 Prerequisite: MGT 350 plus 3 x MGT courses

This senior course explores the cultural relevance of HRM. Lessons from HRM practices and International HRM are used to inform and explore local HRM practices. Topics may include people management across cultures, cultural diversity, globalization in HRM, selected International HRM topics, the implications of (HRM) technology transfer across national boundaries.

MGT 490 Strategic Management

Cr Hr: 3 Prerequisite: MGT 230 AND one of the following ACC 302, FIN 350, MKT 330, OPM 380,MGT 380

This course integrates functional areas of management into developing a business strategy. Furthermore, the course utilizes the Cesim Global Challenge, which is an online business simulation case that develops students understanding of the complexity of global business operations in a dynamic competitive environment. Group projects are required.

MGT 499 COOP training Internship

Cr Hr: 12 Prerequisite: ACC 302, FIN 350, MKT 330, OPM 380, MGT 380

Designed to provide practical and on-the-job experiences within all business areas. The duration of the internship program is four (4) months and the students can earn twelve (12) credits towards their final degree qualification. Students will gain practical skills and experience to reinforce and expand on what was learned in the classroom, plus increasing their employability in an ever competitive job market.

DEPARTMENT OF MARKETING

Dr. Saad Alhoqail, Chair.
Degree Offered: Bachelor of Business Administration (BBA) with Concentration in Marketing
Web address http://cob.alfaisal.edu/programs/marketing

General Department Information

The marketing concentration provides students with an analytical and comprehensive understanding of marketing. Students will be able to generate, analyze, interpret, and present marketing information that firms and other organizations need to satisfy and keep customers through the development of innovative products and services, which build brand equity and provide excellent return on investment. Graduating students will be able to use a wide range of practical and up-to-date marketing tools and techniques. They will be able to utilize information, and knowledge to support innovation in a wide range of organizations including business, non-profit organizations, and government entities.

Concentration Core Courses (18 hours)

Marketing concentration must complete all the courses below. For double concentration, see general notes above.

C. Concentration Core Courses (18 hours)

Course Code	Course-Title	Credits	Prerequisite Course Code
MKT 301	E-Marketing	3	MKT 201
MKT 310	Consumer Behaviour	3	MKT 201
MKT 315	Services marketing	3	MKT 201
MKT 330	Marketing Research	3	MKT 201,OPM 211
MKT 410	Integrated Marketing Communications	3	MKT 201
MKT 420	Marketing Strategy	3	MKT 301

Marketing Course Descriptions

MKT 201 Principles of marketing

Cr Hr: 3 Prerequisite: ECO 102

The principles of marketing course presents a broad overview of the main marketing concepts and activities while also providing in-depth knowledge of key marketing issues such as segmentation, targeting, positioning, marketing environment, marketing information system, branding, customer relationship management, and the elements of the marketing mix. A key emphasis of the course is the importance of recognizing that customers are the fundamental asset of organizations. Key marketing concepts and processes are emphasized using lectures, case studies, client presentations, development of individual/team marketing plans**.**

MKT 301 E-Marketing

Cr Hr: 3 Prerequisite: MKT 201

The E-marketing course provides a framework for understanding how the Internet and related technologies affect marketing. The course covers basic aspects of the technological part of Internet marketing (e.g. Internet development and applications). But the main focus will be on the business part. More specifically, the courses addresses marketing mix over the Internet, online consumer behavior, online market research, mobile marketing, E-CRM, Legal/ethical issues, and social media revolution.

MKT 310 Consumer Behavior

Cr Hr: 3 Prerequisite: MKT 201

The Consumer behavior course covers major influences on the buying process, including affect, cognition, situational and cultural factors. Specific topics include attitudes, learning, intentions, product knowledge, involvement, attention, comprehension, social class, consumer decision-making and behavioral change strategies among others. The marketing implications of understanding the consumer are emphasized. In addition to the class lectures, key consumer behavior concepts and processes are emphasized using case studies, client presentations, class project in which team of students conduct a profound analysis of a physical/offline stores from the consumer behavior perspective.

MKT 315 Services marketing

Cr Hr: 3 Prerequisite: MKT 201

The course is designed to help students understand the unique characteristics of services and the marketing decisions related to these characteristics. The main objective of this course is to provide an in-depth understanding of marketing services with cases featuring a wide array of industries and organizations. Students will also be introduced to customer service oriented mindset. A range of assessment tools are used to facilitate learning in this course.

MKT 320 International marketing

Cr Hr: 3 Prerequisite: MKT 201

The course provides a comprehensive understanding of the issues and challenges inherent in the formulation and implementation of international marketing strategies. Key emphasis is placed on environmental forces affecting international marketing decisions, the selection of international target markets and the design of international marketing plans.

MKT 330 Marketing Research

Cr Hr: 3 Prerequisite: MKT 201, OPM 211

The course covers current techniques and tools necessary for conducting marketing research. Exposition of these techniques will be offered along two dimensions: theoretical and practical. Marketing research emphasize topics such as problem definition, research design, secondary and primary data, questionnaire design, sampling and measurement.

MKT 410 Integrated Marketing Communications

Cr Hr: 3 Prerequisite: MKT 201

The course presents a comprehensive approach to creating and implementing advertising and sales promotions activities. Issues related to event sponsorships, direct marketing, public relations, and business/store image will also be covered. Relevant social, cultural, and ethical issues are emphasized. A range of assessment tools are used to facilitate learning.

MKT 420 Marketing Strategy

Cr Hr: 3 Prerequisite: MKT 330

The course covers the design and implementation of marketing strategies through linking marketing concepts and theories to real life cases. It aims at understanding of the entire marketing mix in light of the strategy of the firm. Main emphasis is placed on problem and opportunity recognition, decision making, segmentation, targeting, positioning, branding, competitive dynamics and administering marketing programs.

DEPARTMENT OF OPERATIONS & PROJECT MANAGEMENT (POM)

Dr. Mario Ferrer, Chair.
Bachelor of Business Administration (BBA) with Concentration in Operations and Project Management
Web address http://cob.alfaisal.edu/programs/OPM

General Department Information

With increasingly competitive businesses environments, corporations are relying on project managers to achieve strategic goals through effective management of innovative solutions. To achieve this target, many organizations adopting business-based project management approach and methodologies to manage and deliver these solutions through projects. This triggered high demand for experienced project managers with knowledge in project management frameworks, lifecycles, processes, tools, and techniques.

A business degree with project management concentration will develop the competence of our graduates and equip them with required skills to plan, control, execute, and manage all project management attributes for successful delivery of the scope, in a timely manner and within budget. With such skills, our graduates are qualified to work in virtually all industries both in public and private sectors.

Concentration Core Courses (18 hours)

Operations and Project Management concentration must complete all the courses below. For double concentration, see general notes above.

C. Concentration Core Courses (18 hours)

Course Code	Course-Title	Credits	Prerequisite Course Code
OPM 310	Introduction to Project Management and Tools	3	OPM 211
OPM 360	Principles of Supply Chain Management and Logistics	3	ACC 202
OPM 370	Quality Management	3	OPM 330
OPM 380	Advanced Project Management	3	OPM 310
OPM 450	Management of Innovation	3	OPM 330
OPM 480	Business Analytics and Risk Assessment	3	OPM 380

Operations and Project Management Course Descriptions

OPM 101 Introduction to Computing

This course introduces the concepts of computer applications and their roles in managing business operations. It introduces students to the understanding on computer hardware, software, essential computer and Internet based systems, and the latest MS Office applications. Substantial portion of the course will be dedicated to hands-on and Internet based exercises.

OPM 211 Business Statistics

Prerequisite: MAT 111

Provides an introduction and overview of descriptive and inferential statistical methods. Topics include measures of central tendency and dispersion, probability, estimation, hypothesis testing, OLS regression, ANOVA, and others. Emphasis is placed on understanding word problems, the appropriate use of analyses, and the interpretation of statistical output.

OPM 330 Quantitative Methods for Business

Cr Hr: 3 Prerequisite: OPM 211

This course covers deterministic and stochastic models for quantitative decision making. The selected topics include linear programming (LP), networks, integer programming, decision trees, sensitivity analysis and simulation. It also covers some of the management science applications like advertising, production scheduling, and financial planning and make-or-buy decision

OPM 340 Operations Management

Cr Hr: 3 Prerequisite: OPM 330

The course studies the fundamental process for production of goods and services in organizations with emphasis on understanding its relationship to other business areas. The course uses quantitative tools in production/operations for effective decision-making. It covers concepts such as operations strategy, process design, forecasting, capacity planning, scheduling, and quality management.

OPM 310 Introduction to Project Management and Tools

Cr Hr: 3 Prerequisite: OPM 211

The course introduces the concepts and methodology of the project management and their usage by the project manager to successfully complete the projects. A key aspect of the course is to manages the projects within the business context with due consideration to balancing the scope, cost, and time constraints. The course explores and apply various tools and techniques such as Microsoft Project 2013 to effectively manage the projects.

OPM 230 Management Information Systems

Cr Hr: 3 Prerequisite: OPM 101, ECO 102

The course covers the use of information and communication technologies in managing operational challenges through integration of management information systems in the day-to-day operations. It discusses the role of management information systems in organizations, networked enterprise, technology infrastructures, security, and key systems applications for the digital age.

OPM 450 Management of Innovation

Cr Hr: 3 Prerequisite: OPM 330

The course empowers students to deliver breakthrough innovations successfully into the world of business. The students explore techniques that seek major growth through innovations in products, services, and business models and develop the skills and gain the knowledge required to bring these innovations successfully to market. Business cases and projects are used to enhance learning experience.

OPM 360 Principles of SC Management & Logistics

Cr Hr: 3 Prerequisite: ACC 202

This course covers principles of supply chain management and provides techniques used to analyze various aspects of logistics systems. Key concepts such as procurement, sourcing, management, communication, warehousing, packaging, materials handling, demand management, distribution, and facility location are examined as an integral part of modern business. Field trips are encouraged**.**

OPM 370 Quality Management

Cr Hr: 3 Prerequisite: OPM 330

The course introduce analytical concepts and tools to accomplish business performance excellence. It exposes the students to quality knowledge improvement methods and addresses the key issues of quality standards and quality needs. It also covers customer satisfaction and focus, tools for quality management, benchmarking, statistical process control, and recent developments in quality improvement.

OPM 380 Advanced Project Management

Cr Hr: 3 Prerequisite: OPM 310

The course focuses on understanding and managing the business changes through adoption and implementation of effective project management approach to successfully achieve targeted project objectives. The course maintain alignment between the business strategic objectives and management of project scope, time, cost, quality, stakeholders, communications, human resources, and procurements. Class-based practical sessions are used to develop students' hands-on experience

OPM 480 Risk Management and Business Analytics

Cr Hr: 3 Prerequisite: OPM 380

This course introduces essential analytical techniques to manage project risk management. The associated concepts and theories are discussed together with the relevant management models. The full life cycle of risk management is presented covering planning, identification, analysis (qualitative and quantitative), response strategies, monitor and control, and governance. Business cases and scenarios are used.

COLLEGE OF MEDICINE

Dean Dr. Khaled Al Kattan, Dean, College of Medicine

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Over the last three decades, the Kingdom of Saudi Arabia has experienced a dramatic improvement in economic status. Health services have developed to an even greater extent, as indicated by accessibility and coverage indicators. Similarly, there also have been improvements in health indicators such as mortality, morbidity, and life expectancy. However, national health manpower development is not coping with the momentum and attendant growth. Saudis make up only 19% of workers in the health sector. This figure is extremely low when compared to other sectors such as education and agriculture. Expanding and changing medical education and medical practice is imperative in order to produce healthcare professionals in the needed quantities and quality, at the right times and in the right places.

The existing curricula of many medical schools in Saudi Arabia follow traditional approaches, which deliver knowledge through fragmented and non-integrated avenues. Instead of being community-oriented, they are teacher-oriented and force students into passive roles. Such institutions produce students who opt to work only in urban areas, contributing further to the poor distribution of stable national health personnel and services throughout the Kingdom. Alfaisal University medical college located in the capital city of Riyadh, responds to all of these challenges. The college follows an innovative approach in the education of health professionals, including problem-based learning and community-based education.

The Alfaisal College of Medicine follows a problem-based, self-directed curriculum, in which patients clinical scenarios and problems are studied from multiple standpoints. Problem-based learning is integrated with appropriate clinical skills training and community-based experiences. Emphasis is placed on critical thinking and problem solving.

The main goal of the undergraduate program is to train students to be critical thinkers and problem solvers, skilled in sensing, formulating, and managing common health problems. In doing so, graduates are being better prepared to expand their competencies in any career and in any particular discipline. Graduate Programs and Research will ensure higher education at an international level that will distinguish the university as research based and working towards dissemination of knowledge.

The mission of the Alfaisal College of Medicine is to prepare its students for meeting and responding to the changing healthcare needs and expectations of the Saudi Arabian community. This is being achieved in full partnership with other healthcare providers and relevant sectors in the community.

College of Medicine Degree Programs

A six year program leading to an MBBS degree (Medical Bachelor and Bachelor of Surgery)

Degree Requirements for MBBS (Medical Bachelor and Bachelor of Surgery)

College of Medicine - UG Course Credit Hour Transcript Ninth Batch - Year 2016								
MAIN COURSE (MBBS)								
Phase & Semester		S#	Course Code	Year	Sem	Course Title	Credit Hrs	
Phase I - Man & The Environment	Semester-I, Fall 2016	1	FON 111	1	1	Foundation Block (4-weeks)	2	(1+0+2)
		2	MSK 112	1	1	Musculo Skeletal Block (7-weeks)	4	(3+0+2)
		3	GIT 113	1	1	Gastrointestinal Block (6-weeks)	3	(2+0+2)
		4	MOL 114	1	1	Molecular Medicine I (Biochemistry & Cell Biology)	3	(1+2+0)
		5	PRO 115	1	1	Communication Skills	2	(0+4+0)
		6	COM 116	1	1	Primary Health Care , Rural Health and Prevention	2	(0+4+0)
		7	ENG 102	1	1	Freshman English I	2	(2+0+0)
			Total Credit Hours for Semester-1				**18**	
	Semester-II, Spring 2017	1	CVP 121	1	2	Cardiopulmonary block (8 weeks)	5	(4+2+0)
		2	HLS 122	1	2	Hematopoietic & Lymphatic System Block (4weeks)	2	(1+2+0)
		3	REN 123	1	2	Renal Block (5-weeks)	3	(2+2+0)
		4	GEN 124	1	2	Genetics	2	(2+0+0)
		5	MOL 125	1	2	Molecular Medicine II (Biochemistry & Cell Biology)	3	(2+0+0)
		6	ENG 113	1	2	English-II	2	(2+0+0)
			Total Credit Hours for Semester-2				**17**	
	Semester-III, Fall 2017	1	END 231	2	3	Endocrine Block (4-Weeks)	2	(1+2+0)
		2	REP 232	2	3	Reproductive Block (4-weeks)	2	(1+2+0)
		3	POD 233	2	3	Pathogenesis of Diseases (Basic Principles of Pharma, Micro, Patho & Immuno) 9-Weeks	5	(3+2+2)
		4	PRO 234	2	3	Professional Skills I (Introduction to clinical Skills)	2	(0+4+0)
		5	BEP 235	2	3	Basics of Biostatistics & Epidemiology	2	(1+2+0)
		6	ARB 101	2	3	Arabic Language I	2	(2+0+0)
		7	ISL 101	2	3	Islamic Studies I	2	(2+0+0)
		8	ENG 224	2	3	English for special purposes	2	(2+0+0)
			Total Credit Hours for Semester-3				**19**	

	Semester-IV, Spring 2018	1	NEU 241	2	4	Neuroscience Block (11 weeks)	6	(4+2+2)
		2	HNS 242	2	4	Head & Neck And Special Senses Block (6-weeks)	3	(2+2+0)
		3	BHS 243	2	4	Behaviour Science	2	(2+0+0)
		4	PRO 244	2	4	Professional Skills II (Integrated with Clinical Sessions)	2	(0+2+2)
		5	RAD 245	2	4	Radiology	2	(0+4+0)
		6	ARB 112	2	4	Arabic Language II	2	(2+0+0)
		7	ISL 113	2	4	Islamic Medical Jurisprudence	2	(2+0+0)
			Total Credit Hours for Semester-4				**19**	
Phase & Semester		**S#**	**Course Code**	**Year**	**Sem**	**Course Title**	**Credit Hrs**	
Phase II - Patho-physiology of the Disease	**Semester-V, Fall 2018**	1	CVP 351	3	5	Cardiopulmonary Block (7-weeks)	4	(3+2+0)
		2	HEM 352	3	5	Hem/Onc Block (4-weeks)	2	(2+0+0)
		3	GIT 353	3	5	Gastrointestinal Block (6-weeks)	3	(2+2+0)
		4	EBM 354	3	5	Evidence Based Medicine	2	(1+2+0)
		5	PRO 355	3	5	Professional Skills III (Integrated with Clinical Sessions)	2	(0+4+0)
		6	MIF 356	3	5	Medical Informatics & Quality and Care	2	(1+2+0)
		7	FMT 357	3	5	Forensic Medicine & Toxicology	2	(2+0+0)
		8	COM 358	2	5	Family Medicine-1 (Env. M, Sports M, Occup. M, Rehab and Patient Safety)	2	(1+2+0)
			Total Credit Hours for Semester-5				**19**	
	Semester-VI, Spring 2019	1	MSI 361	3	6	Musculoskeletal and Integumentary block (5 week)	3	(2+2+0)
		2	END 362	3	6	Endocrine Block (4-Weeks)	2	(2+0+0)
		3	REP 363	3	6	Reproductive & Breast Block (4 Weeks)	2	(1+2+0)
		4	REN 364	3	6	Renal Block (4-weeks)	2	(2+0+0)
		5	PRO 365	3	6	Professional Skills IV (Integrated with Clinical Sessions)	2	(0+4+0)
		6	COM 366	3	6	Family Medicine-II (Women's H, Prenatal C, Geriatrics, Palliative and Alternative M)	2	(1+2+0)
		7	HEN 367	3	6	Health Economics and Health Care Management	2	(2+0+0)
		8	NTN 368	3	6	Nutrition	2	(2+0+0)
		9	PHL 369	3	6	Medical Ethics	2	(2+0+0)
			Total Credit Hours for Semester-6				**19**	
Phase III - Clerkship	**Sem-VII & VIII**	1	MED 471	4	7	Medicine (9-weeks)	9	(2+14+0)
		2	PED 472	4	7	Paediatrics (9-weeks)	9	(2+14+0)

		3	SUR 481	4	8	Surgery (9-weeks)	9	(2+14+0)
		4	GYN 482	4	8	Obstetrics & Gynaecology (9-weeks)	9	(2+14+0)
			Total Credit Hours for Year-4 (Semesters 7 & 8)				**36**	
	Sem-IX & X, 2020/2021	1	MSS 591	5	9	Sub-Specialty Medicine (9w: Cardio 4w, Hem/Onc 4w)	9	(2+14+0)
		2	INS 592	5	9	Integrated Neuroscience (9w: Neuro 6w, Psy 2w)	9	(2+14+0)
		3	SSS 5X1	5	10	Surgical Sub-Specialty (9w: Opth 3 w ENT 3 w & Orth 3w)	9	(2+14+0)
		4	AMB 5X2	5	10	Ambulatory Care (9 weeks: ER and Anaesthesis 4w, FM 4w)	9	(2+14+0)
			Total Credit Hours for Year-5 (Semesters 9 & 10)				**36**	
			Aggregate Credit Hours for UG Course				**183**	
Internship Year			**Hospital Attachment**					

Notes:
*** (1+2+0) 1 is Didactic session, 2 is Tutorial, Practicals, Clinical or Field training session and 0 is Laboratory

MBBS (Medical Bachelor and Bachelor of Surgery Course Descriptions

Phase-I Man and the Environment

FON 111 Foundation Block

Cr Hr: 2

This is a multidisciplinary course (block) foundation course integrating topics in basic and applied clinical anatomy, histology, embryology, and physiology.

MSK 112 Musculoskeletal Block

Cr Hr: 4cr

This is a multidisciplinary course (block) integrating topics in basic and applied clinical anatomy, histology, embryology and physiology related to musculoskeletal system.

GIT 113 Gastrointestinal Block

Cr Hr: 3cr

The overall objective of this course is to stress structural/functional correlates of the different organs within the GIT and how they contribute to the digestion and absorption of ingested nutrients.

MOL 114 Molecular Medicine I (Biochemistry & Cell Biology)

Cr Hr: 3

The overall objective of this course to introduce the student to the molecular mechanisms by which cells interact with their environment and some of the biochemical processes involved in the generation of metabolic energy. To achieve this objective, the course will address basic biochemical properties of amino acids and proteins, protein assembly and folding into three dimensional structures required for function, and principles of enzyme kinetics. In addition, key topics on cell structure, protein trafficking, extracellular matrix and cell signaling will also be discussed. Finally, a review of carbohydrate metabolism and the generation of usable chemical energy by the cell will be presented.

PRO 115 Communications Skills

Cr Hr: 2

The overall objective of this course is to understand the basics of communication skills and its major role in the daily life of health professionals. Show empathy & demonstrate breaking bad news effectively and demonstrate a willingness to be open about themselves, their skills, ideas and responses to people and situations.

COM 116 Primary Health Care & Rural Health

Cr Hr: 2

Upon completion, students will be able to define the role of community medicine in promoting healthcare in the KSA, conceptually define the meaning and purposes of primary healthcare and community medicine and relate them to the healthcare systems in the Kingdom, realize the role of the primary care physician in community health and healthcare, develop supportive attitudes towards health concerns of local communities, learn about some of the scientific perspectives and basic methods of conducting community research relevant to common health problems in local communities and understand the role of epidemiology, and biostatistics in conducting roper community-based research.

CVP 121 Cardiopulmonary block

Cr Hr: 5

This is a multidisciplinary course (block) integrating topics in basic and applied clinical anatomy, embryology, histology and physiology of respiratory and cardiovascular systems.

HLS 122 Hematopoietic & Lymphatic System

Cr Hr: 2

This is a multidisciplinary block integrating topics in basic and applied clinical anatomy, histology, embryology, and physiology related to hemopoietic system.

REN 123 Renal Block

Cr Hr: 3

This is a multidisciplinary course (block) integrating topics in basic and applied clinical anatomy, histology, embryology and physiology of renal system.

GEN 124 Genetics

Cr Hr: 2

The Genetics course is designed to provide medical students with specific knowledge, skills, and behaviors that are essential competencies to the field of medical genetics.

MOL 125 Molecular Medicine II (Biochemistry & Cell Biology)

Cr Hr: 2

The overall objective of this course to introduce the student to the molecular mechanisms by which cells interact with their environment and some of the biochemical processes involved in the generation of metabolic energy. Molecular Medicine II is a continuation of the Molecular Medicine I course. The cell cycle and cell response to external stresses will be addressed. The biochemical pathways involved in lipid metabolism will be reviewed and clinically relevant topics discussed, such as atherosclerosis, obesity, diabetes. Further, protein metabolism and disposal of nitrogen will be addressed. Other relevant topics covered include vitamins and trace elements, haemoglobin, and biomarkers of disease

END 231 Endocrine Block

Cr Hr: 2

This is a multidisciplinary course (block) integrating topics in basic and applied clinical anatomy, histology, embryology and physiology of endocrine system.

REP 232 Reproductive Block

Cr Hr: 2

By the end of the block students should be able to know embryonic development, fetal maturation, and perinatal changes of the reproductive system, know the structure of female reproductive organs, including breast, know the functions of female reproductive system (eg, menstrual cycle, puberty, and menopause), know the structure of the male reproductive organs, Know the functions of the male reproductive system (eg, spermatogenesis, puberty) and understand the hypothalamic-pituitary-gonadal axis, sex steroids, and gestational Hormones.

POD 233 Pathogenesis of Diseases (Basic Principles of Pharma, Micro, Patho & Immuno)

Cr Hr: 5

During this course, students will become conversant with basic characteristics of disease, classification, etiology, pathogenesis, structural and functional manifestations, complications, sequelae, and prognosis. This course deals with basic principles of pharmacology, pathology, immunology, and microbiology in an integrated approach.

PRO 234 Introduction to Medical Skills

Cr Hr: 2

During this course students will conduct and record medical interview and learn to perform general physical examination.

BEP 235 Basics of Biostatistics & Epidemiology

Cr Hr: 2

The main objective of this course is to enhance your ability to understand the methods section in articles presented in medical literature and learn basic principles of biostatistics.

NEU 241 Neuroscience Block

Cr Hr: 6

This block is fully integrated covering normal structure and function as well as integrating disease processes and pharmacotherapy of the diseases related to neurology and psychiatry. The course is runs over eleven weeks. All the learning activities are centered on weekly themes. A typical week starts with the teaching of structure and function followed by disease processes and pharmacotherapy. In the last part of the week clinical lectures are delivered to relate clinical features with the disease processes, and to discuss diagnostic approaches to different clinical presentations. A PBL case relevant to the theme of the week is discussed and serves to anchor the learning around that theme.

HNS 242 Head & Neck and Special Senses Block

Cr Hr: 3

This block is fully integrated covering normal structure and function as well as integrating disease processes and pharmacotherapy of the diseases related to Otolaryngology and Ophthalmology.

BHS 243 Behavior Science

Cr Hr: 2

This course examines progression through the life cycle, including birth through senescence – cognitive, language, motor skills, and social and interpersonal development - sexual development – influence of developmental stage on physician-patient interview and psychological and social factors influencing patient behavior – personality traits or coping style, including coping mechanisms – psychodynamic and behavioral factors, related past experience – family and cultural factors, including socioeconomic status, ethnicity, and gender – adaptive behavioral responses to stress and illness – maladaptive behavioral responses to stress and illness – interactions between the patient and the physician or the health care system – patient adherence (general and adolescent).

PRO 244 Professional Skills IV (Integrated with Clinical Sessions)

Cr Hr: 2

By the end of this course, students will be able to obtain a complete Medical Hx related to Nervous System, Otolaryngeal and Ophthalmic disorders, Communicate respectfully and effectively with patients and their family members demonstrate knowledge of appropriate communication skills in the clinical setting, exhibit keenness to acquire knowledge and skills needed for successful clinical encounter and medical interview. Prove effective utilization of self-directed learning time, exhibit compassion and honesty with patients and their family members respect boundaries and Communicate politely with tutors, peers, and members of the medical team.

RAD 245 Radiology

Cr Hr: 2

In this course, students are required to become aware of and understand the nature of all currently available imaging procedures. Acquire a basic understanding of what each imaging procedure can and cannot accomplish and how to use these procedures in the evaluation of the clinical problem. Gain a firm knowledge of the indications, contradictions, risks and costs of commonly used imaging procedures. Learn the preparation and post procedural routines for imaging examinations. Learn to recognize basic anatomic structures as they appear on imaging studies in the normal patient and in common disease states.

Phase-II Pathophysiology of disease

CVP 351 Cardiopulmonary block

Cr Hr: 4

This course examines the etiology, epidemiology, predisposing factors, pathophysiology and classification, of common respiratory and cardiovascular diseases. In-addition, students are required to relate clinical signs and symptoms result of laboratory diagnostic test, and imaging changes with underlying pathogenesis of common respiratory and cardiovascular diseases. They are required to describe the principles of deferential diagnosis and clinical investigations including laboratory and radiological test in the management of common respiratory and cardiovascular diseases. Discuss the mechanism of action of drugs used in the management of common, describe the principles and practice of prevention of communicable pulmonary diseases, and environmental pulmonary diseases and take a history and perform clinical examinations in patients with pulmonary and cardiovascular disease.

HEM 3524 Hem/Onc Block

Cr Hr: 2

In this course students will learn how to review hematopoiesis and red cell structure, function and metabolism, describe the pathophysiology, clinical features, diagnostic workup and management of red and white cell disorders, bleeding disorders and thrombophilias, diseases of spleen and thymus, interpret the clinical and laboratory information to understand and classify different types of anemia ,describe the mechanisms of hemostasis and thrombosis and correlate it with the interpretation of coagulation tests and the role of coagulants and anticoagulants in the treatment of various diseases, discuss the basis of blood grouping and blood transfusion and perform blood grouping and identify the different types of stem cell transplant currently available and the indications for SCT.

GIT 353 Gastrointestinal Block

Cr Hr: 3

This course examines the etiology, epidemiology, predisposing factors, pathophysiology, and classification, of common gastrointestinal, liver, and pancreatico-biliary diseases. Relate clinical signs and symptoms, result of laboratory diagnostic tests, and radiological changes with underlying pathogenesis of common gastrointestinal, hepatic and pancreaticobiliary diseases. Describe the principles of deferential diagnosis and clinical investigations including laboratory and radiological test in the management of common gastrointestinal, hepatic and pancreaticobiliary diseases. Discuss the mechanism of action of drugs used in the management of common gastrointestinal, hepatic and pancreaticobiliary diseases describe the principles and practice of prevention of communicable and environmental gastrointestinal, hepatic and pancreaticobiliary diseases

EBM 354 Evidence based Medicine

Cr Hr: 2

In this course students learn the basic principles of epidemiologic studies and Evidence Based Medicine (EBM),identify and interpret some of the risk factors affecting patients and the community, interpret epidemiological findings in terms of the population and patients ,Identify issues with regards to medical research and research ethics , learn how to prepare a formal research proposal and prepare it for submission, Appreciate the concept of a healthcare team and be able to collaborate effectively with other professionals and communicate effectively in an essay and in oral presentations.

PRO 355 Professional Skills III (Integrated with Clinical Sessions)

Cr Hr: 2

By the end of this course, students will be able to obtain a complete Medical Hx of disorders related to Cardiovascular, Respiratory, Gastrointestinal and Hematological systems, obtain a detailed comprehensive Hx of the chief complaint and pertaining Hx, explore life style, environmental, and occupational factors pertinent to presentation(s) covered in each session, communicate respectfully and effectively with patients and their family members ,demonstrate knowledge of appropriate communication skills in the clinical setting, exhibit keenness to acquire knowledge and skills needed for successful clinical encounter and medical interview, prove effective utilization of self-directed learning time, exhibit compassion and honesty with patients and their family members, respect boundaries, collaborate with peers, tutors, medical team members, and hospital staff, utilize time and resources provided towards effective completion of session objectives and tasks and understand the role of physicians as health advocates.

MIF 356 Medical Informatics

Cr Hr: 2

This course provides the future healthcare leaders an understanding of the value and capability of information and technology to lead the transformation of healthcare, contain costs, reduce medical errors, and optimize the delivery of services across all healthcare professions. Understand the nature of medical data and the electronic medical records (EMR), knowledge of standards, coding and classifications in medical informatics, an overview of the informatics tools and systems in healthcare and their associated medical departments and clinical support systems, familiar with the foundations of quality, patient safety, and risk management sciences. Demonstrate best practices through quality improvement tools and techniques and educate students to be agents to facilitate patient safety culture.

FMT 367 Forensic Medicine & Toxicology

Cr Hr: 2

In this course, students will learn how to describe the theoretical principles and the basic disciplines of forensic medicine and science, define and explain the importance and applications of crime scene investigation, forensic evidence, death investigation, type of wounds, biological evidence, firearms and weapons and tool marks, death investigation, questioned documents, fire and explosive examination field, different type of wounds and the forensic viewpoint of criminal scene. The students are required to describe the different type of poisons, describe the fundamental concepts of toxicology to commonly encountered abused and toxic substances, illicit drugs and controlled substances act. They are required to describe the postmortem toxic effects of drugs chemical toxins and carcinogens and knowledge of laboratory results interpretations. Correlate and interpret the laboratory result with the clinical information or forensic investigation.

COM358 Family Medicine

Cr Hr: 2

This course identifies clinical presentations common to the field of family medicine; understand concept of preventive medicine and importance of family medicine in implementing community based disease prevention, cancer screening and health promotion programs. Apply family medicine oriented diagnostic approach; introduce students to inter-professional multidisciplinary team approach in the management family medicine patients. Create opportunities to acquire knowledge and skills pertinent to the specialty of family medicine through self-reflection and previously studied courses. Appreciate family physicians important roles as health advocates and resources for their practice and community and relationship in managing patients with on-going health concerns.

MSI 361 Musculoskeletal and integumentary block

Cr Hr: 3

This course examines the etiology, epidemiology, predisposing factors, pathophysiology, and classification of common major musculoskeletal and skin diseases. Relate clinical signs and symptoms, result of laboratory diagnostic tests, and radiological changes with underlying pathogenesis of common major musculoskeletal and skin diseases. Describe the principles of deferential diagnosis and clinical investigations of musculoskeletal and skin disorders. Discuss the mechanism of action of drugs used in the management of common major musculoskeletal and skin diseases.

END 362 Endocrine Block

Cr Hr: 2

This course examines the functions and regulation of pituitary, thyroid, parathyroid, pancreatic and adrenal hormones. It describes the epidemiology, risk factors, pathogenesis and diagnostic workup of disorders of Pituitary, thyroid, parathyroid, pancreatic and adrenal gland. It describes the epidemiology, risk factors, pathological classifications and morphology of tumors of pituitary, thyroid, parathyroid, pancreatic and adrenal gland.

REP 363 Reproductive Block and Breast

Cr Hr: 2

This course examines the functions and regulation of hormones related with the female reproductive system. It describes the epidemiology, risk factors, pathogenesis and diagnostic workup of disorders of female reproductive system and breast. It describes the epidemiology, risk factors, pathological classifications and morphology of tumors of female reproductive organs and breast.

REN 364 Renal Block

Cr Hr: 2

The Renal course in Phase II is directed towards the learning and understanding the disorders of the kidney and urogenital system and their treatment. This is a multidisciplinary block integrating topics in basic and applied pathology, pharmacology, immunology, microbiology, clinical pathology, nephrology, urology, radiology, and clinical medicine.

PRO 365 Professional Skills V (Integrated with Clinical Sessions)

Cr Hr: 2

By the end of this course the students should be able to, take clinical history of a patient with Musculoskeletal, skin, renal, Endocrine and Gynecological & obstetrics problems and/or complaints, perform general physical examination, perform focused physical examination of the Musculoskeletal, skin, abdominal, and reproductive systems.

COM 366 Family Medicine-II (Women's H, Prenatal C, Geriatrics, Palliative and Alternative M)
Cr Hr: 2

The objective of this course is to introduce undergraduate medical learners to family medicine as a clinical yet general medical course. This course covers a broad range of acute and chronic clinical presentations and involves the care of diverse patient population of both genders and across the life cycle with the notion in mind of providing holistic health care to the entire community.

HEN 367 Health economics and Hospital management

Cr Hr: 2

In this course students will learn about health economics and applies the tools of economics to issues of the organization, delivery, and financing of health care. The objectives of this course are to: (1) develop an understanding of the relevance of economic concepts to the health care sector, (2) describe the system of health care financing and delivery arrangements in the health care sector, and (3) impart an understanding of the role of economic factors in the development of public policy concerning health and health care.

NTN 368 Nutrition

Cr Hr: 2

In this course students will learn how to recognize the major macro and micronutrients relevant to human health, and understand their roles and importance, understand the scientific grounds of determining the nutritional requirements of healthy individuals and communities, as well as specific populations, such as children, elderly, and pregnant and lactating women, discuss how nutrition relates to preventing or causing various illnesses, particularly chronic diseases, discuss major nutrition-related disorders and conditions and Suggest a community-based nutritional awareness plan.

Phase-III Clinical Clerkships phase

The first year of clinical clerkship experience usually results in the acquisition of certain global skills as well as learning objectives more specific and tailored to the discipline. The Clinical Clerkship is an integrated learning experience, which will allow students to develop the knowledge, skills, and attitudes essential to care for patients effectively, efficiently, and humanely. The Faculty's goal is to facilitate learning, stimulate curiosity, promote independent thinking, encourage compassionate, excellent care, and to equip students for a lifetime of education.

MED 471 Medicine

Cr Hr: 9

Medical students gain initial clinical experience under direct supervision of clinical instructors. The nine weeks period of enrollment in the teaching hospitals has major and lasting effects on the medical professional. The program for medical students aims to: Provide the basic bed-side skills on history taking and physical assessment, teach the students clinical medicine and link it to basic biomedical sciences, introduce students to work within clinical teams and acknowledge limits, acquire professionalism in medicine, respect for patients, and medical ethics, Gain experience in proper documentation, Enhance communication skills with patients, their families, nursing, and colleagues.

PED 472 Pediatrics

Cr Hr: 9

This course will help students in the acquisition of basic knowledge of growth and development (physical, physiologic and psychosocial) and of its clinical application from birth through childhood, acquisition of the knowledge necessary for the diagnosis and initial management of common paediatric acute and chronic illnesses, an understanding of the approach of paediatricians to the health care of children, an understanding of the influence of family, community and society on the child in health and disease, development of communication skills that will facilitate the clinical interaction with children and their families and thus ensure that complete and accurate data are obtained, development of competency in the physical examination of infants and children, development of clinical problem-solving skills, development of strategies for health promotion as well as disease and injury prevention and Development of the attitudes and professional behaviors appropriate for clinical practice.

SUR 481 Surgery

Cr Hr: 9

In this course students will learn how to perform complete, accurate histories and physical examination on surgical patients, interpret laboratory, diagnostic tests and radiological imaging studies associated with common surgical diseases accurately, formulate from the history, physical exam, and patient studies, a differential diagnosis and develop an initial plan for further patient evaluation and management, describe indications for operative surgery, discuss the risks and benefits of common surgical procedures, Identify the necessary diagnostic modalities to develop a preliminary plan of management, outline a plan of action for the management of surgical infection, with either surgery or a plan for antibiotics, Demonstrate proficiency in the preoperative preparation of patients for surgery and routine post-operative care with

guidance of faculty staff, demonstrate medical communication skills by performing satisfactory (accurate and concise) oral presentations, maintain complete and legible patient care related documentation including writing inpatients progress notes, observe informed consent process noting potential effects of physician-patient power imbalance, cultural disparities and bias and recognize and describe your own role and the roles of other members of the team.

GYN 482 Obstetrics & Gynecology

Cr Hr: 9

The specific objectives of this rotation are to cover different aspects in Obstetrics & Gynecology which include, master history taking from both obstetrics and gynecology patients, perform and appropriately record the essentials of a breast, abdominal and pelvic examination (including speculum and bi-manual pelvic exam), and obtain a Pap smear and cervical/ vaginal cultures • Physiology of pregnancy, normal antenatal and postnatal care, care of medical diseases associated with pregnancy, common obstetric emergencies, common obstetric related problems: multiple gestation, preeclampsia/eclampsia, Rh isoimmunization, preterm delivery, etc. evaluation and monitoring of normal labor, distinguish between the various techniques of antepartum fetal assessment and their indications based on maternal/fetal risk factors, common causes of infertility and their management, describe the common gynecologic neoplasms, including the presentation, diagnosis and treatment; understand the general principles of staging and principles of family planning and different contraceptive techniques.

MSS 591 Sub-Specialty Medicine

Cr Hr: 9

At the end of the CV clerkship, the student should be able to demonstrate competencies in each of the competency domains as outlined, understand the relationship between the basic and clinical sciences as it applies to the fields of cardiovascular medicine, hematology/oncology, demonstrate the ability to assess cardiology/cardiac surgery, hematology/oncology patients and differentiate the need for urgent versus non-urgent care, employ viable treatment plans within the confines of clinical data available, and within the socioeconomic capability of those patients and/or family, integrate the knowledge of medical, ethical, and social-behavioral sciences with the clinical presentation of the disease in his/her patient, encourage patients to seek continuing medical care at intervals appropriate for their condition(s), provide anticipatory health care, perform and record a thorough physical examination, and review the physical findings with the faculty, based on history and physical examination findings as well as any laboratory or diagnostic tests done, identify problems and develop appropriate differential diagnoses, formulate a diagnostic and therapeutic plan for his/her patient based on gathered clinical information and laboratory data, use effective written, verbal, and nonverbal language, and realize the roles of specialists in these areas, in the community and society.

INS 592 Integrated Neuroscience

Cr Hr: 9

By the end of this clerkship students will be able to perform a detailed neurological examination, psychiatric evaluation, make the differential diagnosis and plan initial treatment for patients with neurological and psychiatric disorders by applying clinical reasoning and evidence based medicine, evaluate and analyze prognosis and clinical outcomes.

SSP 5X1 Surgical Sub-Specialty

Cr Hr: 9

This course consists of three rotations in Ophthalmology, Otolaryngology – Head and Neck Surgery (ENT) and Orthopedics. By the end of this clerkship the students will improve their skills and techniques of head and neck examinations, understand the purpose, values and results of numerous laboratory assessments of various otolaryngologic disorders, identify eye movement systems, describe the types of the refractive error, discuss various methods of measuring visual acuity, understand how to record visual acuity, assess patients with orthopedic problems.

AMB 5X2 Ambulatory Care

Cr Hr: 9

This course will consist of three sub clinical rotations including Emergency Medicine, Anesthesiology, and Family Medicine. At the end of the Emergency Medicine and Anesthesiology rotations the students will be able to order and interpret test data, including laboratory, EKG, and radiographic / imaging studies, demonstrate interpersonal communication with patients, families, physicians, EMS personnel, and ancillary staff, identify acutely ill patients and develop a plan for immediate stabilization, demonstrate understanding of emergency medicine procedural treatment skills under attending physician supervision, pre-anesthetic assessment, venous cannulation, airway management, intravenous fluid therapy, acute pain relief, oxygen therapy. By the end of family Medicine rotation the students will be able to gather the relevant information, formulate differential diagnoses and propose management plans for patients with common primary care problems, manage follow-up visits with patients having one or more common chronic diseases and engage in patient education.

COLLEGE OF SCIENCE AND GENERAL STUDIES

Dean Dr. Saad AlShehri, Acting Dean of College of Science and General Studies

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It gives me great pleasure to warmly welcome you all to the College of Science and General Studies (COSGS), one of the largest colleges at Alfaisal University, that sets itself the task of nurturing science, the "key to innovation and inventions," and the foundation for advancement in all other branches of knowledge.

I am truly delighted to be part of this diverse, competent and vibrant academic community operating within an enlightened vision, the corollary dedicated to offering quality science education; groundbreaking scientific research; outstanding service to the local community and beyond; and running in parallel to a prosperous university preparatory program.

Equipped with state-of-the art physical infrastructure and amenities, the CoSGS brings together nationally and globally eminent scholars in disciplines at the center of scientific inquiry, as researchers and educators who take to heart the college vision and mission of supporting its students to achieve their academic and professional goals. Our well-developed academic departments and programs encompass the spectrum of life sciences, chemistry, physics, mathematics, nanoscience and nanotechnology, in addition to humanities and social sciences.

In this complementary and one-of-a-kind environment, our students receive a novel, robust and career-focused education, along with advising and guidance through the years of their study. As doing research is not just an assignment but a vital interest, we get our students earnestly involved in both field and lab research. In particular, our promising students of life sciences and of nanoscience and nanotechnology are directly engaged in pioneering research projects in their respective areas of study and interests, and they constantly receive immense support and guidance from our renowned scientists.

Our programs are definitely feasible and they thus significantly contribute to the Saudi knowledge-based economy. Indeed, we take great pride in our alumni who are either pursuing their higher education in highly reputed western universities, or enjoying the positions for which they are eligible in the Saudi job market, and beyond.

We welcome you to join our science programs

College of Science and General Studies Degree Programs

- Bachelor of Science (B.Sc.) degree in Life Sciences

DEPARTMENT OF CHEMISTRY

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General Department Information

The Department of Chemistry strives to educate and prepare students to excel in the dynamic environment of the Research driven in the scientific world. The Department works to develop, communicates, and applies scientific knowledge through excellent teaching, research, department community service, and professional development. The principal goal of the department is to educate and develop world class scientists and to provide students with a detailed knowledge of scientific research and methods. The ultimate goal is to enable students to seek careers in R&D, academia and the industrial sector.

The Department of chemistry programs is closely linked to the National Science Technology and Innovation Plan (NSTIP) that was created as a product of Science and Technology National Plan of the Kingdome of Saudi Arabia (STNP). Recently, 11.3% of the NSTIP grant money went towards R&D in the Nanotechnology sector.

Chemistry Course Descriptions

CHM 101 General chemistry I

Cr Hr: 3

CHM 101 is the first semester course of a two semesters General Chemistry sequence for students majoring in science, or preparing for entry into health professional programs such as medicine, dentistry, pharmacy and veterinary science. CHM 101 provides a comprehensive introduction to the basic principles of chemistry including atomic and molecular structure, properties of gases, liquids and solids, and chemical thermodynamics.
Prerequisite: None.

CHM 101 L General chemistry I lab

Cr Hr: 1

General Chemistry I Lab (CHM 101 L) provides an introduction to the fundamentals of laboratory techniques in chemistry.

CHM 102 Introduction to Chemistry

Cr Hr: 3 Prerequisite: None

CHM 102 is a single-semester, terminal course designed to provide engineering students with a foundation in the fundamental principles and concepts of chemistry. Topics covered include atomic structure, nomenclature, chemical equations, stoichiometry, thermochemistry, chemical bonding, solution properties, kinetics, equilibrium, electrochemistry, descriptive inorganic, nuclear chemistry, and bio/organic chemistry.

CHM 102 L Introduction to Chemistry lab

Cr Hr: 1

Introduction to chemistry lab (CHM 102 L) provides an introduction to the fundamentals of laboratory techniques in chemistry.

CHM 107 Chemistry in the Environment and Everyday Living

Cr Hr: 3 Prerequisite: None

CHM 107 examines the role of chemistry in everyday life and in the environment, and is intended for students not pursuing scientific or engineering majors. Chemical principles are introduced to the extent necessary for understanding of issues.

CHM 112 General chemistry II

Cr Hr: 3 Prerequisite: CHM 101

CHM 112 is the second of a two semester chemistry course for science majors or those preparing for entry into health professional programs such as medicine, dentistry, pharmacy and veterinary science. CHM 112 builds on fundamental principles mastered in the first semester of the course.

CHM 112 General chemistry II lab

Cr Hr: 1

General Chemistry II Lab (CHM 112 L) The general chemistry laboratory is designed to support and illustrate chemical concepts studied in the lecture portion of the course, as well as to introduce important laboratory techniques and encourage analytical thinking.

CHM 211 Organic Chemistry I

Cr Hr: 3 Prerequisite: CHM 112

CHM 211 is the first semester of a two semester sequence for science majors and those preparing for entry into health professional programs such as medicine, dentistry, pharmacy and veterinary science. CHM 211 focus on bonding principles, functional groups, isomerism, stereochemistry, nomenclature, synthesis and reactions of alkanes, cycloalkanes, alkenes, alkynes, alcohols, and alkyl halides. Addition, elimination, rearrangement and substitution mechanisms.

CHM 211 L Organic Chemistry I lab

Cr Hr: 1

Organic chemistry I Lab (CHM 211 L) provides an introduction to the fundamentals to laboratory techniques in organic chemistry. Introduces students to chemical reactions and syntheses of aromatic, carbonyl, and amine compounds.

CHM 212 Organic Chemistry II

Cr Hr: 3 Prerequisite: CHM 211

CHM 212 Continuation of CHM 211. Nomenclature, properties, reactions and synthesis of conjugated dienes, aromatics, organometallics, alcohols, phenols, ethers, aldehydes and ketones, carboxylic acids and derivatives, and amines. Mechanisms include electrophilic aromatic substitution and nucleophilic addition. Carbohydrates, amino acids, proteins and nucleic acids
Prerequisite: CHM 211

CHM 212 L Organic Chemistry II lab

Cr Hr: 1

Organic chemistry II Lab (CHM 212 L) introduces students to chemical reactions and syntheses of aromatic, carbonyl, and amine compounds. Special topics in carbohydrate, amino acid, and lipid chemistry. Lab work includes simple and multi-step synthesis and spectral identification.

CHM 310 Introduction to Instrumental Analysis

Cr Hr: 3 Prerequisite: CHM 212

Introduction to the theories of analysis by instrumental methods. Basic electronics are applied to chemical measurements. Topics include an introduction to the theory of spectroscopy, ultraviolet, visible, infrared, and others. CHM 310 is an introduction to basic principles and the instrumental design of a variety of analytical techniques, including: electrochemical, spectrochemical (molecular and atomic), chromatographical and mass spectrochemical

CHM 310 L- Introduction to Instrumental Analysis lab

Cr Hr: 1

Introduction to Instrumental Analysis lab (CHM 310 L) will introduce the basic analysis utilizing different instruments such as UV-visible spectrophotometer, IR, NMR, GC, HPLC, Potentiostat, and equipments relevant to the materials of CHM 310 course.

CHM 332 Environmental Chemistry

Cr Hr: 3

The purpose of this course is to gain an understanding of the fundamental chemical and biochemical processes that are occurring in the environment. The course will reflects on major issues in the environment including atmospheric chemistry, air pollution, climate change, energy, water chemistry and water pollution, toxic heavy metals, organic pollutants such as pesticides, herbicides, insecticides , and waste and recycling.

CHM 232 Organic Chemistry

Cr Hr: 3

Organic chemistry is the chemistry of compounds containing the element Carbon. The course provides the students with essential knowledge of atoms, molecules, bonds, functional groups, and structure required to define alkanes, alkenes, alkynes, alcohols, ethers, carbonyl compounds, phenolic compounds, and aryl

halides to understand their properties, structures and actions. The students will determine the chemical structure using Infra-Red (IR), Nuclear Magnetic Resonance (NMR) and Mass Spectroscopy (MS). The mechanisms of organic reactions including addition, elimination, substitution, and rearrangement reactions will be discussed. It will cover physical properties of drug compounds as a basic knowledge required for further subjects such as drug delivery system and pharmaceutical chemistry. Major organic chemical reactions covered in this course will help the student to understand subjects such as pharmacology and medicinal chemistry in the coming semesters.

CHM 232 L Organic Chemistry lab

Cr Hr: 1

Organic chemistry Lab (CHM 232 L) include chemical reactions and syntheses of aromatic, carbonyl, and amine compounds discussed in CHM232 course.

CHM 213 Quantitative Analysis

Cr Hr: 3 Pre-requisites: General Chemistry II (CHM 112)

Co-requisite: Quantitative Analysis Lab (CHM 213L)

Quantitative Analysis (CHM 213) provides a comprehensive introduction to the fundamental theory and laboratory techniques in analytical chemistry. This includes experimental errors and statistics, data analysis methods. Chemical equilibria, titrations, spectrophotometry, and analytical separation methods.

CHM 213 L Quantitative Analysis lab

Cr Hr: 1 Pre-requisites: General Chemistry II Lab (CHM 112L)

Co-requisite: Quantitative Analysis (CHM 213)

Quantitative Analysis Lab (CHM 213L) provides an introduction to the fundamental theory and laboratory techniques in analytical chemistry. This includes experimental errors and statistics, data methods. Chemical equilibria, titrations, spectrophotometry, and analytical separation methods.

CHM 331 Medicinal Chemistry

Cr Hr: 3 Pre-requisites: Organic Chemistry II (CHM 212)

Medicinal Chemistry (CHM 331) will explore role of chemistry in the design and action of drugs. Principles of drug discovery, drug development, drug interactions, and the structure-activity relationship of drugs will be discussed. Aspects of biochemistry and physical chemistry will be covered as required to understand the chemistry of drug action and drug metabolism. Selected case studies from the major classes of drugs and literature will be used to illustrate concepts covered in the course.

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

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General Department Information

The Department of Humanities and Social Sciences is the backbone of the different university colleges in offering both General Educational Requirements, including Arabic, English, and Islamic studies, and a wide range of free elective courses in the domains of anthropology, philosophy, psychology, history, literature and foreign languages. The Department contributes research in humanities and social sciences and supports the college and university's mission in serving the community.

Humanities and Social Sciences Course Descriptions

ISL 101 Islamic Studies I

Cr Hr: 2 Prerequisite: None

Introduces Islamic culture and stresses its importance and contribution to humanity. It addresses Sharia Law in terms of sources, underpinnings, and objectives. It also enhances students' faith in its viability and all-inclusiveness. The course counts as the social science component of the university General Education requirements.

ISL 112 Islamic Studies II

Cr Hr: 2 Prerequisite: ISL 101

Discusses both community and family systems in Islam, their underpinnings and mechanisms for reform. It examines the problems these systems encounter, and shatters misconceptions about them. It also presents the application of Sharia Law in pertinent contexts. The course counts as the social science component of the university General Education requirements.

ISL 113 Islamic Studies II

Cr Hr: 2 Prerequisite: ISL 101

Islamic Medical Jurisprudence ISL 113 introduces the importance of learning medicine in Islam and presents the Islamic legislative rulings related to various medical issues. It also includes principles of jurisprudence and legislative objectives which are strongly connected to medical issues. The course presents contemporary medical issues and the stance of Islamic legislation regarding them in order for the physician to be aware of a set of legislative rulings related to medical issues. The course counts as the social science component of the university General Education requirements.

ARB 101 Arabic Language I

Cr Hr: 2 Prerequisite: None

Concentrates on developing Arabic language skills in areas related to paragraph writing, orthography, punctuation, style, vocabulary, and conversation in Standard Arabic. It also enhances students' literary appreciation and provides morphological and syntactic insights into text analysis. This course counts as a humanities course in the university's General Education requirements.

ARB 112 Arabic Language II

Cr Hr: 2 Prerequisite: ARB 101

Focuses on developing students' Arabic language skills to higher proficiency levels in various domains, including essay writing, and conversation in Standard Arabic. The course also introduces the different literary schools and their respective characteristics. It counts as a humanities course in the university's General Education requirements.

ENG101 Freshman English 1

Cr Hr: 3

ENG102 Freshman English 1

Cr Hr: 2

Prerequisite: admission to AU colleges

A skills-based writing-intensive course that introduces and develops the students' abilities to organize, visualize and write effective paragraphs and essays. The course covers the writing process, and academic oral and written rhetorical moves and grammatical elements specific to a variety of paragraphs and essays. Students will explore and analyze how language is used to achieve communicative goals common to academic writing in various paragraphs and essay genres through in-class writing activities, lectures and homework assignments.

ENG 112 Freshman English II

Cr Hr: 3 Prerequisite: ENG 101

ENG 113 Freshman English II

Cr Hr: 2 Prerequisite: ENG 102

As a continuation of ENG 101/102, ENG 112/113 focuses on developing the student's abilities to organize, visualize and write effective essays. The course continues to cover the writing process and the academic oral and written rhetorical moves and grammatical elements relevant to different essay types uncovered in ENG 101/102. Students will explore and analyze how language is used to achieve communicative goals common to academic writing in these essays through in-class writing activities, lectures and homework assignments.

ENG 222 Technical Writing

Cr Hr: 3 Prerequisite: ENG 112 or ENG 113

Develops reading, listening/speaking and research skills that enhance technical discourse to facilitate advanced-level written expressions that explore the technological parameters of the students' chosen fields.

ENG 223 Literature

Cr Hr: 3 Prerequisite: ENG 112 or 113

The course introduces students to the four major genres of literature: novels, short stories, drama, and poetry. Focus will be brought to the understanding and appreciating of different major works of literature, Students will be able to analyze and respond to major works of literature.

ENG 224 English for Medical Students

Cr Hr: 2 Prerequisite: ENG 102, ENG 113

Is concerned with developing fluency and confidence in using English in medical contexts. It increases EFL medical students' familiarity with medical written language and discourse in different medical contexts. The focus is on carrying out specialized activities in English, but attention is given to reading comprehension skills (expanding the English general and medical vocabulary repertoire through extensive readings), academic and scientific writing skills, and technical medical terms as required.

ENG 231 Medical Terminology

Cr Hr: 2 Prerequisite: ENG 113 or 112

Medical terminology is the study of the principles of building clinical terms used in health care professions. Students will be guided through this with a study of the roots, suffixes, and prefixes. Etymologies of words will also be emphasized. The course will cover the basic anatomy and function of the body's systems. There will be limited attention to pathology of disease.

ANT 101 Introduction to Sociocultural Anthropology

Cr Hr: 3 Prerequisite: None

An introduction to sociocultural anthropology. It helps students explore anthropology and its four major sub-branches. Drawing from diverse ethnographic case studies from around the world, it focuses on the significance of sociocultural anthropology for appreciating the diversity of contemporary and past human cultures and creating an awareness of ethnographic research methods and diverse anthropological perspectives. It enhances students understanding of the similarities and differences among human cultures and their appreciation of cultural constructions of realities.

ANT 102 Entrepreneurial Multiculturalism

Cr Hr: 3 Prerequisite: None

Presents interdisciplinary knowledge on how business cultures evolve in various societies in the world. It explores as to why some individuals/social groups are more successful in entrepreneurship than others within the same societies and cross-culturally".

FRE 101 Elementary French

Cr Hr: 3 Prerequisite: None

Introduces the fundamental elements of French language within a cultural context. Emphasis is places on the development of the basic language skills, vis., listening, speaking, reading, and writing, in addition to grammar and contextual vocabulary.

FRE 112 Elementary French

Cr Hr: 3 Prerequisite: FRE 101

Builds upon the fundamental elements of the French language within a cultural context. Continued emphasis on the development of basic language skills, vis., listening, speaking, reading and writing in addition to grammar and contextual vocabulary.

HIS 101 Islamic Civilization and Mediaeval Europe

Cr Hr: 3 Prerequisite: None

Studies the foundations of the Islamic civilization, its development and prosperity, places of contact between Europeans and Muslims, means of influence, such as direct contact and the translation of Islamic books in science, medicine, philosophy, literature and arts.

PHL 101 A Engineering Ethics

Cr Hr: 3 Prerequisite: None

Examines the ethical dimensions of engineering practice by appealing to relevant concepts and principles in applied ethics; professional ethics; philosophy of technology; science, technology, and society studies. The importance of these principles for good decision making will be highlighted through analysis of the role of engineers in socially and morally complex case study scenarios illustrating practical issues, such as social justice in international engineering projects; standards of professional responsibility;

PHL 101 B Biomedical Ethics

Cr Hr: 2 Prerequisite: None

Presents the basic moral principles that govern medical and scientific research. It also provides insight into the application of these principles through case studies pertinent to ethical issues in international health research as well as clinical ethics.

PSY 101 Introduction to Psychology

Cr Hr: 3 Prerequisite: None

Introduces psychology and its key concepts, theories, research methods, and contributions to the understanding of human behavior. Topics include the nervous system, perception, motivation, learning and memory, social behavior, personality, developmental, and clinical psychology. The course also introduces past and current theories and contributions of eminent psychologists.

DEPARTMENT OF LIFE SCIENCES

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General Department Information

The mission of the Life Sciences program is to disseminate knowledge in the area of molecular biosciences and to nurture the next generation of research scientists, biotechnological entrepreneurs, educators, and biomedical professionals to be active members of their communities in developing a knowledge-based economy. The program aims to provide quality, internationally competitive, student-centered education by offering innovative courses and involving students in interdisciplinary world-class research programs in areas related to human health and the environment with emphasis on molecular mechanisms and nanotechnology.

The Life Sciences program will promote understanding of the fundamental biological processes with an emphasis on the genetic and molecular mechanisms, particularly in relation to human health and environment, as well as cross-disciplinary studies that integrate bioinformatics, computational biology, medicinal chemistry and nanotechnology.

Department of Life Sciences Degree Programs

Bachelor of Sciences (B.Sc.) degree in Life Sciences

Bachelor of Science (B.Sc.) in Life Sciences Suggested Study Plan

The Life Sciences Program requires for graduation a total of 135 credit hours that include 89 credit hours of compulsory courses; 26 credit hours of elective courses; and 20 credit hours of research courses. The compulsory course credits include 14 credit hours of the General Education Requirement courses (ISL, ARA and ENG) and 75 credit hours of the Core Science Courses (MAT, STA, CSC, CHM, PHU, BIO) specified by the Program curriculum. The elective course credits include minimum 2 credit hours of elective courses in Humanity (HUM), 12 credit hours of Advanced Courses in Molecular Biosciences (SCI) and science electives and 12 credit hours of Special Topics in Life Sciences (LST). Choice of elective courses is specified by the Program curriculum.

Students may select one advanced science course from other programs provided that it satisfies the Life Sciences Program goals and mission. A written approval by the Program Director should be obtained prior to registering for courses in other programs. If the course is taken in other College/University, the minimal grade for the course should be at least B-.

CR #	Course-Title	Credit Hours as distributed by Hours		Pre-Requisite CR #	Co-requisite
		Total CRHs	Contact Hours		
General Education Requirement courses 14 CR					
ARB 101	**Arabic Language I**	2	2	**none**	
ARB 112	**Arabic Language II**	2	2	**ARB 101**	
ISL 101	**Islamic Studies I**	2	2	**none**	
ISL 112	**Islamic Studies II**	2	2	**ISL 101**	
ENG 101	**Freshman English I**	3	3	**none**	
ENG 112	**Freshman English II**	3	3	**ENG 101**	
Core science courses 75 CR					
MAT 105	**Calculus for Biomedical Sciences I**	3	3	**none**	
MAT 116	**Calculus for Biomedical Sciences II**	3	3	**MAT 105**	
STA 211	**Probability and Statistics**	3	3	**MAT 116**	
BIO 101	**General Biology I**	3	3	**none**	
BIO 101L	**General Biology I Lab**	1	3	**none**	BIO 101
BIO 112	**General Biology II**	3	3	**BIO 101**	
BIO 112L	**General Biology II Lab**	1	3	**BIO101L**	**BIO 112**
BIO 223	**Microbiology**	3	3	**BIO 101**	
BIO 223 L	**Microbiology Lab**	1	3		BIO 223
BIO224	**Human Physiology & Anatomy**	3	3	**BIO 101**	
BIO224 L	**Human Physiology Lab**	1	3		BIO224
BIO 345	**Molecular Biology I**	3	3	**BIO 112 CHM 112 CHM 211**	
BIO 345 L	**Molecular Biology I Lab**	1	3		BIO 345
BIO 357	**Molecular Biology II**	3	3	**BIO 345**	
BIO357 L	**Molecular Biology II Lab**	1	3		BIO 357
CHM 101	**General Chemistry I**	3	3	**none**	
CHM 101 L	**General Chemistry I Lab**	1	3		CHM101
CHM 112	**General Chemistry II**	3	3	**CHM 101**	
CHM 112 L	**General Chemistry II Lab**	1	3		CHM
CHM 211	**Organic Chemistry I**	3	3	**CHM 112**	
CHM 211 L	**Organic Chemistry I Lab**	1	3		CHM
CHM 212	**Organic Chemistry II**	3	3	**CHM 211**	

CHM 212 L	**Organic Chemistry II Lab**	1	3		CHM
CHM 310	**Introduction to Instrumental Analysis**	3	3	**CHM 212**	
CHM 310 L	**Introduction to Instrumental Analysis Lab**	**1**	**3**		CHM 310
BIO 346	**Biochemistry I**	**3**	**3**	**BIO 223 BIO224 CHM 211**	
BIO 346 L	**Biochemistry I Lab**	**1**	**3**		BIO 346
BIO 358	**Biochemistry II**	**3**	**3**	**BIO 346**	
BIO 358 L	**Biochemistry II L**	**1**	**3**		BIO 358
PHU 205	**Mechanics & Waves for Life Sciences**	3	3	**MAT 101**	
PHU 205 L	**Mechanics & Waves for Life Sciences Lab**	1	2		PHU 205
PHU 216	**Electromagnetism & Optics for Life Sciences**	3	3	**PHU 205**	
PHU 216 L	**Electromagnetism & Optics for Life Sciences Lab**	1	2		PHU 216
CSC 101	**Introduction to Computer Science**	3	3	**none**	**MAT 101**
CSC 112	**Programming**	3	3	**CSC 101**	
Advanced Courses in Molecular Biosciences and Science Electives 12CR					
CHM214	**Analytical Chemistry**	3	3	**CHM 112**	
CHM214 L	**Analytical Chemistry Lab**	1	3		CHM214
CHM331	**Medicinal Chemistry**	3	3	**CHM212**	
CHM332	**Environmental Chemistry**	3	3	**CHM112**	
SCI 321	**Immunology**	3	3	**BIO 223 BIO 224**	
SCI 322	**Cancer Biology**	3	3	**BIO112 BIO 224**	
SCI 323	**Signal transduction**	3	3	**BIO 224 BIO112**	
SCI 324	**Human Genetics**	3	3	**BIO112**	
SCI 325	**Bioinformatics**	3	3	**BIO112; STA211**	
Special Topics in Life Sciences 12 CR					

LST 421	**Life Sciences Special Topics I Epigenetics**	4	4	**BIO 357**	
LST 422	**Life Sciences Special Topics II Nanomaterials**	4	4	**BIO 357 BIO 358**	
LST 423	**Life Sciences Special Topics III Biotechnology**	4	4	**BIO 357 BIO 358**	

Research 20 CR					
LSR 421&422	**Life Science Research Project (Distributed in two semesters)**	16	16	**BIO 357 BIO 358**	
LSR 423	**Integrative Life Science Research Seminar**	4	4	LSR 421	**LSR 422**

Humanity Electives 2 CR							
PHL101B	Biomedical Ethics	2	2				
ANT103	Medical Anthropology	3	3				
FRE101	Elementary French	3	3				
GER101	Elementary German	3	3				
SPN101	Elementary Spanish	3	3				
HIS101	Islamic Civilization and Mediaeval Europe	3	3				
PSY101	Introduction to Psychology	3	3				
SOC101	Introduction to Sociology	3	3				

Life Sciences Course Descriptions

BIO 101 General Biology I

Cr Hr: 3 +1 Lab Prerequisite: None

This is the first module of the general biology introductory course designed for the Life Science Major curriculum. It covers major fields and fundamental principles of the modern biology and provides a foundation to more in-depth and specialized studies during the following years. The course concentrates on physicochemical aspects of life and cellular and molecular mechanisms of fundamental biological process. It also presents the core concepts of modern biology and provides knowledge about the role of various biological macromolecules in the cell physiology; how different types of cells are integrated into multicellular systems; molecular and chromosomal mechanism of heredity.

BIO 103 Introduction to Human Biology

Cr Hr: 3 Prerequisite: None

The course concentrates on the basic aspects of human biology and provides knowledge about the role of various biological macromolecules in the human body, how different types of cells are integrated into multicellular systems, and how organs and organisms develop and function. The course satisfies the General Education Requirements in Science.

BIO 112 General Biology II

Cr Hr: 3 +1 Lab Prerequisite: BIO 101

This is the second module of the general biology introductory course designed for the Life Science Major curriculum. It concentrates on the fundamental aspects of animal physiology with an emphasis on the human body. The course is focused on the evolution, development, structure, function, health and disease of major physiological systems and regulatory mechanisms coordinating their function in the human organism.

BIO 223 Microbiology

Cr Hr: 3 +1 Lab Prerequisite: BIO 101

The course provides a basic understanding of modern medical microbiology with emphasis on the contribution microorganisms make to human health and welfare and intensive study of the processes by which microorganisms cause human disease, how the pathogens can be recognized (identified) and what steps can be taken for the prevention and treatment of infections. There is a particular emphasis on the development of observational, practical and analytical skills through supervised laboratory work and demonstrations.

BIO 224 Human Physiology and Anatomy

Cr Hr: 3 +1 Lab Prerequisite: BIO 112

The course covers human anatomy and physiology from a systems-based perspective, stressing the ways in which different physiological systems interact. Emphasis is on understanding the integration of human anatomy through biological function, development, evolutionary history and genetics. Several clinical examples are given to illustrate how human variation, including congenital defects, emerges from the interaction of development, form, and function.

BIO 345 Molecular Biology I

Cr Hr: 3 +1 Lab Prerequisite: BIO 112; CHM 211

As the first module of the Molecular Biology course, BIO 345 concentrates on molecular mechanisms of genetic processes. This module explains how the flow of biological information from DNA to RNA to protein gives rise to the recognizable, inherited attributes of living organisms. It uses seminal experiments to introduce the students to basic classical and molecular genetics, and then expands on these themes to include genetic engineering and genomic approaches to these phenomena.

BIO 346 Biochemistry I

Cr Hr: 3 +1 Lab Prerequisite: BIO 112; BIO224 BIO 223; CHM 211

The two-module Biochemistry course complements the Molecular Biology course by focusing on the chemical and physicochemical basis of biological processes. BIO 346 concentrates on the chemical properties of biological macromolecules with particular attention to the relationship between physical structure and biological function. The module specifically covers amino acids, the fundamentals of protein structure, simple and complex sugars, lipids, and membrane structures, the basics of enzyme catalysis and kinetics with specific case studies, Ion transport, and other transport proteins, the utilization of proteins and soluble cofactors to generate and store metabolic energy, the physicochemical basis of signal transduction, vitamins and their functional role in the body.

BIO 357 Molecular Biology II

Cr Hr: 3 +1 Lab Prerequisite: BIO 345

As the second module of the Molecular Biology course, BIO 357 concentrates on molecular mechanisms of cellular physiology and interactions. This module provides a detailed knowledge of the structural organization and differentiation of eukaryotic cells as well as key processes in development that are based on cell-cell communication and cell movement. It introduces fundamental properties of the cytoplasm and the roles of the cytoskeleton in fundamental biological processes including chromosome separation, cell motility and intracellular transport processes as well as the evolution, function and biogenesis of cell organelles.

BIO 358 Biochemistry II

Cr Hr: 3 +1 Lab Prerequisite: BIO 346

The second module of the Biochemistry course concentrates on the complexity of metabolic pathways and their regulation. It reviews the inter-linked metabolic processes involved in nutrient handling and homeostasis.

SCI 321 Immunology

Cr Hr: 3 Prerequisite: BIO 223; BIO 224

SCI 321 aims to provide students with an understanding of immunology and the immunological basis of some common and well-known diseases. The course will balance basic knowledge of the underlying complexity of the immune system, such as T and B cell receptor genes, the MHC and antigen presentation, with the application of immunological aspects to infectious diseases, cancer, inflammation and autoimmunity.

SCI 322 Cancer Biology

Cr Hr: 3 Prerequisite: BIO112 BIO 223; BIO 224

This course will introduce the core aspects of cancer biology. Emphasis will be placed on molecular mechanisms of cancer pathophysiology - such as signal transduction, DNA damage and repair and regulation of cell division, death and senescence as well as on system biology, microevolution of tumors, interaction between tumor and organism. Course will include cancer epidemiology and analysis of causes of cancer; examine normal and disregulated signaling mechanisms and their manifestations as cancer phenotype. Traditional and novel strategies of cancer prevention, diagnosis and treatment will be discussed.

SCI 323 Signal Transduction

Cr Hr: 3 Prerequisite: BIO112 BIO 223; BIO 224

Signal transduction course provides a comprehensive overview of major eukaryotic signaling pathways. The concept of "signal transduction pathway" is one of the major advancement in our understanding of how living cell – a unit of life – is functioning: how it adapt to changing environment and communicates with neighbors in multicellular organisms. Perspective of "signal trasduction" is essential to understand complex biological processes and diseases ranging from memory formation to diabetes and cancer. Signal transduction course presents the principles that underlie all known signaling processes. It provides undergraduate students with the tools needed to make sense of the dizzying array of pathways used by the cell to communicate.

SCI 324 Human Genetics

Prerequisite: BIO112

SCI 324 will cover: 1) the genetic and molecular basis of heredity and inherited traits, 2) how genetics and genomics help to understand the human condition, including genetic diseases, cancer, and human evolution, 3) how basic and translational genetics research is leading to improvements to human health, and 4) current ethical discussions related to human genetics.

SCI 325 Bioinformatics and Computational Genomics

Prerequisite: BIO112, STA211

The course is a combination of lectures and instructor-guided practical sessions. SCI325 will cover: 1) the theoretical basis of various comparative analyses of DNA and protein sequences, 2) how bioinformatics, genetics and genomics help to understand the population and evolutionary processes, 3) how computational genomic analyses generate testable hypotheses, and 4) a role of bioinformatics in conservation biology, current human genetics and medicine.

LST 421~423 Life Science Special Topics I~III

Cr Hr: 4 Prerequisite: BIO 357; BIO 358

Each of these three individual courses introduces special topics relevant to the fields of Biomedical Science, Biotechnology or Chemistry. The course subjects can be modified according to faculty availability, students' preferences and pathways.

LST 421 Epigenetics

The course will first review recent progress in our understanding of fundamental epigenetic mechanisms and events controlling normal human development and physiology, such as growth, metabolism and ageing processes together with environmental factors affecting human epigenome. This will follow by reviews of recent discovering of epigenetic etiology of some most significant human disorders.

LST 422 Nanomaterials and their Applications in Life Sciences

This course focuses on the fundamentals of Nanoscience and Nanotechnology such as the basic properties of nanoparticles, structural control of nanoparticles and Environmental and safety issues with nanoparticles. In addition, this will introduce the students to the synthesis and characterization of nanomaterial for possible applications in Nanotechnology. Moreover,this course will also focuses on the

current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics, and energy.

LST 423 Biotechnology

The aim of this course is to provide a basic understanding of modern biotechnology and its applications. This course is focused on the molecular and genetic tools used to analyze and modify organisms to produce desired small molecules and proteins. We will discuss potential growth substrates (such as agricultural waste and carbon dioxide) that can be used and learn about both established and cutting-edge manipulation techniques in the field of synthetic biology. We will also cover the production of biofuels, bioplastics, amino acids, food additives, various bulk chemicals, and biopharmaceuticals.

LSR 421~422 Life Science Research Project I&II

Cr Hr: 16 Prerequisite: BIO 357; BIO 358

The courses represent a two-semester-term individually guided investigation project involving laboratory work and/or computational investigation in some aspect of Biomedical Science. The background, results and conclusions of the study to be reported in the form of an oral presentation in reading week of the second semester of the year and a thesis, submitted at the end of the course.

LSR 423 Integrative Life Science Research Seminar

Cr Hr: 4 Prerequisite: BIO 357; BIO 358

Co-requisite: LSR 421 / 422

LSR423 course is designed to train students to summarize results obtained during student research project courses, built up scientific hypotheses and discuss their merits in group seminars with assessment of the subsequent self-directed learning in oral presentations, coursework or undergraduate thesis writing and defense.

This course develops transferable skills, associated with analysis and presentation of laboratory-based experimental research in Life Sciences and Molecular Biosciences in the form of poster and podium presntation.

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCES

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General Department Information

Mathematics are critical to well understand scientific and engineering concepts. Nature laws are described in a mathematical language and engineering concepts are modeled and achieved through mathematical tools. The Department of Mathematics & Computer Science is endeavoring to become a world-class leader in mathematics and computer science by designing advanced programs and a vibrant environment for developing graduates with the strong academic and technical backgrounds. To achieve this challenging objective, the department if offering world-class education for our students and maintain a high quality research programs, the department offers a wide selection of courses that allow students to acquire a solid base in mathematics and computer science. Our teaching is aimed for developing the students' analytical skills and critical thinking capacities, and to give the students the opportunity to discover the intellectual depth of mathematics & computer science, and their relations to other disciplines.

Mathematics and computer science are playing an ever-increasing role in many emerging fields of study, most notably in Engineering, Life Science and Physical Sciences. As the Kingdom is moving towards knowledge-based industries, applied mathematics and computer science are considered as strategic fields of national importance. As a support for the emergence and the rapid growth of the cited fields, the department is offering a wide range of courses for Engineering, Life science, Medicine and Business programs.

Mathematics & Computer Science Course Descriptions

CSC 101 **Introduction to Computer Science**

Cr Hr: 3 **Prerequisite: None**

Co-requisite: MAT 101 or MAT 105

This course provides an introduction to a disciplined approach to computer programming and problem solving, utilizing a block-structured high-level language, with an emphasis on procedural abstraction and good programming style. Students will apply programming skills in solving a variety of problems. Algorithmic concepts are also introduced. This course also provides a survey study of data structures and data abstraction, and an introduction to complexity considerations and program verification.

CSC 112 Programming I

Cr Hr: 3 Prerequisite: CSC 101

This course offers an overview of computer hardware and software, programming in C with emphasis on modular and structured programming technique, problem solving and algorithm development, simple engineering and scientific problems, basic data types and operators, basic object-oriented concepts, wrapper classes, console input/output, logical expressions and control structures, classes, arrays, and strings.

MAT 100 Pre-calculus

Cr Hr: 3 Prerequisite: None

This course builds sound and strong basic mathematics that are required for studying undergraduate mathematics. This course is particularly important to students whose mathematical skills are not sufficiently developed at the high school level. The course covers materials that include algebraic operations, radical and rational expression, equalities and in-equalities, functions and analytic geometry, special types of functions (linear, quadratic, inverse, polynomial, rational, exponential, logarithmic and trigonometric), solution to equations, and identities involving some types of functions.

MAT 102 Mathematics for Medical Students

Cr Hr: 2 Prerequisite: None

This course will cover basic topics in algebra and serves as an introduction to trigonometry. Topics covered include the real line and coordinate system, functions and graphs, symmetry and translation, inverse functions, polynomial and rational functions, exponential and logarithmic functions, trigonometric functions and special identities. Some applications of these concepts to problems that may be helpful to the further study of quantitative methods in the medical sciences will be considered.

MAT 101 Calculus I

Cr Hr: 3 Prerequisite: None

This course introduces the basic concepts of mathematical analysis used in science and engineering. The course teaches an introduction to differential and integral calculus. Topics include limits; the derivative; rates; Newton's method; the mean-value theorem; max-min problems; the integral and the fundamental theorem of integral calculus; areas, volumes, and average values.

MAT 105 Calculus for Biomedical Sciences I

Cr Hr: 3

This course offers a solid introduction to differential and integral calculus and is designed for students in the biomedical sciences. The course begins with an intensive review of important topics from pre-calculus and an introduction to discrete time and population models. Then it proceeds to cover limits, continuity, differentiation, derivative rules, curve sketching, optimization, difference equations, anti-derivatives, Riemann sums, definite integral, fundamental theorem of calculus, applications of integration. Prerequisite: UPP College Algebra or Equivalent.

MAT 111 Business Calculus

Cr Hr: 3 Prerequisite: MAT 100

The main objective of this course is to help the student in understanding the basic concepts of calculus on the one hand, and to develop the skills needed for using calculus as a viable tool to solve problems that arise in the study of business and economics. Topic covered include, limits, types of functions (polynomial, rational, exponential and logarithmic), their derivatives, anti-derivatives and their various applications.

MAT 112 Calculus II

Cr Hr: 3 Prerequisite: MAT 101

This course is a continuation to Calculus I. The course covers basic mathematical analysis and mathematical tools that are widely used and are essential for mathematical analysis and applications. Topics include sequences; infinite series; power series; conics; polar, cylindrical, and spherical coordinates; vectors and the geometry of space; and vector valued functions.

MAT 116 Calculus for Biomedical Science II

Cr Hr: 3 Prerequisite: MAT 105

This course is a continuation of MAT 105. The course covers further integration techniques, such as integration by parts, by substitution and by partial fractions. Other topics include improper integrals, sequences and series, convergence tests, power and Taylor series, solving differential equations, limits and continuity of functions of two variables, partial derivatives, the double integral.

MAT 211 Calculus III

Cr Hr: 3 Prerequisite: MAT 112

This course deals with multi-dimensional calculus. It is designed primarily for engineering majors and is taken by other technical majors. The student will develop an understanding of limits and continuity of functions of several variables; compute partial derivatives and apply to optimization problems; set up and compute iterated integrals to compute areas, volumes of solids; understand and apply Green's Theorem, the Divergence Theorem and Stoke's Theorem.

MAT 212 Linear Algebra

Cr Hr: 3 Prerequisite: MAT 112

The course teaches an introduction to linear algebra. Topics include complex numbers, geometric vectors in two and three dimensions and their linear transformations, the algebra of matrices, determinants, and solutions of systems of equations, vector space, eigenvalues and eigenvectors.

MAT 213 Differential Equations

Cr Hr: 3 Prerequisite: MAT 112

This course is an introduction to the theory and application of ordinary differential equations and the Laplace transform. The main objective is for the student to develop competency in the basic concepts and master certain solution methods. Topics covered include linear and nonlinear first order equations; higher order linear differential equations; undetermined coefficients method; variation of parameters method; Cauchy-Euler equation; Laplace transform; linear systems solution; solution by series method.

MAT 224 Numerical Methods

Cr Hr: 3 Prerequisite: MAT 212, CSC112 or equivalent

This course introduces the basic concepts of numerical analysis that are employed in science and engineering. It includes a solid introduction to the basic methods and approximation techniques in use, and to the reliability and accuracy of the approximations. Applications of the methods to simplified/model problems that represent real-life problems are also included. Programming skills (based on MATLAB/OCTAVE) needed to implement the methods on a computer are also covered.

MAT 215 Discrete Mathematics

Cr Hr: 3 Prerequisite: MAT 101

MAT 215 is an introduction to results and proofs of discrete mathematics and their applications. It is primarily designed for computer science and engineering students. Topics covered include: formal logic,

induction proofs, sets, relations, counting principles & discrete probability, asymptotic notation and growth of functions, recurrence, and an elementary introduction to graph theory.

STA 101 Basic Statistics

Cr Hr: 3 Prerequisite: None

This course is an introductory course of probability and statistics designed for business and humanities majors. The emphasis of the course is on applying and computing rather than deriving. The student learns how to compute probabilities and descriptive measures of data sets. Topics covered include the concepts of probability and its properties, descriptive statistics, discrete and continuous random variables, expected values, distribution functions, the central limit theorem, random sampling and sampling distributions

STA 211 Probability and Statistics

Cr Hr: 3 Prerequisite: MAT 116

STA 211 introduces the basics of probability and statistics as used in sciences. It covers introduction to probability, random variables, some common probability distributions, random vectors, sample statistics, regression, and applications in experimental sciences.

STA 212 Probability and Statistics for Engineers

Cr Hr: 3 Prerequisite: MAT 112

The course is designed to teach students the basics of probability and statistics as used in engineering and the sciences. The course covers introduction to probability theory, random variables, statistics, and regression.

DEPARTMENT OF PHYSICS

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General Department Information

As a part of the College of Science and General Studies (COSGS) at Alfaisal University, the Department of Physics seeks to become a nationally and internationally recognized model in training of the next generation of Highly Qualified Personnel (HQP) in strategic sectors of a high relevance to Kingdom of Saudi Arabia and worldwide, such as Energy (Alternative Energies), Nanotechnology and Health (Medical physics). This can be achieved by offering world-class education and training of students in Applied Physics. Capitalizing on high-caliber faculty, this objective will be strongly supported by cutting-edge research activities exploiting the exceptional local infrastructure. The ultimate goal is to serve the Kingdom of Saudi Arabia through contributing to the development of knowledge-based economy.

Physics is also valuable in different areas of biology, engineering, business and medicine. As such, the Physics Department of Alfaisal University is currently offering physics courses for life sciences, engineering, business and preparatory year medicine-pathway students.

Physics Course Descriptions

PHU 101 Astronomy

Cr Hr: 3 Prerequisite: None

This elective course is designed for the students of the College of Business to fulfill part of their science requirements. The material of the course is presented in a survey manner using only pre-calculus mathematics. The covered material includes spectroscopy, telescopes, the solar system and its formation theories, the life cycle of stars, galaxies and the general structure of the universe, and an introduction to cosmology.

PHU 102 The Science of Energy and the Environment

Cr Hr: 3 Prerequisite: None

This elective course is designed for College of Business students to fulfil part of their science requirements. The material of the course is presented in an interactive manner with the students with a minimum use of mathematics. The course material covers topics ranging from basic energy concepts to fossil fuels, including oil and gas, renewable and nuclear energy sources and usage. The course also covers the environmental issues as they pertain to the Kingdom of Saudi Arabia, the Gulf region and globally.

Within the context of global energy and oil prices crisis, the course also covers renewable energy resources that might displace or substitute oil in the future. Finally, the course aims to familiarize the business students with the general scientific issues that influence the energy economy of Saudi Arabia, the economy in which the business students will be conducting their future business activities

PHU 103 Mechanics and Waves for Engineers

Cr Hr: 3 Prerequisite or Co-requisite: MAT 101 (Calculus I)

The material of this course requires knowledge of differential and integral calculus. The covered material includes the basics of vectors, kinematics, Newtonian Mechanics, energy and momentum conservation, harmonic motion, mechanical waves, and sound.

PHU 103 L Mechanics and Waves for Engineers Labs

Cr Hr: 1 Prerequisite or Co-requisite: PHU 103

This material constitutes the laboratory related to the course PHU 103.

PHU 124 Electromagnetism and Optics for Engineers

Cr Hr: 3 Prerequisite: PHU 103

The material of this course requires knowledge of differential and integral calculus. The covered material includes the basics of electricity and magnetism, electromagnetic radiation, and optics.

PHU 124 L Electromagnetism and Optics for Engineers Labs

Cr Hr: 1 Prerequisite or Co-requisite: PHU 124

This material constitutes the laboratory related to the course PHU 124.

PHU 205 Mechanics and Waves for Life Sciences

Cr Hr: 3 Prerequisite: None

The material of the course is Algebra based. The covered material includes the basics of vectors, kinematics, Newtonian Mechanics, solids/fluids, harmonic motion and mechanical waves.

PHU 205 L Mechanics and Waves for Life Sciences

Cr Hr: 1 Prerequisite or Co-requisite: PHU 205

This constitutes the laboratory related to the course PHU 205.

PHU 216 Electromagnetism and Optics for Life Sciences

Cr Hr: 3 Prerequisite: PHU 205

The material of the course is Algebra based. The covered material includes the basics of electricity and magnetism, electromagnetic radiation, and optics.

PHU 216 L Electromagnetism and Optics for Life Sciences Labs

Cr Hr: 1 Prerequisite or Co-requisite: PHU 216

This material constitutes the laboratory related to the course PHU 216.

College of Pharmacy

Program director: Dr Manal Alem, MBBS, KFUD, MSc., MRCP (UK), PhD.

Assistant Prof of Clinical Pharmacology

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College of Pharmacy is a very new college at Alfaisal University that enrolls graduates from the university preparatory program UPP into a further 5 years of didactic/ experiential courses within Pharm.D. Program. This program will offer the graduate with a degree of; **Doctor of Pharmacy (Pharm.D.),** conditioned with successful performance in all courses, including the final advanced pharmacy practice experience APPE rotations in the final year.

College of Pharmacy at Alfaisal University will be recognized for excellence in pharmacy education, research and practice with the goal of providing professional, innovative, and evidence-based patient care and state-of the art contribution to research and pharmaceutical industry in the Middle East and the whole world.

College of Pharmacy at Alfaisal University is committed to the following standards;

• Help the graduate to develop, integrate, and apply knowledge from the basic as well as clinical sciences to evaluate scientific literature, explain drug action, and solve therapeutic problems.
• Grant the graduate with the knowledge, skills, abilities, behavior, and attitude necessary to provide patient-centered care, manage medication use systems, promote health and awareness, and describe the influence of population-based care on patient-centered care.
• Grant the graduate with the knowledge, skills, abilities, behavior, and attitude necessary to solve problems, educate, and communicate with a broad range of patients and to collaborate and communicate with health care professionals.

Faculty organization and departments

College of Pharmacy is a very new college in Alfaisal University, and is in the process of recruiting and hiring new faculty staff recruited for the college, that will be organized into 2 separate departments:

- **Pharmaceutical sciences**

  It will Include those faculties specialized in Pharmaceutical sciences, such as Medicinal Chemistry, Drug Discovery, Pharmaceutics, Drug Delivery, Pharmacology, Toxicology, Physiology and Biotechnology

- **Pharmacy practice**

It will include those faculties specialized in Clinical pharmacy, Experiential education, and Pharmacy practice.

College of Pharmacy Degree Program

Pharm.D. curriculum (Doctor of Pharmacy)

The curriculum of the Doctor of Pharmacy (Pharm.D.) Program at Alfaisal University is designed to systemically provide a solid foundation in the basic sciences on which to build upon, and integrate the pharmaceutical sciences, social/administrative/behavioral sciences, and clinical sciences. Consistent with the College of Medicine at Alfaisal University, the Pharm.D. curriculum uses the "SPICES" curriculum model as a guiding philosophy with these elements: Student-centered/active learning, Problem/practice based, Integrated, Community/systems-based, Electives, and Systematic approaches. In addition, the curriculum incorporates research and interprofessional experiences.

The integrated pharmacotherapy course sequences with case-based seminars that employ case-based collaborative learning (CBCL) approach; a hybrid of problem-based learning (PBL), and team-based learning (TBL) approaches. These courses will be offered in the early professional phase of the Pharm.D. curriculum to promote learning in both small groups to prepare for "case-based seminars" and in a tutorial settings with student-directed learning.

Distinguishing features of the program include state-of-the art practicum and simulation experiences, a pharmacy practicum training laboratory with inpatient ambulatory care, and community pharmacy components will be offered is a set of patient care and health system management laboratory courses. Introductory Pharmacy Practice Experience (IPPE) courses in a community settings, as well as in an inpatient and outpatient settings will expose the students to the various pharmacy practice opportunities. Students will learn the fundamental research principles and apply research skills by conducting a research project as a capstone experience prior to the Advanced Pharmacy Practice Experiences (APPE) phase. The last phase of the Pharm.D. program will consist of state of the art APPE rotations in-patient (hospital/health system) and out-patient (community/ambulatory care) settings that expose students to diverse patient populations as part of an interprofessional team.

Program structure

Year	Courses	Credit hours
First year	University Preparatory Program	**23**
Second –fifth year	Didactic courses	**135**
	Practicum/simulation laboratory	
	Introductory practice experiences	
Sixth year	Advanced clinical/experiential education, via	**40**
	Advanced Pharmacy Practice Experience (APPE) rotations	
	Total	**198**

Program objectives

The Doctor of Pharmacy (Pharm.D.) program at Alfaisal University prepares clinical pharmacists to provide comprehensive medication management using a patient-centered approach within interprofessional health care teams. The entire program requires a total of six years; the first year as the University Preparatory Program (UPP), followed by 4 years of didactic, practicum/simulation and introductory practice experiences, and a final year of advanced clinical/experiential education. Graduates of the program will be qualified practitioners with unique training in the appropriate use of medications and expertise in the provision of patient care services in a variety of different practice settings. The integration of research within the Pharm.D. program provides an optimal environment that promotes critical thinking, analytical and lifelong learning, and prepares graduates for application of research.

At the conclusion of the Pharm.D. Program, all graduates will achieve the following outcomes:

1. Demonstrate a scientific foundation as related to the clinical, pharmaceutical, and social/administrative/behavioral sciences.
2. Identify and evaluate research methods and demonstrate research skills relevant to the pharmacy profession that can be applied in different practice settings.
3. Integrate systems management concepts in the pharmacy profession, including the management of drug formulary systems (i.e., hospital, healthcare system, or national-based).
4. Practice evidence-based decision making and implement pharmaceutical care plans.
5. Provide comprehensive medication management to optimize medication use and health outcomes, reduce adverse drug events and improve patient safety.
6. Promote and implement public health, wellness and disease prevention concepts.
7. Demonstrate effective oral and written communication skills to peers, other professionals, patients and the public.
8. Demonstrate a commitment to continuous professional and leadership development.

Pharm.D. curriculum

Year 1-Phase 1 Semester 1							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial /practical**	**Pre-requisite**	**Co-requisite**
PCHE 101	Chemistry I	3	2	1	-	-	-
PHSF 101	Human Structure and Function I	4	3	1	-	-	-
PAM 101	Algebra	3	3	-	-	-	-
PENG 005	English 005	4	UPP criteria are available for exemption from English courses.				
PENG 006	English 006	4					
Total credit hour				**10**			

Year 1-Phase 1 Semester 2							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial /practical**	**Pre-requisite**	**Co-requisite**
PCHE 112	Chemistry II	3	2	1	-	PCHE101	-
PHSF 112	Human Structure and Function II	4	3	1	-	PHSF 101	-
PPHYM112	Physics for Medicine and Life Sciences	3	3	-	-	-	-
PBIO 112	Principles of biochemistry	3	3	-	-	PCHE101	-
PENG 007	English 007	3	UPP criteria are available for exemption from English courses.				
PENG 008	English 008	3					
Total credit hour				**13**			

Year-2—Phase 2 Semester 3							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial /practical**	**Pre-requisite**	**Co-requisite**
ENG 231	Medical terminology	2	2	-	**-**		**-**
CHM 232	Organic chemistry	4	3	1	**-**		-
ANT 233	Anatomy and histology	4	3	1	**-**	**All Phase I subjects**	PHY 234
PHY 234	Physiology	3	3	-	**-**		ANT 233
MAT 235	Calculus	3	2	-	1 **-**		-
ARB 102	Elective; Arabic Language I	2	2	-	-	-	-
Total credit hours					**18**		

Year 2-phase 2 Semester 4							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial/ practical**	**Pre-requisite**	**Co-requisite**
MCH 241	Medicinal chemistry	4	3	1	**-**	CHM 232	**-**
BCH 242	Biochemistry	4	3	1	-	CHM 232	**-**
MIC 243	Microbiology	3	2	1	**-**	-	**-**
IMM 244	Immunology	2	2	-	**-**	PHY 234	**-**
BST 245	Biostatistics and basic research methods	3	2	-	1 -	-	-
ISL 102	Elective: Islamic studies I	2	2	-	-	-	-
Total credit hours					**18**		

Year 3---Phase 2 Semester 5							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial/ practical**	**Pre-requisite**	**Co-requisite**
CAL 351	Pharmacy calculations	1	-	-	1 -	MAT 235	-
KIN 352	Pharmacokinetics	3	2		1 -	MAT 235 MCH 241	-
PHC 353	Pharmaceutics I: Dosage forms and stability	3	2	1	-	-	-
MIC 354	Advanced microbiology	2	1	1	-	MIC 243	-
IMM 355	Clinical immunology	1	1	-	-	IMM 244	-
PRC 356	Pharmacy practice and health care systems	3	3	-	-	-	-
ARB 113	Elective; Arabic language II	2	2	-	-	-	-
ESP 224 **PSY 101** **SOC 101**	Elective	3	3	-	-	-	-
Total credit hours					**18**		

Electives available: English for Specific Purposes **ESP 224**, Introduction to psychology **PSY 101**, and Introduction to sociology **SOC 101**

Year 3---Phase 2 Semester 6							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial/ practical**	**Pre-requisite**	**Co-requisite**
PHC 361	Pharmaceutics II: Drug delivery	2	2	-	-	PHC 353	-
PTH 362	Parenteral therapy	2	1	1	-	CAL 351	-
REG 363	Pharmacy regulations and health ethics	2	2	-	-	-	-
SCR 364	Self-care and non-prescription drugs	1	1	-	-	-	-
BPH 365	Basic pharmacotherapy	3	3	-	-	-	BPH 366
BPH 366	Basic pharmacotherapy; *case based seminars*	1	-	-	1 -	-	BPH 365
BPH 367	Pharmacotherapy of antimicrobial agents	3	3	-	-	MIC 243	-
ISL 113	Elective; Islamic studies II	2	2	-	-	-	-
Total credit hours					**16**		

Year 4—Phase 3 Semester 7							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial/ practical**	**Pre-requisite**	**Co-requisite**
MTM 471	Medication therapy management	2	2	**-**	-		**-**
DIT 472	Drug information and evidence-based practice	3	2	1	-		**-**
IPH 473	Integrated pharmacotherapy: cardiovascular CVS and renal I	3	3	-	-		IPH 474
IPH 474	Integrated pharmacotherapy: cardiovascular CVS and renal I *"case based seminars"*	1	-	-	1 -	**All phase 2 subjects**	IPH 473
IPH 475	Integrated pharmacotherapy: musculoskeletal MSK and respiratory RES	3	3	**-**	-		IPH 476
IPH 476	Integrated pharmacotherapy: musculoskeletal MSK and respiratory RES *"case based seminars"*	1	-	-	1 -		IPH 475
PCL 477	Patient care and health system management lab I	2	1	1	-		IPH 473 IPH 474 IPH 475 IPH 476
PHG 478	Elective/ selective Pharmacogenomics and personalized medicine	2	2	-	-		**-**
Total credit hours					**17**		

Year 4---Phase 3 Semester 8							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial/ practical**	**Pre-requisite**	**Co-requisite**
KIN 481	Clinical pharmacokinetics	2	1	-	1	-	-
ECO 482	Pharmacoeconomics and health outcomes	3	3	-	-	-	-
IPH 483	Integrated pharmacotherapy: Endocrine and women's health	3	3	-	-	-	IPH 484
IPH 484	Integrated pharmacotherapy: Endocrine and women's health *"case based seminars"*	1	-	-	1 -	-	IPH 483
IPH 485	Integrated pharmacotherapy: central nervous system CNS and gastrointestinal GIT	3	3	-	-	-	IPH 486
IPH 486	Integrated pharmacotherapy: central nervous system CNS and gastrointestinal GIT *"case based seminars"*	1	-	-	1 -	-	IPH 485
PCL 487	Patient care and health system management lab II	2	1	1	-	-	IPH 483 IPH 484 IPH 485 IPH 486
CAM 488	Elective/ selective Complementary and alternative medicine	2	2	-	-	-	
Total credit hours					**17**		

IPP 489	summer

Introductory Pharmacy Practice Experience (IPPE) I **3 credit hours**

4 weeks training in the summer time in; Community service/ pharmacy, and pharmacies in primary health care centers

Year 5---Phase 3 Semester 9							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial/ practical**	**Pre-requisite**	**Co-requisite**
IPH 591	Integrated pharmacotherapy: cardiovascular CVS and renal II	3	3	-	-	IPH 473	IPH 592
IPH 592	Integrated pharmacotherapy: cardiovascular CVS and renal II "*case based seminars"*	1	-	-	1 -	IPH 474	IPH 591
IPH 593	Integrated pharmacotherapy: Infectious disease	3	3	-	-	-	IPH 594
IPH 594	Integrated pharmacotherapy: Infectious disease "*case based seminars"*	1	-	-	1 -	-	IPH 593
PCL 595	Patient care and health system management laboratory III	2	1	1	-	PCL 477 PCL 487	IPH 591 IPH 592 IPH 593 IPH 594
IPP 596	Introductory Pharmacy practice experience (IPPE) II (out-patient pharmacy)	2	-	-	- 2	-	-
RES 5X6	Research project	0	0	0	0	-	-
PHI 597 **MRT 598** **MIM 599**	Elective	3	3	-	-	-	-
Total credit hours					**14**		

Electives available: Pharmaceutical industry **PHI 597**, Marketing for pharmacists **MRT 598**, Medical imaging for pharmacists **MIM 599**

Year 5---Phase 3 Semester 10							
Course code	**Course title**	**Credit hour**	**Theory**	**Lab**	**Tutorial/ practical**	**Pre-requisite**	**Co-requisite**
IPH 5X1	Integrated pharmacotherapy: Hematology/ oncology and palliative care	3	3	-	-	-	IPH 5X2
IPH 5X2	Integrated pharmacotherapy: Hematology/ oncology and palliative care *"case based seminars"*	1	-	-	1 -	-	IPH 5X1
MSF 5X3	Medication safety and health informatics	3	2	1	-	-	-
PCL 5X4	Patient care and health system management laboratory IV	2	1	1	-	PCL 477 PCL 487	IPH 5X1 IPH 5X2
IPP 5X5	Introductory Pharmacy practice experience (IPPE) III (in-patient pharmacy)	2	-	-	- 2	-	-
RES 5X6	Research project	3	-	-	- 3	-	-
Total credit hours					**14**		

6th year
Advanced pharmacy practice experience rotations (APPE)

Core rotations		Selective/ Elective rotations	
Ambulatory care	APP 001	General pediatrics	APP 005
General internal medicine	APP 002	Infectious diseases	APP 006
Institutional pharmacy practice	APP 003	Cardiology	APP 007
Community pharmacy practice	APP 004	Adult critical care	APP 008
		Paediatric/ neonatal critical care	APP 009

Free/ Elective rotations
APP 010-021

Organ Transplant
Adult hematology/Oncology
Nephrology
Acute care
TPN
Pharmacy administration and management
Pharmacy automation and informatics
Surgery
Drug Information
Investigational drug services
Medication safety
Pharmacy quality improvement

Total	**40 weeks**

All students after finishing phase 3, are expected to finish 10 rotations for a maximum of 40 weeks of advanced pharmacy practice experience. 4 core rotations are mandatory for all. From the elective rotations, 3 can be chosen from the selective/ elective rotations, and the remaining ones are freely chosen from the free elective list. This proposed structure is the make most of the rotations focused on direct patient care and communication.

General objectives of program courses

First year

PCHE 101 Chemistry I

Cr Hr: 3

This course is designed to give students a solid foundation in basic chemistry as a preparation for undergraduate studies. Students will learn of the central role of chemistry in science. They will learn the history and development of simple models used to describe the material world, with an emphasis on structure of matter at the atomic and molecular level. Students will learn how major classes of compounds, with characteristic properties, can be identified by gaining an appreciation of chemical bonding and how different molecules interact with each other. They will understand that structure determines physical and chemical properties. Then they will learn how chemists quantify matter, and finally they will study some of the major types of chemical reactions. Students will also develop practical skills in laboratory protocols and writing of formal laboratory reports.

PHSF 101 and PHSF 112 Human Structure and Function I& II

Cr Hr: 4

The field of medical science and medical education has accumulated huge amounts of information about human systems biology including anatomy, physiology and molecular medicine (biochemistry, immunology, microbiology etc.). This course will concentrate on knowledge (factual content, understanding processes and concepts), applied and critical cognitive skills (problem based learning, situated and experiential learning). The course will be an introduction to anatomy and human systems physiology. It is expected that students will develop a broad, general understanding of the principles and concepts of human physiology and understand the relationship of structure to function. Students will recognize that structures permit some functions while, at the same time limit others. At a content/factual level, students will have an understanding that certain molecules (for example, enzymes, amino acids, nucleic acids and ATP) are ubiquitous. Students will gain an understanding of homeostasis in physiological systems; they will recognize the checks and balances that exist in living processes.

PAM 101 Algebra

Cr Hr: 3

This course specifically aims to review and develop basic and intermediate Algebra skills. It focuses on the fundamentals of algebra with an emphasis on linear, quadratic, rational, radical, exponential and logarithmic functions. All topics include applications and problem solving techniques. The primary general education learning outcome for this course is quantitative reasoning, which will require students to read and analyze data, develop mathematical models, draw inferences and support conclusions based

on mathematical reasoning. A graphical approach will be utilized throughout the course with an emphasis on solving application problems.

English 005 PENG 005

Cr Hr: 4

This course specifically aims to develop the students' four language skills: listening, speaking, reading and writing, with special emphasis on reading, writing and communications. The emphasis of the listening and speaking component centers on oral communication and the retention and analysis of information based on students' abilities to listen and comprehend. Students listen to a variety of real-life recordings and critically discuss the topics. The second primary aim of the course is to develop students' skills to read, reflect upon, analyze, synthesize, and evaluate information in a variety of texts. The third primary goal aims to enable students to write different kinds of clear, well-organized and coherent paragraphs and then short essays including process, narrative, definition/descriptive, opinion and cause/effect.

English 006 PENG 006

Cr Hr: 4

This course focuses primarily on developing reading and writing skills with specific emphasis on communication and grammar. The writing component centers on extending students' ability to express themselves in the written word, to compose clear, well-organized, and coherent multi-paragraph texts that incorporate a variety of rhetorical modes including opinion/persuasive and compare/contrast essays. The reading component centers on extending students' ability to interact with the written word, to reflect upon, analyze, synthesize, and critically evaluate information from a variety of textual forms. The listening component focuses on identifying main and supporting points in an academic style lecture while developing note-taking skills.

PCHE 112 Chemistry II

Cr Hr: 3

This course is designed to give students a solid foundation in basic chemistry as a preparation for undergraduate studies. Students will learn the stoichiometry of chemical equations and to carry out calculations using balanced equations. They will apply kinetic theory to gases to explain their properties. Students will learn about the gas laws both theoretically and experimentally and use these laws to carry out calculations. They will learn about the flow of energy in chemical reactions and how energy is quantified experimentally. The properties of acids and bases will be studied along with measurement and calculation of pH. The fundamental principles governing buffer action will be learned. Oxidation and reduction will be defined and reactions involving these processes will be carried out and their balanced equations deduced. The sources, properties and major uses of hydrocarbons will be emphasized. Students

will learn to classify organic molecules according to functional groups. They will study basic reactions of selected functional groups. The importance of polymerization and polymers will be emphasized.

PPHYM 112 Physics for medicine and health sciences

Cr Hr: 3

This is an introductory physics course required from students applying for the medicine and life sciences pathway in the University Preparatory Program (UPP) of Alfaisal University. The covered material will include the basics of mechanics, thermodynamics, electricity and electromagnetism, optics, wave optics, and modern physics covering basic concepts of quantum physics, atomic nucleus and radioactivity.

PBIO 112 Principles of biochemistry

Cr Hr: 3

This course will help student to understand and appreciate organic chemistry as a necessary tool and an integral part of understanding biochemistry and the important biological molecules, their physical, chemical and biological properties and functions. This course will start with reviewing general chemistry concepts, to progress with organic functional groups and important organic reactions, structure and reactivity of aromatic compounds, polymers, and biopolymers. Important structures, and functions of biological macromolecules, such as proteins, nucleic acids, carbohydrates and lipids, which provide the structure of cells will also be discussed.

PENG 007 English 007

Cr Hr: 3

This course specifically aims to develop the students' four language skills: listening, speaking, reading and writing, with special emphasis on reading, writing and communications. The emphasis of the listening and speaking component centers on oral communication and the retention and analysis of information based on students' abilities to listen and comprehend. Students listen to a variety of real-life recordings and critically discuss the topics. The second primary aim of the course is to develop students' skills to read, reflect upon, analyze, synthesize, and evaluate information in a variety of texts. The third primary goal aims to enable students to write different kinds of clear, well-organized and coherent essays including argumentative and cause/effect.

PENG 008 English 008

Cr Hr: 3

This course mainly focuses on reading and writing, with a minor emphasis on listening and speaking. The first primary goal of this course is for students to gain exposure to a wide range of texts (pathway related texts, essays, articles, and professional journals) that will provide the basis for their essay writing that students engage in during the course. This course is designed to improve students' critical reading and thinking skills, increase analytical, inferential and evaluative comprehension, expand vocabulary skills, and employ effective study strategies for use across academic disciplines. The second primary goal is to improve the students' academic writing skills, and enable them to write clear, well-organized and coherent argumentative essays. The general use of academic writing conventions are promoted throughout the writing component as students are expected to incorporate basic citations in their writing at this level to avoid plagiarism.

General objectives of program courses

Second year

ENG 231 Medical terminology

Cr Hr: 2

This course is essential for students pursuing any health care profession to learn and recognize word roots, prefixes, suffixes used in medical communications, to combine words to create meaningful medical conditions as well as to realize their definition and identify the correct spelling. The students will acquire the foundation, pronunciation and abbreviation of medical terms related to different body systems (cardiovascular, respiratory, renal, gastrointestinal,.. etc.) including structures, procedures, and diseases. It assists health care professionals to comprehend and utilize medical terminology to communicate with each other and with other health care professionals efficiently to maximize patients care.

CHM 232 Organic chemistry

Cr Hr: 4

Organic chemistry is the chemistry of compounds containing the element Carbon. Therefore, this course is essential to educate the students about organic nomenclature as a basic knowledge to understand the organic physical-chemical properties of drugs. The course provides the students with essential knowledge of atoms, molecules, bonds, function groups, and structure required to define alkanes, alkenes, alkynes, alcohols, ethers, carbonyl compounds, phenolic compounds, and aryl halides to understand their properties, structures and actions. The students will determine the chemical structure using Infra-Red (IR), Nuclear Magnetic Resonance (NMR) and Mass Spectroscopy (MS). The students will designate the mechanisms of organic reactions of substitution, addition, and elimination, and understand stereochemistry to detect chiral molecules and explain the difference in stereoisomers characters and

reactions. It will cover in depth physical properties of drug compounds as a basic knowledge required for further subjects such as drug delivery system and pharmaceutical chemistry. Major organic chemical reactions covered in this course will help the student to understand subjects such as pharmacology and medicinal chemistry in the coming semesters.

ANT 233 Anatomy and histology

Cr Hr: 4

This course is designed to expand the basic anatomy concepts gained from human structure and function courses in the first year. It provides fundamentals of the organization of the human body and provides a comprehensive foundation for topics including anatomical structure of cell, tissues, organs, and organ systems. Organ systems covered will include central nervous system, cardiovascular system, gastrointestinal, musculoskeletal, respiratory, urinary, and others in a systemic and integrated approach to promote critical thinking of the clinical consequences of cellular disorders and tissue related diseases. In addition to lectures, students will gain practical experience of the overall structure of these organ systems and of their components by working with models and histological specimens to prepare the student for the pathophysiological concepts of diseases and their pharmacological interventions in the fourth year.

PHY 234 Physiology

Cr Hr: 3

The course is designed to expand physiological concepts gained from human structure and function courses in the first year. It will teach the students basic principles of human physiology that keeps the human body functioning and in homeostasis. The principal level of focus on physiology in this course is at various levels of organization, ranging from cellular and molecular to tissue and organ system levels. The physiology of cardiovascular, endocrine, central nervous systems, respiratory, gastrointestinal tract, and others will be covered in detail where emphasis will be placed on understanding the integrated regulation of various body processes among these major systems. Such knowledge will prepare the students to the pathophysiological basis of diseases incorporated into pharmacotherapy courses starting in the fourth year. This course will run parallel to the anatomy and histology course with regard to the sequence of the covered subjects.

MAT 235 Calculus

Cr Hr: 3

Calculus is the mathematical study of change with two major branches, differential calculus (concerning rates of change and slopes of curves), and integral calculus (concerning accumulation of quantities and the areas under and between curves). This course will provide a comprehensive introduction to calculus as applied to the study of pharmacokinetics and the practice of pharmacy. In this the course, concepts of functions, domain and range, composition and finding the inverse of a function, limits (understand the

concept of limits, one- sided and two-sided limits, existence of limits, infinite limits, vertical asymptotes and learn the limit rules), continuity, and develop skills for their determinations. They will recognize the derivative, and develop skills for using rules of differentiation. They will also understand the integral concept and its use in computing areas of various regions with curved boundaries.

ARB 102 Elective/ Arabic language I

Cr Hr: 2

This course concentrates on developing Arabic language skills in areas related to paragraph writing, orthography, punctuation, style, vocabulary, and conversation in Standard Arabic. It also enhances students' literary appreciation and provides morphological and syntactic insights into text analysis. This course counts as a humanities course in the university's General Education requirements.

MCH 241 Medicinal chemistry

Cr Hr: 4

This course introduces the concepts required to understand how the biological activities of drugs will be derived from their chemical structures and physicochemical properties of various organic functional groups. In this course the students will understand functional groups, drug pKa, lipophilicity/hydrophilicity, potency, stereochemistry, the effect of structural modifications on stability, and molecular targets. In general these properties will determine drug's metabolic pathways, types of metabolites expected to have biological activity, signal transduction and drug-receptor interactions. The course will discuss different analytical methods used to assay pharmaceuticals and will classify drugs acting on different systems, their mechanisms of action, structure activity relationship and issues related to their pharmacology and clinical use.

BCH 242 Biochemistry

Cr Hr: 4

This course will build upon on the knowledge the students acquired from the biochemistry course in the first year. The course will lay the foundation for subsequent courses in pharmacology and pathophysiology by expanding students' knowledge about proteins, nucleic acids, carbohydrates, and lipids metabolism. It is designed to provide an understanding of the molecular and cellular features that constitute and regulate the central pathways in metabolism. Such knowledge will allow for an understanding of enzyme mechanisms, the therapeutic use of enzyme inhibitors, intermediary metabolism, and accordingly understand the effects of drugs on various metabolic pathways, signal transduction, and biotransformation processes. The laboratory sessions will deal with the isolation, characterization, and quantitative determination of carbohydrates, lipids and proteins.

MIC 243 Microbiology

Cr Hr: 3

This course will provide the students with a basic understanding of modern medical and general microbiology with emphasis on role of microorganisms in human health and disease. The course will address the fundamental concepts on characteristics of microorganisms of medical importance including bacteria, virus, fungi, protozoa, and helminthes. The basics of the taxonomy and classification, morphology, nutrition, growth conditions, metabolism and genetics of these microbes will be discussed. The concept of host-parasite relationship, pathogenicity and microbial virulence factors will also be addressed. Using an integrated approach, the students will then be able to explore how these concepts relate to the infectious disease process, laboratory diagnosis and identification of microbes and targets of antimicrobial drugs. The students will explore the development of antimicrobial resistance and correlate microbial gene transfer mechanisms with dissemination of resistance genes. This course will use a diversity of teaching approaches such as lectures, laboratory practical sessions and interactive large group discussions, through which, it is expected that this course will equip students with the basic principles of microbiology. This will serve as a basis for their continuing understanding of infectious diseases in later stages of the curriculum.

IMM 244 Immunology

Cr Hr: 2

This course is designed to provide students with a basic understanding of immunology. The study of the principles of immunology will provide students with an understanding of how the immune system functions in protecting the human body against non-self, including infectious threats and transformed cells. These concepts will also form the basis of understanding altered immune responses including autoimmune disorders, allergic reactions and immunodeficiencies. Using a diversity of teaching approaches including lectures and case discussions, it is expected that this course will provide the basic scientific principles necessary for developing a solid foundation needed for the clinical immunology course to be offered in the senior year of this program.

BST 245 Biostatistics and basic research methods

Cr Hr: 3

This course will assist the students to develop the necessary skills to understand and perform basic statistical analysis for parametric and non-parametric data using computer-based program. They will be capable of interpreting the results of biomedical research papers in the literature. The students will appreciate the fundamentals of research ethics. Planning research projects, the students will learn how to write a research proposal using systematic approach, starting with comprehensive literature review,

writing an introduction, adding a methodology section with an emphasis on data collection protocol and data analysis, summarizing results, and writing an inclusive discussion and an effective conclusion.

ISL 102 Elective/ Islamic studies I

Cr Hr: 2

This course will introduce Islamic culture and stresses its importance and contribution to humanity. It addresses Sharia Law in terms of sources, underpinnings, and objectives. It also enhances students' faith in its viability and all-inclusiveness. The course counts as the social science component of the university General Education requirements.

General objectives of program courses

Third year

CAL 351 Pharmacy calculations

Cr Hr: 1

This course will introduce the students to the knowledge and skills of fundamental mathematical calculations utilized in pharmacy practice. It will explain to the students the important basic conversions, how drugs strengths are expressed, and how to do the required calculations for compounding medications. Topics include: systems of measurement, expressions of concentrations, general considerations in calculation of doses, calculation of doses according to the patient parameters, buffer system calculations, isotonicity calculations and electrolytes specific calculations. Principles taught in this course will allow the students to interpret and dispense prescriptions and medication orders.

KIN 352 Pharmacokinetics

Cr Hr: 3

The interrelationship of the physical-chemical properties of the drug, and the LADME properties of a drug (liberation, absorption, distribution, metabolism and excretion) will be explained in this course. Drug modelling such as one and two compartment open models will be covered. Effect of route of administration on the drug disposition after IV bolus, IV continuous infusion and oral administrations will be also addressed. In this course, the students will understand the difference between linear and non-linear pharmacokinetics, drug interactions, bioavailability, bioequivalence, and the factors affecting drug elimination (metabolism and excretion). The relationship between drug concentration, effect, and side effects will be explored in this course. Tutorial sessions for problem based learning using case scenarios will be an integral part of this course. The aim of these tutorial sessions is to help students grasp the basic theories and basic skills of pharmacokinetics, and to develop the students' ability to analyze and solve problems. At the end of this course, the student will be able to design and adjust a patient's drug dosage regimen to obtain a plasma/serum concentration within a desired therapeutic range.

PHC 353 Pharmaceutics I: Dosage forms and stability

Cr Hr: 3

This course introduces the student to the technologies involved in pharmaceuticals development processes and their required pharmaceutics components or excipients. Students will learn the basic requirements of good manufacturing practices (GMP) followed worldwide for drug or pharmaceuticals development. The students will differentiate between the most common dosage forms, their routes of administrations, and the use of bioavailability and bioequivalence for formulations' assessments. The major classifications and pharmaceutical compounding of dosage forms will be covered, including; powders and granules, capsules, tablets (coating, disintegration, dissolution), solutions (solubility, polymorphism, crystal

structure), polyphases systems (colloids, gels, suspension, emulsions, surface tension, surfactants, HLB), topical dosage forms (creams, ointments, absorption), and mucosal delivery (nasal, pulmonary, buccal). Stability and quality control studies of each dosage form will be addressed. The basic principles associated with pharmaceutical (extemporaneous) compounding will be explained. There will be laboratory sessions to provide general principles and hands-on experience in the preformulation, formulation, manufacturing, and quality control fields that are necessary in design, formulation, compounding and manufacturing of drug dosage forms.

MIC 354 Advanced microbiology

Cr Hr: 2

This course will introduce students to key concepts and principles of infection control in relation to pharmaceutical practice. The various approaches to control of growth of microbial agents and the types of microbial control agents utilized in healthcare and industrial settings will be addressed. In this course students learn about the indications, approaches, equipment and agents utilized for cleaning, sterilization and disinfection processes in the healthcare setting as well as in industrial pharmaceutical settings. They will begin to understand the criteria for selecting and monitoring the usefulness of the agents, equipment and monitoring approaches used for sterilization & disinfection. The course will also address approaches to infection control practices in the community with special emphasis on community pharmaceutical practices.

IMM 355 Clinical immunology

Cr Hr: 1

This course will build on the basic concepts the students learnt in Immunology course. In the first weeks of the course, the applications of these concepts in the context of normal host immune responses such as inflammatory response and mucosal immunity, immunodiagnostic approaches, immunotherapy and immunization will be addressed. In the second half of the course, we will use examples of various immunological disorders as the basis for correlating basic concepts, clinical presentation, immunodiagnostic and immunotherapy approaches. Large group tutorial and laboratory demonstration sessions will be used to reinforce various concepts. In addition, this course will expose the students to emerging clinical immunotherapeutic applications.

PRC 356 Pharmacy practice and health care systems

Cr Hr: 3

This course introduces students to the profession of pharmacy and the diversity of pharmacy-related services that relates to the modern health care system. Students will be introduced to the contribution of pharmacy to health care systems in different settings such as; community-, hospital-based. It will also enable the students to develop a more specialized range of attributes to the healthcare system. It will

introduce the student to clinical pharmacy practice, patient counselling and compliance, drug utilization reviews, drug interactions, treatment of poisoning and other areas of practice. Special emphases will be on the role of pharmacist's in patient care and public health in Saudi Arabia-health care system.

ARB 113 Elective/ Arabic language II

Cr Hr: 2

This course focuses on developing students' Arabic language skills to higher proficiency levels in various domains, including essay writing, and conversation in Standard Arabic. The course also introduces the different literary schools and their respective characteristics. It counts as a humanities course in the university's General Education requirements.

Elective courses -3 options

Elective 1-

ESP 224 English for Specific Purposes

Cr Hr: 3

This course aims to develop fluency and confidence in using English in medical contexts. It also aims to increase EFL medical students' familiarity with medical written language and discourse in different medical contexts. The focus is on carrying out specialized activities in English, but attention is given to reading comprehension skills (expanding the English general and medical vocabulary repertoire through extensive readings), academic and scientific writing skills, and technical medical terms as required.

Elective 2-

PSY 101 Introduction to Psychology

Cr Hr: 3

This course will introduce the students to psychology as a science and to major perspectives in psychology (e.g., behaviourism, psychoanalytic, and cognitive). Major application of psychology in the assessment and treatment of mental health problems is covered along with other application in clinical circumstances and counselling which will be an important concept for pharmacy students. Another application of psychology is in industrial and organizational settings, as well as scientific research on a wide range of topics related to mental processes and behavior will be also covered. Application of the knowledge taught in this course in interpersonal communication and at work will encourage personal as well as professional growth and development.

Elective 3-

SOC 101 Introduction to Sociology

Cr Hr: 3

This course will introduce the students to the basic concepts in the field, research methods, and theories in sociology. It addresses the interrelations among human societies, individuals, groups and organizations. Topics include social interaction, social institutions, social stratification, community, and social change strategies. This course elaborates on the social structure of Saudi Arabian society, its social institutions and stages of social transformation.

PHC 361 Pharmaceutics II: Drug delivery

Cr Hr: 2

This course will introduce students to the pharmaceutical aspects of drug delivery systems as well as alternative application sites with a view to optimize therapeutic effect. It will discuss selected modern formulation principles (applied as well as potential) theoretically and methodically to explain problems/issues concerning the optimization of absorption, selective transport and targeting as well as the properties and effect of excipients. The course will cover drug classes (small molecules, prodrugs, peptides, proteins, nucleotides, etc.); applicable delivery systems (solid dispersions, self-emulsifying systems, cyclodextrins, polymeric nanoparticles, liposomes, etc.) and administration routes (oral, IV, IM, topical, pulmonary, nasal, etc.). Students will learn the development and characterization of drug delivery systems, release models, transport and absorption studies in *in vitro* and *in vivo* models.

PTH 362 Parenteral therapy

Cr Hr: 2

This course will introduce the students to parenteral routes of drug administration, including; Intramuscular, Intravenous, Intra-arterial, Intra-cardiac, Intra-thecal, Intradermal (Intra-cutaneous) and Subcutaneous route (Hypodermic). Topics such as intravenous admixture preparation, compatibility of parenteral products, hazardous drugs and radiopharmaceuticals preparations will be covered. This course will also focus on the clinical aspects of enteral feeding and parenteral nutrition therapy. The practical sessions of the course will enable the student to prepare individualized sterile medications, suitable for specific patient needs; containing the prescribed ingredients in the correct amounts, free from microbial and pyrogenic contaminants as well as undesirable levels of particulate or other toxic contaminants. Product stability, compatibility, labelling, and storage according to the principles of good drug quality control will be emphasized. This course will be highly dependent on mathematical and pharmaceutical knowledge the students acquired in previous courses to make this service feasible and efficient.

REG 363 Pharmacy regulations and health ethics

Cr Hr: 2

This course will introduce the students to pharmacy law and the regulatory aspects applicable to pharmaceutical products and the practice of pharmacy internationally. Students should learn the various laws and regulations that will govern their daily practice in connection with the principal authority that is; Saudi Food and Drug authority (SFDA). The role of such authority in drug registration, licensing and control will also be explained. Laws and regulation set by ministry of health that govern medication dispensing and control substances will be also explained.This course will teach the students the ethics related to pharmacy practice and ethical consideration in clinical trials and research. These ethics are set via rules and regulations of SFDA.

SCR 364 Self-care and non-prescription drugs

Cr Hr: 1

Self-care is the independent act of preventing, diagnosing, and treating one's own health conditions without seeking medical advice. This practice includes, but is not limited to, general care measures and dispensing of nonprescription drugs. This course is designed to prepare future pharmacists to assess whether patients are candidates for self-care and to recommend appropriate self-care measures for commonly encountered self-manageable conditions. The students will learn how to assess, manage and recommend over-the-counter OTC medications or natural medicines for the following common complaints/disorders: cough, common cold, pain, allergic rhinitis, nausea, vomiting, dyspepsia, muscle injury, dermatologic disorders (acne, insect bites, and sunburn), wound care, and many others. Students will apply the concepts acquired from this course to different courses such as integrated pharmacotherapy "case-based seminars" and patient care and health system management laboratory courses.

BPH 365 Basic pharmacotherapy

Cr Hr: 3

Integrated pharmacotherapy courses in this program will be introduced via an introductory basic pharmacotherapy course, where it will teach the students basic pharmacodynamic principles. It will introduce the students to the normal physiology of Autonomic nervous system ANS and the pharmacology of drugs acting on parasympathetic and sympathetic nervous system. This knowledge will give the student a fundamental background to understand the actions of various groups of drugs and their clinical applications. This course also will cover drug toxicity and poisoning lectures along with principles of treatment of poisoning. The concepts of environmental, occupational, and forensic toxicology will be introduced to the students by the end of the course. This course is quiet important because it will introduce the student to the concept of integration in learning process as, various discipline are involved such as; pharmacology, physiology, pathology, as well as pharmaceutical practice.

BPH 366 Basic Pharmacotherapy "case-based seminars"

Cr Hr: 1

Case based seminars is a practical application of the knowledge the students acquired from the concomitant pharmacotherapy course. This course in particular will focus on application of the knowledge acquired from basic pharmacotherapy course with regard to pharmacodynamics, autonomic nervous system, drug poisoning and environmental as well as occupational toxicology. The course will start with a series of lectures focusing on communication and presentation skills. Followed by the usual conduct of such course via "case based seminars" which applies "case-based collaborative learning" which integrate problem-based learning (PBL), with team-based learning (TBL). The students are divided into small groups with the help of the tutor, to work on a case-based scenario that works as a problem they might see in the future. The group will analyze the case, and determine the learning objectives that helps to find the best management plan for it. The group needs to work as a team on the management plan that will be eventually presented as student seminars to their colleagues. Seminar presentation is a good experience to develop their presentation and communication skills, and their ability to handle discussion.

This course should parallel basic pharmacotherapy course delivery over 7 week's period.

BPH 367 Pharmacotherapy of antimicrobial agents

Cr Hr: 3

Antimicrobials are a large group of diverse structures with myriad mechanisms of actions against bacteria, viruses, fungi, and parasites. This course will introduce the student to general classes of antimicrobial drugs. The student will understand how the biological activities will be derived from their chemical structures and physicochemical properties. Pharmacological principles of these classes will be covered afterwards, such as pharmacokinetics, mechanism of action, patterns of kill, adverse effects and mechanisms of resistance. The concept of antimicrobial stewardship will be introduced to the student to emphasize its goals; to enhance patient health outcomes, reduce resistance to antimicrobial agents, and to decrease unnecessary costs.

ISL 113 Elective/ Islamic studies II

Cr Hr: 2

This course will discuss both community and family systems in Islam, their underpinnings and mechanisms for reform. It examines the problems these systems encounter, and shatters misconceptions about them. It also presents the application of Sharia Law in pertinent contexts. The course counts as the social science component of the university general education requirements.

General objectives of program courses

Fourth year

MTM 471 Medication therapy management

Cr Hr: 2

Medication Therapy Management (MTM) is a distinct service that optimize therapeutic outcomes for individual patients. This course will introduce the students to the MTM service in pharmacy practice and its five core elements; medication therapy review (MTR), personal medication record (PMR), medication-related action plan (MAP), intervention and/or referral, documentation and follow-up, with brief discussion of topics in social and cognitive pharmacy. MTM service emphasizes on performing a comprehensive medication therapy review to identify medication-related problems, and to create an individualized therapy plan to resolve them. Part of MTM is to enhance the patient understanding of appropriate drug use, improve patient adherence with prescribed drugs and reduce the risk of adverse events associated with inappropriate drug use. It will introduce the student to the concept of evaluating complicated medication regimens as a scope of therapy management career. Ultimately this service is capable of increasing safety of healthcare practices. Practical application of the knowledge gained in this course will be done in patient care and health system management laboratory courses I-IV.

DIT 472 Drug information and evidence-based practice

Cr Hr: 3

This course will provide the students with the necessary knowledge to build their skills required to search, retrieve, interpret, and disseminate drug information in the most efficient and effective manner with special focus on patient and medication safety using the suitable databases. This course will teach the student the critical appraisal of drug literature, randomized clinical trials, systematic reviews with meta-analyses, clinical service literature, and quality assessment and improvement techniques. The students will learn how to balance individual patient care with population-based assessment of pharmacotherapy outcomes. The student will learn that evidence-based practice requires screening, evaluating and implementing evidence from the rapidly evolving medical literature. They will learn also how data are summarized into evidence reports and clinical guidelines and learn about the limitations of this process. In this course students will use published evidence/ practice to identify targets for quality improvement, to formulate the best strategies for identifying high-risk patients, and to evaluate patient outcomes.

IPH 473 Integrated pharmacotherapy: Cardiovascular CVS and renal I

Cr Hr: 3

Integrated pharmacotherapy courses aims to build the knowledge of the students about how to manage patients with different pathological conditions. It will start by delivering lectures in pathophysiology about a certain disease that belongs to the system covered in the course, followed by pharmacology lectures that

cover pharmacological actions of drugs designed to treat such condition and the physiological responses of the body to these drugs. Current practice guidelines for the management for such diseases will follow along with a small exercise that introduces a one simple case to discuss the therapeutics options suitable. This course in particular will introduce the student to basic cardiovascular and renal disease scenarios.

Application of the knowledge acquired will be applied in the "case based seminar" course that run in parallel to it in 7 weeks period.

IPH 474 Integrated pharmacotherapy: Cardiovascular CVS and renal I "case-based seminars"

Cr Hr: 1

Case based seminars is a practical application of the knowledge the students acquired from the concomitant pharmacotherapy course. This course in particular will focus on application of the knowledge acquired from cardiovascular and renal pharmacotherapy course I with regard to pathophysiology, pharmacology, and current management guidelines of basic cardiovascular diseases, a renal conditions. Case based seminars applies "case-based collaborative learning" which integrate problem-based learning (PBL), with team-based learning (TBL). The students are divided into small groups with the help of the tutor, to work on a case-based scenario that works as a problem they might see in the future. The group will analyze the case, and determine the learning objectives that helps to find the best management plan for it. The group needs to work as a team on the management plan that will be eventually presented as student seminars to their colleagues. Seminar presentation is a good experience to develop their presentation and communication skills, and their ability to handle discussion

This course should parallel integrated pharmacotherapy: cardiovascular and renal I course that will be delivered over 7 week's period.

IPH 475 Integrated pharmacotherapy: Musculoskeletal MSK and Respiratory RES

Cr Hr: 3

Integrated pharmacotherapy courses aims to build the knowledge of the students about how to manage patients with different pathological conditions. It will start by delivering lectures in pathophysiology about a certain disease that belongs to the system covered in the course, followed by pharmacology lectures that cover pharmacological actions of drugs designed to treat such condition and the physiological responses of the body to these drugs. Current practice guidelines for the management for such diseases will follow along with a small exercise that introduces a one simple case to discuss the therapeutics options suitable. This course in particular will teach the student pathophysiology of inflammation and drugs working as anti-inflammatory agents in preparation to discuss common musculoskeletal related conditions such as muscle injury, bursitis, tendinitis, gouty arthritis, along with more difficult conditions to manage such as rheumatoid arthritis. The second half of this course will introduce the student to the pathophysiology and pharmacological management of allergic conditions, and common respiratory disorders such as; bronchial asthma and chronic obstructive airway disease.

Application of the knowledge acquired in this course will be applied in the "case based seminar" course that run in parallel to it in 7 weeks period.

IPH 476 Integrated pharmacotherapy: Musculoskeletal MSK and Respiratory RES "case-based seminars"

Cr Hr: 1

Case based seminars is a practical application of the knowledge the students acquired from the concomitant pharmacotherapy course. This course in particular will focus on application of the knowledge acquired from musculoskeletal and respiratory pharmacotherapy course with regard to pathophysiology, pharmacology, and current management guidelines of common inflammatory/ rheumatological disorders, and common allergic and respiratory diseases. Case based seminars applies "case-based collaborative learning" which integrate problem-based learning (PBL), with team-based learning (TBL). The students are divided into small groups with the help of the tutor, to work on a case-based scenario that works as a problem they might see in the future. The group will analyze the case, and determine the learning objectives that helps to find the best management plan for it. The group needs to work as a team on the management plan that will be eventually presented as student seminars to their colleagues. Seminar presentation is a good experience to develop their presentation and communication skills, and their ability to handle discussion

This course should parallel to integrated pharmacotherapy: musculoskeletal and respiratory course that will be delivered over 7 week's period.

PCL 477 and 487 Patient care and health system management laboratory I-II

Cr Hr: 2

Patient care and health system management laboratory courses are designed to build and reinforce contemporary pharmacy practice skills in the provision of patient care and health systems management. Throughout the course series students will participate in practicum and simulation components of the lab, to expand their practice skills in preparation for advanced pharmacy practice experience (APPE) rotations. In particular, patient care and health system management laboratory courses I and II will give the student the experience required in community, hospital, ambulatory care, and alternative settings by focusing on foundational practice skills that are aligned with the fourth year "integrated pharmacotherapy courses" and their "case-based seminars", such as;

- Handling prescription and dispensing of commonly used prescription and non-prescription medications and various dosage formulations
- Patient assessment
- Communication skills including patient counselling on medications and/or devices
- Development of patient care plans
- Community and hospital medication review and dispensing (including intravenous dosage forms)
- Application of medication safety principles while handling community/ ambulatory/ institutional prescription orders

Selective/ Elective courses

PHG 478 Pharmacogenomics and personalized medicine

Cr Hr: 2

This course will teach the students the basic principles of human genetics and how it contributes to inter-individual variation in treatment strategies. They will apply the principles of molecular and cellular biology to understand how genetic variability in genes encoding drug metabolizing enzymes, drug transporting proteins, and drug receptors (targets) can contribute to variability in drug disposition and action. Accordingly the genetic makeup of an individual will lead to major changes in pharmacokinetics, pharmacodynamics, and clinical outcome. They will be able to discuss the impact of pharmacogenomics in different therapeutic areas, using case studies reporting the clinical consequences of pharmacogenomics on therapeutic efficacy or toxicity. They will apply pharmacogenomics concept to a particular drug therapy to solve relevant problems in pharmaceutical care. The societal and ethical implications of genetic testing and the resultant individualization of drug therapy will be covered in this course. By the end of this course, the students will be equipped to critically evaluate the current and future literature in the area of pharmacogenomics.

KIN 481 Clinical Pharmacokinetics

Cr Hr: 2

This course involves clinical applications of pharmacokinetic principles. Emphasis is placed on the identification of actual and theoretical factors that contribute to variabilities in pharmacokinetic parameters and associated pharmacological responses. Design of optimized dosing regiments for patient care utilizing drug monitoring techniques and computer technology will be also covered in this course. Case studies with different patient population and with co-morbidities are utilized whereby students will apply pharmacokinetic concepts in a clinical context and discuss drug dosing and therapeutic drug monitoring. Latest standardized techniques and dosing methods are critically explored, contrasted, and applied to patient-specific dosing scenarios. The student will apply the principles for pharmacokinetics and therapeutic drug monitoring in decision-making and improvement of patient care.

ECO 482 Pharmacoeconomics and health outcomes

Cr Hr: 3

This course will provide the pharmacy student with an overview and applications to assess the value and the standards of pharmacoeconomics, health outcomes, health economics, and epidemiology. It will teach the student basic concepts, assumptions, terminology, and methods associated with pharmacoeconomics and health-related outcomes research. An overview of pharmacoeconomic analysis using cost-effectiveness, cost-minimization, cost-utility, cost-benefit, and cost-identification studies will be addressed. This course will also teach the student to the basic features, strengths, and weaknesses of

pharmacoepidemiological study designs. Various methods of collecting pharmacoepidemiological information, drug utilization studies, cross-sectional studies, observational studies, and clinical trials will be covered. Principles taught in this course will help the student to build their knowledge of how to assess and conduct research in the future to demonstrate the effectiveness, safety, and economic value of a new treatment.

IPH 483 Integrated pharmacotherapy: Endocrine and women's health

Cr Hr: 3

Integrated pharmacotherapy courses aims to build the knowledge of the students about how to manage patients with different pathological conditions. It will start by delivering lectures in pathophysiology about a certain disease that belongs to the system covered in the course, followed by pharmacology lectures that cover pharmacological actions of drugs designed to treat such condition and the physiological responses of the body to these drugs. Current practice guidelines for the management for such diseases will follow along with a small exercise that introduces a one simple case to discuss the therapeutics options suitable. This course in particular will teach the student pathophysiology of common endocrine disorders and topics related to female and male reproduction. Common dermatological conditions will be discussed briefly at the end of the course.

Application of the knowledge acquired in this course will be applied in the "case based seminar" course that run in parallel to it in 7 weeks period.

IPH 484 Integrated pharmacotherapy: Endocrine and women's health "case-based seminars"

Cr Hr: 1

Case based seminars is a practical application of the knowledge the students acquired from the concomitant pharmacotherapy course. This course in particular will focus on application of the knowledge acquired from endocrine and women's health pharmacotherapy course with regard to pathophysiology, pharmacology, and current management guidelines of common endocrine conditions and topics related to female and male reproduction. Common dermatological scenarios will be also included in the cases discussed briefly at the end of the course. Case based seminars applies "case-based collaborative learning" which integrate problem-based learning (PBL), with team-based learning (TBL). The students are divided into small groups with the help of the tutor, to work on a case-based scenario that works as a problem they might see in the future. The group will analyze the case, and determine the learning objectives that helps to find the best management plan for it. The group needs to work as a team on the management plan that will be eventually presented as student seminars to their colleagues. Seminar presentation is a good experience to develop their presentation and communication skills, and their ability to handle discussion

This course should parallel to integrated pharmacotherapy: endocrine and women's health course that will be delivered over 7 week's period.

IPH 485 Integrated pharmacotherapy: Central nervous system CNS and gastrointestinal GIT

Cr Hr: 3

Integrated pharmacotherapy courses aims to build the knowledge of the students about how to manage patients with different pathological conditions. It will start by delivering lectures in pathophysiology about a certain disease that belongs to the system covered in the course, followed by pharmacology lectures that cover pharmacological actions of drugs designed to treat such condition and the physiological responses of the body to these drugs. Current practice guidelines for the management for such diseases will follow along with a small exercise that introduces a one simple case to discuss the therapeutics options suitable. This course in particular will teach the student pathophysiology of central nervous system and gastrointestinal system disorders.

Application of the knowledge acquired in this course will be applied in the "case based seminar" course that run in parallel to it in 7 weeks period.

IPH 486 Integrated pharmacotherapy: Central nervous system CNS and gastrointestinal GIT "case-based seminars"

Cr Hr: 1

Case based seminars is a practical application of the knowledge the students acquired from the concomitant pharmacotherapy course. This course in particular will focus on application of the knowledge acquired from central nervous system CNS and gastrointestinal GIT pharmacotherapy course with regard to pathophysiology, pharmacology, and current management guidelines of common CNS and gastrointestinal disorders. Case based seminars applies "case-based collaborative learning" which integrate problem-based learning (PBL), with team-based learning (TBL). The students are divided into small groups with the help of the tutor, to work on a case-based scenario that works as a problem they might see in the future. The group will analyze the case, and determine the learning objectives that helps to find the best management plan for it. The group needs to work as a team on the management plan that will be eventually presented as student seminars to their colleagues. Seminar presentation is a good experience to develop their presentation and communication skills, and their ability to handle discussion.

This course should parallel to integrated pharmacotherapy: CNS and GIT course that will be delivered over 7 week's period.

Selective/ Elective courses

CAM 488 Complementary and Alternative Medicine

Cr Hr: 2

The course gives an overview of the most commonly used complementary and alternative medicine CAM modalities centered on the five domains of Complementary, Integrative and Alternative Medicine. These include the Alternative medical systems (traditional Chinese medicine, Unani medicine, Ayurveda, homeopathy, naturopathy); Mind-body Medicine (techniques designed to facilitate the mind's capacity to

affect the physical body's functions in health and illness, such as meditation, yoga, and MBSR); Manual therapies (osteopathy, massage, and chiropractic); Energy-based therapies (biofeedback, acupuncture); and Biologically-based therapies (herbal medicine and dietary supplements). Principles of Prophetic medicine will be introduced where the major elements of traditional Islamic healing methods will be covered. The course will present theory and principles of CAM practices and train students to critically evaluate evidence of their efficacy and safety.

IPP 489 Introductory pharmacy practice experience I

Cr Hr: 3

In this introductory pharmacy practice experience, the student is required to spend 4 weeks of training (40 hours/week) for a total of 160 hours, to gain experience in clinical pharmacy practice in the community setting. The students will be distributed among community pharmacies via placement in traditional community pharmacies or in an outpatient pharmacy in primary health care centers. This course represent a great opportunity to apply basic practice and communication skills and to interface with patients and healthcare providers. Students will also participate in community service that can be planned with the college as an educational campaign focusing on face-to-face interaction with the community. It will serve as an important introduction of the clinical pharmacy profession to the community.

General objectives of program courses

Fifth year

IPH 591 Integrated pharmacotherapy: Cardiovascular CVS and renal II

Cr Hr: 3

Integrated pharmacotherapy courses aims to build the knowledge of the students about how to manage patients with different pathological conditions. It will start by delivering lectures in pathophysiology about a certain disease that belongs to the system covered in the course, followed by pharmacology lectures that cover pharmacological actions of drugs designed to treat such condition and the physiological responses of the body to these drugs. Current practice guidelines for the management for such diseases will follow along with a small exercise that introduces a one simple case to discuss the therapeutics options suitable. This course in particular will build further the knowledge that the student acquired from basic cardiovascular and renal disease I course, by progressing to a more advanced scenarios with emergency presentation. Application of the knowledge acquired in this course will be applied in the "case based seminar" course that run in parallel to it in 7 weeks period.

IPH 592 Integrated pharmacotherapy: Cardiovascular CVS and renal II "case-based seminars"

Cr Hr: 1

Case based seminars is a practical application of the knowledge the students acquired from the concomitant pharmacotherapy course. This course in particular will focus on application of the knowledge acquired from cardiovascular and renal pharmacotherapy II course with regard to pathophysiology, pharmacology, and current management guidelines of advanced cardiovascular and renal conditions. Emergency scenarios and cases with complications will be covered in this course. Case based seminars applies "case-based collaborative learning" which integrate problem-based learning (PBL), with team-based learning (TBL). The students are divided into small groups with the help of the tutor, to work on a case-based scenario that works as a problem they might see in the future. The group will analyze the case, and determine the learning objectives that helps to find the best management plan for it. The group needs to work as a team on the management plan that will be eventually presented as student seminars to their colleagues. Seminar presentation is a good experience to develop their presentation and communication skills, and their ability to handle discussion

This course should parallel integrated pharmacotherapy: cardiovascular and renal II course that will be delivered over 7 week's period.

IPH 593 Integrated pharmacotherapy: Infectious diseases

Cr Hr: 3

Integrated pharmacotherapy courses aims to build the knowledge of the students about how to manage patients with different pathological conditions. This course in particular will focus on application of the knowledge acquired from microbiology, advanced microbiology, pharmacotherapy of antimicrobial agents, to progress with understanding the clinical microbiology, and pathophysiology of common infectious diseases. Current practice guidelines for the management for such diseases will follow along with a small exercise that introduces a one simple case to discuss the therapeutics options suitable.

Application of the knowledge acquired in this course will be applied in the "case based seminar" course that run in parallel to it in 7 weeks period.

IPH 594 Integrated pharmacotherapy: Infectious diseases "case-based seminars"

Cr Hr: 1

Case based seminars is a practical application of the knowledge the students acquired from the concomitant pharmacotherapy course. This course in particular will focus on application of the knowledge acquired from microbiology, advanced microbiology, pharmacotherapy of antimicrobial agents, and infectious disease pharmacotherapy courses with regard to microbiology, pathophysiology, pharmacology, and current management guidelines of common infectious diseases. Case based seminars applies "case-based collaborative learning" which integrate problem-based learning (PBL), with team-based learning (TBL). The students are divided into small groups with the help of the tutor, to work on a case-based scenario that works as a problem they might see in the future. The group will analyze the case, and determine the learning objectives that helps to find the best management plan for it. The group needs to work as a team on the management plan that will be eventually presented as student seminars to their colleagues. Seminar presentation is a good experience to develop their presentation and communication skills, and their ability to handle discussion

This course should parallel to integrated pharmacotherapy: infectious disease course that will be delivered over 7 week's period.

PCL 595 and 5X4 Patient care and health system management laboratory III-IV

Cr Hr: 2

Patient care and health system management laboratory courses are designed to build and reinforce contemporary pharmacy practice skills in the provision of patient care and health systems management. Throughout the course series students will participate in practicum and simulation components of the lab, to expand their practice skills in preparation for advanced pharmacy practice experience (APPE) rotations. In particular, patient care and health system management laboratory courses III and IV will give

the student the experience required in hospital, and other alternative settings by focusing on foundational practice skills that are aligned with the fifth year "integrated pharmacotherapy courses" and their "case-based seminars", such as;

- Hospital medication order processing and dispensing (automated medication dispensing devices, and bar coding)
- Handling prescription and dispensing of commonly used prescription and non-prescription medications in a patient with multiple co-morbidities
- Advanced level patient assessment
- Patient counselling on medications, especially those with communication barriers
- Patient counselling in a team-based setting
- Development of comprehensive patient care plans
- Identification of complex drug therapy problems
- Pharmacy-based immunization training
- Interprofessional education

IPP 596 and 5X5 Introductory Pharmacy Practice Experience II-III

Cr Hr: 2

In these two introductory pharmacy practice experience courses, the student is required to spend 5 hours/week; comprising 75 hours of training in each course (150 hr of total training) in an institutional environment. These two courses will provide the students with great practice experiences in institutional outpatient pharmacy services and institutional inpatient pharmacy services, respectively. Students will apply basic practice skills and interface with patients and providers including evaluating medication orders, prescriptions, dispensing of medications and other pharmaceutical services.

Introductory pharmacy practice experience II: (Institutional outpatient pharmacy services)

Introductory pharmacy practice experience III: (Institutional inpatient pharmacy services)

Elective courses -3 options

Elective 1-

PHI 597 Pharmaceutical industry

Cr Hr: 2

This course is designed to expose students to the pharmaceutical industry, its environment, inner workings, and approach to engaging customers and stakeholders. It is intended to broaden the pharmacy students' understanding of this industry, introduce critical concepts and terminology, build confidence and prepare students who may seek a career in Pharmaceutical industry. Pharmacy students will learn the principles of pharmaceutical manufacturing and the requirements for good manufacturing practices (GMP) certification. The basic operations involved in the production of a dosage form; from research and development (R&D) until quality control (QC) procedures involved will be demonstrated. It involves different visits to local pharmaceutical companies to follow the manufacturing processes in general and

tableting process, in particular, starting with excipients' selection, tableting steps and coating techniques, and ending with the required QC procedures to evaluate the outcome.

Elective 2-

MRT 598 Marketing for pharmacists

Cr Hr: 2

This course examines the underpinning theoretical concepts and applied techniques of marketing that are used in the delivery of pharmaceutical care in the for-profit and/or not-for-profit environment as well as the practical marketing strategies that can be used in day to day pharmacy management. Throughout the course, topics relevant to public policy formation and evaluation will be central to discussion. Topics will include important marketing concepts, managing service performance, advertising and promotion, significant laws affecting pharmacy practice management, consumer behavior, strategic marketing planning, segmentation, communication, pricing pharmacist services, channels of distribution and marketing ethics. Lectures will focus on theoretical concepts and examples of strategies currently being used within pharmacy and the broader health care environment. This course will be of value to pharmacy students seeking careers in pharmaceuticals companies, management, and industrial pharmacy.

Elective 3-

MIM 599 Medical imaging for pharmacists

Cr Hr: 2

This course will discuss the principles and applications of medical imaging in patient care. Great emphasis will be on radiopharmaceuticals and nuclear medicine imaging (SPECT and PET) but other imaging technologies such as; MRI, ultrasound, x-ray, mammography and CT scan will be discussed briefly. These technologies are applied greatly in diagnosing various disease states such as; infectious diseases, cancer, cardiovascular, hepatobiliary, renal and neurological disorders. The emerging role of molecular imaging using PET and SPECT in selecting patients for personalized medicines for cancer as well as monitoring response to these new therapies will be also discussed.

IPH 5X1 Integrated pharmacotherapy: Haematology/ Oncology and palliative care

Cr Hr: 3

Integrated pharmacotherapy courses aims to build the knowledge of the students about how to manage patients with different pathological conditions. It will start by delivering lectures in pathophysiology about a certain disease that belongs to the system covered in the course, followed by pharmacology lectures that cover pharmacological actions of drugs designed to treat such condition and the physiological responses of the body to these drugs. Current practice guidelines for the management for such diseases will follow along with a small exercise that introduces a one simple case to discuss the therapeutics options suitable. This course in particular will introduce the student to common

haematological, and neoplastic disorders, and conclude the last pharmacotherapy course with the concept of palliative care.

Application of the knowledge acquired in this course will be applied in the "case based seminar" course that run in parallel to it in 7 weeks period.

IPH 5X2 Integrated pharmacotherapy: Haematology/ Oncology and palliative care "case-based seminars"

Cr Hr: 1

Case based seminars is a practical application of the knowledge the students acquired from the concomitant pharmacotherapy course. This course in particular will focus on application of the knowledge acquired from haematology, oncology pharmacotherapy and palliative care course with regard to pathophysiology, pharmacology, and current management guidelines of common haematological and neoplastic disorders, along with principles of palliative care. Case based seminars applies "case-based collaborative learning" which integrate problem-based learning (PBL), with team-based learning (TBL). The students are divided into small groups with the help of the tutor, to work on a case-based scenario that works as a problem they might see in the future. The group will analyze the case, and determine the learning objectives that helps to find the best management plan for it. The group needs to work as a team on the management plan that will be eventually presented as student seminars to their colleagues. Seminar presentation is a good experience to develop their presentation and communication skills, and their ability to handle discussion

This course should parallel integrated pharmacotherapy: haematology, oncology and palliative care course that will be delivered over 7 week's period.

MSF 5X3 Medication safety and health informatics

Cr Hr: 3

Medication safety deals with the identification and prevention of medication errors. Students will learn about different types of medication errors, factors that contribute to their occurrence, their severity, and the steps required for their prevention. They will be provided with the core knowledge and skills needed to understand the background and culture of patients' safety, data privacy and security. Students in this course will gain experience in collecting data on medication errors, analyzing the findings, communicating with other health care professionals and administrators through a reporting mechanism, and tracking and trending an area of failure and success. The students will encourage developing their own ideas of implementing patient's safety, especially for those graduate **seeking careers in:** health-system, ambulatory, and community pharmacy management and leadership. This course will also teach the concepts and tools required to understand informatics in pharmacy practice. The field of health informatics includes the development, deployment, and use of hardware and software technologies to enhance patient care including improvements in efficiency and safety. Key items that will be discussed include software's, such as; electronic medical records, computerized provider order entry/e-prescribing,

and clinical decision support tools as well as hardware solutions, such as; robotic dispensing/picking, bar code medication administration, and automated dispensing cabinets.

RES 5X6 Research project

Cr Hr: 3

Students will enroll themselves in a graduation research project during semester 10 of the fifth year. The aim of the course is to give the students an opportunity to perform a research project within the field of an emerging area of pharmaceutical sciences/ practice of interest under direct supervision of a faculty member from the college of pharmacy. Students will apply research knowledge and skills to design, implement, show independence, critical and creative thinking, and to execute their research projects. Students will summarize the results in a research report and present the results of the project to the academic community as a poster presentation in the "Research week".

General objectives of program courses

APP 001-021 Advanced pharmacy practice experience rotations - sixth year

Cr Hr: 4

After completion of the previous courses successfully, students will participate in a series of advanced clinical rotations in which they communicate with patients, professionals, and other health profession students; identify and assess clinical problems; further develop their skills in patient care and pharmaceutical services; contribute effectively as a member of a health care team; and formulate solutions to optimize patient outcomes. A total of 10 clinical rotations (40 weeks) will be required during a full academic year (total of 2,000 hours) of clinically-oriented rotations offered primarily at off-campus sites. There will be **4 core rotations that are mandatory for all (ambulatory care, general internal medicine, institutional pharmacy practice, and community pharmacy practice). Another 3 rotations can be chosen from the selective/ elective options (general paediatrics, infectious disease, cardiology, adult critical care, and paediatric/ neonatal critical care). The remaining 3 rotations are freely chosen from the free elective list that comprises (organ transplant, adult haematology/ oncology, nephrology, acute care, TPN, pharmacy administration and management, pharmacy automation and informatics, surgery,…and many others). This proposed structure is the make most of the rotations focused on direct patient care and communication.**