



جامعة الإمام عبد الرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

College of Architecture and Planning
Department of Building Engineering

STUDENTS PROSPECTUS

Bachelor of Science Program in
Building Engineering

2020

Welcome from the Chairman

The Building Engineering Department at IAU prides itself on being the first in the Kingdom to offer Building Engineering (BE) Program. The BE program has been well received by the private sector measured by Alumni and Employers' Surveys. The BE program bridges the gap between architecture and engineering by its curriculum structure and scope.

This guide, along with the Student Handbook contains the regulations and requirements for graduation as a Building Engineer. It outlines the structure of the program, the curriculum and contents of courses required for the Bachelor of Science in Building Engineering. In addition, it highlights the employment opportunities in the private, semi-private, and public sectors. Educational resources such as labs, libraries and faculty's list are also included in this guide to enrich the learning experience of the students.

Students should study this guide in conjunction with Student Handbook and University Catalog, which will enable them to plan for the completion of the degree requirement in a timely and orderly manner. Students are encouraged to meet their advisors periodically to follow up on their BE program. It is the policy of the Department to promote students' learning and to motivate them to seek knowledge beyond the classroom.



Dr. Faris A. Almaziad
Department Chairman

**Bachelor Program in
Building Engineering**

STUDENTS PROSPECTUS



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THE UNIVERSITY

Imam Abdulrahman Bin Faisal University opened its doors to women and men in 1975 with two pioneering colleges, the College of Medicine and the College of Architecture. Almost four decades later this academic institution has grown into a leading research university with 21 colleges spread throughout the Eastern Province and a student population of over 45,000. Imam Abdulrahman Bin Faisal University (IAU) began as the Dammam Campus of King Faisal University (KFU) based in Al-Hasa. The Dammam campus then separated and established as an independent university, named as University of Dammam in 2009, the name was modified to Imam Abdulrahman bin Faisal University in 2016.

THE COLLEGE OF ARCHITECTURE AND PLANNING

The first 60 students were admitted in the fall of 1975 to commence studies in College of Architecture and Planning. The College of Architecture and Planning had grown to encompass five departments enrolling more than 900 students in five academic undergraduate programs and seven graduate programs. These include: Architecture, Building Engineering, Landscape Architecture, Urban and Regional Planning and Interior Architecture.



THE DEPARTMENT OF BUILDING ENGINEERING

The Department of Building Engineering at the College of Architecture and Planning has a dual role of serving the other college departments by providing teaching and consultation in technical, engineering and scientific concerns of buildings. In addition, the department runs its own Bachelor program in Building Engineering and also four other programs; Master of Building Science, Master of Construction Engineering Management, Higher Diploma in Fire and Safety and Diploma of Surveying. The faculty members of the department include a diversity of specializations in fields of building sciences. The department currently holds more than 120 students in all programs.

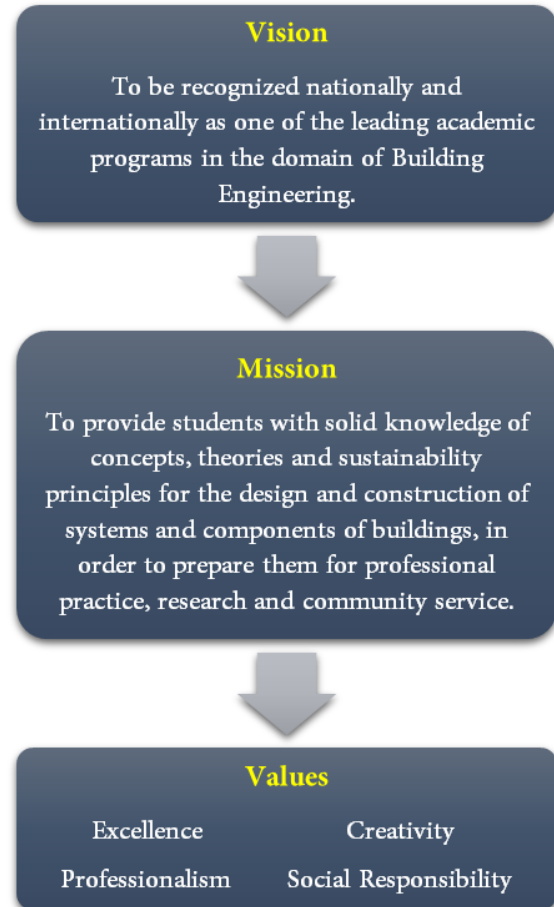
INTRODUCTION

The design, construction, operation and management of new buildings, the repair and maintenance of the existing buildings, and the development of new building materials and technologies, have become serious concerns for the building construction industry, particularly in the Kingdom of Saudi Arabia. Moreover the issues of sustainability, pollution, energy use and health are crucial in the fast growing built environment. It is obvious that, the lack of scientific knowledge and proper strategic planning can result in huge losses in terms of poor construction quality, human discomfort, energy wastage and health hazards.

Therefore, there is need of competent building engineering professionals in Saudi Arabia, with adequate scientific skills and expertise, who are capable of tackling the aforementioned problems, thereby ensuring high performance and sustainable buildings and built environment for the future. Accordingly, the Bachelor of Building Engineering program encompasses diverse fields of study that essentially address the scientific, engineering and technological aspects of design, materials, construction, systems, management and maintenance, pertaining to buildings. The purpose of this program is to provide predictive capability to optimize building performance and understand or prevent building failures. All the courses in this program are specifically designed to suit the national and international building standards and accreditation criteria, and are useful for all professionals or clients, who seek a better understanding of the way buildings should be constructed to optimize structural strength, energy performance and longevity.

The Department of Building Engineering introduced the Bachelor Program in Building Engineering in 1993. The program started with 10 students and has currently grown to more than 85 students. Twenty-one batches graduated from the program since 1997, for a total of more than 370 Building Engineers graduates by 2019.

PROGRAM VISION, MISSION AND VALUES



PROGRAM GOALS AND OBJECTIVES

GOAL 1. To accomplish teaching excellence.

- 1.1. To provide highly qualified teaching staff in sufficient numbers to teach students.
- 1.2. To design high quality courses to accomplish the learning objectives of the program.
- 1.3. To establish a well-structured teaching plan (curricular plan) to provide high quality educational opportunities for the students.
- 1.4. To develop and implement suitable assessment strategies for students' performance.

GOAL 2. To achieve students' learning excellence.

- 2.1. To admit meritorious students into the program.
- 2.2. To regularly improve the standards of learning and assessment methods to meet the needs of the job market.
- 2.3. To support and motivate students to be effective learner through appropriate training and counselling services.
- 2.4. To expose students to continuous development programs required to improve their learning skills.
- 2.5. To expose students to both extra and co-curricular activities.

GOAL 3. To ensure sufficient infrastructure and resources, and conducive learning environment for effective program delivery.

- 3.1. To constantly update the library facilities to fulfil the needs of both current and prospective students.
- 3.2. To provide up-to-date information technology resources to achieve the mission of the undergraduate building engineering program.
- 3.3. To facilitate a state-of-the-art classrooms, laboratories and design studios.
- 3.4. To ensure that safety, security and requirements of special needs are fulfilled.



GOAL 4. To accomplish excellence in research and industry-institute interactions.

- 4.1. To establish bilateral ties with leading industries and research organizations.
- 4.2 To establish industry-institute interaction cell in the department.
- 4.3. To promote research activities among students to get involved in the undergraduate research projects.
- 4.4. To identify research focus areas that are relevant to the needs of both Eastern Province and KSA.

GOAL 5. To achieve competency in community services and professional practice.

To establish a unit/cell for students to motivate and train them and provide opportunity to carry out community services and professional practice.

GOAL 6. To accomplish compliance with national and international quality standards as well as the Kingdom's Vision 2030.

- 6.1 To establish and maintain QMS in the department.
- 6.2 To achieve national academic accreditation.
- 6.3 To achieve international academic accreditation.
- 6.4 To contribute to fulfilling the demands of Kingdom's Vision 2030.

STRUCTURE OF THE PROGRAM

The BE program aims at emphasizing four main areas of building technical specializations associated with sustainable construction, which comprise:

- Environmental Technology and Building Services,
- Building Structure,
- Construction Technology, and
- Construction Management.

The program gives general and equal exposition to these main areas of building technology. Accordingly, the program curriculum is sequentially organized in two main modules:

A) THE BASIC LEVEL

This emphasizes basic architectural fundamentals and provides a solid foundation of theoretical and designs courses. The duration of study, at this level, is for two years. The first year is shared with the preparatory year for engineering track colleges of the university. The second year is shared with all bachelor programs of the College of Architecture and Planning. These are aimed at developing basic graphical and architectural design skills and acquire a common language with architects and enhancing the understanding of buildings and their complex interactions.

The first two years addresses the following main requirements:

- University Requirements: Islamic Culture and Physical Education courses.
- Basic Skills: English Language and Basic Graphics.
- Scientific Fundamentals: Mathematics and Physics.
- Basic Technical Courses: courses in each of the areas of structure, construction and environmental controls.
- Architectural Design Fundamentals design courses.
- Surveying course

B) THE PROFESSIONAL LEVEL

The professional part of the program is of three years duration. It is aimed at enhancing and widening the student knowledge and capabilities in the four areas of building engineering specializations, emphasized by the program, leading to specialized qualification in Building Engineering. This is achieved through theoretical courses and technical projects, which

are used as means of practical illustration and consideration of technical of buildings. The scope of the student learning experiences and professional capabilities are enhanced with a balanced combination of mandatory building engineering, engineering science courses and elective courses.

During the professional level, the student should undergo a monitored period of practical training in an institution approved by the College.

At the professional level, the curriculum covers:

PRIMARY BUILDING ENGINEERING COURSES

- Nine courses in the areas of building structures, construction technology.
- Six courses in the areas of environmental engineering and building services, three in each area.
- Four courses in economics, construction Management, Supervision and maintenance and professional practices.

SUPPORTIVE COURSES

- Four engineering science courses, including engineering math, Thermodynamics, statistics and BIM computing.

TECHNICAL PROJECTS

- Five technical projects are offered essentially meant to address practical technical issues pertinent to buildings' technological aspects. These enable the implementation of theoretical knowledge and ensure the student practical training in problem solving. The senior projects at the professional senior level develop the student personal initiative in project selection, problem definition and technically integrated solution. It is carried out at two stages over one year, as a research and senior project.

ELECTIVE COURSES

Four elective courses are allowed to widen the student scope of knowledge and upgrade and emphasize particular areas of interest and technology specialization.

THE DEGREE OFFERED

The program offers the student, upon successful completion of the program requirements, the degree of **Bachelor of Science in Building Engineering (B.Sc. Bldg. Eng.)**. The degree requirement are established in accordance with international standards for engineering education.



ACCREDITATION OF BUILDING ENGINEERING PROGRAM

The Bachelor of Science in Building Engineering Program is accredited by the National Centre for Academic Accreditation and Evaluation (NCAAA) at Education and Training Evaluation Commission for a period of 4 years from Sep 1, 2019 to Aug 31, 2023 and agrees to uphold the NCAAA standards for Quality Assurance and Accreditation of Higher Education Programs. The NCAAA is the independent body for the accreditation of higher education institutions and programs in the Kingdom of Saudi Arabia.



MARKET POTENTIAL FOR THE GRADUATES

The graduates from the program can be seen to serve the varied fields of the building industry. These comprise the following main opportunities:

- Governmental institutions, consultancy and contractual concerns.
- Building sites, construction supervision, inspection and maintenance.
- Legislative authorities and institutions concerned with the development and/or implementation of standards, codes, regulations and by-Laws.
- Building industry: materials manufacturing, components and construction companies.

PROGRAM LEARNING OUTCOMES

Upon successful completion of the Bachelor of Building Engineering program, the students will be able to:

1. KNOWLEDGE

- 1.1 Recognize the fundamental principles and theories of basic sciences, mathematics, statistics, computation and mechanics, related to building engineering.
- 1.2 Recognize the various codes, specifications, standards and terminology related to diverse disciplines of building engineering including working drawings, and various tools for building information modelling and simulation.
- 1.3 Recognize the fundamentals and applications of architecture, construction materials, systems and technologies, and structural systems, analysis and design, pertaining to buildings.
- 1.4 Recognize the basics, functions and applications of building services such as mechanical, plumbing, electrical, energy, safety and fire protection, as well as environmental aspects such as thermal, acoustics and illumination.
- 1.5 Recognize the principles and practices of building construction management including planning, scheduling, economics, supervision and maintenance.
- 1.6 Recognize the principles of professional ethics and responsibility, and Islamic values.

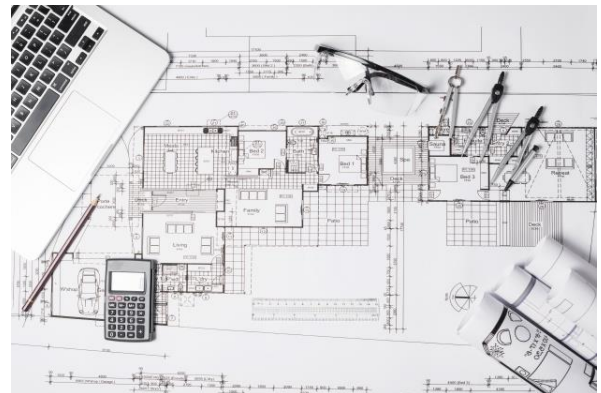
2. SKILLS

- 2.1 Conduct field and laboratory experiments, measurements, and surveys, as well as analyze and interpret data, related to building engineering.
- 2.2 Design components, systems or processes pertaining to buildings, which meet specified needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, and sustainability.

- 2.3 Develop integrated design by incorporating architecture, construction, structure, services, energy, environment, life-safety, and other relevant components and systems, to realize high- performance buildings.
- 2.4 Demonstrate effective oral, written and graphical communication skills, by using the most appropriate forms of presentation for differing issues and audiences.

3. COMPETENCIES

- 3.1 Demonstrate ability to work effectively in groups in the building industry, whether as a member or as a leader.
- 3.2 Demonstrate responsibility for own learning and enthusiasm for continuing professional development.
- 3.3 Analyze information, concepts and evidences from various sources and draw meaningful conclusions to address diverse scientific and technical issues in buildings.
- 3.4 Analyze complex problems related to buildings and propose creative and innovative solutions, with limited guidance.
- 3.5 Utilize appropriate information technology, numerical techniques and software packages, necessary for building engineering practice.
- 3.6 Demonstrate high level of compliance with professional ethics and Islamic values, and strong commitment to serve the society.



CURRICULUM

The following table outlines the general program structure, define the program courses, contact hours, course weighting and sequential arrangement. The first years is shared with the University preparation year for engineering track. The second year is shared with all five bachelor programs of the college of Architectural and Planning.

	1 st Sem.	2 nd Sem.	
First Year	16	16	cr. hrs.
Second Year	17	17	cr. hrs.
Third Year	19	17	cr. hrs.
Fourth Year	17	17	cr. hrs.
Fifth Year	17	16	cr. hrs.
Total:	169	cr. hrs.	

		Course No.	Title	Credit Units	Theory	Practical	Contact Hours	Prerequisite
First Year	First Semester	ENGL-101	English Language (1)	7	20	0	20	Admission
		MATH-111	Mathematics (1)	3	3	0	3	Admission
		LRSK- 141	Learning & Research Skills	2	2	0	2	Admission
		PHEDU-162	Health and Physical Education	1	0	2	2	Admission
		ARCH-121	Basic Design Studio (1)	3	0	4	4	Admission
	Second Semester	LRSK 142	Communication Skills	2	2	0	2	Admission
		COMP-131	Computer Skills	2	0	4	4	Admission
		PHYS -132	Physics	3	3	0	3	Admission
		ARCH -122	Basic Design Studio (2)	3	0	4	4	ARCH-121
		MATH-112	Mathematics (2)	3	3	0	3	MATH-111
ENGL-102	English for Academic Specific Purposes	3	12	0	12	ENGL-101		
Second Year	First Semester	ARCH -201	Design Studio (3): Arch. and Interior Design	4	0	8	8	Preparatory Year
		ARCH -211	Concept of Structures	3	3	0	3	Preparatory Year
		ARCH -221	Surveying	2	1	2	3	Preparatory Year
		ARCH -231	Environmental Design (1)	2	2	0	2	Preparatory Year
		ARCH -241	CAD Applications	2	0	4	4	Preparatory Year
		ARCH -251	Design Methods	2	2	0	2	Preparatory Year
		ISLM-271	Islamic Creed and Ethics	2	2	0	2	Preparatory Year
	Second Semester	ARCH -202	Design Studio (4): Urban and Landscape Design	4	0	8	8	ARCH -201
		ARCH -212	Construction Systems & Materials	3	2	2	4	ARCH -211
		ARCH -222	Environmental Control System (Thermal)	2	1	2	3	Preparatory Year
		ARCH -232	Environmental Design (2)	2	2	0	2	ARCH -231
		ARCH -242	Advanced CAD & GIS Applications	2	0	4	4	ARCH -241
		ARCH -252	Site Planning	2	2	0	2	Preparatory Year
		ISLM -272	Introduction to Islamic Culture	2	2	0	2	Preparatory Year

		Course No.	Title	Credit Units	Theory	Practical	Contact Hours	Prerequisite
Third Year	First Semester	BSTC-301	Design Studio (5): Tech. Proj. (Const. Details)	4	0	8	8	ARCH -202
		BSTC -311	Construction Systems (1)	3	2	1	3	ARCH -212
		BSTC -321	Strength of Materials	3	2	2	4	ARCH -211
		BSTC -331	Thermo Dynamics & Fluid Mechanics	3	3	0	3	
		BSTC -341	Engineering Mathematics	3	3	0	3	
		BSTC-351	Building Information Modeling (BIM)	1	2	0	2	ARCH -242
		ISLM - 273	The Economic System in Islam	2	2	0	2	
	Second Semester	BSTC -302	Design Studio (6): Tech. Proj. (Building Services)	4	0	8	8	BSTC-301
		BSTC -312	Construction Systems (2)	2	2	1	3	BSTC -311
		BSTC -322	Structure Analysis	3	3	0	3	BSTC -321
		BSTC -332	Environmental Engg. (1): Energy Systems	2	2	0	2	BSTC -341
		BSTC -342	Probabilities & Statistics	2	2	0	2	BSTC -341
		BSTC - 352	Building Services (1): Electrical Systems	2	1	2	3	BSTC -341
		ISLM -274	Political & Social System in Islam	2	2	0	2	
Forth Year	First Semester	BSTC -401	Design Studio (7): Tech. Proj. (Structural Design)	4	0	8	8	BSTC -302
		BSTC -411	Construction Technology (1): Material Sciences	2	1	2	3	BSTC -312
		BSTC -421	Reinforced Concrete Design	4	3	1	4	BSTC -322
		BSTC -431	Building Services (2): Plumbing Systems	2	1	2	3	BSTC -331
		BSTC -441	Structural Steel Design	3	3	0	3	BSTC -321
		BSTC -451	Engineering Economics	2	2	0	2	BSTC -341
	Second Semester	BSTC -402	Design Studio (8): Technical Project (BIM)	4	0	8	8	BSTC -401
		BSTC -412	Construction Technology (2): Concrete Technology	3	2	2	4	BSTC -411
		BSTC -422	Geotechnical Engineering	3	2	2	4	BSTC -321
		BSTC -432	Building Services (3): Mechanical Systems	2	1	2	3	BSTC -331
		BSTC -442	Technical Writing	2	2	0	2	
		BSTC -452	Building Management	3	3	0	3	
		BSTC- 444	Practical Training	0				
		Fifth Year	First Semester	BSTC -501	Design Studio (9): Tech. Proj. (Integrated Design)	4	0	8
BSTC -511	Cost Estimation & Specifications			3	3	0	3	BSTC -451
BSTC -521	Environmental Engg. (2): Building Acoustics			2	1	2	3	BSTC -341
BSTC -531	Senior Project Report			2	2	0	2	BSTC -442
	Elective (1)			3	3	0	3	
	Elective (2)			3	3	0	3	
Second Semester	BSTC -502		Design Studio (10): Tech. Proj. (Integrated Design)	4	0	8	8	BSTC -501
	BSTC -512		Building Maintenance & Supervision	2	2	0	2	BSTC -511
	BSTC -522		Environmental Engg. (3): Building Illumination	2	1	2	3	BSTC -352
	BSTC -532		Professional Practice	2	2	0	2	BSTC -401
			Elective (3)	3	3	0	3	
			Elective (4)	3	3	0	3	

Elective Courses

Elective courses cover four areas of program subjects:
 Technical skills, Environment and services, Structure,
 Construction, and Management.

	Course No.	Title	Credit Units	Theory	Practical	Contact Hours	Prerequisite
Basic Engineering	BSTC-550	Statistical Analysis	3	3	0	3	BSTC-342
	BSTC-551	Advanced BIM	3	3	0	3	BSTC -351
Building Construction system and management	BSTC -560	Construction Process Improvement	3	3	0	3	BSTC -312
	BSTC -561	Construction Equipment	3	3	0	3	BSTC -302
	BSTC -562	Knowledge Management Systems	3	3	0	3	BSTC -452
	BSTC-563	Risk Management	3	3	0	3	BSTC -302
	BSTC-564	Value Engineering	3	3	0	3	BSTC -302
Building Structural Systems	BSTC -570	Advanced Steel Structure	3	3	0	3	BSTC -441
	BSTC -572	Pre- Stressed Concrete Design	3	3	0	3	BSTC -421
	BSTC -573	Problems & Failures in Building	3	3	0	3	BSTC -421
	BSTC -574	Foundation Design	3	3	0	3	BSTC -422
	BSTC -575	Advanced Geotechnical Engineering	3	3	0	3	BSTC -422
Building environmental Systems & Services	BSTC -400	Green and Sustainable Buildings	3	3	0	3	BSTC -332
	BSTC -580	Modeling and Optimization of Energy Systems	3	3	0	3	BSTC -332
	BSTC -581	Advanced Plumbing Design in Buildings	3	3	0	3	BSTC -431
	BSTC -582	Acoustical Modeling	3	3	0	3	BSTC-521
	BSTC -583	Advanced Topics in Building Energy	3	3	0	3	BSTC -332
	BSTC -584	Building Sustainability & Assessment	3	3	0	3	BSTC -302
	BSTC -585	Fire Protection and Life Safety	3	3	0	3	BSTC -302
	BSTC -586	Noise and Vibration Control	3	3	0	3	BSTC -302
BSTC -587	Safety and Security in Buildings	3	3	0	3	BSTC -302	

COURSES DESCRIPTIONS

This section provides an overview of the contents and focus of various courses in the existing curriculum.

Mandatory Courses

ENGL-101: English Language (1)

The Intensive English Program course at IAU is a pre-sessional course. That is, it is taken before the students' main academic courses start. The intensive English language program for the preparatory year students at IAU is a language skills program during which new students will be taught English and trained on how to use English utilizing the "communicative approach" for two semesters. Students will study 20 hours a week with a total of 300 hours for the First semesters. The program will actively seek to deliver and build solid foundation of English language proficiencies for students on the one hand and improve students' communicative competency in their fields of study on the other hand. The Intensive English program at UD focuses on delivering "General English" during the first semester in which students will learn authentic English to enable them to communicate effectively in various social contexts and situations for various purposes.

MATH-111: Mathematics (1)

The Math-1 course reinforces basic math skills and their relevance to everyday applications. These skills encompass the ability to solve mathematical problems, analyze and interpret data. The purpose of this course is to develop the comprehension

of the course material in English, improve their computational skill, demonstrate writing ability of solutions with logical steps and prepare students for pre-calculus. An emphasis will be given to the understanding of the statement of problem and the mathematical terminology. The course primarily aims at the development of critical thinking among the students through the mathematical concept studied at the high school. The topics include Fundamentals of Algebra, Equation and Inequalities, Polynomial and Rational Function, Complex Numbers and Vectors, Functions and Graphs, Exponential and Logarithmic Functions.

LRSK- 141: Learning & Research Skills

The course of learning and research skills aims at helping the students acknowledge the concepts, the theories and the application skills through the study of learning skills and using effective teaching methods which rely on the students' activity and motive to learn through practice and self-study. The students acquire the skills doing group work and interaction. This course encourages the students to use different learning resources, good reading skills and using libraries to get the information they need. It trains the students to follow scientific research steps to prepare a research project and prepare the students learn dealing with lectures and being ready for them. The course also directs the student to use studying skills and thinking skills successfully.

PHEDU-162: Health and Physical Education

Interested in providing the student the general principles and techniques developed for the measurement and evaluation of physical effort for various sports games (collective - individual) and deepen student understanding of the various dimensions of

the curriculum of physical education and acquire the ability to develop in the light of developments and changes in physical education. The decision consists of two parts: First, "Physical Education: the development of physical and mental abilities of students by exercise and see the effects of different exercises on the internal organs of the body and build muscle by exercise and various sports activities (collective - individual) and swimming. Second, "health education (theory): to give the information to improve health and health behavior according to the contents and the various university activities and healthy nutrition and taking into account the mental health and how to deal with accidents, injuries and first aid.

ARCH-121: Basic Design Studio (1)

The course is the first studio in a sequence of design courses for all departments, also an introductory studio course to develop Engineering colleges and skills for visual representation of student's ideas. It is an introduction to the basic equipment, materials, drawing, graphic communication and rendering techniques. Development of the general architectural communication skills (for all Depts.) while familiarizing with basic general architectural conventions. The course contents and their disposition will arrange on a week by week basis and issued on the scale leading from simpler to complex exercises. At the advent of each project, lecture session will explain the objectives of the project in groups or one group; anticipated results, their quality; and the methodology to achieve the same. So, it will be mandatory for the students to follow closely the instructions issued by your instructors and follow the time or work schedule.

LRSK 142: Communication Skills

The course of communication skills aims at helping the students acknowledge the modern concepts in the area of communication and the basic skills in self-communication and with others using effective teaching methods which rely on the students' activity and their will to learn practice and self-study. Also learn the skills using group work and interactive methods. the course helps the students develop their skills in verbal communication through learning the basics of speaking and its foundations. Also, through acquiring the good listening skills needed for effective conversation. The students are also exposed to the non-verbal methods of communication. The students also learn to improve their communication skills with others through (dialogue, convention, argument, negotiation, personal interview, diction and expositions and resume writing).

COMP-131: Computer Skills

This course aims to provide the students with advanced skills to operate and make use of a personal computer in different environments such as in an academy, or at home. The course introduces the students to the main concepts and terminologies of information technology and equips them with the knowledge to administer one of widely-used operating systems. Furthermore, the course provides the students with the practical skills to utilize an office productivity package for different purposes such as Word-processing, Data Sheets, and Presentations. The delivery of the course contents will be based on a hands-on approach. Upon completion of this section, the student will be able to pass ICDL Start After finishing the first part, the student will have to take an additional program depending on his major at college. This additional program will include a special program concerned with

applied programs for drawing and photo, helps the student with different applications to be connected to other programs that need some technical support in making illustrations and drawings.

There could be another program concerned with applied statistics. This can provide the student with the basic concept of statistics with its different aspects and it helps the student with organizing data and representing it in tables and graphs a comprehensive understanding of the subject and a more participatory approach in the learning process.

PHYS -132: Physics

The course aims to enable the student to describe physical phenomena in terms of models, laws and principles. It helps them recognize the operation of scientific principles in established practical applications to apply acquired knowledge, experience and skills to new situations in a novel manner. The purpose of this course is not to give students the rigorous preparation necessary for physics majors, but to turn them on to a more perceptive view of physical reality by introducing them to the central ideas and principles. The course primarily aims at the development of critical thinking among the students through the physical concept studied at the high school. The topics include Basic Ideas, Looking At Forces, Turning Effect of Forces, Describing Motion, Newton's laws and Momentum, Work, Energy and Power , Circular Motion, Gravitational Forces and Fields, Wave Motion ,Reflection and Refraction, Interference and Diffraction, Current and Charge, Electric Circuits, Magnetic Fields and thermodynamics.

ARCH -122: Basic Design Studio (2)

The course introduces the student to basic architectural drawing skills and techniques. Fundamentals of architectural drawing; conventions of graphic representation, drawing as an important means to architecture, orthographic projection, architectural composition through abstract shapes and forms by using models, study of architectural space, plan, section, elevation, perspective, other graphic means. Student should acquire an ability to communicate simple forms graphically by transforming visual information into a two-dimensional image with shade and shadow. The course examines the language of architectural form and deals with the techniques of analyzing and representing it by different means of rendering. The course is based on studio exercises and includes lectures. By the end of the semester student should submit two projects, the first is an abstract composition project using basic shapes, while the second is an architectural application on a simple two-story villa which will be submitted in two techniques, the manual approach and Photoshop presentation approach.

MATH-112: Mathematics (2)

The Math-2 course reinforces basic math skills which are used widely in calculus. These skills encompass the ability to solve mathematical problems, analyze and interpret data. The purpose of this course is to develop the comprehension of the course material in English, improve their skill and demonstrate writing ability of solutions with logical steps and prepare students for calculus. An emphasis will be given to the understanding of the statement of problem and the mathematical terminology. The course primarily aims at the development of critical thinking among the students through the mathematical concept studied at

the high school. The topics include Trigonometric Functions, Topics in Analytic Geometry, System of Equations, Matrices, Introduction to Differentiation and Integration and their applications.

ENGL-102: English for Academic Specific Purposes

The program of English 102 this preparatory scheduled at the IAU and offers models, methods and content and the nature of language specialist to help establish the connection-oriented field of specialization and specialization gradually with potential and put them in a position to proceed with confidence toward their university Are allocated 150 hours of English academic and specialized (150 in the second quarter) is used different strategies in the teaching of this decision, where teachers use the direct method of lectures and group activities, workshops and field activities in addition to the extra-curricular activities. The focus during the teaching process mainly on the interactive method.

ARCH -201: Design Studio (3): Arch. and Interior Design

This course introduces the students to the architectural and interior design processes. Topics covered include: a description of each phase in the process, activities, objectives and a problem-solving exercises in design that will utilize graphic thinking. Emphasis will be placed on the understanding of the socio-cultural, environmental and climatic issues. Additionally, basic technical aspects of spatial composition and development, building function, construction materials and systems will be explored. Physical aspects such as: interior space delineation, rendering techniques, color schemes, furnishings, materials and lighting will be studied comprehensively.

A simple but complete project will be required that will utilize all of the design principles that have been taught. This project will also include issues related to the aesthetic components of design as well as design concepts, relationships, symbolism, style and their effect on the users. The physical components of design and design procedures will comprise the preliminary phases of the course where different theories will be implemented. During this phase students will define a project, develop and evaluate alternatives and select and communicate solutions.

ARCH -211: Concept of Structures

The Concept of Structure course covers the fundamentals of structure, which are essential concepts for all students of architecture. The following subjects will be covered: an introduction to structural phenomenal loads, forces, reaction, structural elements, types of supports, stability and analysis and determinacy, normal force, shear force, identifying the bending moment for different structural members, analysis of simple frames and trusses, properties of plan sections as well as normal stress distributions.

ARCH -221: Surveying

Introduction to a variety of surveying techniques will be the focus of this Surveying course. These techniques will include: linear measurements, angular measurements using a theodolite and total station, traverses, leveling, contouring as well as computation of areas and volumes and the actual surveying of building sites. Building laying off, the coordinate system and mapping leveling will also be discussed. During the applied section of the course, students will work in the field learning the practical aspects and familiarizing themselves with the techniques and equipment used.

ARCH -231: Environmental Design (1)

Introduction to the art and science of Architecture, Interior design, and Building technology as the environmental design professions, and the process of environmental design goal formulation.

ARCH -241: CAD Applications

This course will introduce the students to the fundamentals of Computer Aided Design drafting. Students will learn how to use simple drafting commands and standard drafting methods to produce technical and standard 2D drawings. The course exposes students to a number of drafting techniques, while allowing them to also develop their own techniques. Students will learn how to manipulate and alter 2D drawings, how to work in two spaces specifically: model and paper spaces, how to integrate 2D drawings with other project information and databases and how to link project information and make it easy to read and interpret. In addition, the basics of mass modelling will be taught. The student will become familiar with using networked workstations and be able to produce various types of output files. The students will also learn how to print out a hard copy of a digital drawing using plotters and printers and to transfer a hard copy drawing or an image into a digital one using scanners, digital cameras and digitizers.

ARCH -251: Design Methods

The Design Methods class will examine the definition of design, the principle of design and the elements of design within the framework of the design process. How physical and social aspects of design are analyzed, synthesized and proposed in a space will make up the fundamentals of this course. Different

theories, concepts and criteria will be studied in accordance with design principles in order for the students to fully understand the similarities and differences in design projects.

The main objective of this class is to enable students to think and create an optimum and rational design along with an awareness of various design aspects. This class will help the designer to follow certain norms that are important for the architecture and interior design professions, such as: concepts of color, human factors and spatial composition, design in relation to technology, economy, social and cultural factors, safety, security, comfort, religious as well as all other related issues in our built environment. How designers approach the development of a model for problem solving and how they recognize the different stages or phases in the design process will be covered along with how to analyze, compare and criticize a built environment. Contemporary issues related to design and a clear understanding of the transition between traditional and modern architecture are important issues, which will be examined using a local context.

ISLM-271: Islamic Creed and Ethics

Consolidating the correct Islamic faith and connect the Muslim generations with the basic principles of Islam and illustrate the method of our good ancestors and explaining the position of ethics in Islam and its connection with faith and worship.

ARCH -202: Design Studio (4): Urban and Landscape Design

The design studio course builds on the outcome of previous design studios. The course focuses on important issues of landscape and urban design, which are related to the site; such as: views, topography, circulation (pedestrian and vehicular), orientation, hierarchy of spaces (private, semi-private, semi-

public and public), as well as hard and soft landscape elements. Emphasis will be placed on scale projects, stressing design principles and composition (form-function relationships) including: landscape design; site planning and urban planning processes, standards and design criteria. It will include simple design problem solving issues and will also enhance the student's graphics and presentation skills.

ARCH -212: Construction Systems & Materials

Principles and fundamentals of building construction and materials, including construction techniques and basic concepts of structural systems and foundations according to building loads and soil characteristics.

ARCH -222: Environmental Control System (Thermal)

The course aims to enable students to understand the direct relationship between the climate (macro and micro) and human comfort. A brief introduction to climatology and weather deviations. Explaining the techniques and tools of analysing and controlling the macro and micro climatic factors affecting the building.

ARCH -231: Environmental Design (2)

Introduction to the art and science of Urban Planning and Landscape Architecture as environmental design professions, with focus on the process of plan making, from goal formulation to master-planning.

ARCH -242: Advanced CAD & GIS Applications

Introduction to the fundamentals of 3D modelling and GIS concepts and techniques, including conversion of 2D to 3D, mesh & mesh models, and compilation between these models.

ARCH -252: Site Planning

This course serves as an introduction to the theories and methods of spatial arrangement and management of the external physical environment. Topics will include site selection, the creation of meaningful spaces and site planning in order to achieve the ideal relationship between the building and the site. Various techniques used for site analysis with regards to the form, shape and size of the development will be demonstrated. Several environmental considerations will be examined, including: the natural site (geological, formations, topography of the ground, water, vegetation, wildlife), aesthetic, and legal aspects associated with highly sensitive environmental sites. Protection of the natural habitat as well as the harmonization between the new development with its surroundings, the grounds and the site will be examined as well as the justifications for why one site is preferable to another. Different constraints, special characteristics and features of a site will be examined along with whether a site is in an urban or rural area and the historical, ecological and environmental constraints, which would affect the design. Special attention will be paid to the choice of species, plants, soil, orientation and drainage. The mechanics of how to set up an efficient development program that will fulfil the user's requirements and activities, (which can differ regarding the kind of users involved), as well as strengthen the relationship between form and design. Students will undertake a field study, which will

help them to fully understand various issues related to site planning that have been taught in this course.

ISLM -272: Introduction to Islamic Culture

Introduction to concepts of Social Policy in Islam: belief and the importance of its study, its advantages and its sources, the reality of belief, the notification of ethics, and the study of models of Islamic morals.

BSTC-301: Design Studio (5): Tech. Proj. (Const. Details)

The Design Studio 5 course focuses on working drawings and uses the wide range of information that the students have amassed in the following two previous courses: Building Systems of Materials and Concept of Structure and Environments. Various techniques that are used in making working drawings will be presented along with different methods used to complete and finalize execution documents. Students will be asked to present their work in the form of architectural plans, sections, façades, schedule types, details and the assembly of building components. The technical aspects of external building shells based on architectural function requirements will be discussed and the material and structure systems will be introduced, along with a discussion on initial environmental behaviour. One project will make up a major portion of this class: the low-rise building. Students will select the building types at the beginning of the term.

BSTC -311: Construction Systems (1)

This course will build on the knowledge amassed in the Construction Systems and Materials course. Revision of basic construction systems, such as: foundation, floor, wall and roof

systems will be presented. Students will learn about basic building components such as doors and windows, moisture and thermal protection, glass systems and specialized construction, in addition to the performance requirements and specifications of materials and finish work. Students are expected to know building construction details, which will be accomplished through working drawing exercises.

BSTC -321: Strength of Materials

The Strength of Materials course covers the fundamental characteristics and behaviours of different building and structural materials, the structural system of buildings and various structural calculations. This class is organised into various modules which systematically cover topics, such as: units, definitions, the stress-strain relation, normal stresses and shear stresses, Hook's Law, proof stresses and working stress. Students will also learn about statically indeterminate structures, thermal stresses, bending stresses in simple and composite beams, compound stresses and receive an introduction to reinforced concrete, deflection of beams, buckling of columns, conditions limits for long columns and learn about Rankine's Formula.

BSTC -331: Thermo Dynamics & Fluid Mechanics

This course will address and expose the students to the main physical principles that form the bases of many building engineering systems and building technologies that influence performance and operation of buildings. The application of these principles has improved the quality of buildings and as a consequence, daily life. Students will learn about the principles and application of the laws of thermodynamics, heat flow and energy balances, along with the principles of hydraulics, fluid

flow and their engineering applications in building systems. The fundamentals of heat transfer, solar energy utilization and the principles of radiant exchange and its impact on the luminous and thermal environment will also be presented.

BSTC -341: Engineering Mathematics

The Engineering Mathematics course provides a review of derivative and integration techniques, as well as a review of vectors in two and three dimensions, dot and cross product, line, plane and surfaces. Polar coordinates, parametric equations and conic sections will also be presented as well as vector fields, line integrals, Green's Theory, surface integrals, Stokes's Theorem, partial derivatives, directional derivatives, tangent planes and normal lines, double and triple integrals, area and volume, surface area, as well as cylindrical and spherical coordinates.

BSTC-351: Building Information Modeling (BIM)

This is a practical computer-based course that uses the computer laboratory. Students will learn the concepts of building information modelling, get training on working in a 3D space with levels, create building components, work with construction documentation and create structural components. The students will construct a building model from a template, work with various project levels, grid-lines, specify the construction of walls, floors, roofs, etc., specify the project's north and true north, create a ground floor plan, structural columns, floors, walls, doors, windows, other components and furniture. They will also gain experience by creating a typical floor plan with columns, floors, walls, doors, windows, other components and furniture and then copy typical floor plans with vertical circulation, multilevel stairs, railing, shafts, elevators views,

elevations, sections, 3D isometric views, 3D interior and exterior perspective views, site plans, building pad, parking spaces and planting components. The students will create A0 or A1 sheets that show different views at desired scales, ceilings, rooms, area, construction documentation (door schedule, room schedule and other schedules), renderings and walkthrough beams, slabs, structural walls and structural schedules.

ISLM - 273: The Economic System in Islam

The Economic System in Islam course introduces the students to a number of concepts regarding the Islamic economic system. Topics will include: how the economy and religion are related, the Islamic solutions for various economic problems and issues, what are the economic policies related to contracts as well as Islamic banking. In addition to coursework related to the Islamic economic system, the students will be required to memorize the 28th part or juz of the Holy Qur'an.

BSTC -302: Design Studio (6): Tech. Proj. (Building Services)

This is the second course that addresses architectural structures in the program. The subject matter will progress by investigating the design and analysis of structural systems through concrete structural design, the properties and design potential of various materials, building services such as electrical and HVAC systems and will address the relationship between the superstructure, construction and architecture. In addition, the students will learn about the processes necessary for the assembly of structures and construction through an examination of the performance requirements for each and the design potential inherent in their components. The students will gain a solid understanding of the techniques employed in the specification and design of elements

that serve each system, as well as a working knowledge of the factors that influence the configuration of those elements and the resulting morphologies. An appreciation of the technical complexity involved will lead to the development of a high level of competence, which will be employed in the search for opportunities to integrate the two systems with building services. One project will make up a major portion of this class: the multi-story building. Students will be asked to present their work in the form of architectural plans, sections, façades, reinforced concrete structural design details and mechanical systems.

BSTC -312: Construction Systems (2)

This course will build on the knowledge from the following two previous courses: Construction Systems and Materials and Construction Systems I. Students will learn about selecting different construction systems with regard to the structural, construction and architectural requirements as well as the various methods of construction for high-rise frames, including: system configuration, joining techniques, rules of thumb, trussed and girder systems, grid systems, folded and flat plates, shell structures, cable and pneumatic structures and pre-stressed systems.

BSTC -322: Structure Analysis

The Structural Analysis course is intended to provide the student with a clear and thorough presentation of the theory and application of structural analysis as it applies to various structural elements. Emphasis is placed on developing the student's ability to both model and analyse a structure and provide realistic applications that are encountered in a professional practice. The students will be able better grasp the way loads are transmitted

through a structure and have a complete understanding of the way the structures deform under loads.

BSTC -332: Environmental Engg. (1): Energy Systems

This Environmental Engineering 1 course on energy systems in buildings will focus on thermal performance and the components of heating and cooling load calculations. Students will learn how to estimate building cooling loads and air-conditioning loads by using the latest software for building energy analysis. Building energy management systems will also be discussed with regard to materials, systems and operational assessment through energy auditing.

BSTC -342: Probabilities & Statistics

In this course students will acquire an understanding of probability and statistics through mathematical formulas and by examining data. Students will apply probability and statistical concepts in class activities and projects related to the engineering field. Topics will include: the presentation of data, using textual, tabular and graphical formats, sampling techniques, measures of central tendency, mean, median, mode, measures of variation, range, variance, standard deviation, probability distributions, counting techniques as well as uniform, binomial, normal and exponential distributions. Students will also learn about hypothesis testings, various tests regarding means, variation and proportion, the analysis of variance, combinatorial mathematics, the fundamental principles of counting and the Binomial Theorem.

BSTC - 352: Building Services (1): Electrical Systems

This course describes and introduces students to electrical terms and electrical technology in buildings. It will provide the students with the basics in electricity, electric circuits, electric generation, electric supplies with regard to electrical equipment inside buildings. Moreover, students will learn how to read electrical plans and how to perform basic calculations for electric circuits and electric wiring systems. The main objective of this course is to provide students with a sufficient understanding of electrical systems in buildings.

ISLM -274: Political & Social System in Islam

This course introduces a political system: its notification, its features, the country corners: homeland, society, authority, the country targets, the country bases. Ruling principles in Islam: justice, equality, consolation. Human rights in the Islamic state. Rights of none Muslims in the Islamic state. The appearances of implementation of Islam in the Kingdom of Saudi Arabia: the basic system for the rule, consultation, justice, education, the enjoining of good deeds (al-Ma'ruf) and the forbidding of bad deeds (al-munkar). The human being in Islam (the succession and the responsibility). Family in Islam: its position, the care of Islam for it, the bases the family structure depend on Islam. Marital relations: its goals, its bases, the mutual rights between the sons and the parents. Women position and its rights in Islam and at the previous nations. Suspicion around the family and social system in Islam and their refutation.

BSTC -401: Design Studio (7): Tech. Proj. (Structural Design)

The Design Studio 7 course will concentrate on developing the student's technical knowledge, as well as understanding and bringing awareness of the complexity of special structural systems for distinguished projects. Technical system designs will be used to address constructional efficiency, functional requirements, structural requirements, environmental performance and architectural aspects. This course also provides comprehensive and integrated solutions for structure, services, construction and architecture. Details of construction components and detailing of joint techniques are produced to form a whole set of execution drawings, including: architectural, structural, construction, environmental and services. This experience will be applied on a long span public project and open plan building.

BSTC -411: Construction Technology (1): Material Sciences

This course will present an in-depth study of all building materials, such as: stones, lime, bricks, cement, steel, timber, glass and plastic. The students will also learn how these materials are manufactured along with their mechanical, chemical and electrical properties, and the environmental, functional and architectural implications. Other topics will include experimental and model analysis, methods of testing and performance specification standards, building codes and ordinances. The laboratory aspect of this course will include experimental tests for building materials in order to identify their properties.

BSTC -421: Reinforced Concrete Design

The Reinforced Concrete Design course will focus on concrete design, with an emphasis on the ultimate strength design method for two-way slab systems (solid, ribbed, waffle, flat slab, flat plate, etc.), stairs, reinforced concrete frame systems and isolated and combined footings.

BSTC -431: Building Services (2): Plumbing Systems

This course concentrates on the design of water supply and distribution systems, including both hot and cold water supply systems. Both surface and underground drainage schemes will be examined in detail. Sanitary systems, including sewage treatment and disposal systems along with their plumbing systems, physical and hydrological principles of fluid flow, plumbing system designs, water storage provision, requirements and design will be covered in this course. Plumbing systems (water supply, drainage and firefighting) components, appliances and fixtures and flow requirements will be addressed in this course as well, in addition to network sizing and design, plumbing materials and installation and building design integration, plumbing regulations, design representations and specifications.

BSTC -441: Structural Steel Design

The Structural Steel Design course will present the properties of steel (shapes, sections, fatigue and fire protection), along with the following topics: structural systems and load assessments for buildings analysis and design of tension members, beam behaviour, analysis and design (use of design aids), continuous and composite beams; columns under axial loads behaviour and basic formula (analysis and design of one and two-directions of columns in frames; analysis of welded and fastened connections

under simple, shear and moment resistant, as well as base plates behaviour and design.

BSTC -451: Engineering Economics

This course provides the students with the principles and fundamentals of building economics and introduces them to the financial and economic concepts that are inherent to building construction, engineering and design. The students will become familiar with professional and appraisal techniques, which help simplify comparisons. The following topics will also be included in this course: financial statements and accounting concepts related to economic analyses, the time value of money, interest rates, economic decision making, life-cycle costing and cash flow equivalence, cost capital along with the Minimum Attractive Rate of Return (MARR). Other critical topics will include defining mutually exclusive alternative development studies and methods used for addressing uncertainty risk. Emphasis will be placed on the application of economic analysis for evaluating feasible solutions to problems and consideration of realistic constraint.

BSTC -402: Design Studio (8): Technical Project (BIM)

This studio will focus on environmental performance and building information modelling. The students will master the computer as a design tool and be able to effectively use computer applications in environmental design, which will be achieved by using state-of-the-art computer program packages. Building Information Modelling (BIM) addresses a combination of engineering and technical design considerations. BIM creates an improved way of working collaboratively, using models created from coordinated and consistent design information. This allows for earlier decision-making, better documentation and the

evaluation of alternatives for sustainable project designs as well as making improvements by using this analysis before construction begins. The students' projects will support complex and integrated considerations for a range of technical issues.

BSTC -412: Construction Technology (2): Concrete Technology

This course builds on the knowledge gained in the Concrete Technology 1 course. Topics will include the following: composition, cement, water, aggregates, admixtures, air entrainment, properties of fresh concrete and their specifications, handling and placement of concrete, properties of hardened concrete and their standards, types of concrete, concrete behaviour under different environmental factors (fire, weather, frost, sulphate, etc.) along with mixing design methods.

Laboratory Tests:

-QC and standards for: cement, aggregate, fresh and hardened concrete

-Inspection: NDT testing with ultrasound and concrete test hummer

BSTC -422: Geotechnical Engineering

In the Geotechnical Engineering course the students will learn about soil investigation in addition to the following topics: soil characteristics, granular, fine and organic soil, soil structure and classification, Atterberg's Limits tests, shear in soil, Mohr's circle (stress in soil), consolidation and settlement, water movement (conceptual), lateral pressure and retaining walls, bearing capacity and foundations, piles, conceptual soil as well as improvement techniques.

BSTC -432: Building Services (3): Mechanical Systems

The students will learn about vertical movement systems, such as: elevators, escalators and conveyors and their design and specifications in this course as well as the principles of refrigeration, air-conditioning, ducting systems and design. The various types of HVAC systems and their selection criteria will be outlined and the students will receive an introduction to of the course introduces students to active solar A/C systems.



BSTC -442: Technical Writing

This course is an integral part of the senior project report and will emphasize writing skills in both the academic and professional realms. A review of basic sentence, paragraph and essay structure will be presented as well as instruction on how to gather and organize information. The students will become familiar with audience targeted writing; report formatting, graphics,

document design and oral presentations. Students will review and master basic patterns and elements of the sentence, sentence and paragraph structure, essay writing, information structure and report writing focusing on the process and structure. The students will explore how to effectively design their documents with various computer design features, focus on writing and editing, hone their research and organizational skills, be able to analyse their intended audience and become familiar with various types of technical reports, libraries, documentation, cross-referencing and writing ethics.

BSTC -452: Building Management

This course focuses on the principles and fundamentals of project management for a building project. The first part will emphasize project planning, project scheduling and cost control techniques. Construction labor, materials management, equipment productivity and safety will also be presented. A brief background on management will be given along with the basic concepts involved in successful management. The process of preparing project bid packages and types of construction contracts and legal issues will also be presented. In addition, students will be introduced to how to develop a work breakdown structure, determine the sequence of work packages, estimate development and cost control related to the WBS. As the course progresses, students will learn how to develop networks and using bar charts and CPM in logic scheduling and project control. Cost control and cost process will be covered so that the students will learn how to develop a schedule for a small building project, as well as cost estimates and be able to control costs by using earned value management to measure project performance and progress.

BSTC- 444: Practical Training

Practical training will enrich the students' skills and knowledge in the building engineering practice. The training requirements are:

- The student must complete 100 credit hours taken at the College of Engineering and in the Building Engineering Program.
- The student must be enrolled in a reputable company or consultant firm that has a broad experience in the domain of building engineering.
- Each student must have their practical training approved by the training committee.
- The training will last for 16 weeks.
- Students will be monitored and supervised by the assigned training committee.
- The training will be evaluated upon completion, based on the feedback report furnished by the company. Students will give a presentation as part of their evaluation.

BSTC -501: Design Studio (9): Tech. Proj. (Integrated Design)

This course is the first part of two parts for the graduation project. Integrated design deliveries are involved in order to address architectural, structural, construction, services and environmental aspects. The course concentrates on preparing and developing the required program an engineer must complete in order to understand the building's users, building codes, building constraints and design requirements in developing the final program. Building Information Modelling (BIM) is used to address an integrated process that utilizes reliable information about the project from design, construction and into operation by using BIM to create coordinated, digital design information, and documentation as well as accurately visualize, simulate and

analyse performance. The students will focus on the architectural and structural aspects and their integration with both the technical and service aspects. The project vehicle for this exercise should reflect the corresponding complexity of multi-functional and multi-story structures.

BSTC -511: Cost Estimation & Specifications

The principles and techniques of estimating construction costs with emphasis on quantity take-off and pricing elements of construction works will be the focus of this course. Topics will include: direct and indirect construction costs, databases, work breakdown and structure of estimates using CSI uniform and master formats, as well as contingency and risk estimate adjustments for productivity. The second part of the course will concentrate on the concepts and methods of preparing, writing and reading construction specifications with an emphasis on using standards and master guides in the building industry with a focus on Saudi Arabian standards. Automated techniques and specifying will also be applied.

BSTC -521: Environmental Engg. (2): Building Acoustics

The course follows a logical progression of acoustic interactions. Beginning with a history of architecture history, the fundamentals of acoustics, human perception and reaction to sound, acoustic noise measurements and noise metrics and environmental noise will be presented. Wave acoustics will then be discussed followed by sound and solid surfaces, sound in enclosed spaces, sound transmission loss, sound transmission in buildings, vibration and vibration isolation, noise transmission in floor systems, noise in mechanical systems and sound attenuation in ducts. Part of the course will focus on specific design problems,

including treatment of multifamily dwellings, office buildings as well as rooms for speech, sound reinforcement systems, rooms for music, multipurpose rooms, auditoriums, sanctuaries, studios and listening rooms. While providing a thorough overview of acoustics, the course will also include the theory of loudspeaker systems and sound system modelling as well as an in-depth presentation of computer modelling.

BSTC -531: Senior Project Report

This course is an integral part of the final project program. The course emphasizes the identification and development of practical and technical ideas and concepts, which are to be researched, analysed, programmed and documented in an effective and efficient professional report. The research should include pertinent analysis, solutions and issues in an integrated form. The student is responsible for original, independent development of the research under the direction of a faculty advisor with an expertise in the area of investigation.

BSTC -502: Design Studio (10): Tech. Proj. (Integrated Design)

This course is the second part of the graduation project. It is based on the integrated design deliveries that are involved in order to cover all building disciplines with an emphasis on the design of technical and service systems required for the project, such as: HVAC, electrical, plumbing, fire protection, environmental aspects, etc. The application of BIM has made feedback more efficient and sustainable. System information should cover vast design concerns, green buildings, sustainable design, structural analysis, energy performance, service quality, material quantities, property construction, management, etc. A

comprehensive and detailed study will be finalized based on BIM. Integrated practice will be emphasized in this course since it is an intensely collaborative process that utilizes the best program packages. Analysis and calculation for all engineering systems will also be stressed in this course. Final submissions should reflect a professional, integrated technical project using several presentation alternatives, detailed drawings, a physical model, a digital model and working drawings. The project vehicle is an integral part of the first semester's project.

BSTC -512: Building Maintenance & Supervision

The Building Maintenance and Supervision course will present several concepts including: construction supervision and its importance in building construction quality and durability, planning and scheduling of construction projects, causes and rates of deterioration in building materials and components, quality assurance concepts, building maintenance problems and their solutions, operation and maintenance cost efficient building designs, management and maintenance costs for efficient building design, management and maintenance programs and in-house maintenance vs. contracted maintenance.

BSTC -522: Environmental Engg. (3): Building Illumination

Fundamentals of day lighting will be introduced and their relevance to design decisions emphasized in this course along with the following topics: the benefits and availability of daylight, the sun's course, solar radiation and protection, photometry, the physics of light propagation, visual and color perception, day lighting metrics, visual and thermal comfort, electric lighting and primary day lighting strategies. More advanced lighting design topics will also be presented and

practiced through a design project, class lectures and homework assignments, such as advanced lighting design strategies (innovative glazing and shading technologies, advanced control), as well as design and assessment tools for lighting management (experimental approaches, computer-based design tools).

BSTC -532: Professional Practice

The importance of planning and setting personal goals will be addressed in this course as well as the need to have a vision, mission and set of specific goals that address self-development. The students will learn how to prepare their CV's and being ready for their first personal interviews. The course looks at how to address competency requirements while matching industry expectations with a particular emphasis on work ethics. The course also addresses how to establish one's own business and how to conduct feasibility studies, establish a design office, and the how to estimate costs, draw up contracts as well as managing an office.



Final Jury examination of students

Elective Courses

Basic Engineering:

BSTC-550: Statistical Analysis

The first half of the Statistical Analysis course will focus on descriptive statistics using graphical and numerical procedures for summarizing data and the remainder of the class will concentrate on inferential statistics by using sample data to make estimates of a population. Emphasis will be placed on data analysis over data collection. The topics covered include: introduction to the design and carrying out a quantitative study, overview of the statistical principles necessary for the construction of questionnaires, the collection of data and sampling methods. Descriptive analysis, bivariate analysis and causality are some of the statistical methods that will be taught as well as an introduction to inferential statistics and the use of SPSS software.

BSTC-551: Advanced BIM

The Advanced BIM course will present modeling of lighting design in buildings, lighting circuits, electrical switch systems, electrical power loads, plumbing and piping systems as well as planning and designing fire protection systems. This course is designed to sequentially deliver the following topics: dividing the building model in spaces and zones, assigning space and zone properties, energy analysis of the building model, heating and cooling requirements, placing air terminals, adjusting air flow to fulfil the energy requirements, creating air supply duct work, sizing the ducts according to the air flow, placing and connecting the air conditioners, checking the connectivity of all equipment, specifying electrical settings to determine the voltages, wiring,

distribution systems, and demand factors, specifying and scheduling the lighting levels that are required for the various spaces within the building, placing light fixtures in the model, using the space analysis schedule, adding the electrical equipment for the distribution systems, creating power circuits/circuit groups, creating a panel schedule report, examining the circuitry, creating the piping for the sanitary plumbing system, domestic cold and hot water systems and adding pipes to connect all fixtures.

Building Construction System and Management:

BSTC -560: Construction Process Improvement

Several concepts in the improvement of processes will make up the content of this course with a special emphasis on the construction process. Topics include: the concept of a process, process initialization, process definition, process control, analysing process, process assessment and process feedback. Additionally, cases from construction processes, including all phases from project inception to salvation will be used in the implementation of process improvement methodology.

BSTC -561: Construction Equipment

The Construction Equipment course provides the student with a general background for understanding the equipment used in construction projects as well as the following subjects: evaluation and selection of equipment for construction projects, earthmoving, paving, steel and concrete construction, formwork, trenching, excavation, tunneling, site preparation and organization. Equipment economics, engineering fundamentals and analyzing production outputs, estimating equipment cost

including ownership, operating costs and determining economic life and replacement policy will be of great value for construction estimators. The course will include a determination for the optimum mix of equipment and estimating the equipment productivity that will help the engineer know how to maximize the profit of an equipment-intensive construction project.

BSTC -562: Knowledge Management Systems

This course provides the student with the concept of knowledge management and the systems that enable the engineer to acquire, store, distribute and process knowledge. Knowledge will be defined as well as the types of knowledge that exist. Understanding how systems think is integral to understanding and managing knowledge. Other topics that will be discussed include: economic issues, acquiring, storing, distributing and processing knowledge.

BSTC -563: Risk Management

This course is structured to provide an in-depth understanding of risk assessment and management techniques, methods and models used in industry to minimize, control and communicate risks, including conducting various risk management protocols. In addition, the class will examine ISO 14001 and ISO 31000 standards. As an upper level course, students need to be exposed to not only the technical knowledge content of the subject but also to the integration of the subject's technical content into a risk management system. This includes the understanding of several management tools used in the professional application of industrial risk management. This course will assist the learner in understanding what is contained in dynamic and technical

applications of risk management and how to develop such types of documents.

BSTC-564: Value Engineering

Value Engineering is an important and integral part of successful planning, design and construction of any project. This course presents and examines state-of-the-art methods, techniques and approaches used in value engineering. The role and responsibility of designers and owners in value engineering will be addressed and students will have the chance to examine real life examples and project case studies that demonstrate the application and benefits of value engineering. Furthermore, the student will learn the life cycle cost analysis in order to be used for analysing the value of the project on the long-term basis.

Building Structural Systems:

BSTC -570: Advanced Steel Structure

The Advanced Steel Structures course will provide an introduction and classification of plate girders in addition to the following topics: moment capacity of plate girders, buckling of web in shear and bending, introduction to plastic analysis, plastic hinge concept, portal frame design, introduction to multi-story rigid frames, design of multi-story rigid frames, introduction to moment connections, analytical techniques in moment connections, introduction and behavior of hollow sections, design of circular hollow sections as well as the design of rectangular hollow sections.

BSTC -572: Pre- Stressed Concrete Design

This course provides the students with a deep understanding of the concepts of pre-stressed structural concrete calculations and their advantages in structures and designs, the behaviours of hollow core slabs, along with the following topics: single-T and double-T beams, under different conditions, fundamental structural formulas for pre-stressed concrete used to understand their behaviour for external subjective forces in large spans and how to apply structural design in the practical structural engineering domain. Topics will also include the concepts of pre-stressed concrete, the difference between reinforced concrete (RC) and pre-stressed concrete (PC), materials and equipment requirements, methods of pre-stressing, the loss of pre-stress, analysis of flexural members, design of flexural pre-stressed concrete members, cracking moment, design for shear and preliminary design of pre-stressed concrete flexural members.

BSTC -573: Problems and Failures in Building

This course concentrates on the various types and causes of structural failures that occur at various building age stages along with different inspection and testing procedures of concrete materials and the fundamental methods of repair and their applications for failures in building. The course will also include presentations on the following subjects: construction and service, effects of soil, environmental factor attacks, non-destructive (NDT) and semi-NDT testings of hard concrete, types of cracks, inspection of concrete structural buildings, materials used for repaired and protected concrete structures, methods of repair and ways to strengthen concrete structures for different structural members as well as methods use to protect concrete structures.

BSTC -574: Foundation Design

The Foundation Design course will begin with a review of the geotechnical properties of soil, shear strength of soils, consolidation and settlement including lateral earth pressure of soil, total vertical pressure, effective pressure, pore water pressure and active and passive earth pressure. Retaining structures, gravity and cantilever walls will be discussed along with sheet piles including deep foundations, piles, pile group, pile cap, pile load tests, caissons and well foundations. The stability of slopes and foundations on slopes will also be covered in this course.

BSTC -575: Advanced Geotechnical Engineering

This course will begin with an introduction to geotechnical exploration, methods of boring, types of samples and sampling, field tests and a look at geophysical exploration. Students will learn about the following tests, including: standard penetration test, plate load test, cyclic plate load test, static and dynamic cone penetration test, pressure meter tests, dilatometer tests and in-situ permeability tests. Presentation and processing of soil exploration data and its interpretation will be discussed along with shallow foundation and the bearing capacity of foundation based on in-situ tests. Bearing capacity for foundation on slope, mat foundations including floating raft, settlement calculations for footings on cohesive and cohesion less soil based on in-situ tests will also be presented along with information on deep foundations, including the following topics: mechanics of load transfer in piles, load carrying capacity, pile load test, design of pile groups and settlement calculations.

Building Environmental Systems & Services:

BSTC -580: Modeling and Optimization of Energy Systems

Modelling simple buildings and the concept of simulation will be the focus of this course using simulation in the schematic design phase of building and various optimization techniques and their applications on building simulations. The students will receive a review regarding heat and mass transfer, building energy systems and an introduction to simulation and modelling. The students will explore the various steps involved in simulation, such as starting, thermal zone with open studio, construction, surface matching, zone loads, running Energy-plus software, debugging input files, running and verifying results, modifying input files according to individual projects, running first run and error-checking among other topics.

BSTC -581: Advanced Plumbing Design in Buildings

The Advanced Plumbing Design in Buildings course will introduce the students to the advanced aspects of plumbing design for sustainable design applications and building related water resource management. The topics covered by the course will include: hydraulic principles of plumbing design, gravity system characteristics and advantages, communal design of multi units in large buildings and complexes, vacuum sanitary system, characteristics and application, grey water use and water management, plumbing for fire-fighting systems, storm water drainage, water harvesting and utilization.

BSTC -582: Acoustical Modelling

This course is designed for students who possess the basic experience in using computer-aided acoustic modelling tools. The

course is a combination of demonstrations, lectures and hands-on experience. Geometry modelling, which concerns how to import a 3D building model into the acoustic modelling software, will be covered as well as and how to create a geometry model from scratch using the ODEON extrusion modeler. Input and calculations will be used to verify the quality of the models. Hints and tricks for calculation setup and saving calculation time will be taught. The course also covers modelling natural sound sources and loudspeakers, line arrays, etc. The students will learn how to present acoustic results to customers and learn how to incorporate data, graphics, sound and animations in reports and presentations and use the ruralisation options with headphones or with a surround sound speaker setup.

BSTC -583: Advanced Topics in Building Energy

The Advanced Topics in Building Energy course covers innovative methods and systems for integrated design and evaluation of energy efficient buildings, developing energy-saving and cost-effective solutions for buildings and harnessing technology that is designed to reduce energy consumption and energy waste in commercial and residential buildings. Advanced building energy simulation tools types and capabilities will be introduced and will include underlying concepts, modelling inputs and analysis methods of building components such as: envelope, lighting, occupants, equipment, process loads, HVAC, service hot water systems, model building performance using energy simulation software, interpreting simulation results and troubleshooting errors, use of measured building energy data to calibrate simulation model as well as evaluation of EEMs and performing parametric analysis to identify optimal solutions.

BSTC -584: Building Sustainability and Assessment

The students will be introduced to the concept of sustainable buildings and high-performance green building delivery systems. Sustainability assumptions encompass the entire life cycle of the building and its constituent components, from resource extraction through disposal at the end of the material's useful life. The course will delve into the design process of sustainable buildings. The course is organized into three parts, each of which covers an aspect of sustainable buildings, these include: Part I, sustainable building foundations, which covers the basic concepts and vocabulary. Part II explores sustainable building systems, site-plans, landscaping, energy and atmosphere, materials selection and indoor environmental quality. Part III examines several important subjects related to the implementation of green buildings, construction operation, green building commissioning and the future direction of sustainable construction.

BSTC -585: Fire Protection and Life Safety

The nature and behavior of fire and fire risks in buildings will be the focus of this course along with the following topics: building design requirements for fire safety and control of fire and smoke spread, performances of various materials in fire, site design for fire safety and fighting requirements, building fire safety codes and regulations and design of escape routes. Other topics include: building functional activities and classifications of fire risks, the health effects of fire, smoke and hazardous gases, building fire spread mechanisms, building and material behavior in fires, building fire controls and fire resistance, design for fire safety, design of exits and means of escape, fire sensors and detection systems, fire alarms and signals systems, firefighting site design,

pipng and sprinkler system design and integration of fire safety systems and building design

BSTC -586: Noise and Vibration Control

The Noise and Vibration Control course will introduce the basic principles and terminology of acoustics and noise control engineering in buildings. Students will learn about sound pressure levels, sound power levels, sound intensity levels, vibration levels, frequency, temporal variations, loudness, vibration transmissibility and vibration isolation. Noise Criteria (NC) and Room Criteria (RC) curves and how they are used in acoustical engineering projects will be presented along with Speech Interference Levels (SIL), Sound Pressure Levels (SPL) and room constants along with how the principles of sound Transmission Loss (TL), Noise Reduction (NR) and Sound Transmission Class (STC) are used in project design. By the end of this course, the students will be able to apply basic acoustical engineering principles to a variety of projects.

BSTC-587: Safety and Security in Building

These courses cover the basic understanding of the threats and risks to buildings, facilities and the occupants as well as provide the techniques and solutions for physical protection. The fundamental principles for the safe design of buildings from a fire hazard, security, and so forth will be presented along with an understanding of building codes, fire properties of building materials, building design criteria to limit the spread of fire and smoke, control of ignition sources, storage of combustible and flammables, life safety and active fire protection systems. Other topics include: the smart building, safety measures in public, educational and commercial buildings, fundamental principles for

the safe design of buildings, threat based risk assessments (TRA), risk assessment methodologies, types of sensors and detectors such as CCTV, smoke sensors etc., selection of sensors and detectors for building, alarm system and its types, selection of alarm systems for buildings, life safety and active protection system, storage of combustible and flammables and system integration.



Building Engineering students during educational visit to various under construction buildings



EDUCATIONAL RESOURCES

The Department of Building Engineering shares the College of Architecture and Planning with the following well-equipped laboratories to meet the academic, research and consultancy purposes for students and faculties as well as the professional needs of the government and private organizations along with the community services.

STRUCTURES & MATERIALS LABORATORY

The Lab has the ability and potential to conduct research experiments. The Lab is equipped with the latest devices and equipment including tensile, flexural and compression testing machines, Non-Destructive Testing apparatus etc. to conduct experiments in accordance with the international standards and specifications. The lab also conducts experiments on new materials for local markets, or to predict and capture the behavior of some structural elements in order to be used in the development of construction specifications and to break up and resolve disputes between different parties. The lab also provides scientific and professional expertise in structural works and construction areas.



GEOTECHNICAL LABORATORY

Geotechnical engineering is an important field in building engineering since it provides the students with the needed knowledge to understand the soil behavior for different constructions. The experiments conducted in our geotechnical engineering laboratories help integrating our students' theoretical knowledge with real applications. This helps our students to better understand and realize the importance of different soils parameters and their importance in the design of buildings, bridge foundations, dams, road, tunnels, embankments and slope stability. The building engineering department has one of the best well equipped geotechnical engineering laboratories that provide students with all facilities required to expand their understanding of the principles governing soil engineering properties and behavior. These experiments include, Moisture Content, Sieve and Hydrometer Analysis, Specific Gravity, Atterberg Limits & Shrinkage Limit, Standard Proctor Compaction, Permeability of granular soils, Consolidation test, Direct Shear Test, Triaxial Test, Unconfined Compression Test, California Bearing Ratio Test etc.



ACOUSTICS LABORATORY

One of the best laboratory of international standards available at the department of Building Engineering is the Acoustics lab.

This lab is equipped with highly professional equipment including lab transmission suit which consists of anechoic and reverberation chambers, air pollution and noise & sound control apparatus etc. The lab covers the needs of undergraduate as well as post graduate courses.

The lab technicians and faculty members related with Acoustics are experienced in various commercial and institution projects ranging up to the industrial level simulations.



THERMAL AND ENERGY LABORATORY

This Laboratory is equipped with several rigs and test facilities for the demonstration of principles, concepts and applications of theories introduced in various environmental and energy related courses in bachelor and master programs, in addition to serving research and community and industry consultations. The lab is equipped with latest devices and equipment used to conduct a wide variety of experiment and test according to the international standards such as thermal conductivity of insulation

materials, heat transfer across the building envelope, indoor environmental quality, air flow & leakage test, indoor climate analyzer, heat stress, thermal comfort monitor. The thermal laboratory has also a large range of equipment for building monitoring, diagnosis & energy audit such as thermal imaging with infra-red cameras, heat flux meters, blower door, duct and HVAC measurements.

The Energy Laboratory has the facility to generate renewable energy from solar, wind, fuel cell, geothermal, water wave and biomass.



LIGHTING LABORATORY

Portable and Precision Photometers for luminance and illuminance measurements; Architecture models lighting measurements.

COMPUTER LABORATORY

A large computer lab which is equipped with latest computers systems and are provided with internet for research. The students, during some courses, use the lab for various software learning e.g. AutoCAD, Revit for Building Information Modelling. The computers are also installed with other related technical software including STAAD and SAFE for structures etc. The number of computers is more than the number of students, hence each student get the full time and completely hands on experience of operating the software for the full time of the lectures.

MODEL MAKING WORKSHOP

A huge model making workshop is established which is equipped with high tech equipment for cutting, joining and fabricating various parts of the building models. The equipment includes laser cutters and 3D printers. Students are encouraged to create and produce models of the whole buildings or any part of the building which they design on paper.

SURVEYING LABORATORY

The surveying lab has complete range of survey equipment including the equipment used for traditional surveying methods and the latest surveying machines, GPS, theodolites and total stations. The lab helps the diploma students to learn each and every aspect of surveying in practical manner.

LIBRARY

The Deanship of Library Affairs at the IAU has a distinguished collection of both printed and electronic resources to support faculty, researchers, undergraduate and graduate students. This is in line with both the vision and mission of the Deanship of Library Affairs in its endeavor to fulfill the principles of the

collection development policy in order to support all university programs and research.

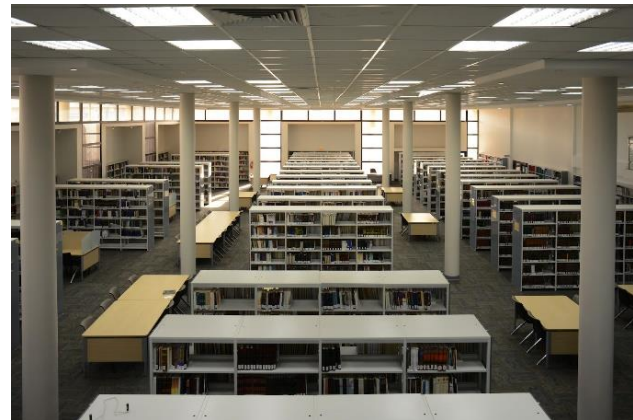
Here one can find the academic materials that will support all learning endeavors by utilizing the following tools:

E-Resources: These resources will direct the users to the IAU library E-Resources Portal where they can search all electronic databases that IAU has subscribed to.

Summon: This federated search engine will help users simultaneously search all printed and electronic resources at the libraries of IAU. Abstracts or the full text of articles and E-books can be viewed. Summon can suggest the most relevant databases that best suit the user's research needs.

Library catalog-OPAC: This helps user find their resources from books and E-books with a link for full text display.

Institutional repository: This is an effective tool for searching the publications of IAU's faculty, including theses and research papers published in both international and regional journals.



IAU Central Library

ACADEMIC POLICIES FOR STUDENTS

ATTENDANCE

Regular students must attend punctually at least 75% of lectures and of labs in each course. Any student failing to complete this percentage will be denied to sit for the exam and will be marked (DN). Within this framework, a student will be denied if he is absent more than 15% and 25% if he has an official excuse.

DROPPING A SEMESTER

A student is allowed to submit an electronic written excuse for not attending a semester and is not to be marked (Fail) in the courses. Deadlines for submitting this form must be checked on the university website www.iau.edu.sa

POSTPONEMENT OF STUDIES

A student is allowed to postpone studies when the University Council approves his application. A student cannot postpone 2 consecutive semesters or 3 non-consecutive ones; otherwise he will be expelled from the university. Only on exceptional cases, a student can be granted an exception for further postponement. The postponement is not counted in the graduation requirements. Deadlines for submitting this form must be checked on the university website www.iau.edu.sa

DROPOUT

If a student drops out a semester without submitting a postponement application, he will be expelled from the university. However, this does not apply to study abroad or exchange students

TRANSFER

A student is allowed to transfer to another college as long as he completes 24 credit hours in his current college and as long as he meets the requirements of the desired college. Deadlines for

submitting this form must be checked on the university website.

REWARDS

Each student is rewarded a monthly stipend to be deposited into his account.

- The amount due for each student is 1000 Saudi Riyals. Ten Riyals will be deducted monthly for the Student Fund.
- Students must open a bank account to get his monthly stipend transferred.
- All students must fill in the application in the Admission and Registration section of the university website.

GRADING AND CUMULATIVE GRADES

The grading scale used in the college is as follows:

Percentage	Evaluation	Grade	Weight (GPA)
95-100	Excellent+	A+	5.00
90 to less than 95	Excellent	A	4.75
85 to less than 90	Very Good+	B+	4.50
80 to less than 85	Very Good	B	4.00
75 to less than 80	Good+	C+	3.50
70 to less than 75	Good	C	3.00
65 to less than 70	Pass+	D+	2.50
60 to less than 65	Pass	D	2.00
Less than 60	Fail	F	

PRE-REQUISITES/CO-REQUISITES

The student is expected to know and follow the academic rules and regulations. It is entirely his responsibility to make sure that both pre-requisite and co-requisite requirements have been met for the courses added during the Early Registration period. He should refer to the Undergraduate Bulletin or consult his Advisor for these requirements.

WITHDRAWAL

A Student may be allowed to withdraw from the College for a semester and not be considered as having failed if the Student furnishes an acceptable excuse to the authorized body as determined by the College Council, at least five (5) weeks before the commencement of the final examinations. If absolutely necessary, the College Council may extend this period. A grade of "W" will be recorded for the Student in that semester, and the semester will be included in the period within which the Student is required to complete graduation requirements.

SUSPENSION & INTERRUPTION OF ENROLLMENT

- A Student may submit an application for suspension of enrollment, for reasons acceptable to the appropriate authority designated by the College Council, provided the suspension period does not exceed two consecutive semesters, or a maximum of three non-consecutive semesters, during the Student's entire course of study at the College. Otherwise, the Student's enrollment status will be canceled. However, the College Council may, at its discretion, make exceptions to this rule. The period of suspension will not be included in the period within which the Student is required to complete graduation requirements.
- If a regular Student interrupts studies for one semester without submitting an application for suspension of enrollment, the Student's enrollment status at the College will be canceled. The College Council, however, may at its discretion, cancel a Student's enrollment status if the Student discontinues studies for a period of less than one semester. The enrollment status of a Student studying by affiliation will be canceled if the Student makes himself absent from the final examination of all the courses in the semester without submitting a valid excuse.
- A Student is not considered to have interrupted studies during the terms spent as a visiting student in other universities.

RE-ENROLLMENT

Student, whose enrolment status has been canceled, may apply for re-enrollment with the same College ID number and academic record the Student had before his suspension, if provided:

- The Student applies for re-enrollment within four regular semesters from the date of cancellation of his enrollment status.
- The Student obtains the approval of the College Council and related bodies for reenrollment.
- That four or more semesters have lapsed since cancellation of the Student's enrollment, in which the Student can apply to the College for admission as a new Student without considering the Student's old academic record, if the Student fulfills all the admission requirements for new Students. However, the College Council may make exception to this rule, in accordance with the regulations established by the Council.
- The Student has not been re-enrolled previously. The however exempt the Student from this restriction, if needed.
- The Student was not on academic probation prior to the cancellation of his enrollment.
- A Student who has been dismissed from the College for academic or disciplinary reasons - or from other universities for disciplinary reasons - will not be re-enrolled at the College. If it becomes known later that a Student has been dismissed for such reasons, enrollment will automatically be considered null and void as of the reenrollment date.

DISMISSAL

The Dismissal from the University will occur in the following circumstances:

- A Student will be dismissed if the Student obtains a maximum of three consecutive academic probations as the result of his cumulative GPA being less than 2.00 out of 5.00 or 1.00 out of 4.00. The College Council may allow the student a fourth opportunity if the Student is able to improve his cumulative by taking additional courses.
- A Student will be dismissed if the Student fails to complete the graduation requirements within a maximum additional period equal to one half of the period determined for the Student's graduation in the original program period. The College Council, however, may exempt the Student from this restriction and give him the opportunity to complete the graduation requirements within an additional period of maximum duration equal to that of the original program.
- In exceptional cases, the University Council may allow the student to complete the graduation requirements within an additional period of a maximum duration equal to two semesters at most.

PROBATION

Students are expected to maintain satisfactory academic progress toward graduation. Any student not making satisfactory academic progress may be placed on academic probation upon recommendation of the ACC. The ACC seeks to uphold the essence and the spirit of the College's rules and regulations, and is therefore empowered to make exceptions in cases where regulations may be working to a student's educational disadvantage.

1. A minimum cumulative GPA of 2.75 which must be maintained throughout the program to be considered for graduation from the program.

2. If a GPA below 2.75 minimum is achieved, or if the student earns an "F" grade in a course, the student is placed on probation with specific requirements that must be fulfilled. The student remains on probation until the course with the "F" grade is successfully remediated.

3. A student will be placed on probation if either the semester GPA or the cumulative GPA falls below 2.75. A student will remain on probation until both the semester and the cumulative GPA are 2.75 or above. A student will remain on probation if the semester GPA falls below 2.75, regardless of whether the cumulative GPA is above 2.75. A student may be suspended or dismissed, as determined by the ACC if, while on probation, (1) the cumulative GPA falls below 2.75; (2) the student receives a failing grade; or (3) the semester GPA falls below 2.75 for two consecutive semesters.

4. A student on probation must successfully complete all requirements for academic performance developed by the ACC. If the student meets the requirements for academic performance and the semester and cumulative GPA are at least 2.75, the student may be removed from probation. If the requirements are met but the cumulative GPA is still less than 2.75, the student will remain on probation. If goals are not met, the student may be suspended or dismissed as determined by the ACC.

5. A student on probation for any reason, or who has a GPA less than 3.0 may not serve in a leadership position (i.e. class officer).

PROBATIONARY PROCEDURES

1. It is the student's responsibility to be aware of his academic status, including the status of probation. The ACC Chair will contact the student regarding the probationary status and requirements for the student to be removed from probation.

2. A student will normally have one probationary semester to raise his term or cumulative grade point averages to 2.0 or above, or to remediate a failed course.

3. If the student's semester or cumulative GPAs are between 2.0-2.74 at the end of the probationary semester, or if a course is not remediated by the end of the next term, the ACC will decide whether to place the student on probation for a second semester or to dismiss the student from the program.

GRADUATION

A Student graduates after successfully completing the graduation requirements according to the degree plan, provided his cumulative is not less than "pass". Following the recommendation of a department council, the College Council may determine certain additional courses the student should take to improve the Student's cumulative GPA if the Student has passed the required courses, but with a low GPA.

STUDENT GRADE REPORTING & APPEALS

Grade reports for each course are submitted to the University Registrar at the close of each semester by a date and time determined by the University Registrar. Once a grade has been posted it becomes part of the student's permanent record and can be changed only by the faculty member and with the approval of the college council. Students who want grade information before the end of the semester and prior to official posting of grades must ask their Faculty. Student evaluations and assignments of final course grades are the responsibility of the faculty. The faculty member is accountable for any and grades assigned to students; therefore, each faculty member shall maintain records to support student evaluations and grades. Students who have reasons which can be substantiated to request grade changes must:

- Write a formal letter to the Instructor (or to the Vice Dean of academic requesting a reevaluation of their performance in the course.
- Provide the following information in the letter: name and student ID, course number, title, and section; semester and year

taken; name of the Instructor and a clear statement of the grade change request and reasons which justify the request.

I. Incomplete Grades

Course work is considered "incomplete" when a student fails to submit all required assignments when they are due or is absent from the final examination. An 'IC' grade may be assigned instead of a failing grade only when:

1. The student has demonstrated satisfactory progress and attendance in the course;
2. The student is unable to complete all course work due to unusual circumstances that are beyond personal control (e.g. illness or family emergency)
3. The student must submit reasons supporting a grade of "IC" to the Course coordinator prior to the time that the final grades are due. The Course coordinator will make a determination based on these reasons. If the Course coordinator determines that the student should receive a grade of "IC", the student must complete the coursework by the end of the subsequent semester, or the 'IC' grade will be changed to an 'F' grade until remediated.

II. Failing Grades

Rectifying Failing Grades: The Course Director will provide input before the Committee on Student's Circumstances to determine actions for remediation (whether the F can be remediated and/or what activities or assignments will be required to remediate) All Failure and Incompletes grades must be rectified by the end of the subsequent semester.

GRADING AND TESTING DISPUTES

Complaints regarding grades and testing must first be discussed with the Course coordinator. If the dispute is not resolved; the student must then discuss the matter with the department chair. If the matter remains unresolved at that level; the Vice Dean for Academic Affairs should be notified in writing. It will be shared with the appropriate committee, and a meeting will be

established for further discussion. The student will have the opportunity to discuss the complaint directly with the committee. The committee will then make a recommendation to the Vice Dean for Academic Affairs, who will make a final decision on the disposition of the complaint. Disputes, requests and complaints MUST be submitted and resolved according to announced deadline each semester. Faculty members, upon receiving of a student's request for a grade change, will review their records. If it is determined that a student's request is justified, the faculty member will prepare a Grade Change Authorization Form, with appropriate documentation and submit it to the Vice Dean and to the Dean for authorization. The grade change is forwarded to the Office of the Registrar. A faculty member may not change an F grade to a W grade in those cases in which the student did not follow the proper procedures for withdrawing from the course. The student can appeal a negative decision of a faculty member. The steps in the appeal process are as follows:

- Present the appeal to the faculty member's College Dean who refer the appeal to a committee for hearing and decision.
- 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.

POLICY FOR A REVIEW OF EXAM SHEET

The student submits a review of course grade appeal to the dean of the faculty concerned during two weeks from the date when the students' GPA's have been submitted according to university academic calendar or the announcement of the results. In the Appeal, the student states reasons for the change, and he pledges that the information he provided are all correct. The college concerned prepares a form including the following data: student name; university ID number; number, code, and title of the course; number of the student's section; the grade of the quarterly works; the semester; the student's GPA; number of academic warnings, if any; name of the instructor; date of having the exam. The college council, where the course is taught, may

take a decision concerning the appeal submitted by the student. Reviewing the test answer sheet must be done in time not exceeding two weeks from the beginning of the following semester. If the appeal has been accepted, the council of the concerned collage forms a committee to revise the test sheets. Then the committee submits the acceptance report to the faculty council to take its decision which is the final decision.

Procedures:

In general, through this operational foundation, the colleges may follow the following procedure for reviewing a grade.

1. The student, who has questioned his grade, submits exam review request form no longer than two weeks from the announcement of the grade concerned. The form is submitted to the concerned department. By that, his request enters the academic system and he\she is given a notice (using a review form).
2. The head of the department shows the student his answers in comparison to the modal answer sheet. If the student is convinced of the correctness of the review, he\she signs a waiver, and the then file is saved after shall be signed by the head of the department.
3. In the case that the student is not convinced of the result of the review, the head of the department forms a committee includes two faculty members from the department- the teacher of the course concerned is not one of them. Then the committee submits a report to the head of the department to take his decision of either changing the grade or not. Then the student will immediately be informed.
4. In the case that the student is still not convinced, he may re-appeal to the collage council within two weeks from the date he\she is informed. The appeal is submitted officially to the dean of the collage explaining reasons and justifications of this appeal, supporting his case with tangible and convincing set of evidence. The appeal should also include a statement from the deanship of admission and registration showing the previous requests of review submitted by the student if any, along with the decisions taken concerning them.
5. If the collage council rejects the case once more and does not agree on the grade change, it takes the decision to close the case.

6. If the collage council agreed on the grade change, it forms a committee of at least three faculty members, one of them is to be from outside the department, and the teacher of the course should not be one of them.

7. The committee gathers to re-correct the student's answer sheet. And then it submits its report to the collage council within fifteen days from the day of its establishment. Then the appeal is discussed by the council to take the final decision in its next session.

MAKE-UP EXAMS

A student who is unable to take an examination due to unavoidable circumstances (e.g., hospitalization, car accident, major illness) is expected to: Contact the Office of Academic Affairs prior to the time of the examination (except during unexpected circumstances), to notify the College about his absence. At the discretion of the course director, the student may make-up the examination at an alternative pre-arranged time only when the unavoidable circumstances have been substantiated by the Office of Academic Affairs in concert with the Course Director. Make-up exams are to be completed within 2 College days of the student's return to the College. Make-up exams should cover the same content area of the missed examination but should not be the same exam that was administered to other students.

Procedures:

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. All communications with the student must be via e-mail, with the University Registrar copied on each exchange.

4. Assign an incomplete (IC) grade to the student if unable to grade the final exam before the final grade deadline and submit a Grade Change.

5. Authorization Form to the Vice dean of academic affair and the College Dean for approval online copy to the Office of the Registrar.

STUDENTS' ADVISING & COUNSELLING

Academic advising and counseling service is an assistant educational system, whereby faculty members introduce the students to the university and college systems and inform them by their roles, responsibilities and rights. Academic advising and counseling service provides guidance and support for students to overcome any academic problems or personal difficulties that may hamper student's academic progress, as well as develops the students' capacities and potentials, that enhances their academic performance. Academic advising and counseling services are basic steps that guarantee collaborative relationship between faculty members and students. The intent of this collaboration is to facilitate learning by providing opportunities for students to achieve their goals and uphold the academic standards of the college.

Roles and Responsibilities of the Academic Advisors

- Acquaint students with rules and regulations of IAU, especially the newcomer students and provide outreaching programs about advising and counselling.
- Assist students in their decision-making related to course selection and registration in collaboration with the Registrar's office.
- Provide accessible advising services to students by scheduling and maintaining regular office hours throughout the semester;
 - Send invitations to students encouraging them to visit the counselling office to discuss and review their academic and non-academic problems.

- Identify and Select meritorious and ideal students, continuously encouraging them and honoured them at the University level to maintain excellence
- Maintain confidentiality of students' information and academic records unless student requesting approval in written.
- Assist in overcoming barriers that may prevent the students from completing their educational plan.
- Provide supportive academic advising by recognizing the personal, social or educational difficulties and responding to the different students ' needs.
- Follow-up and monitoring student 'academic progress and provide guidance program Provide information regarding courses, requirements, tests, registration, course changes, and so forth.



CODE OF ACADEMIC CONDUCT

DOCUMENTATION AND ACADEMIC HONESTY

- Submit your homework covered with a sheet containing your name, number, course title and number, and type and number of the homework (e.g. tutorial, assignment, and project).
- Any completed homework must be handed on the due date.
- Submission after the deadline will lead to one grade decrease in the score of the homework for each delayed day in addition to decrease in score of professional behavior.
- You must keep a duplicate copy of your work because it may be needed while the original is being marked.
- Coursework, laboratory exercises, reports, and essays submitted for assessment must be your own work, unless in the case of group projects a joint effort is expected and is indicated as such.
- Use of quotations or data from the work of others is entirely acceptable and is often very valuable provided that the source of the quotation or data is given.
- Failure to provide a source or put quotation marks around material that is taken from elsewhere gives the appearance that the comments are ostensibly your own. When quoting word-for-word from the work of another person quotation marks or indenting (setting the quotation in from the margin) must be used and the source of the quoted material must be acknowledged.
- Sources of quotations used should be listed in full in a bibliography at the end of your piece of work.

AVOIDING PLAGIARISM

- Unacknowledged direct copying from the work of another person, or the close paraphrasing of somebody else's work, is called plagiarism and is a serious offence, equated with cheating in examinations. This applies to copying both from other students' work and from published sources such as books, reports or journal articles.
- Paraphrasing, when the original statement is still identifiable and has no acknowledgement, is plagiarism. A close

paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable for you to put together unacknowledged passages from the same or from different sources linking these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is a form of plagiarism.

- Direct quotations from an earlier piece of your own work, if not attributed, suggest that your work is original, when in fact it is not. The direct copying of one's own writings qualifies as plagiarism if the fact that the work has been or is to be presented elsewhere is not acknowledged.

PLAGIARISM POLICY

Plagiarism is the submission of another's work as one's own. It includes:

1. Use of another's exact words without use of quotation marks and acknowledgement of that use in a footnote or endnote.
2. Use of another's organizational scheme without acknowledgement of that use in a footnote or endnote.
3. Either close paraphrasing of the work of another without attribution or submission of a work which is largely a paraphrasing of another's work without attribution.

Procedures:

Upon discovering what is believed to be plagiarism on written work submitted by a student in a course, a faculty member may:

1. Assign a grade to the written work based on the faculty member's determination of plagiarism. This determination and the explanation thereof shall be expressed in writing and transmitted to the student with a copy to the Chairman of the department and Vice dean for academic affair;
2. Refer the matter to the Disciplinary Committee or an Ad hoc committee formed by the dean with defined responsibilities. The committee will deal the situation according to the given mandate. A student found guilty of plagiarism by the committee may appeal to the Dean for review of the penalty assessed.

SANCTIONS FOR STUDENT PLAGIARISM

In the academic world, plagiarism by students is usually considered a very serious offense that can result in punishments such as a failing grade on the particular assignment, the entire course, or even being expelled from the institution. Generally, the punishment increases as a person enters higher institutions of learning. For cases of repeated plagiarism, or for cases in which a student commits severe plagiarism (e.g., submitting a copied piece of writing as original work), suspension or expulsion is likely.

1. Upon receiving notification from a faculty member of his determination of plagiarism, and determining that plagiarism has been committed, the Dean, shall appoint a committee of five faculty members to conduct a hearing to determine whether plagiarism has been committed by the student.
2. At the hearing, the faculty member will introduce evidence relevant to the question of whether plagiarism has been committed. The student is entitled to be represented by counsel of his choice, to introduce relevant evidence and to confront and cross-examine any witnesses against him.
3. To support a finding of plagiarism at least four members of the committee must identify plagiarism beyond a reasonable doubt. A finding of plagiarism by the committee in accord with the procedures established by this policy shall be final and binding on the dean and the student.
4. The committee shall file with the dean a written report on its proceedings and its findings. If plagiarism has been found by the committee, the report shall include a recommended sanction. The presumptive sanction shall be a one semester suspension, but the committee may recommend a different sanction, either more or less severe. Such sanctions include, but are not limited to, expulsion, suspension for a longer period, probation or remedial activity.
5. The final determination of the appropriate sanction for plagiarism shall be made by the dean. It may be more or less severe than any sanction recommended by the committee. This determination shall be expressed in writing and provided to the student within 14 days of the filing of the committee's report with the dean. The committee members and the complaining professor shall receive copies of the dean's

determination of sanction. The dean's determination of sanction may be appealed to the provost of the University.

6. In response to appropriate inquiries, the College shall make available to appropriate bar officials the written committee report and the dean's final determination of sanction.

DISCIPLINARY OFFENSES

Any student or student organization found to have committed or to have attempted to commit the following actions is subject to appropriate disciplinary action under this policy:

1. **Scholastic Dishonesty:** Scholastic dishonesty includes plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on any academic activity; accepting, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain grades, honors, awards, or professional endorsement in a dishonest manner; altering, forging, or misusing a College academic record; or fabricating or falsifying data, research procedures, or data analysis.
2. **Disruptive Classroom Conduct:** Disruptive classroom conduct includes engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or a student's ability to learn. A "classroom" is intended to include any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements, or related activities.
3. **Falsification:** Falsification means willfully providing University/College offices or officials with false, misleading, or incomplete information; forging or altering without proper authorization official University / College records or documents, or conspiring with or inducing others to forge or alter University/College records or documents without proper authorization; misusing, altering, forging, falsifying, or transferring to another person University-issued identification; or intentionally making a false report of a disaster or other emergency to a University/College official or an emergency service agency.
4. **Refusal to Identify and Comply:** Refusal to identify and comply includes the willful refusal to properly identifying oneself or willfully failing to comply with a proper order or summons when requested by an authorized University official.
5. **Attempts to Injure or Defraud:** Attempts to injure or defraud includes accepting, creating, forging, printing, reproducing, copying, or altering any record, document, writing, or identification used or maintained by the University/ College when done with intent to injure, threaten, defraud, or misinform.
6. **Threatening, Harassing, or Assaultive Conduct:** Threatening, harassing, or assaultive conduct includes engaging in conduct that endangers or threatens to endanger the health, safety, or welfare of another person, including, but not limited to, threatening, harassing, or assaultive behavior.
7. **Disorderly Conduct:** Disorderly conduct includes engaging in conduct that incites or threatens to incite an assault or breach of the peace; obstructing or disrupting teaching, research, administrative, or public service functions; or obstructing or disrupting disciplinary procedures or authorized University/College activities.
8. **Illegal or Unauthorized Possession or Use of Drugs or Alcohol:** Illegal or unauthorized possession or use of drugs or alcohol includes possessing or using drugs or alcohol illegally or, where applicable, without proper University/College authorization.
9. **Unauthorized Use of College Facilities and Services:** Unauthorized use of College facilities and services includes the wrongful use of College properties or facilities; misusing, altering, or damaging fire-fighting equipment, safety devices, or other emergency equipment, or interfering with the performance of those specifically charged to carry out emergency services.
10. **Theft, Property Damage, and Vandalism:** This includes theft or misuse of, damage to, destruction of, unauthorized possession of, or wrongful sale or gift of property.
11. **Unauthorized Access:** It includes accessing without authorization College property, facilities, services, or information systems, or obtaining or providing to another person the means of such unauthorized access, including, but

not limited to, using or providing without authorization keys and /or access codes.

12. **Disruptive Behavior:** Disruptive behavior includes willfully disrupting University/College events; participating in a campus demonstration that disrupts the normal operations of the University/College and infringes on the rights of other individuals; leading or inciting others to disrupt scheduled or normal activities of the University/College; engaging in intentional obstruction that interferes with freedom of movement on campus, either pedestrian or vehicular; using sound amplification equipment on campus without authorization; or making or causing noise, regardless of the means, that disturbs authorized University/ College activities or functions.
13. **Rioting:** Rioting includes engaging in, or inciting others to engage in, harmful or destructive behavior in the context of an assembly of persons disturbing the peace on campus, in areas approximating the campus, or in any location when the riot occurs in connection with, or in response to, a University/ College sponsored event. Rioting includes, but is not limited to, such conduct as using or threatening violence to others, damaging or destroying property, impeding or impairing fire or other emergency services, or refusing the direction of an authorized person.
14. **Violation of University/College Rules:** It includes engaging in conduct that violates University, collegiate, or departmental regulations that have been posted or publicized, including provisions contained in University contracts with students.
15. **Violation of Laws:** It includes engaging in conduct that violates a law, including, but not limited to, laws governing alcoholic beverages, drugs, gambling, sex offenses, indecent conduct, and/or arson.
16. **Persistent Violations:** Persistent violations include engaging in repeated conduct or actions that are in violation of this Code.

HEARING & APPEAL OF STUDENT DISCIPLINARY DECISIONS

Disciplinary Decisions Any student or student organization charged with violation of the Code shall have the opportunity to receive a fair hearing.

1. In cases of academic or general misconduct, the Dean will form a committee comprised of the following members:
 - Vice Dean for Academic Affairs
 - Chair of department related to incident
 - College faculty member
2. The committee will investigate the incident.
3. The committee will schedule a meeting not later than one week from the date of the incident.
4. A report with committee recommendations will be submitted to the Dean, who will forward it to the Permanent Disciplinary Committee at the University to determine the appropriate action.

Note: Please also refer to the “Policy and Guidelines for Student Code of Conduct” and annexure therein “IAU Student Disciplinary Bylaws”.

Further information about Student Services & Activities as well as Student Rights and Responsibilities can be found in the Student Handbook on the web site of IAU and The Department of Building Engineering.

BUILDING ENGINEERING DEPARTMENT

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**DEPARTMENT OF
BUILDING ENGINEERING**

Excellence

Creativity

Professionalism

Social Responsibility

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