College of Sciences

Department of Biochemistry

Department of Biochemistry

"Program Manual"

Prepared by

Development and Quality committee

Version1, Nov 2023

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About the department

The Department of Biochemistry (BCH) is one of the oldest departments in the College of Sciences. It aims at qualifying competent national graduates to serve the laboratory, Industrial, and health sectors to promote community health, improve the quality of medical biochemistry fields, enhance health awareness, and empower community members to a sustainable healthy environment.

The BCH is a premier venue for undergraduate, master's and PhD studies in Saudi Arabia. Since its inception, the department has been preparing authorized scientific staff with numerous degrees to take positions in a multitude of sectors such as:

- Healthcare: virology, immunology, enzymology.
- Forensic: toxicology, DNA analysis, scientific instrumentation.
- Pharmacology: drug properties, interactions, application and development.
- Environmental: testing, air, water, and waste management, regulation.
- Agricultural: crop production, herbicide/pesticide development and applications.
- Nutrition and Food science: food-disease interaction, preservation, fortification.
- Cosmeceutical: development and applications.
- Scientific investigations: seek laboratory experiences such as research projects.

The Department of Biochemistry was established in 1401 H (1981 G) in response to Saudi Arabia's need for this science and its various applications. During the four decades of the department, there has been an evolutionary shift of academic plans to keep pace with scientific progress in this science, and to meet the requirements of the labor market for graduates and graduates of the department, Initially the biochemistry department offered the B.Sc. Program only, but since 1987, the Department has been offering both B.Sc. and M.Sc. Programs.

Faculty members, within the department, are specialized in different areas of biochemistry allowing them perform discipline studies life in all biological systems: human, animal, plant, and microorganisms, and viruses at the molecular level. BCH interacts actively with related-sciences in addition to a number of researchers and technicians.

The BCH seeks to achieve its mission of education, research and community services by offering undergraduate and graduate programs available for both male and female students. The Bachelor’s Degree program starts at the third till eight levels and includes specialized theoretical and practical courses over a period of six semesters.

Faculty members contribute to community services through health researches, educational lectures and scientific awareness exhibitions, as well as their contribution in other training programs and as reviewers for various Indexed listed specialized national and international journals.

The department has many scientific and cultural activities such as: Saudi Dietetic Association, the student club counseling and training contributions inside and outside the University.

BCH Bachelor Vision, Mission and Objectives

Vision:

High quality in teaching and scientific research in the field of biochemistry and its application to contribute in building the knowledge-based society.

Mission:

To provide education and scientific research with high quality to meet the needs of the community through an innovative and stimulating academic and administrative environment, with the optimal use of technology and local and international partnerships in the field of Biochemistry and its applications.

Objectives:

1) Achieving high quality in education and scientific research in the field of Biochemistry and its applications.
2) Developing and implementing an approach to ensure the quality in performance and outcomes in Biochemistry program.
3) Optimal use of modern technology in education and scientific research.
4) Executing advanced training programs to increase the graduate's skills in the field of Biochemistry and its applications
5) Providing an innovative academic and administrative environment capable of attracting the best faculty, researchers, students and staff.
6) Building effective national and international partnerships with academic institutions and research centers specializing in Biochemistry sciences.

BCH Master Vision, Mission and Objectives

Vision:

Regional leadership and international reputation in the fields of biochemistry.

Mission:

To build multidisciplinary biochemical learning and research environments to support biochemistry graduates to contribute effectively, efficiently, and responsibly with high standards to the community through stimulating environment and partnerships at the national and international levels.

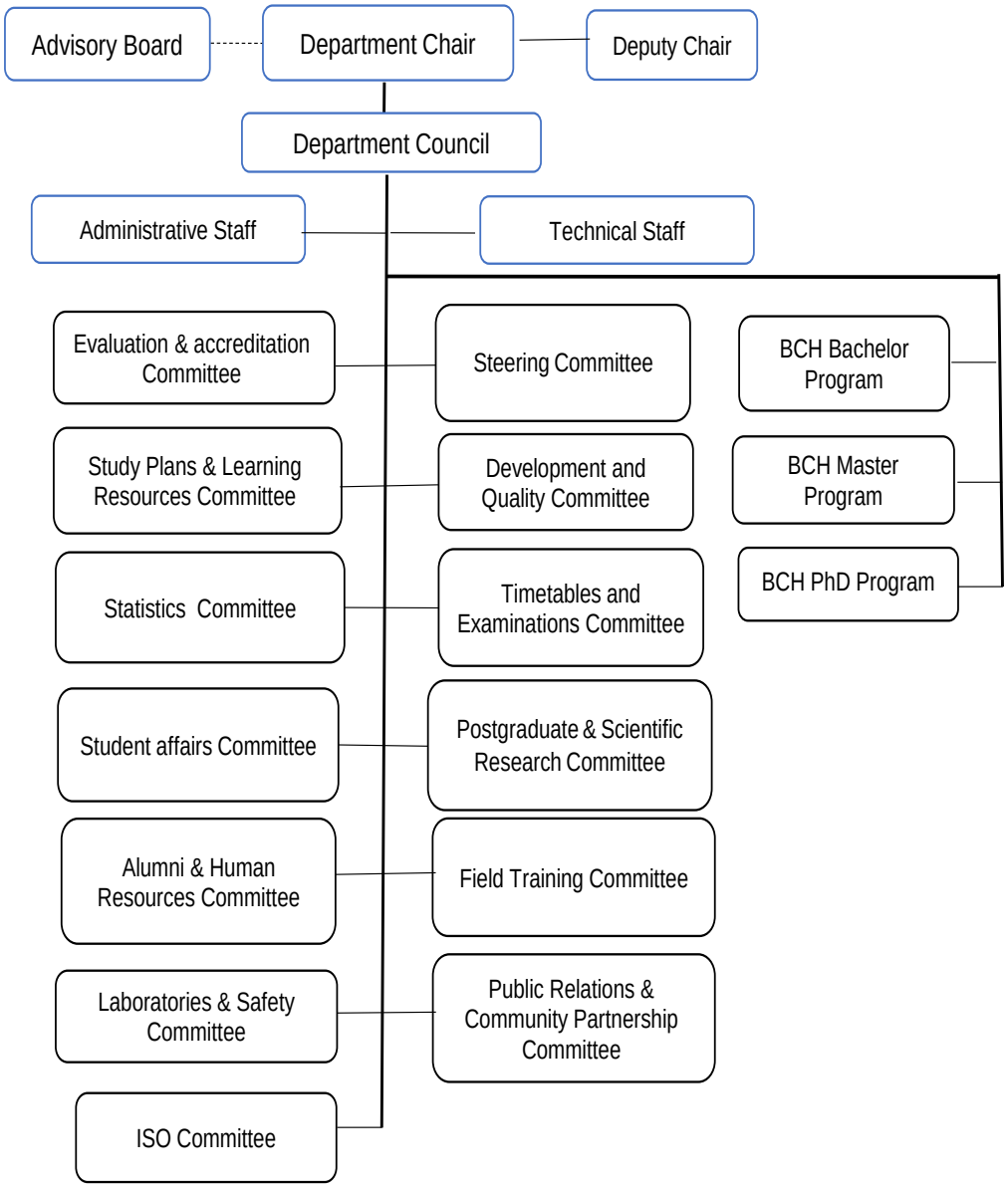
Objectives

1) To fulfill the national need for advanced and quality education in biochemistry.
2) To enrich the community with qualified researchers who have the ability to analyze and interpret problems using various biochemical techniques.
3) To offer extensive prospects for the biochemistry graduates to enhance their academic, educational, and scientific values.
4) To promote skills among the biochemistry graduates to contribute to the vision of the Kingdom.
5) To build a stimulating academic and administrative environment that attracts the best faculty and researchers
6) To establish partnerships with related national and international organizations.

Department of Biochemistry

Organizational chart

Organizational Chart of the Department of Biochemistry (BCH)



Prepared by:	Dr. Mohamed Farouk Badr
Approved by:	BCH Department council
Date:	Oct-23

Academic Programs Offered by the Department:

Bachelor Degree in Biochemistry

Admission Criteria

The College Council specifies the number of students to be admitted in accordance with the comprehensive development plan of the Kingdom. For a student to be admitted, he/ she has to meet the general admission criteria of KSU and should get no less than 85% for his/ her high school degree.

Students should meet the admission criteria of the Common First Year- science track, under the terms of Deanship of Admission and Registration and passing a personal interview and a language placement test

After passing the Common First Year, students are asked to fill out a form identifying their favored specializations. Students are accepted within the BCH program based on their cumulative GPA, academic record and availability of seats.

Transfer Requirements:

Dates for transferring from a department to another in the College of Sciences are specified by the College Council.

Each student is responsible for contacting the Department to learn about the dates specified.

For more information: https://dar.ksu.edu.sa/en/AdmFaqs

Graduates' Job Description:

Professional Title: Biochemistry Technician.

Career Opportunities:

The BCH is a premier venue for undergraduate, master's and PhD studies in Saudi Arabia. Since its inception, the department has been preparing authorized scientific staff with numerous degrees to take positions in a multitude of sectors such as:

- Healthcare: virology, immunology, enzymology.
- Forensic: toxicology, DNA analysis, scientific instrumentation.
- Pharmacology: drug properties, interactions, application and development.
- Environmental: testing, air, water, and waste management, regulation.
- Agricultural: crop production, herbicide/pesticide development and applications.
- Nutrition and Food science: food-disease interaction, preservation, fortification.
- Cosmeceutical: development and applications.
- Scientific investigations: seek laboratory experiences such as research projects.

Job opportunities for graduates of the program are available in different governmental and private health sectors, such as hospitals and primary health care centers, professional institutions, regional health organizations, and nonprofit organizations.

The College offers the opportunity to recruit excelling Saudi graduates as demonstrators which provides the graduates with the opportunity to pursue a Master's Degree either in Saudi Arabia or abroad. Graduates also have the opportunity to join the Master's and Doctoral Programs in BCH offered by the department since 1406 H.

Terms of graduation:

In order to obtain a Bachelor's degree in of Sciences in the field of Biochemistry Program from King Saud University, students must successfully pass 136 credit hours - eight levels (including the common first year and years of specialization).

Graduation Requirements:

Requirements	Credit hours
University requirements (common first year).	32 hours
Department requirements (the program and the specialization)	104 hours
Total	**136 hours**

Bachelor Degree of Biochemistry

Curricular Plan

1st Semester (Common First Year)				
Course Code	Course Title	Requisite		Credits
		Pre.	Syn.	
ENG 100	English Language	-	-	6
MATH 101	Differential Calculus	-	-	3
ENT 101	Entrepreneurship	-	-	1
CHEM 101	General Chemistry	-	-	4
ARAB 100	Written skills	-	-	2
Total of Credit Hours				16

2nd Semester (Common First Year)				
Course Code	Course Title	Requisite		Credits (Lect.- Exer.-Pract.)
		Pre.	Syn.	
ENG 110	English Language	-	-	6
CI 101	University skills	-	-	3
CT 101	Computer Skills	-	-	3
STAT 101	Introduction to Statistics	-	-	3
CHS 101	Fitness and healthy culture	-	-	1
Total of Credit Hours				16

3rd Semester				
Course Code	Course Title	Requisite		Credits (Lect.- Exer.- Pract.)
		Pre.	Syn.	
BCH 103	Biochemical fundamentals of Life	-	-	2 (2+0+0)
ZOO 103	Principles in General Zoology	-	-	3 (2+0+2)
CHEM 108	Introduction in Organic Chemistry	-	-	4 (3+0+2)
MBIO 140	Microbiology	-	-	3 (2+0+2)
BCH 202	General Biochemistry	-	-	4 (3+0+2)
Elective Course group (A)			-	2 (2+0+0)
Total of Credit Hours				18

4th Semester				
Course Code	Course Title	Requisite		Credits (Lect.- Exer.- Pract.)
		Pre.	Syn	
PHYS 102	General Physics	-	-	4 (3+0+2)
CHEM 233	Chemical Thermodynamics	-	-	3 (2+0+2)
CHEM 251	Analytical Chemistry	-	-	3 (2+0+2)
BCH 303	Protein Biochemistry	BCH 202	-	3 (2+0+2)
BCH 312	Biochemical calculations		-	3 (2+0+2)
Elective Course group (A)			-	2 (2+0+0)
Total of Credit Hours				18

5th Semester				
Course Code		Requisite		Credits (Lect.- Exer.- Pract.)
		Pre.	Syn.	
BCH 320	General Enzymology	BCH 303	-	3 (3+0+0)
BCH 322	Experiments in Enzymology		BCH 320	+4)•2 (0+
BCH 361	Molecular Biology		-	)٢+•4 (3+
BCH 452	Biomembrane and Cell signaling	BCH 202	-	+0)•2 (2+
Elective course (Biochem. dept. or other)				2 (2+0+0)
Elective course (Biochem. dept. or other)				3 (2+0+2)
Elective Course group (A)			-	2 (2+0+0)
Total of Credit Hours				18

6th Semester				
Course Code	Course Title	Requisite		Credits (Lect.-Exer.-Pract.)
		Pre.	Syn.	
BCH 332	Physical Biochemistry	BCH 303	-	+0)•3 (3+
BCH 340	Metabolism-1	BCH 320	-	+0)•3 (3+
BCH 333	Experiments in Biophysical Biochemistry	BCH 312	BCH 332	+4)•2 (2+
BCH 462	Biotechnology and Genetic engineering	BCH 361	-	4(2+0+4)
BCH 471	Blood Biochemistry	BCH 320	-	3 (2+0+2)
Elective course from Biochemistry Dept.			-	3)Elective ٢+•(2+ Course Group (A)
Total of Credit Hours				18

7th Semester				
Course Code	Course Title	Requisite		Credits (Lect.- Exer.- Pract.)
		Pre.	Syn.	
BCH 440	Metabolism- II	BCH 340	-	+0)•3 (3+
BCH 447	Practical Metabolism		-	2(0+0+4)
BCH 463	Bioinformatics	BCH 361	-	+4)•3 (1+
BCH 477	Immunochemistry	BCH 471	-	2(2+0+0)
BCH 453	Hormones	BCH 340 BCH 452		2(2+0+0)
BCH 484	Introduction in Scientific Research skills	BCH 333 BCH 361		2(1+2+0)
Elective course (Biochem. dept. or other)			-	2 (2+0+0)
Elective Course group (A)			-	2(2+0+0)
Total of Credit Hours				**18**

8th Semester				
Course Code	Course Title	Requisite		Credits (Lect.- Exer.-Pract.)
		Pre.	Syn.	
BCH 445	Biochemistry of Nutrition	BCH 303	-	3(2+0+2)
BCH 496	Field Training in Biochemistry	BCH 361 BCH 484 BCH 340	-	5(0+0+10)
BCH 493	Research Project	BCH 484 Finishing 115 h	-	2(0+0+4)
Elective course from Biochemistry Dept.				2 (2+0+0)
Elective course from Biochemistry Dept.				2 (2+0+0)
Total of Credit Hours				**14**

List of the Elective Courses

Course Code	Course Title	Requisite		Credits (Lect.- Exer.- Pract.)	Level
		Pre.	Syn.		
BCH 350	Plant Biochemistry	BCH 303	-	2(2+0+0)	5th
BCH 476	Chemistry of Antibiotics	BCH 202	-	2(2+0+0)	5th
ZOO 352	Principles of Genetics	-	-	2(1+0+2)	5th
MBIO 250	General Virology	-	-	3(2+0+2)	5th
MBIO 260	General Bacteriology	-	-	3(2+0+2)	5th
CHEM 341	Heterocyclic Organic Chemistry	CHEM 108	-	2(2+0+0)	5th
FED 420	Biotechnology for food	-	-	2(2+0+0)	5th
BCH 472	Biochemistry of Biological fluids	BCH 320	-	3(2+0+2)	6th
BCH 473	Biomarkers in Health and Diseases	BCH 320	-	3(2+0+2)	6th
BCH 450	Biochemistry of Specialized Tissues	BCH 340	-	2(2+0+0)	7th
BCH 434	Biophysics	BCH 340	-	2(2+0+0)	7th
BCH 441	Bioenergetics	BCH 320	-	2(2+0+0)	8th
BCH 464	Gene Expression	BCH 361	-	2(2+0+0)	8th
BCH 465	Molecular Genetics	BCH 303	-	2(2+0+0)	8th
BCH 436	Nanotechnology	BCH 332	-	2(2+0+0)	8th
BCH 454	Toxicology & Carcinogens	BCH 440	-	2(2+0+0)	8th
BCH 466	Molecular Biology of Cancer	BCH 361 BCH 452	-	2(2+0+0)	8th

List of Courses [Group A] (Student elects 8 credit hours)

Course Code	Course Title	Pre-requisite	Credits (Lect. – Exer. - Pract.)
IC 100	Studies in the Biography of the Prophet	-	2 (2+0+0)
IC 101	Introduction of Islamic Culture	-	2 (2+0+0)
IC 102	Islam and Building up the Society	-	2 (2+0+0)
IC 103	Economic System in Islam	-	2 (2+0+0)
IC 104	Political system in Islam	-	3 (2+0+1)
IC 105	Human Rights	-	3 (2+0+1)
IC 106	Islamic Jurisprudence	-	2 (2+0+0)
IC 107	Ethics of Occupation	-	2 (2+0+0)
IC 108	Contemporary Issues	-	2 (2+0+0)
IC 109	Woman and Her Developmental Role	-	2 (2+0+0)

List of Service cources offered to other departments

Course code	Course Name	Credits	Prereq.	Benefitting Departments
BCH 101	General Biochemistry	4 (3+0+2)	--	College of Science/Computer Science
BCH 102	Cellular Biochemistry	2 (1+2+0)	--	Chemistry Department
BCH 220	Fundamentals of Blood Biochemistry	2(1+0+2)	--	Microbiology Department

BCH Courses' Description

Course No. and abbrev: BCH 103 Credit hours: 2 (2+0+0) Contact hours: 2	Course title: Biochemical fundamentals of Life Level: 3ed level Course prerequisites: None
Course Description: This course covers general introduction to biochemistry. It describes the living cell, its organelles and the general foundations determining cell structure and functions. It also covers relevant chemical concepts, properties of water as main constituent of life, chemicals elements and their distribution in earth and cell, different chemical bonds, functional groups chemical equilibrium and homeostasis, acids, bases and buffer solution, the formation of macro-molecules from small building blocks.	
Course No. and abbrev: BCH 202 Credit hours: 4(3+0+2) Contact hours: 5	Course title: General Biochemistry Level: 3ed level Course prerequisites: None
Course Description: This is an introductory course in biochemistry. It covers carbohydrates; their stereo-isomers, and configuration; function and structure, monosaccharides, reducing and non-reducing, sugar derivatives, oligosaccharides, and polysaccharides, storage, functional and structural polysaccharides. Lipids; fatty acids, triglycerides, phospholipids, sphingolipids, derived lipids, lipoproteins and steroids. Introduction about nucleic acids, nitrogenous bases. Introduction to hormones and vitamins, etc. with special emphasis on macromolecules structures and functions.	
Course No. and abbrev: BCH 303 Credit hours: 3 (2+0+2) Contact hours: 4	Course title: Protein Biochemistry Level: 4th Level Course prerequisites: BCH 202
Course Description: This course covers the structural features of natural amino acids, stereo-isomerism, and configuration; their classification, functional groups and their effect on protein conformation, zwitterion and pI, titration curve; chemical reactions specifying each amino acid, spectroscopic properties, and their biological importance. Peptide bond formation, it is regid and planar and biologically active peptides. Protein classification, levels of protein structure (primary to quaternary), alpha helix, beta sheet; protein architecture. Physical and chemical properties. Fibrous vs globular proteins; domains and motifs; Different functions of proteins, biosynthesis, folding and the role of molecular chaperons. Protein denaturation and renaturation. Effect of protein structure on ligand binding, ex. Hemoglobin/O2, immunoglobulins/antigens. Techniques used in amino acid analysis, peptide synthesis, protein purification, quantification, protein sequencing and its role in elucidating the evolutionary relationships; mass spectrometry.	

Course No. and abbrev: BCH 312 Credit hours: 3 (2+0 +2) Contact hours: 4	Course title: Biochemical Calculations Level: 4th level Course prerequisites: BCH 202
Course Description: An introductory course that deals with the most common calculation problems in biochemistry including calculation of concentration, pH value, ionization of weak acids, buffer composition, and reaction constants as well as the subjects of spectrophotometric measurements and statistical analysis of data. The course also offers tutorials on the same subjects supported by hands-on experiments whenever possible.	
Course No. and abbrev: BCH 320 Credit hours: 3 (3+0+0) Contact hours: 3	Course title: General Enzymology Level: 5th level Course prerequisites: BCH 303
Course Description: General aspects: nature of enzymes, localization, units of enzyme activity, specificity and specific Nonenzyme catalysts: ribozymes and apoenzymes. Enzymes kinetics. Michaelis-Menten equation. Enzyme inhibition. Irreversible inhibition and suicide inhibition. Bisubstrate reaction. Cooperativity and allosteric enzyme. The transition state theory and its analogs. Types of enzymatic catalysis. Definition, classification of coenzymes. Multi-molecular form of enzymes. Isolation, purification, characterization of enzymes and criteria of purity of enzymes. Applications of free and immobilized enzymes in the food, and pharmaceutical industries. Enzyme applications in cheese manufacture. Utilization of enzymes baking. Analytical and therapeutic applications of enzymes.	
Course No. and abbrev: BCH 322 Credit hours: 2 (0+0+4) Contact hours: 4	Course title: Experiments in Enzymology Level: 5th level Course prerequisites: BCH 303
Course Description: A set of special experiments designed to study parameters of enzyme activity, activation & inhibition, and isolation & characterization of enzymes.	
Course No. and abbrev: BCH 361 Credit hours: 4 (3+0+2) Contact hours: 5	Course title: Molecular Biology Level: 5th level Course prerequisites: BCH 303
Course Description: This course covers fundamental aspects of molecular biology with emphasis on human genome: composition, chemical and physical properties, genes, and gene products. The course covers most DNA-associated processes such as replication, transcription, translation, as well as DNA transposition, recombination and rearrangements, gene expression, and recent advances in molecular biology. The course aims at providing basic knowledge necessary to understand the importance of the central dogma in molecular biology and the more advanced concepts such as genetic engineering or recombinant DNA technology.	

Course No. and abbrev: BCH 452 Credit hours: 2 (2+0+0) Contact hours: 2	Course title: Biomembranes and Cell Signaling Level: 5th level Course prerequisites: BCH 202
Course Description: General structural and functional properties of natural and synthetic membranes. Functions and properties of proteins, lipids and carbohydrates of biomembranes. Solubilization and fractionation of biomembranes. Fluids mosaic model. Types of transport across biomembranes. Calculation of energy change in each case. Composition and function of the different types of cellular membranes: Membranes of erythrocyte, intestinal mucosa, renal tubules, muscle cells, mitochondria, nerve cells, retinal cells and bacterial cells. Types and properties of signals and signal transduction. Biosynthesis and assembly of membranes.	

B. List of the Elective Courses

Course No. and abbrev: BCH 350 Credit hours: 2 (2+0+0) Contact hours: 2	Course title: Plant Biochemistry Level: 5th level Course prerequisites: None
Course Description: Plant Biochemistry is a course designed to introduce the students to biochemical processes that take place in plant such as photosynthetic reactions, nitrogen fixation, plant secondary metabolites, the metabolic pathways, plant hormones, the use of plant in medicine and industry and plant molecular biology. The goal of this course is to study the plants biochemistry based on the latest knowledge and the biochemical differences between plants and other organisms. This course can target students from different disciplines such as biochemistry, botany and anyone using plant products -in food and medicines.	
Course No. and abbrev: BCH 476 Credit hours: 2(2+0+0) Contact hours: 2	Course title: Chemistry of antibiotics Level: 5th level Course prerequisites: BCH 202
Course Description: This course covers an introduction to secondary metabolites and their chemical structure, properties and function. It also covers the classification of antibiotics, usage, isolation and purification, characterization, structural and functional properties, mode of action and resistance from the chemical and biochemical point of view.	

C. List of Service courses offered to other departments

Course No. and abbrev: BCH 101 Credit hours: (2+0+3)4 Contact hours: 5	Course title: General Biochemistry Level: 3ed level Course prerequisites: None
Course Description: Cell structure and organelle function. Biological buffers. Amino acids. Peptides. Proteins. Enzymes. Carbohydrates. Lipids. Metabolism of carbohydrates. Metabolism of lipids. Metabolism of proteins. Nucleic acid. Hormones. Vitamins. Biochemistry of blood.	
Course No. and abbrev: BCH 102 Credit hours: 2(1+2+0) Contact hours: 3	Course title: Cellular Biochemistry Level: None Course prerequisites: None
Course Description: The aim of this course is to give knowledge about the cellular organelles and their structures and functions. Eukaryotic and prokaryotic cells, life cycle of virus, cellular molecules, fractionation and separation of organelles, plasma membrane and cytoskeleton, cell division and cell culture. Nucleus , DNA , RNA and Central dogma of molecular biology Mitochondria , Endoplasmic Reticulum, Cytosol, Lysosomes, Peroxisomes, Golgi Apparatus …etc	
Course No. and abbrev: BCH 220 Credit hours: 2 (1+0+2) Contact hours: 3	Course title: Fundamentals of Blood Biochemistry Level: 3ed level Course prerequisites: None
Course Description: This course is oriented for Microbiology student's in the preparatory year as an introductory course in biochemistry of blood. This course covers the physical properties, basic compositions and functions of blood. Blood formation. Erythrocytes structure, metabolism and its abnormalities. Some types of anemia. Leucocytes types and functions. Platelets and blood clotting mechanism. Blood grouping and some components of plasma proteins and fats.	

Course No. and abbrev: BCH 332 Credit hours: 3(3+0+0) Contact hours: 3	Course title: Physical Biochemistry Level: 6 Course prerequisites: BCH 303
Course Description: A course designed to study the methods for purification and characterization of biomolecules. The topics of this course include biochemical applications of Spectroscopy (absorption, fluorescence, and Mass spectroscopy), basic & common methods (tissue homogenization, dialysis, filtration, and salting out), Hydrodynamic methods (various forms and applications of centrifugation), Electrophoresis (paper, PAGE, and agarose), various forms and applications of Chromatography (gel filtration, ion-exchange, adsorption, affinity, and HLPC), and Radioisotope applications in Biochemistry.	
Course No. and abbrev: BCH 333 Credit hours: 2(2+0+4) Contact hours: 6	Course title: Experiments in Biophysical Biochemistry Level: 6 Course prerequisites: BCH 312
Course Description: A set of experiments to introduce the students to the most common methods and equipments used in biochemistry.	
Course No. and abbrev: BCH 340 Credit hours: 3(3+0+0) Contact hours: 3	Course title: Metabolism -1 Level: 6 Course prerequisites: BCH 320
Course Description: Introduction to metabolism and bioenergetics. Saccharides metabolism. Glycogen metabolism. Glycolysis and its regulation. Citric acid cycle, glyoxylate cycle. Oxidative phosphorylation. Gluconeogenesis. Diabetes. Pentos phosphate shunt. Photosynthesis. Defects in carbohydrate metabolism. Classification of lipid, lipolysis, lipogenesis. Biosynthesis of fatty acids. Oxidation of fatty acids. Ketogenesis. Defect in lipid metabolism.	
Course No. and abbrev: BCH 462 Credit hours: 4 (2+0+4) Contact hours: 6	Course title: Biotechnology and Genetic engineering Level: 6 Course prerequisites: BCH 361
Course Description: The main objective of this course is to introduce the modern and emerging approaches in Molecular Biotechnology and its applications in Biochemistry. The course is divided into four rotations, each with its own theoretical and practical sessions with emphasis on the theoretical basis of each technique, the actual working method, hands-on experience, pitfall and strengths of each technique.	
Course No. and abbrev: BCH 471 Credit hours: 3(2+0+2) Contact hours: 4	Course title: Blood Biochemistry Level: 6 Course prerequisites: BCH 320
Course Description: Physical properties and functions of blood. Cellular and non-cellular components of blood. Structure and function of hemoglobin. Metabolism of erythrocytes and its abnormalities (e.g. jaundice). Types of anemia, biochemical basis of each. Types and functions of leucocytes. Coagulation and its interrelationship to platelets. Blood formation and its disorders. Types of plasma proteins and their variation in different diseases.	

Course No. and abbrev: BCH 440 Credit hours: 3(3+0+0) Contact hours: 6	Course title: Metabolism -2 Level: 7 Course prerequisites: BCH 340
Course Description: Lipoproteins properties and their metabolism. Metabolism of prostaglandins. Sterol metabolism. Digestion and absorption of amino acids. Catabolism of amino acids. Biosynthesis of amino acids. Conversion of amino acids to specialized products. Biochemistry of prophyrins. Integration of metabolism.	
Course No. and abbrev: BCH 447 Credit hours: 2(0+0+4) Contact hours: 4	Course title: Practical Metabolism Level: 7 Course prerequisites: BCH 340
Course Description: A selection of metabolic experiments that include carbohydrates, lipids, and proteins.	
Course No. and abbrev: BCH 453 Credit hours: 2 (2+0+0) Contact hours: 2	Course title: Hormones Level: 7 Course prerequisites: BCH 340, BCH 352
Course Description: Mechanism of action of hormones. Definition and classification of hormones. Hypothalamus and pituitary hormones. Hormones of adrenal cortex. Hormones of the adrenal medulla. Thyroid gland hormones. Parathyroid hormones. Pancreatic hormones. Gonadal hormones.	
Course No. and abbrev: BCH 463 Credit hours: 3(1+0+4) Contact hours: 3	Course title: Bioinformatics Level: 7 Course prerequisites: BCH 361
Course Description: This is a practical course designed to train students in the use of public data banks & software to retrieve, analyze, and assemble biological data with special emphasis on concepts relating to gene and protein structures.	
Course No. and abbrev: BCH 477 Credit hours: 2(2+0+0) Contact hours: 2	Course title: Immunochemistry Level: 7 Course prerequisites: BCH 471
Course Description: The fundamental aspect of innate and adaptive immunity. Humoral immunity: antibodies: classes and subclasses, structure and function, biosynthesis, reaction with antigen. Complement system. T-lymphocytes and cell mediate immunity. Human HLA antigens and transplation immunity; immunosuppression; hypersensitivity; autoimmunity; vaccination. Disorders; of the immuno deficiency. Immunochemistry techniques.	

Course No. and abbrev: BCH 484 Credit hours: 2(1+2+0) Contact hours: 3	Course title: Introduction in Scientific skills Level: 7 Course prerequisites: BCH 333, BCH361
Course Description: This course trains students with concepts and mechanisms of scientific research including the various stages of preparation, implementation and observing the ethics of scientific research. The course also trains students with important techniques in Biochemistry.	

Course No. and abbrev: BCH 445 Credit hours: 3(2+0+2) Contact hours: 4	Course title: Biochemistry of Nutrition Level: 8 Course prerequisites: BCH 303
Course Description: This course is designed to study nutrition via biochemical concepts with emphasis on biochemical and physiological fundamentals of nutrition. The course presents an integrated approach to the roles of protein, fat, carbohydrate, energy, minerals and vitamins in metabolism, and their relationships to nutritional concepts.	
Course No. and abbrev: BCH 493 Credit hours: 2(0+0+4) Contact hours: 4	Course title: Research Project Level: 8 Course prerequisites: BCH 484, Finishing 115 h
Course Description: Senior student engages in an independent research project in one of the applied field of biochemistry at the department research laboratories under the supervision of a staff's member. By the end of the semester, he should present a seminar and full report about his project.	
Course No. and abbrev: BCH 496 Credit hours: 5(0+0+10) Contact hours: 10	Course title: Field Training in Biochemistry Level: 8 Course prerequisites: BCH 484-BCH 361-BCH 340
Course Description: This course is field training practical course given in the 8th semester in collaboration with Biomedical Laboratories in hospitals, pharmaceutical and food companies. The course aims to practice students on various biochemical techniques and their applications in clinical and diagnostic laboratories, chemical and pharmaceutical companies and food industries, and the foundations in methodologies. This training course is designed to complement what was studied in our curriculum e.g., blood biochemistry, body fluids, biomarkers, immunology, metabolism, endocrinology and molecular biology. At the end of the course, students will prepare and present their finding as a report. The students' progress will be evaluated by both internal and external supervisor.	

Master Degree in Biochemistry

Degree offered by the program: Master of Science in Biochemistry.

The Master's Program in Biochemistry was initiated in 1407 H, and is spread over two years during which thestudent should be able to:

1- Complete 26 credit hours of courses (compulsory and optional).

2- Complete 2 credit hours of the thesis ; The Department Council should agree on the proposal of the research project and the student submits the results of the study in the form of a thesis for assessment.

3- Present a seminar on the project which is open for questions and discussion by those present and the Examination Committee.

The objectives of the Master's Program:

To reinforce the student's scientific training so that he/she can engage in teaching, academic research, and industrial efficiency with confidence through:

1- The competence to continue higher studies at the Ph.D. level.

2- The development of personal academic qualities through academic seminars where the student has an active role in the presentation and discussion.

3- Addressing technical and practical situation in order to enable the student to participate in solving problems after graduation.

Master of Science in Biochemistry (M.Sc.)

The graduate course (M.Sc.) in biochemistry is a perfect blend of taught modules and research dissertation. The students undertake more rigorous studies at advanced level of biochemistry to attain a deep understanding of complex pathways and mechanisms of biochemistry. In addition, the students receive rigorous grounding in the interrelated areas such as molecular biology, biotechnology, immunology, toxicology and biomedical science as well as extensive exposure to laboratory practical and technical advancements. After successful completion of taught modules, the students are required to demonstrate their laboratory and research skills by accomplishing independent research projects under the supervision of assigned faculty. Finally, the students present their research findings

and defend their thesis before the examination committee for successful award of the degree.

Admission Requirements

In addition to the admission conditions contained in the unified regulations for postgraduate studies in Saudi universities and the organizational and executive rules and procedures for postgraduate studies at King Saud University, the following requirements are required to join the program:

1. The applicant must have a bachelor's degree in biochemistry or related disciplines from King Saud University or its equivalent, with a grade of no less than good if it is from a university that grants it with a grade, regarding the cumulative bachelor's degree average, and what was indicated in determining the cumulative average. The committee clarifies that the current conditions are written "with a grade of no less than good if it is from a university that grants it with grade," and therefore it is implicitly mentioned, and if the council explicitly wants to clarify this, it suffices with "with a grade of no less than 3.25 for the bachelor's degree," which is equivalent to good if It was from a university that awarded it with distinction.
2. The department has the right to require supplementary materials in a manner that does not conflict with the regulations of postgraduate studies at King Saud University (after accepting a maximum of five courses).
3. Obtaining a score of no less than (45) on the TOEFL-IBT test or (5.0) on the IELTS or its equivalent. The applicant must pass the written examination conducted by the department with a success rate of no less than 60% and a relative weight of 0.9%.
4. A personal interview is conducted (with a relative weight of 10%) for those who pass the written exam

Admission requirements to the Master's Program:

1. Admission and registration procedures must follow the regulations of the Deanship of Graduate studies at King Saud University.
2. The applicant must have a Bachelor's degree in Biological Sciences with grade "Very Good" and above with a grade of at least "3.5/5.0" or equivalent.
3. . The applicants with grade "High Good" may be admitted in accordance with Article 15 of the Higher Studies Statutes at King Saud University.
4. The admission is for full – time status.
5. Holders of a Bachelor's degree from universities other than King Saud University are required to pass supplementary courses as deemed. necessary by the Department.
6. The student must pass the supplementary assessment courses with grades not less than "good", and a cumulative average not less than "very good".

Admission criteria:

In addition to the admission requirements enumerated in the Unified Law Organizing Graduate Studies at Saudi Universities and King Saud University rules the Department requires the following:

1. A bachelor degree in Clinical Nutrition obtained from King Saud University or equivalent, with a grade of at least "3.5/5.0" or equivalent.
2. A minimum TOEFL score of 53 (IBT) (Internet-Based Test) or equivalents scores of other official language tests is required for admission to the program.
3. The student must pass the written exam scheduled by the department.
4. The student must pass the oral exam (Personal interview) scheduled by the department

Master Study Plan and Courses:

1. Study Plan Structure

Program Structure		No. of Courses	Credit Hours	Percentage
Course	Required	5	13	50%
	Elective	4	12	46%
Graduation Project (if any)		-	-	-
Thesis (if any)		1	1	4%
Field Experience (if any)		-	-	-
Others (.....)		-	-	-
Total		10	26	100%

* Add a table for each track (if any)

2. Program Courses:

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours
Level 1	BCH 520	Mechanisms of Enzyme Action	Required	-	3
	BCH 530	Biochemical Methodology	Required	-	3
	BCH 540	Recent Advances in Metabolism and its Regulation	Required	-	3
Level 2 & Level 3	BCH 545	Inborn Errors of Metabolism	Elective	-	3
	BCH 550	Molecular Biology of the Gene	Required	-	3
	BCH 555	Experimental Techniques in Molecular Biology	Elective	-	3
	BCH 560	Biochemical Endocrinology	Elective	-	3
	BCH 565	Biochemistry of Mammalian Reproduction	Elective	-	3
	BCH 570	Biochemistry of Cell Surface	Elective	-	3
	BCH 575	Neurochemistry	Elective	-	3
	BCH 577	Biochemistry of Blood	Elective	-	3
	BCH 580	Biochemistry of Human Nutrition	Elective	-	3
	BCH 590	Selected Topics in Biochemistry	Elective	-	3
	BCH 596	Thesis Proposal Preparation	Required	-	1
Passing 25 credit hours: 13 credit hour's obligatory courses and 12 credit hours' elective courses					
Level 4	BCH 600	Thesis	Required	.	1

* Include additional levels if needed
** Add a table for each track (if any)

Program Schedule

Courses	Title	Credit hours
(*) BCH 520	Mechanisms of Enzyme Action	3+0
(*) BCH 530	Biochemical Methodology	0+3
(*) BCH 540	Recent Advances in Metabolism and its Regulation	3+0
BCH 545	Inborn Errors of Metabolism	3+0
(*) BCH 550	Molecular Biology of the Gene	3+0
BCH 555	Experimental Techniques in Molecular Biology	3+0
BCH 560	Biochemical Endocrinology	3+0
BCH 565	Biochemistry of Mammalian Reproduction	3+0
BCH 570	Biochemistry of Cell Surface	3+0
BCH 575	Neurochemistry	3+0
BCH 577	Biochemistry of Blood	3+0
BCH 580	Biochemistry of Human Nutrition	3+0
BCH 590	Selected Topics in Biochemistry	3+0
BCH 596 (*)	Preparation of Master Research Proposal	1+0

- obligatory (*)
- optional

Master Of Science (M.Sc) Course Description

520* BCH: Mechanisms of Enzyme Action	**(3+1) credit-hours.**
General introduction. Theories of enzyme action. Forms of enzyme mechanisms (single and double-displacement mechanisms, substituted enzymes and ternary complexes, steady-state kinetics and analysis of two substrate formal mechanisms). The particulars of enzyme mechanisms (rate and equilibrium constants from steady state velocity and equilibrium studies, the direction of electron displacement, substrate analogues, thermodynamic and activation parameters, identification of specific groups, use of pH variation and group-specific reagents). Control of metabolism at the enzyme level (regulatory enzymes and sigmoid kinetics, coupled and cyclic systems). Regulation of enzymatic activity in the body. Mechanism of action of some individual enzymes.	
530* BCH: Biochemical Methodology	**(2+0) credit-hours.**
v Spectrometry: spectrophotometry (scanning), I.R. analysis, spectrofluorimetry. v Chromatography: purification of proteins, affinity and/or hydrophobic chromatography. v Electrophoresis: polyacrylamide gel electrophoresis (e.g. LDH isoenzymes), SDS-polyacrylamide gel electrophoresis (molecular weight determination) Immunoelectrophoresis, isoelectric focusing. v Centrifugation: sub-cellular fractionation, molecular weight determination by sucrose density gradient. v Radioactive counting and radioimmunoassay v Gas chromatography of lipids v Transport of ions in biomembranes	
540* BCH: Recent Advances in Metabolism and its Regulation	**(3+0) credit-hours.**
Basic metabolism of carbohydrates, lipids and proteins and their interrelationships. Recent aspects in general metabolism. Hormonal, ionic, enzymatic and other factors involved in the regulation of metabolism.	
545 BCH: Inborn Errors of Metabolism	**(2+2) credit-hours.**
Chromosome basis of human heredity. Disorders of carbohydrate metabolism (pentosuria, diseases of fructose metabolism and glycogen storage diseases), amino acid metabolism (urea cycle disorders, disorders of folate metabolism), lipid and steroid metabolism (lipoprotein deficiency and hyper-lipoproteinaemia, familial diseases of sterol metabolism), purine, pyrimidine, metals and porphyrin metabolism. Disorders of connective tissue, muscle and bone metabolism. Defects in the transport of carbohydrates, lipids, amino acids and steroids. Deficiency of circulating enzymes and plasma proteins.	
550* BCH: Molecular Biology of the Gene	**(1+1) credit-hours.**
Review of the gene and its structure, transcription, replication and translation in prokaryotic cell, eukaryotic cell and viruses. Cell differentiation and the cell control of cell proliferation at the molecular level.	
555 BCH: Experimental Techniques in Molecular Biology	**(3+0) credit-hours.**
Isolation of DNA from virus and E. coli by sedimentation and Marmur extraction. DNA characterization and instability studies. RNA isolation and its secondary structure. Mapping of DNA using restriction endonucleases. mRNA and its translation. Hybridization kinetics (DNA labeling) . mRNA and its translation.	

560 BCH: Biochemical Endocrinology	(0+2) credit-hours.
Central nervous system, endocrine glands, target tissues. The hormones of the pituitary gland, adrenal cortex, adrenal medulla, pancreas, thyroid gland, parathyroid glands and gonads: biosynthesis, releasing factors, effects, degradation and elimination, disorders of metabolism and assays. Prostaglandins and thromboxins.	
565 BCH: Biochemistry of Mammalian Reproduction	**(2+1) credit-hours.**
Brief review of mammalian reproductive system and the eukaryotic cell. Endocrinology of reproduction: the hormones of the pituitary gland, .the hormones of the thyroid gland, interrelation of the pituitary gland and ovary, interrelation of the hypothalamus and the pituitary gland. The hormones of reproduction: releasing factors, trophic and peptide hormones, gonadal hormones, prostaglandins, mechanism of hormone action. Biochemistry of the oestrous cycle, menstruation, ovulation and fertilization. Hormonal control of pregnancy. Function of the placenta. Androgens and the hormonal control of spermatogenesis. Parturition. Lactation. Hormonal control of fertility. Sterility. Birth control.	
570 BCH: Biochemistry of Cell Surface	**(2+0) credit-hours.**
Review of biomembrane structure (prokaryotic and eukaryotic cells). Passive and active transport in different membrane systems. Conduction of nerve impulses. Regulation of transport. Ionophores. Biosynthesis of membranes (plant cell walls, bacterial cell walls and cell coats). Structure and function of cell surface carbohydrates. Hormone receptors. Binding sites of antibodies. Erythroleukernia and its effect on cell membrane. Applications of synthetic liposomes and vesicles.	
575 BCH: Neurochemistry	**(1+2) credit-hours.**
Organization of cells, properties of and axoplasmic flow, the brain and nervous system. Types of neurons, neuronal function, soma, axons, exoplasmic flow, and blood-brain barrier. Conduction and transmission of nerve impulses. Neurotransmitters. Review of brain and neural metabolism (carbohydrates, lipids, amino acids, peptides, proteins and nucleic acids). Biochemical mechanism of thinking. Biochemistry of mental illness.	
577 BCH: Biochemistry of Blood	**(2+0) credit-hours.**
Review of blood composition. Erythrocyte, leucocytes and platelet composition and metabolism. Hemoglobin and porphyrin metabolism. Metabolism of iron and its storage disorders. Factors affecting blood clotting mechanism. Inherited disorders of hemoglobin (e.g. hemoglobinopathies, porphyrias, sickle cell anemia). Bilirubin metabolism. Hyperbilirubinaemia.	
580 BCH: Biochemistry of Human Nutrition	**(2+0) credit-hours.**
Caloric significance of diets. Metabolic energy of carbohydrates, lipids and proteins. Total energy requirement and its expenditure. Significance of fiber in the diet. Vitamins: their absorption, excretion, functions, assay methods, and daily requirements. Vitamin malabsorption. Vitamin antagonists. Minerals in food and their importance in nutrition. Evaluation of fresh and preserved foods. Balanced diets. Application of nutrition to critical periods throughout the life span. Nutrition in pregnancy and lactation. Diets in some diseases. Body weight control with reference to nutrition (e.g. obesity, underweight, anorexia nervosa). Diets in some inborn errors of metabolism (e.g. galactosaemia, diabetes, phenylketonuria, maple syrup urine disease).	
590 BCH: Selected Topics in Biochemistry	**(3+0) credit-hours.**
Selected advanced topics, with emphasis on the latest developments.	

PhD Degree of Biochemistry:

The PhD program in Biochemistry was approved on 24/3/1439H (corresponding to 12/12/2017G).

- **Admission Requirements**

In addition to the general conditions set forth in Article XIII Regulations for Graduate studies the following conditions will also apply:

1. To have a master degree in biochemistry or related specialties from King Saud University or its equivalent with a very good grade (if from a University that offer a grade) and no more than five years from getting the master degree.
2. To pass the written examination conducted by the department.
3. To pass the personal interview conducted by the department.
4. To get the TOEFL-iBT (45) on internet TOEFL or its equivalent.

- **Requirements for Obtaining the Degree:**

The requirements for obtaining the Degree are as follows:

  - **Thesis with some Courses Option**
    - **A-** Passing 19 study units of the program.
    - **B-** Passing successfully the Comprehensive Exam.
    - **C-** Successful completion of doctoral Thesis.

- **Program's Tracks (if any):**

The program has the following tracks:

1. Applied Biochemistry
2. Clinical Biochemistry

- **Program's General Structure:**
  - **Thesis with some Courses Option**

The required study units are 19 study hours in addition to 24 study hours for the thesis as shown in the following table:

Type of Courses	No. of Courses	No. of Units Required
Core Courses	9	(16) study hours
Elective Courses	5	(3) study hours
Comprehensive Exam	1	(0)
Thesis	1	(24) study hours
Total	**16**	**(19) study units + (24) study units for thesis**

Program's Objectives

1. To enable the distinguished recipients of a master's degree in biochemistry and life sciences to continue to develop their abilities for a PhD and to serve the scientific and academic research.

2. To provide the Saudi labor market with high-capacity scientifically trained personnel carrying PhD degree in biochemistry.

3. The development of scientific research and academic profile of the students through organizing seminars in which students actively participate.

4. Transfer the experiences of faculty members for a new generation of researchers and keep abreast with the latest global research trends.

5. Innovation of research programs to meet the local requirements to support the development plans of scientific and research excellence and to contribute to the cognitive development of the national economy.

Admission Requirements

In addition to the admission requirements mentioned in the unified regulations for graduate studies in Saudi universities and the organizational and executive rules and procedures for postgraduate studies at King Saud University, the department requires the following to enroll in the program:

1. Must have a master degree in biochemistry or related specialties from King Saud University or its equivalent with a very good grade (if from a University that offer a grade) and no more than five years from getting the master degree.
2. Obtain a score of at least (45) in the TOEFL online test (IBT) or equivalent.
3. The candidate must pass the written exam conducted by the department with a success not less than 60% and with a relative weight of 80%.
4. A personal interview will be conducted (with a relative weight of 20%) for those who passed the written exam successfully.

- **Program's Study Plan:**

❖ **First Level**

#	Course Code	Name	No. of Study Units	Prerequisite Course
1	BCH601	Advances in applied biochemistry	2 (2+0)	
2	BCH602	Advanced bioanalytical techniques	2 (2+0)	
3	BCH603	Recent aspects of molecular genetics	2 (2+0)	
4	BCH604	Advanced topics in biochemical research	2 (2+0)	
5	BCH605	Bioethics	1 (1+0)	
Total			**9 study units**	

❖ **Second Level**

#	Course Code	Name	No. of Study Units	Prerequisite Course
1	BCH606	Advances in genomics and bioinformatics	2 (2+0)	
2	BCH607	Advanced topics in metabolism	2 (2+0)	
3	BCH608	Biochemical and protein engineering	2 (2+0)	
4	BCH699	Thesis proposal preparation	One study unit	(9) study units
5	BCH …	Elective Course (1)	1 (1+0)	
6	BCH …	Elective Course (2)	2 (2+0)	
Total			**10 study units**	

❖ **Elective Courses: Student selects only two courses with a total of 3 study units**

#	Course Code	Name	No. of Study Units	Prerequisite Course
1	BCH609	Bionanotechnology	2 (2+0)	
2	BCH610	Genetic manipulations and therapy	2 (2+0)	
3	BCH611	Recent aspects in biochemical cell signaling	2 (2+0)	
4	BCH612	Biochemical data analysis	1 (1+0)	
5	BCH613	Seminars in biochemistry	1 (1+0)	

❖ **Third Level:**

#	Course Code	Name	No. of Study Units	Prerequisite Course
1	Com700	Comprehensive Exam	0	(19) study units

❖ **Fourth Level**

#	Course Code	Name	No. of Study Units	Prerequisite Course
1	BCH700	Thesis	(24) study units	BCH699, Com700
Total			**(19) study units + (24) study units for thesis**	

PhD Course Description

BCH601	**Advances in applied biochemistry**	**2(2+0)**
Methods and techniques associated with biomolecule separation and purification. Biochemical sensor design, biochemical fuel cell applications, bioremediation and biodegradation. Industrial carbohydrate applications. Eicosanoids, heat shock proteins and interferons identification. Applications of enzyme immobilization. Biomolecular electrode technology.		
BCH602	**Advanced bioanalytical techniques**	**2(2+0)**
Biochemical methods used in next generation sequencing, 3D imaging, protein crystallization, macromolecule engineering, large scale production and stabilization of recombinant protein, protein PEGylation, circular dichroism, Any new technique invented in the field of biochemical research that evaluated structure- function relationships will be included.		
BCH603	**Recent aspects of molecular genetics**	**2(2+0)**
Nucleic acid structure and topology, genome structure and its stability, the regulation of gene expression at the levels of transcription, post-transcriptional processing, translation, post-translational modification; DNA damage, mutagenesis and repair. Transposons and site-specific recombination and recombinant DNA technology and genetic engineering with their applications.		
BCH604	**Advanced topics in biochemical research**	**2(2+0)**
Recent aspects in peptides, proteins structure, enzyme function, carbohydrate metabolism, lipid metabolism, oxidative phosphorylation, photosynthesis and carbon fixation, nitrogen metabolism, integration of metabolism, nucleic acids, replication, transcription, immunology and cancer biochemistry.		
BCH605	**Bioethics**	**1(1+0)**
Scientific integrity and compliance with regulations for laboratory research. Ethical issues in life science. Principles of bioethics and technology. Recognize and compare biochemistry (science) and ethics (philosophy). Bioethical problems. Provide rational justification for ethical decisions.		
BCH606	**Advances in genomics and bioinformatics**	**2(2+0)**
Human molecular genetics, whole genome alignment, next generation sequencing data, comparative genomics, phylogenetic, biological database, system biology, simple Mendelian diseases, complex diseases, functional genomics, population genetics, epigenetics, SNPs, copy number and structural variations, personal and clinical genomics, cancer genomics. Metagenomics and metatranscriptomics.		
BCH607	**Recent advances in metabolism**	**2(2+0)**
Pathways of intermediary and secondary metabolism. Regulation of these pathways. Relation between human diseases and metabolic pathways. Role of nutrition in the prevention and treatment of disease. Metabolism of vitamins and minerals. Unusual pathways of metabolism. Detailed nucleotides and amino acids metabolism. Integration of metabolic systems. Electrolyte and fluid balance.		
BCH608	**Biochemical and protein engineering**	**2(2+0)**
Concepts of biochemical and protein engineering and their applications. Compare amino acid sequence and structure of proteins, and relate this information to the function of proteins. Techniques used for creating and modifying the structure of biomolecules. Protein and biocatalyst engineering. Models of biologically engineered enzymes. Tissue engineering.		
BCH609	**Bionanotechnology**	**2(2+0)**
Techniques and concepts used in bionanotechnology. Characterization of biomaterials and development of bionanotechnology-based devices. Implementation of bionanotechnology in toxicology, cancer biology, life sciences, biochemistry, DNA sequencing and delivering biomolecules to target cells.		

BCH610	Genetic manipulations and therapy	2(2+0)
Gene manipulation in the Post-Genomics Era. Cutting and joining DNA molecules. Plasmids, phage and cosmids cloning strategies. Site-directed mutagenesis, manipulating DNA in different living organisms (bacteria, yeast, fungi and animal cells), advanced transgenic technology. Applications of gene manipulation in practical life.		
BCH611	**Recent aspects in biochemical cell signaling**	**2(2+0)**
Membrane transport. Cell communication. Signal transduction through receptor activation, and the generation of second messengers. Ion channel functions. Cell signaling and apoptosis. Different receptors families: e.g., protein kinases, growth factor receptors, G-proteins, Phospholipase and Phosphoinositide 3-Kinase, insulin receptor, and nuclear receptors.		
BCH612	**Biochemical data analysis**	**1(1+0)**
Mathematical biology concepts. Tools for describing and summarizing data; inference methods on population means and proportions; statistical hypothesis testing; group comparisons; simple linear regression; categorical data analysis; power and sample size in study designs.		
BCH613	**Seminars in biochemistry**	**1(1+0)**
Practice in preparing and presenting an oral presentation of any recent research in biochemistry. Explaining used techniques. Integrate various pieces of knowledge that has obtained. Ability to answer wide aspects of questions. Ability to participate in group discussions.		
BCH699	**Prepare a search plan**	**1(1+0)**
Instructing the student to select the subject of the thesis and identify the research problem, and help in preparing the research plan for the research point chosen according to the general framework of the research plan**.**		
BCH700	**Thesis**	**1(1+0)**
The research plan for the PhD thesis is implemented. Where students first work on designing a plan to manage and analyze the problem in question. And then perform laboratory experiments to devise the next step in the research. At each stage of the research, a detailed discussion with the faculty supervisor of the thesis will be carried out to guide the student in the selection of ways to analyze the results of the research, critique it and how to display and publish.		

Department of Biochemistry
Teaching staff members, Research and Community Service activities

Teaching staff members

Teaching staff members within the department are qualified staff from different nationalities and graduated from various international universities and different research schools.

Details on the teaching staff are available on the college website:

Male: https://sciences.ksu.edu.sa/en/node/755

Female: https://sciences.ksu.edu.sa/en/node/1195

Research activities

The research activities within the department are carried out on both staff and students levels in a form of published research papers and research projects.

The department established a committee of scientific research comprising members of both male and female sections to advise and direct the strategies for researches within the department. At the end of each academic year, the coordinator of the committee submits an annual report of its activity and sends it to the coordinator of the quality committee who sends it to the department head to be discussed in the department council meeting.

Details on the research activities are available on the college website:

Staff's Published research papers: https://sciences.ksu.edu.sa/en/node/835

Research Chairs https://sciences.ksu.edu.sa/en/node/1544

Community Service activities

The CHS department established a committee of community service comprising members of both male and female sections to advise on and direct the community services within the department and its programs

The community services within the department are offered through both teaching staff members and students with sufficient skills and abilities to conduct such services and directed to both King Saud University and Saudi Community in Riyadh City. The community services include offering awareness lectures to the Saudi community, providing training programs and workshops to the health care team, and other related biochemistry services to the community indoor and outdoor.

The community contributions of the staff and students are recorded on an annual basis by the committee of community service. The coordinator of the committee submits an annual report of its activity and sends it to the coordinator of the quality committee who sends it to the BCH department head to be discussed in the department council meeting.

Details on the community service activities and research chairs are available on the college website:

Staff's community service activities: https://sciences.ksu.edu.sa/en/node/1547

Students Regulations

Registration

The students can automatically register the desired courses during every academic semester through online academic portal of the deanship of admission and registration available at https://edugate.ksu.edu.sa/ksu/ui/home.faces

The students may enter the academic system gate by using a user name and password to cancel courses, add courses, modify the schedule, confirm registration and print the schedule. The students must confirm their registration within the first week of the semester. The minimum load is (12) units and the maximum is (20) units.

The student who is not willing to study in the first semester or in any semester must apply for withdrawal, otherwise he will fail in the courses of that semester. If the student encounters any problems concerning his registration, he must go to his academic guide or to the Student Affairs office in the college.

Absences and Warnings

Absences are counted from the first day of the semester. The student must regularly attend all lectures and practical lessons. The student will not be allowed to continue the course or participate in the final examinations if his percentage of attendance is less than (75%) of the lectures and practical lessons allotted for the course.

Students who are deprived of attending the final examination will fail that course.

Students will receive an academic warning if their accumulative average doesn't go beyond (2.00) and they will be expelled if they receive three consecutive warnings.

Expulsion from University

If the student receives a maximum of thee academic warnings due to his low accumulative average (less than 2). The student may have a fourth chance to increase his accumulative average assuming that he will obtain 48 points by studying 12 units. This process is automatically calculated.

If the student does not finish the university requirements within a maximum of half the duration allotted for his graduation. In addition to the program duration, the college council may give the student an additional chance to finish the university requirements within a maximum of double the duration allotted for graduation, based upon specific conditions.

Leave of Absence

Students are allowed to be excused from the semester for a period not exceeding five weeks or eight weeks (for students in the academic year system) prior to the beginning of the final examination if he submits an excuse acceptable to the college council.

The student must complete all the appropriate procedures and submit the form to the Department of Documentation in the Deanship of admission and registration before the deadline.

The Deanship requires the consent of the female student's guardian when she applies to be

excused. The duration of absence is counted within the duration required for fulfilling the requirements of graduation.

The student must obtain the approval of his employer if he works or has a scholarship when applying for a leave of absence. A visiting student will not be approved for leave of absence during the semester if he studies outside the university.

Study Postponement and Suspension

The student is allowed to apply for postponement before the end of the first week of the semester, if he presents an excuse acceptable by the dean, and the postponement duration must not exceed two consecutive semesters or a maximum of three inconsecutive semesters.

The students applying for postponement during the academic year are not allowed to postpone two consecutive years or more than a maximum of two inconsecutive years throughout the duration of study, otherwise, the student's file will be cancelled and he will be terminated from the University.

The postponement is not calculated within duration necessary for fulfilling the requirements of graduation.

Graduation

The Deanship of Admissions and Registration Affairs prepares the graduation report (i.e. memorandum) at the end of each semester and delivers it to the university council to be approved. Students will not graduate unless they obtain the approval of the university council.

The prospective graduates must go to the Deanship of Admissions and Registration Affairs to make sure that they have fulfilled the requirements of graduation and to fill in the form related to the graduation book within the first week of the semester in which graduation is expected. They must submit the following:

- One photo (4x6): (for male students only).
- One copy of Passport (page one, for those who want to write their names in English).
- Identification card (one copy for Saudi male students) or Family notebook for Saudi female students.

The university invites you to attend the graduation ceremony. The graduate student must go to the Deanship of Admission and Registration Affairs file section and obtain a clearance letter to be signed by the respective Departments.

Conditions for Obtaining First/Second Honor Rank

- The student should not fail in any course he has studied in the university or any other university.
- The student should fulfill the university requirements within a maximum of the average duration expected for graduation.
- The student should study at King Saud University a minimum of (60%) of the graduation requirements.

- If the student meets the conditions above and he scores an accumulative average ranging from (4.75) to (5.00), he will be granted the first honor rank. However, the student who scores an accumulative average ranging from (4.25) to less than (4.75) is granted the second honor rank.

Transfer

Transfer from one university to another

Upon the approval of the Dean of the particular college that the student is transferring to, the student will be admitted into the university in accordance with the following requisites:

- The student should have studied at an accredited college or university
- The student shall not be admitted into the university if he is transferring for disciplinary and/or academic reasons.
- The student shall meet the transferring conditions specified by the college council.
- The number of required units the transferred student should study at King Saud University should not be less than 60% of the total units required for the bachelor's degree by the university.
- The college council equates courses that the student has studied out of the university according to the recommendation of the Deanships' councils. The equated courses are registered in the student's academic record, but they are not calculated in his accumulative average.
- If it turns out after the transfer that the student was dismissed for disciplinary or academic reasons, his registration is cancelled from the date of his transfer to the university.
- Transferring the student occurs in any semester from one university to another in accordance with the aforementioned procedures and the dates which he is transferred to the university shall be in accordance with the general conditions of transfer.

Transfer from One college to another inside the university

Firstly, this process will occur by the approval of the Deans of the two respective colleges.

The student is allowed to transfer in accordance with the conditions determined by the college in which student is willing to transfer to.

Secondly: all courses previously studied by the student along with the scores and accumulative averages are fixed in the academic record of the student who is transferred from one college to another.

Transfer from one course of study to another within the College

Upon the approval of the dean of the college, the student is allowed to transfer from one course of study to another in accordance with the conditions set by the college council.

All courses previously taken by the student, along with the scores, accumulative and semester averages are all fixed in the academic record of the student during his university study.

Monthly Stipends

- All Saudi national students are granted stipends at the undergraduate and postgraduate

levels of study provided they do not work in the public sector. In addition, the scholarship students from abroad and the students from Saudi mothers are also granted monthly stipends. The stipends are deposited in the bank and the students are issued ATM cards by their respective colleges. The stipend is 1000 Saudi Riyals for students of scientific studies, 850 Saudi Riyals for the students of humanitarian studies and 900 Saudi Riyals for postgraduate students.

- Stipends are issued during the regular period of the program assigned for graduation on the basis of the study plan approved by the university council. Example: The regular duration of the college of arts is four years. The regular duration starts from the time of admission into the semester including withdrawal and transfer semesters but not postponed semesters.
- Stipends are not granted during the summer semester unless the student registers in the summer semester or studies the second semester preceeding the summer semester.
- Stipends are not granted to students who withdraw from or postpone the semester.
- Stipends are not granted to the students who received academic warnings due his accumulative average being less than (2.00).
- Postgraduate students are granted exceptional stipends of 900 Saudi Riyals for reference books and materials as well as an additional 3000 Saudi Riyals for printing the thesis and 4000 Saudi Riyals for printing the dissertation once a year.
- Students who score an excellent average consecutively (i.e. both semesters) in one year are granted an extra allowance.
- 10 Saudi Riyals are deducted from the allowances for the students' fund.

Disability Allowance

Disabled students are granted an additional stipend for disabilities. The stipend is divided into two classes:

- **First type:** students with severe disabilities.
- **Second type:** students with moderate disabilities.

These types of disabilities are classified by the Ministry of Labor and Social Affairs. Disabled students apply for a disability allowance at the Deanship of Student Affairs.

Reference Letters

Reference letters are issued to the students for various purposes by the Deanship of Students Affairs. The Deanship of Admissions and Registration Affairs issues the letters referring to the students' academic status in the university and letters necessary outside the kingdom.

Student University I.D. Cards

Freshman students are granted university I.D. cards so they can:

- Maintain proof of identity within the campus of the university.
- Receive the monthly stipends issued to each student.

- Borrow books from the library.
- Purchase books from the book store inside the university.
- Enter the sports facilities available on campus.
- Participate in examinations.
- Enter the campus restaurants and living quarters designated for university students.

By announcing the appointments designated for the issuing of student I.D. cards, for the admitted students, every student must submit the admission form and the identification card to the Student University Card Office in the Deanship of Admissions and Registration. Every student must protect and maintain his card from being lost or damaged.

Procedures for Replacing Lost Cards

- The student signs a statement that he has lost his student I.D. card. He pledges to return the new card in the event he finds the card he lost initially. The student will be subject to punishment if he allows someone else to use his card during his study or after graduation.
- The student writes a report illustrating why and how he lost his card.
- The student must announce that he has lost his student I.D. card in the University newspaper or in any of the local newspapers if the university newspaper is not published. The procedure starts one month after the announcement.

Withdrawal from University

The student can completely withdraw from the university if he finishes the clearance procedures, returns the student I.D. card and brings his identity documents to restore his file.

If the student is willing to re-register in the university after withdrawal, he will undergo the regulations of suspension.

When a student withdraws from the university, he must take the following points into consideration.

- The period of his withdrawal from university is counted as if he was suspended from study.
- The student who withdraws from university will not be granted a stipend until he registers in a new semester.
- Monthly stipends are not granted during the summer semester unless the student registers in the summer semester.
- The student must submit a letter of clearance concerning housing, library and other university facilities.

Semester Average and Accumulative Average

Semester Average: The result of dividing the sum of points obtained by the student by the number of units representing the courses the student has studied in any semester.

The points are calculated by multiplying the academic unit with the equivalent grade the student gets in each course.

Accumulative Average: The result of dividing the sum of points obtained by the student in all the courses that he has studied by the number of units representing these courses.

Examinations and Grading

The council of the college that teaches the course may allow the student to study the requirements of any course in the following semester on the basis of a recommendation by the instructor of the course.

The student then receives (IC) grade in his academic record and it is not calculated in his semester average nor in his accumulative average unless he fulfill the requirements of that course. If one academic semester passes without changing the (IC) grade in the student's record due to not fulfilling the course, the (IC) grade is replaced by (F) which is calculated in his semester average and in his accumulative average.

The mark of class work is calculated in these two ways:

- Oral exams, practical exams, researches, class activities or all of these choices or some of these choices in addition to at least one written exam.
- At least two written exams.
- If research courses entail more than one semester, The student receives (IP) in his record.

By fulfilling the requirements of the course, the student will obtain the grade of that course. However, if the student cannot fulfill the course within the allotted time, the council of the college may approve an (IC) grade in his record.

•The grades are calculated as follows:

Points	Grade	Course Grade	Mark
5.00	A+	Excellent Plus	95 - 100
4.75	A	Excellent	90 less than 95
4.50	B+	Very Good Plus	85 less than 90
4.00	B	Very Good	80 less than 85
3.50	C+	Good Plus	75 less than 80
3.00	C	Good	70 less than 75
2.50	D+	Pass Plus	65 less than 70
2.00	D	Pass	60 less than 65
1.00	F	Fail	Less than 60

The general grade of the student when he graduates (based on his accumulative average) shall be as follows:

- Excellent: if the student's accumulative average is not less than (4.50).
- Very Good: if the student's accumulative average ranges from (3.75) to less than (4.50).

- Good: if the student's accumulative average ranges from (2.75) to less than (3.75).
- Pass: if the student's accumulative average ranges from (2.00) to less than (2.75).

The first honor rank is granted to the student who scores an accumulative average ranging from (4.75) to (5.00) at the time of graduation. The second honor rank is granted to the student who scores an accumulative average ranging from (4.25) to less than (4.75) at the time of graduation.

Final Examination Procedures are as follows:

- The student shall not attend more than two examinations within the same day.
- The student is not allowed to attend the examination half an hour after the examination session begins. He is also not allowed to leave the examination hall before a minimum of half an hour from the initial start of the examination.
- Cheating or violating the rules and regulations of the final examination are violations that entail disciplinary action based upon the disciplinary system issued by the university council.
- The council of the college that teaches the course (in necessary cases) approves re-marking answer sheets within a duration not exceeding the beginning of the following semester.

Restrictions of Re-Marking Examination Answer Sheets:

- The student may apply to the department that presents the course to re-mark his answer sheet which will be referred to the college council within a maximum of one month after the end of the final examination.
- The student may not apply for a request to re-mark his answer sheet beforehand, as his request will be invalid.
- The student must not apply for re-marking the answer sheets for more than one single course during one semester.
- A written form is filled out including the items 1,2,3 stated above in addition to: student's name, I.D. number, course number(s), course code(s), course name(s), branch number, the semester, absence rate, accumulative average, warnings, instructor's name, examination date, reason(s) for re-marking request and a pledge from the student regarding the accuracy of information submitted in the form.
- In case of approval, the college council constitutes a committee including at least three staff members who will re-mark the answer sheet(s) and present a report to the college council who will give a final decision.

A Sample of Calculating the Semester Average and the Accumulative Average for the First Semester

Courses	Units	Mark	Grade	Course Grade	Points
Islamic	2	85	B+	4.50	9
Chemistry	3	70	C	3.00	9
Math	3	92	A	4.75	14.25
Physics	4	80	B	4.00	16.00
Total	**12**				**48.25**

First semester average:

Sum of points (48.25)/12 = 4.02

Sum of units (12)

Second Semester

Courses	Units	Mark	Grade	Course Grade	Points
Islamic104	2	96	A+	5.00	10
Chemistry327	3	83	B	4.00	12
Math 314	4	71	A	3.00	12
Physics326	3	81	B	4.00	12
Total	**12**				**46**

Second semester average:

Sum of points (46)/12 = 3.83

Sum of units (12)

Accumulative average:

Sum of point (4.02 + 3.83)/2 = 3.93

Sum of units (12) + (12) = 24

Student Rights and Obligations

The university expect from its students and all employees to accept and respect the mentioned principles in this document. The university confirm that this document do not consider a substitute law or rule for the applied rules, in case of inconsistency the mentioned texts in this document with any applied rules in the kingdom or the university, the last rules must be applied.

This document aims to enlighten the students with their academic and non- academic rights that are presented by the university according to its possibilities, and the manner of practicing these rights and the body is concerned with, also, it aims to enlighten the students with their obligations towards the university, that's because the university is keen on the quality of the academic function and the associated matter of strong relation between the students and the university master, organization and units as another side, and the nature of this relation from clarity and transparency with the different university functions in its different fields.

The university student's rights and obligations include the following:-

The university student right in <u>the academic field:</u>

- The right of the student to provide them with the adequate educational environment for comprehension and grasping easily by ensuring all the educational facilities to support this aim.
- The right of the student to get the educational and acknowledgement related to the university curriculums that are studied accordance with the university regulations and rules that control the academic function.
- The right of the student to get the college and departments study plan, as well as the available specializations. Also to know the educational schedules before they begin to study and to know also the registration rules which enable them to register themselves in the available curriculums, also to consider the priorities arrangements according to fair standards when it is become not available to all students' desires.
- The right of the student to eliminate or add any curriculums or even eliminate a whole semester in accordance with the study and registration rules within the limited period that is announced to the students.
- The right of the student to abide the faculty members by the lectures timing, and fulfilling both scientific and practical fixed hours, not canceling lectures or changing its time, except when it is necessary, and it is very important to provide the students with substitute lectures instead of the missed lectures, thus all of this has to be accomplished in accordance with the coordination between students and specified department.
- The right of the student to ask and participate in an adequate scientific discussions with faculty members, without any supervision or penalty unless the discussion goes too far beyond the general moral and the appropriate manners and etiquette, both during lectures and during the office hours allocated to meet students.
- The right of the student to be questions within the curriculum components and within the discussed matters, the tests should consider the equal and logical distribution of the marks, thus to ensure the fair evaluation for the abilities of the students.
- The right of the student to attend all tests unless there is an systematic obstacle, and the student has to be informed with deprivations from attending exams with enough

time.

- The right of the student to know the typical answers for the seasonal exams questions and the marks distribution to the answers parts which are considered the evaluation bases, in order to evaluate the student before the final exam.
- The right of the student to revise his answers to the final exam according to the university regulations and rules that manage the system of revision and its terms.
- The right of the student to know his results which he got in the monthly, sessional or final exams after evaluating and approving it.

The university student right in the <u>non-academic field:</u>

- The right of the student to profit from social aid and care that are offered by the university, and participate activities that are carried out in accordance with the university regulations and rules.
- The right of the student to get the proper medical care by treating him/her in the hospital and medical centers affiliated to the university.
- The right of the student to profit from the university services and utilities (university references, university residence central and subsidiary libraries, sporting playgrounds, restaurants, parking…etc) according to the regulations and rules applied in the university.
- The right of the student to get the financial rewards and bonus according to the rules especially the outstanding students.
- The right of the student to be nominated for the training courses, programs and inside and outside trips, and his right to increase his participation in cultural activities and to participate in local society service activities and voluntary contributions.
- The right of the student to complain of any matter that he/she is suffering from in his relation with the teaching staff members, the department, the college or any of the university units. The student submits his/her complaint or petition according to the student' rights protection unit regulations and enabling him to follow his/her complaint path at the concerned unit.
- The right of the student to defend himself/herself before any unit in the university in any disciplinary case is sued against him/her, and his/her right to be not charged except after listening to his/her defense unless it is proved that his/her absence was because of u acceptable excuse and after recalling him/her for the second time.
- The right of the student to complain from the disciplinary decision issued against him/her according to the stated rules in these cases by student discipline rules.
- The right of the student to keep the contents of the university file, not to deliver any of the contents of the file except to the student himself/her or their guardian or to who is officially authorized, except when the investigation or judgment authority or any other governmental authority ask to disclose it. And it is not acceptable to disclose or spread the scores of the student exams for discipline or as a penalty.
- The right of handicapped student to get the adequate service that is appropriated for his /her requirements according to the applied rules.

The obligations of the university student in academic field:

- The student is obligated to go on the study and undertake all the students' requirements in light of the rules and timing determining for the beginning and ending the session, transformation, registration, excuses, elimination, and addition according with the rules mentioned in the applied regulations in the university.
- The student is obligated to respect the teaching staff members, employees, workers, from the university employees and others from the contracting companies with the university, the students in the university, the visitors, not to expose to them with hurt even by saying, doing or by any other action.
- The student is obligated to respect the rules and arrangement related to the lectures running. Attend and not absent from the lecture except only with accepted excuse according to the rules and regulations.
- The student is obligated to prepare the researches and the different studies requirements for the curriculums without cheating, not sharing with others in prepare them with any form, to ascribe others' efforts to himself, follows any of illegal tricks to prepare these researching, the reports, the papers, studies and other of the basic requirements for the curriculums.
- The student is obligated to attend exams, discipline, not attempt to cheat attempting, assistance to commit it with any form, to pass off as, forgery or entering the forbidden materials or appliances to the examination sites or labs.
- The student is obligated to the guidance and instructions that are delivered to them by the responsible or the observers in the examination sites or labs, not break the calmness during undertaking the examination

The obligations of the university student in the non-academic field:

- The student is obligated to the university rules, regulations, instructions and the issued decision carrying out for it, not deceive over it, not infringe it, not use forger documents to get right or benefit other than what is mentioned in the related rules.
- The student is obligated to carry the university ID during his presence in the university and submit it to the employee or to the teaching staff member when they request it and when perform any procedure for the student inside the university.
- The student is obligated not to damage, trifle or breakdown the university properties (supplies or buildings) or by sharing with others.
- The student is obligated by the related instructions with the university utilities and supplies arrangement, organization or using it in the specified purpose. The student is bounded by to get an advance permission from the concerned management to use the utilities and supplies in a purpose other than the specified purpose.
- The student is obligated by the clothes and behavior that agreement with university and Islamic traditions. The student is bounded by not to commit any action against the Islamic common morals or the general morals considerate inside the university.
- The student is obligated by calmness and tranquility inside the university utilities, abstaining from smoking inside it, not to make disturbance, illegal gathering, or legal gathering in other than the particular places.

Reference: The Student Rights Protection Unit, King Saud University.

Deanship of Student Affairs, King Saud University

Disciplinary Regulations

Everything that comes from the student of breach of public morality, public order and the regulations and instructions and decisions of the university is a disciplinary offense perpetrator subjected to disciplinary sanctions, including the following acts:

- Disable study, instigating and refrain from attending lectures and other academic activity that require attendance by.
- Breach of order and discipline in the university and all its attachments, as well as creating chaos in units of university housing and university buses or any other university facilities.
- All the cheats in the test by any means, or to initiate or participate in it , or get illegally on the test questions before held and fraud reports, research and practical field training exercises, and graduation projects and theses and doctoral, as well as fraud enter student substitute in midterm or final or entry tests a substitute for other.
- Impersonation of others and give the documents or the identity of the university in intent to use them illegally or speak on behalf of the University in non-official status.
- Any act from the student said or done touches faith or honor or dignity of others, or prejudice to good conduct and behavior, or contrary to public morality or what would harm the reputation of the university.
- Assault by word or action to the employees of the university and its staff.
- Viewing unlawfully on confidential information of employees of the university, publishing it, for guidance for accessing it.
- The establishment of any activities or events within the university without the consent of the competent authorities, including issuing, publishing or distribution of publications and leaflets and posters or collect signatures or donations or money.
- Compromising Islamic principles and social foundations of the nation or to harm national unity or the call to join the anti-home arrangements, or to promote any political ideas or regional violates the government system.
- Falsification of official documents, certificates and use of falsified documents.
- Misuse or sabotage to the property of the university or university transfer property without the approval of the competent authorities.
- Carrying a firearm and even if licensed or knives or flammable materials or explosion or the introduction of any material can be used for that purpose within the university and its attachments, or threaten to use it.
- The use of modern technologies in order to damage the university or one of its employees.
- Possession of devices or movies or pictures or magazines or newspapers or recordings contrary to ethics and public morals.
- Lack of commitment to public taste attire or image, including the disproportionate to the Islamic values and traditions of Saudi society and the university instructions.
- Students go out of the university or the students housing without official permission from the competent authority.
- Failure to provide documents to the competent authorities if requested.

- Breach of the system during interrogation or break the limits of morals and ethics with the Disciplinary Committee.
- Every other violation of the university considers it constitutes a breach of the university regulations and is not mentioned above.

For detailed information about disciplinary penalties' and conditions please refer to

Deanship of Students Affair http://sa.ksu.edu.sa/ar

Academic Counselling

The main purpose of academic counselling is to facilitate the academic process for each student and to overcome obstacles, on the way, successfully through this important stage of his life. Thus, it is inevitably to appoint a Committee for Academic advising at the division level to regulate the counselling and then appoint a faculty member as an advisor for each grade level, who would be responsible for following up this level until graduation.

Objectives of the Academic counselling:

- To facilitate the learning process through the active participation of students and enable them to:
    - determine the educational objectives appropriate to their abilities and aspirations
    - Improve their academic skills to overcome academic difficulties facing them.
    - Access to academic information and guidance and to increase awareness of the university message, its objectives and regulations.
    - participate in extra-curricular activities, discovery and development of talent
- To study cases of delinquent, drop-out students and to try to reduce and treat these problems.
- To guide and follow up students during their study at the university

Responsibility and role of students in academic counselling

Students have a central role in the process of academic counselling. They have the responsibility to ask for counselling from the academic counsellor. This will assist them in developing study plans, and to achieve the highest return from academic advising contacts. Student must be encouraged to make use of contacts with their advisors by:

1. Informing them with the Office Hours of the academic advisor.
2. Setting a date with the academic advisor, preferably to start the contact prior to each semester and to strive to identify those appointments early.
3. Reviewing college manual, which explains all requirements that is needed by the department.
4. Setting a target date for graduation and consult with his/her academic counsellor.
5. Sharing with the academic advisor to develop a syllabus with a schedule including what is being planned to be studied in the following coming semester.
6. Asking all questions that come to his/her mind. The academic advisor can help when a student has a clear vision of what he/she is planning to do.
7. Bearing the responsibility for his academic progress. Where advice and guidance is an important tool for success, but above all a student, is primarily responsible for his/her success.

Department of Biochemistry

Useful links

Title	Link	Uses
King Saud University (KSU)	http://ksu.edu.sa/en	Information about colleges, deanships, administrative departments, faculty, students and e-services within the university
College of Sciences	https://sciences.ksu.edu.sa/en	Information about departments and their programs, faculty, and students within the college
Online Academic Portal (Edugate)	https://edugate.ksu.edu.sa/ksu/ui/home.faces	Insertion of the students absenteeism as well as marks for the course, checking students lists, students' evaluation for the course, and staff schedule
TAWASOL	https://tawasol.ksu.edu.sa/user	Sending e.mails and free SMS
e-services Portal	https://login.ksu.edu.sa/Login.aspx	Follow up salaries, vacations and issuing a letter of introduction, and clearance
Electronic basket	http://ebasket.ksu.edu.sa/	University employees affairs regulations and academic research regulations
e-transactions and communications	http://etc.ksu.edu.sa/	Getting technical support, creating KSU e-mails, downloading licensed software
Deanship of Admission and Registration	https://dar.ksu.edu.sa/ar	Admission and Registration Regulations and Procedures.

Department of Biochemistry

Contact Information

	Male section	Female section
Building NO	5	5
Office NO	2B14; First Floor	166; Third floor
Office phone NO		
– Head/ Vice head of the department	4675799	8055693
– Secretary	4675800	8055624
Mailing Address	biochemistry@ksu.edu.sa P.O. Box / 2455, Riyadh / 11451	
Web Site:	https://sciences.ksu.edu.sa/en/node/113	

Important numbers to call for safety and security:

Emergency at the University campus: 950

Chamber of the university operations: 4677866 OR 4676298

Civil Defense inside University campus: 955

Civil Defense outside University campus: 998

King Khalid hospital ambulance: 4671699

Alternate director: 4673128

Female campus

Emergency unit contact numbers:

0118051751, 0118050482, 0118050963

Medical clinics contact numbers:

0118051929, 0118054450, 0118054451

In case of robbery, contact: 8050796