Alfaisal University

Graduate Catalogue

Programs, Curricula & Study plans

2015-2016

Office of Research & Graduate Studies

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PROGRAMS, CURRICULA & STUDY PLANS

1. Introduction

This section of the Graduate Catalogue dealing with current graduate programs, courses & study plans has been prepared by the Office of Research & Graduate Studies in coordination with the College Directors of graduate studies. Course acronyms and codes have been standardized to make it easier to follow. For example, there is one acronym for each graduate program, irrespective of the number of tracks within that program. This will allow graduate students, faculty and staff to easily find the codes and description of courses as well as study plans for current graduate programs at Alfaisal University.

All graduate programs and their tracks, if any, are first listed in alphabetical order. This is followed by course listings, course descriptions and study plans. The catalogue will be updated on a regular basis.

2. Graduate Programs

Alfaisal University currently has six active graduate programs. The programs and their tracks, if applicable, are:

2.1 Master Degree in Business Administration (MBA)

The Alfaisal University College of Business MBA degree provides students with the theoretical knowledge and practical skills needed to take advantage of career opportunities and to deal effectively and responsibly with complex business challenges. Global and regional organizations require their managers and leaders to have a variety of technical and interpersonal skills. The Alfaisal University MBA will equip students with the skills and qualification needed to realize these objectives and better serve your organization, your community, and your nation.

2.2 Master Degree in Biomedical Sciences (MBS)

The Ministry of Education (MOE) approved two year Graduate Program which has been submitted for accreditation to the Saudi Commission for Health Specialties (SCHS) is open to both male and female students, Saudi and non-Saudi allows students to choose to join one of five tracks. All tracks are Thesis Option.

2.2.1. *Analytical Biochemistry:* The program aim is to provide graduates with an understanding of fundamental biological processes at a molecular level; it also contributes to solving of medical problems and drug discovery and disease curing.

2.2.2. *Biotechnology:* The program includes courses dealing with the advanced techniques of molecular biology, genetic engineering, applications of nanotechnology, and special topics such as nanomedicine and its applications in disease diagnosis, drug formulation, and drug delivery.

2.2.3. *Clinical Embryology & Reproductive Biology:* Graduates will be prepared to meet the rising need in the Kingdom of Saudi Arabia and the Gulf region for qualified and well-trained assisted reproductive technology (ART) professionals.

2.2.4. *Infection Control:* Graduates from this program which meets international standards will have achieved the competencies for developing and leading infection prevention programs in healthcare facilities.

2.2.5. *Molecular & Cell Biology:* The Graduate Program offers a unique environment of higher education that integrates the research and training capabilities at KFSHRC and Alfaisal University in a distinctive modern educational setting.

2.3 Master Degree in Genetic Counselling (MGC)

The goal of this program is to meet the current and future demand of healthcare system for highly qualified, competent and culturally sensitive genetic counsellors in Saudi Arabia and in the region. Students graduating from the program will be recognized by the Saudi Commission for Health Specialties (SCHS) as a *Specialist in Genetic Counselling*.

2.4 Master Degree in Nanoscience & Nanotechnology (MNT)

The program is materials-oriented with emphasis in materials chemistry, micro-electronics, photonics, and their biomedical and energy applications. Tracks include *Nano materials for Energy & Environmental Applications, and Nano medicine & Nano diagnostics*. Both tracks are Thesis Option.

2.5 Master Degree in Public Health (MPH)

The two year program is designed for working physicians, residents, public health officials, policy makers, medical students and college graduate students interested in public health. Students must choose one of three possible tracks: *Mass Gatherings Health (Hajj and Umrah), Epidemiology and Biostatistics, or Health Policy*.

2.6 Master Degree in Radiological and Imaging Sciences (MRS)

The program which is open to training men and women, Saudi and non-Saudi, local and international students, is designed in three specialization tracks: *Radiologic Education, Radiologic Management, OB/ GYN Ultrasound*. All tracks are Courses-only Option.

3. List of Graduate Courses

Course Code	Course Title
Master of Business Administration	
MBA 510	Managerial Accounting
MBA 511	Quantitative Analysis
MBA 512	Marketing Management
MBA 513	Managerial Economics
MBA 514	Organizational Behavior
MBA 515	Research Methodology
MBA 516	Managerial Finance
MBA 518	Human Resource Management
MBA 519	Strategic Management
MBA 520	Applied Management Skills
MBA 522	Operations Strategy
MBA 530	Managing Strategic Business Projects
MBA 534	Leading Organizational Change
MBA 535	Applied Business Research Project
MBA 538	Entrepreneurship and Innovation
MBA 541	HR Planning, Recruitment & Selection
MBA 543	Internet Marketing Strategy
MBA 544	Financial Statement Analysis & Security Valuation
MBA 545	Independent Study (3Credits)
MBA 546	Comparative Management
MBA 547	Contemporary International Management Issues
MBA 548	Independent Study (2Credits)
MBA 550	Service Marketing
MBA 558	Value Innovation Strategy
MBA 560	Healthcare Management
MBA 590	Real Estate Analysis
Master of Biomedical Sciences	
MBS 500	Basics of Molecular & Cellular Biology
MBS 501	Topics in Integrated & Systems Biology
MBS 502	Methods in Molecular & Cellular Biology
MBS 503	Signal Transduction I
MBS 505	Advanced Biochemistry
MBS 521	Reproductive Biology And Embryology
MBS 522	Introduction To Assisted Reproduction
MBS 523	Infertility And Reproductive Medicine
MBS 524	Semen Analysis And Processing/Andrology
MBS 525	Advanced Assisted Reproduction
MBS 527	Practical Molecular Biology
MBS 531	Basics Of Microbiology
MBS 532	Fundamentals of Epidemiology and Surveillance
MBS 533	Infection Control Program Design & Management
MBS 534	Environmental Management
MBS 535	Patient Care Processes & Evidence Based Infection Control Practices
MBS 536	Competencies In Infection Control
MBS 541	Analytical Biotechnology
MBS 542	Techniques of Biotechnology
MBS 551	OMICS techniques and their applications
MBS 552	Advanced analytical Biochemistry
MBS 553	Analytical techniques for Clinical Biochemistry
REC 500	Research Thesis
REC 501	Research Project

REC 502	Biostatistics
REC 503	Research Methodologies
REC 504	Biomedical Ethics

Master of Genetic Counselling

MGC 500	Introduction To Medical & Population Genetics
MGC 501	Master's Research Project
MGC 502	Topics In Genetic Counseling I
MGC 503	Topics In Genetic Counseling II
MGC 504	Genetic Basis Of Inherited Disease
MGC 505	Cancer Genetic Counseling
MGC 506	Biochemical And Newborn Lab Pract
MGC 507	Psychosocial Aspects Of Genetic Counseling
MGC 508	Molecular Genetics Practicum
MGC 509	Introduction To Anatomy & Physiology
MGC 510	Observational Clinic Rotation
MGC 511	Medical Genetics Practicum
MGC 512	Prenatal Clinic Practicum
MGC 513	Advanced Medical Genetics Clinic Practicum
MGC 514	Ultrasound Clinic Practicum
MGC 515	Islam and Genetic Counseling
MGC 516	Cytogenetics Laboratory Practicum
MGC 517	Clinical Internship

Master of Nanoscience & Nanotechnology

MNT 500	Master's Research Thesis
MNT 502	Nanobiotechnology
MNT 503	Special Topics in Nanomedicine
MNT 504	Biosensors and Lab on a Chip
MNT 510	Introduction of Nanoscience and Nanotechnology -I
MNT 511	Renewable Energy Storage Systems
MNT 512	Polymer Nanocomposites
MNT 513	Topics in Nanomaterials Science
MNT 520	Introduction to Nanoscience in Nanotechnology -II
MNT 530	Experimental Techniques in Nanotech - I
MNT 540	Experimental Techniques in Nanotech - II

Master of Public Health

MPH 500	Principles of Biostatistics
MPH 501	Capstone (Master's Research Project)
MPH 502	Principles of Epidemiology
MPH 503	Environmental and Occupational Health
MPH 504	Communicable Diseases
MPH 505	Non Communicable Disease
MPH 506	Social & Behavioral Determinants of Health
MPH 507	Advanced Biostatistics
MPH 508	Advanced Epidemiology
MPH 509	Regression Analysis
MPH 510	Principles of Mass Gathering Health
MPH 511	Principles of Disaster Management
MPH 512	Emerging Infections & Infectious Diseases Management
MPH 513	Health Policy
MPH 514	Quality Assurance in Public Health
MPH 515	Health Systems Management
MPH 516	Survival Analysis
MPH 517	Categorical Data Analysis
MPH 518	Ethics in Research

MPH 519	Public Health and Healthcare Systems in KSA
MPH 520	Health Economics
MPH 521	Health Informatics
MPH 522	Global Health
MPH 523	Research Design
MPH 524	Nutrition

Master of Radiological & Imaging Sciences

MRS 500	Radiation Counting Statistics
MRS 501	RIS Research Project
MRS 502	Radiological Research
MRS 503	Ethics in Radiology
MRS 504	Radiological And Imaging Sciences I
MRS 505	Radiological And Imaging Sciences II
MRS 506	Topics in Medical Imaging
MRS 507	Topics in Radiation Therapy
MRS 508	Topics in Nuclear Medicine
MRS 509	RIS Seminar
MRS 510	Academic Program Management
MRS 511	Faculty Development
MRS 512	RIS Instruction & Assessment
MRS 513	RIS Academic Program Accreditation
MRS 514	Radiologic Financial Management
MRS 515	Personnel Management in Radiology
MRS 516	Clinical Accreditation And Quality Management
MRS 517	Professional Development
MRS 518	Ultrasound Physics
MRS 519	Sonography Cross-Sectional Anatomy
MRS 520	Abdominal Sonography
MRS 521	Pelvic Sonography
MRS 522	Obstetrical Sonography
MRS 523	Clinical Sonography

4. Course Descriptions

4.1 Master of Business Administration

MBA 510 Managerial Accounting (Core)

Cr Hr: 3 Pre-req. MBA 511 Grad Scheme: Letter

The objective of this course is to provide prospective users of corporate financial information, such as managers, stockholders, financial analysts, and creditors with the fundamentals of financial accounting. The course will give students the opportunity to develop the technical skills needed to read, analyse and interpret financial data, appreciate the financial consequences of their decisions and make informed business decisions. In this course, students will study the assumptions and concepts underlying financial reporting, the basic accounting equation and how it is affected by financial transactions, the accounting cycle, accounting adjustments and constructions and interpretations of financial statements: the income statement, balance sheet, owners' equity statement and cash flow statement.

MBA 511 Quantitative Analysis (Core)

Cr Hr: 3 Grad Scheme: Letter

This course provides an introduction to quantitative methods and their application in business. On completion of this course students should be able to apply a variety of methods for exploring, summarizing and presenting data, know the uses, capabilities and limitations of various statistical procedures, be able to interpret the results of statistical procedures and tests; and make informed decisions based on data using analyses enabled by MS Excel.

MBA 512 Marketing Management (Core)

Cr Hr: 3 Grad Scheme: Letter

Topics covered include environmental assessment, market research and forecasting, new product development, pricing, distribution, positioning, and promotion. Key strategic concepts and processes are emphasized using lectures, case studies and a sophisticated marketing simulation game where feedback is provided to teams regarding the impact of strategic and tactical decisions based on financial performance.

MBA 513 Managerial Economics (Core)

Cr Hr: 3 Pre-req. MBA 511 Grad Scheme: Letter

This course explores the relationship between the economic environment and a firms' business operations. Students are introduced to a number of microeconomic principles including supply and demand principles and elasticity and its implication for product pricing strategies. The course then analyses a range of macroeconomic variables including inflation, unemployment and economic growth. Fiscal and monetary policy tools are also explored within the context of the aggregate demand/aggregate supply model. Prerequisite: Quantitative Foundation course or equivalent.

MBA 514 Organizational Behaviour (Core)

Cr Hr: 3 Grad Scheme: Letter

This course focuses on individual and group behaviour in organisations. Topics covered may include: personality and behaviour, personal performance; the theory and practice of leadership; employee motivation and empowerment; leadership ethical issues; power and politics; team and group dynamics; organisational change and communication; and gender and diversity issues in organisation's structure.

MBA 515 Research Methodology ** (Elect)

Cr Hr: 3 **Pre-req. MBA 511** **Grad Scheme: Letter**

At the end of this course, students will be able to design, analyse, apply and evaluate appropriate research designs and methodologies to address organizational problems.

MBA 516 Managerial Finance (Core)

Cr Hr: 3 **Pre-req. MBA 514** **Grad Scheme: Letter**

Managerial finance is interested in determining the best way to use money to improve future opportunities to earn money and minimize the impact of financial shocks. To accomplish these goals managerial finance uses the following techniques covered in this course: financial statements and firm's cash flow analysis, interest rates and required returns, long-term investment decisions using capital budgeting techniques, short-term financial decision and working capital management, Valuation, capital structure, and dividend policy.

MBA 518 Human Resource Management (Core)

Cr Hr: 3 **Pre-req. MBA 514** **Grad Scheme: Letter**

This course provides an introduction to the theories and practice of international Human Resource Management (HRM). The aim of the course is to help participants gain a practical and strategic mindset for recognizing, analysing and addressing complex human resource management issues to impact organizational competitiveness.

MBA 519 Strategic Management (Core)

Cr Hr: 3 **Grad Scheme: Letter**

Strategy is examined in this course in relation to the analysis of organizations' internal characteristics and external competitive environments. The aim of the course is to help participants gain a strategic perspective for analysing and addressing complex strategic business issues.

MBA 520 Applied Management Skills (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course explores the practical and context-relevant application of management skills. The course takes a positive, evidence-based approach to the study of work and management. The macro and micro context (i.e. the work environment and the cognitive processes) of managerial capacity development will be considered. Typical course content may therefore feature skills to manage time and stress, conflict and communication strategies, problem-solving and decision making, as well as skills to manage performance from a personal, interpersonal and work team perspective.

MBA 522 Operations Strategy (Core)

Cr Hr: 3 **Pre-req. MBA 511** **Grad Scheme: Letter**

The main aims of this course are:

- To introduce students to the concepts of operations strategy and show how an operations strategy can contribute to the sustainable competitiveness of the business.
- To show the linkages between operation strategy and the overall role of the operations function in the organization.
- To examine each of the individual elements of an operations strategy, so that students become familiar with the language used for describing operations strategy, and the concepts and issues faced by most organizations
- To provide students with the opportunity to develop appropriate analytical skills.

- To provide an overall framework for developing and implementing operations strategies.

MBA 530 Managing Strategic Business Projects (Elect)

Cr Hr: 3 **Pre-req. MBA 511** **Grad Scheme: Letter**

The course has a strong business focus to emphasize the importance of aligning business projects with the enterprise business strategy. The main aims of this course are to apply project management approaches to effectively manage organizational change, improve organizational performance, and meeting strategic objectives. It is designed to help the students understand and lead organizational changes through effective implementation of successful project management techniques with due considerations to the interrelated aspects such as stakeholders management, effective communications, Leadership, Triple constraints, and Earned Value Management. Modern techniques and approaches are adopted to achieve these goals and sustain improvements through continuous monitoring of the business alignment. For this purpose, structured presentations, discussions and business cases are utilized to develop appropriate understanding of project management roles in the contemporary businesses. Fundamental concepts and theories in project management are discussed, including project initiating, planning, executing, monitoring, controlling, and closing. The course also emphasis the practical aspects of the projects management approach through hands-on practices, templates, and application of best known standards and frameworks. These will build required confidence in applying the approaches, utilize lesson learned from previous experiences and improve the success rate of the projects.

MBA 534 Leading Organizational Change (Elect)

Cr Hr: 3 **Pre-req. MBA 514** **Grad Scheme: Letter**

The Leading Organisational Change (LOC) course examines the complexities of changing and transforming contemporary organisations in an environment of accelerating global, economic, social and technological change. The course explores the essential elements of leading and managing organisational change initiatives for sustained adaptability and longevity. As this is a case study-based course, the principles will be inferred from case analyses and supported by theoretical enquiry.

MBA 535 Applied Business Research Project ** (Elect)

Cr Hr: 3 **Pre-req. MBA 511)** **Grad Scheme: Letter**

MBA 538 Entrepreneurship and Innovation (Elect)

Cr Hr: 3 **Pre-req. MBA 513, MBA 514** **Grad Scheme: Letter**

The course aims to develop innovative and dynamic leaders who have the capability and talent to pursue opportunities in today's hypercompetitive global market. The course provides an understanding of the entrepreneurial process and empowers participants to deliver innovation successfully into the world of business. The course has three main objectives: (1) to help managers develop an entrepreneurial orientation towards sustainable business growth; (2) to provide an integrated and practical approach to bringing innovation to market; (3) and to examine the creative process and introduce techniques that creatively solve problems and promote inventive solutions.

MBA 541 Human Resource Planning, Recruitment & Selection (Elect)

Cr Hr: 3 **Pre-req. MBA 518** **Grad Scheme: Letter**

Any responsible HR process starts with a plan to determine the organisation's HR supply and demands before recruitment and selection can commence. The integration of HR planning with the strategic plans of the organisation is therefore the starting point of the HR process and both HR practitioners and line managers are involved. They also have to

work together to ensure that right candidates are attracted to the organisation from which to select the most appropriate talent. This course is therefore equally useful for line managers and HR practitioners and may include topics such as HR strategy, HR demand and supply forecasting, job analyses, recruitment planning and processes, valid and reliable selection techniques.

MBA 543 Internet Marketing Strategy (Elect)

Cr Hr: 3 **Pre-req. MBA 512** **Grad Scheme: Letter**

This course addresses the marketing strategies that are particular to the Internet and other related technologies. More specifically, the course explores the following: the marketing mix over the Internet, online consumer behaviour, online market research, website developments, legal and ethical issues, and social media marketing. Understanding these aspects is necessary to develop a successful Internet marketing strategy.

MBA 544 Financial Statement Analysis & Security Valuation (Elect)

Cr Hr: 3 **Pre-req. MBA 510** **Grad Scheme: Letter**

This course provides students with a comprehensive understanding of financial statement analysis fundamentals: how to use financial statement analysis to evaluate a firm's past performance, make judgment about its earnings quality, determine its current financial position, examine the underlying accounting assumptions of its major assets and liabilities, forecast its future prospect, and estimate its fundamental value. The core emphasis of this course is on using financial statement analysis for the purposes of equity valuation.

MBA 545 Independent Study (Elect)

Cr Hr: 3 **Grad Scheme: Letter**

Enable students to responsibly study a specific topic independently.
At the end of this course, students will be able to demonstrate independent learning outcomes to meet the requirements of a learning plan which has been agreed by both parties and approved by the MBA Office.

MBA 546 Comparative Management (Elect)

Cr Hr: 3 **Pre-req. MBA 514** **Grad Scheme: Letter**

At the end of this course, students will be able to analyse, compare, and then evaluate the contextually appropriate application of management approaches from a variety of international settings into their local environments. Students design and apply a comparative benchmarking process to differentiate and reconstruct relevant management responses for local application.

MBA 547 Contemporary International Management Issues (Elect)

Cr Hr: 3 **Pre-req. MBA 514** **Grad Scheme: Letter**

During this course, students will demonstrate their ability to responsibly gather intelligence about specified contemporary international business and/or managerial topics. They will then analyse of the opportunities and threats posed by these topics and respond with locally relevant recommendations and strategies.

MBA 550 Service Marketing (Elect)

Cr Hr: 3 **Pre-req. MBA 512** **Grad Scheme: Letter**

This course is designed for individuals who are working (or aspire to work) in organizations that operate in the service sector, this includes but is not limited to: bank/financial intuition, healthcare, education, tourism, consultancy/training, insurance and telecommunications.

The main objective of this course is to enable students to develop and implement effective marketing programs in services companies.

MBA 558 Value Innovation Strategy (Elect)

Cr Hr: 3 **Pre-req. MBA 538** **Grad Scheme: Letter**

This course introduces the key concepts, frameworks and tools of value innovation strategy and lays out the fundamental methodology for creating and capturing new market space. Using theory-based videos and cases, this course enables students to apply the core concepts of value innovation strategy and give students an opportunity to explore and study in depth the logic and methods that are common to strategic moves in real business settings.

MBA 560 Healthcare Management (Elect)

Cr Hr: 3 **Grad Scheme: Letter**

The Health Management course provides a foundation in healthcare management as a discipline and a management process. Students will be able to analyse and evaluate the ethical and legal considerations of healthcare decisions, demonstrate an understanding of the healthcare system, policies, healthcare quality, patient safety and decision-making in hospital and healthcare organisations.

MBA 590 Real Estate Analysis (Elect)

Cr Hr: 3 **Pre-req. MBA 513** **Grad Scheme: Letter**

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

4.2 Master of Biomedical Sciences

MBS 500 Basics of Molecular & Cell Biology (Subj)

Cr Hr: 3 Grad Scheme: Letter

This course is designed to allow the students to understand fundamental principles of molecular and cell biology and to better understand the ever increasing stream of publications and reviews. The course is aimed to develop critical analysis of the literature and to summarize the progress in specific fields of interest by preparing critical reviews in written and oral presentations.

MBS 501 Topics in Integrated & System Biology (Subj)

Cr Hr: 3 Grad Scheme: Letter

This course is designed to allow students to study the fundamental principles of biomedical sciences and how the different organs or biological systems work together in an integrated fashion to attain "homeostasis". These objectives will be accomplished by studying relevant published studies in biomedical sciences.

MBS 502 Methods in Molecular & Cellular Biology (Subj)

Cr Hr: 3 Pre-req. MBS 500 Grad Scheme: Letter

This course is designed to allow students to develop skills in basic cellular and molecular biology techniques. These objectives will be covered both in a formal lecture setting where students apply their theoretical knowledge to practice the techniques in the laboratory.

MBS 503 Signal Transduction I (Subj)

Cr Hr: 3 Pre-req. MBS 500 Grad Scheme: Letter

This course is designed to allow students to develop an understanding of the major signal transduction pathways and how such pathways can influence metabolism as well as gene expression.

MBS 505 Advanced Biochemistry (Subj)

Cr Hr: 3 Pre-req. Biochemistry Grad Scheme: Letter

At the end of this course students will be able to read, understand and interpret the literature that deals with any aspect of Biochemical pathways in the context of physiological functions.

MBS 521 Reproductive Biology and Embryology (Subj)

Cr Hr: 2 Grad Scheme: Letter

Reproductive Biology and Embryology course provides students with comprehensive understanding of human reproductive biology. It is designed to offer students required knowledge to pursue assisted reproductive technology and/or a reproductive biology research career.

MBS 522 Introduction to Assisted Reproduction (Subj)

Cr Hr: 2 Grad Scheme: Letter

Introduction to Assisted Reproduction course provides students with basic understanding of human assisted reproduction and clinical embryology. It is designed to offer students required knowledge and practical skills to pursue assisted reproductive technology and clinical embryology.

MBS 523 Infertility and Reproductive Medicine (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

The Infertility and Reproductive Medicine course provides students with a comprehensive understanding of infertility from a clinical perspective. It is designed to offer students required knowledge to pursue assisted reproductive technology and/or a reproductive biology research career.

MBS 524 Semen Analysis and Processing/Andrology (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

Semen analysis and processing/Andrology course provides students with necessary theoretical and practical aspects of examination and processing of human semen. It is designed to offer students to understand to most recent WHO recommendation on the standardization of semen analysis and processing.

MBS 525 Advanced Assisted Reproduction (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

The Advanced Assisted Reproduction course provides students with practical part of human assisted reproduction and clinical embryology. It is designed to offer students required knowledge and practical skills to pursue assisted reproductive technology and clinical embryology.

MBS 527 Practical Molecular Biology (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

Practical Molecular Biology course introduces students to basic experimental techniques and procedures widely used in molecular biology research and clinical genetic analysis.

MBS 531Basics of Microbiology (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

The course will encompass the study of the general characteristics of microorganisms, the processes by which these microorganisms cause human disease and how these pathogens are identified in the diagnostic laboratory. The classification and mechanism of action of major groups of antibiotics as well as methodologies for antibiotic susceptibility testing will also be covered. The development of antibiotic resistance and associated concerns will be discussed and related to the global situation. This course will also encompass the study of infectious diseases in the healthcare setting with particular reference to healthcare associated infections (HCAI). The challenges of emerging and re-emerging infections in the clinical setting will also be addressed.

MBS 532 Fundamentals of Epidemiology and Surveillance (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

This course is designed to introduce the fundamental concepts in epidemiology and surveillance as it applies to institutional infection control. The uses of epidemiological data in clinical decision-making for infection control programs will be addressed. This course explores the contemporary principles of the science and practice of surveillance and monitoring and outbreak management it applies to institutional infection control. The design of surveillance systems, collection, compilation and interpretation of surveillance data will be covered

MBS 533 Infection Control Program Design & Management (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

The course explores the role of the infection control practitioner, systems of clinical governance, infection control framework and management plans, and performance indicators for infection prevention and control. Students develop skills in the management and coordination of infection control programs, with a particular emphasis on prevention. The students will also develop the skills needed to assess needs, develop goals and measurable objectives, and prepare lesson plans for educational offerings.

MBS 534 Environmental Management (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

The course is designed to help students to develop a clear understanding of the importance of various cleaning, sterilization and disinfection processes as essential elements of an infection control program. The indications, approaches, equipment and agents utilized for cleaning, sterilization and disinfection processes in the healthcare setting will be discussed. The criteria for selecting and monitoring the usefulness of the agents, equipment and monitoring approaches used for sterilization & disinfection will be covered.

MBS 535 Patient Care Processes & Evidence Based Infection Control Practices (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

The course is designed bring together all the concepts learnt in the previous courses and enable students apply these concepts in various scenarios in the health care setting. This course sets the stage for the more intensive hands-on experience that students will be engaged in during the second year of the course.

MBS 536 Competencies in Infection Control (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

This is a practical course during which students will be mentored by experienced infection prevention and control professionals in assigned hospital units. Students will observe and perform a pre-determined number of procedures under the supervision of the mentor.

MBS 541 Analytical Biotechnology (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Modern analytical biotechnology is focused on the use of a set of enabling platform technologies that provide contemporary, state-of-the-art tools for genomics, proteomics, metabolomics, drug discovery, screening, and analysis of natural product molecules. Thus, analytical biotechnology covers all areas of bioanalysis from biochips and nano-chemistry to biology and high throughput screening. Moreover, it aims to apply advanced automation and micro fabrication technology to the development of robotic and fluidic devices as well as integrated systems. This course focuses on enhancement technology development by promoting cross-disciplinary approaches directed toward solving key problems in biology and medicine. The scope thus brings under one umbrella many different techniques in allied areas. The purpose is to support and teach the fundamental principles and practical uses of major instrumental techniques. Major platforms are the use of immobilized molecules in biotechnology and bioanalysis, immunological techniques, immunological strip tests, fluorescence detection and confocal techniques, optical and electrochemical biosensors, biochips, micro dotting, novel transducers such as nano clusters, atomic force microscopy based techniques and analysis in complex media such as fermentation broth, plasma and serum. Techniques related to HPLC, capillary electrophoresis, gel electrophoresis, and mass spectrometry will be covered in the course. Fundamentals in analytical biotechnology

include basic and practical aspects of characterizing and analyzing DNA, proteins, and small metabolites.

MBS 542 Techniques of Biotechnology (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

This course focuses on the fundamentals of DNA tools biotechnology, molecular genetics biotechnology, DNA isolation, manipulation and amplification techniques, restriction enzymes, microarrays and biochips, DNA sequencing, genetic engineering and biotechnology, biotechnology revolution, gene therapy, gene doping and beyond.

MBS 551 OMICS Techniques & their Applications (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

MBS 552 Advanced Analytical Biochemistry (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

MBS 553 Analytical Techniques for Clinical Biochemistry (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

REC 500 Research Thesis (Core)

Cr Hr: 18

Students completing a Thesis Track master's degree are expected to write a report, referred to as a thesis, on the results of an original investigation, in conjunction with the Master's Advisory Committee. Length and style of the thesis vary by college/department. All these are filed with the Office of Graduate Studies. A *Master's Advisory Committee* will be formed for each student and will consist of three members; an Alfaisal faculty member as the Major Advisor and Chair, and two other members, one of whom may be from an organization outside of the University. The Chair of the Committee must have research and graduate student advising experience. This Committee will assist the student in the formulation of the Thesis Project Proposal, and later advise the student in the execution of the research project, the Thesis write-up, and help the student to prepare for the oral defense.

REC 501 Research Project (Core)

Cr Hr: 6

The intent of this project is to enable to the student to learn to pursue a chosen topic through a literature search on a topic approved by the graduate advisor, collection and analysis of data, project report preparation and defense. Actual submission to a journal will be encouraged, but not required. The intent of this project is to enable to the student to learn to pursue a chosen topic through a literature search on a topic approved by the graduate advisor, collection and analysis of data, project report preparation and defense. Actual submission to a journal will be encouraged, but not required. Although this course officially begins in second year, the trainees are encouraged to identify a project topic and supervisor in their first year so that they are able to begin their research project in the fall of their second year.

REC 502 Biostatistics (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course is designed to review the fundamental principles of probability and statistics. This will be covered both in a formal lectures setting, self-directed learning setting with tutorials, and during the statistical analysis lab. This course will give students direct practice

in the statistical reasoning skills needed to choose appropriate procedures for analyzing research data and to better understand the design, conduct, and analysis and subsequently interpret the results of biomedical research studies.

REC 503 Research Methodologies (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course is designed to allow students to work in groups on a hypothetical research grant application in the general area of their research interest based on a list of case studies provided by the instructor.

REC 504 Biomedical Ethics (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course is designed to introduce students to the basic principles and methods of analysis from ethical theories applicable to contemporary moral problems in biomedical research and professional practice. This includes evaluation of scientific misconduct in relation to international standards of research through case studies with examples from international settings.

4.3 Master of Genetic Counselling

MGC 500 Introduction to Medical & Population Genetics (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

This course will focus on introduction specific genetic principles as they relate to clinical practice. The text for this course will be Genetics in Medicine, 6th Edition and Thompson. Didactic instruction will be enhanced through student led tutorials. All students are expected to review the chapter in advance of class and complete the problem sets at the end of each chapter. The problem sets will be reviewed during the tutorial.

MGC 501 Master's Research Project (Core)

Cr Hr: 6 **Grad Scheme: Letter**

This intent of this project is to enable to the student to learn to pursue a chosen topic through a literature search on atopic approved by the graduate advisor, collection and analysis of data, project report preparation and defence. Actual submission to a journal will be encouraged ,but not required .Although this course officially begins in second year .the trainees are encouraged to identify a project topic and supervisor in their first year so that they are able to begin their research project in the fall of their second year.

MGC 502 Topics in Genetic Counselling I (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

This course will serve as an introduction to the profession of Genetic Counselling and will provide students with the information necessary to function in the clinical setting. Basic skills used by genetic counsellors will be introduced and practiced. Psychodynamic approaches to counselling and their relevance to the field of genetic counselling will be reviewed.

MGC 503 Topics in Genetic Counselling II (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

The course will build upon the foundation established in the second semester and continue to develop the clinical skills used in genetic counselling. Interview and letter writing skills will be reinforced; techniques for presenting genetic information to different age groups, to individuals with cognitive delay and to individuals from different cultural backgrounds will

be reviewed. Available medical and social services for the individual/family with a genetic condition will be discussed.

MGC 504 Genetic Basis of Inherited Disease (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

This course describes the chromosomal basis of human disease and stresses the molecular and biochemical mechanisms underlying inherited disorders. Diagnostic laboratory methods will be an important aspect of this course.

MGC 505 Cancer Genetic Counselling (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

This course will introduce students to the molecular basis, clinical characteristics and management of hereditary cancer syndromes. Specific types of cancer syndromes will be reviewed with emphasis on pedigree evaluation, pathology, management and genetic testing options. The psychosocial impact of these conditions on the family and individual will also be examined.

MGC 506 Biochemical and Newborn Screening (Lab)

Cr Hr: 2 **Grad Scheme: Letter**

Students will develop an understanding of general biochemical laboratory methods, sample requirements and set up, biochemical techniques and quality control issues.

MGC 507 Psychosocial Aspects of Genetic Counselling (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

This course will deal with ethical issues in genetic counselling with special emphasis on prenatal diagnosis. The student will be expected to understand the psychological and social impact genetic disease has on patients and families and how counselling techniques can be modified accordingly. The student will be expected to demonstrate skillful assessment of psychosocial needs of patients and families and to provide appropriate counselling intervention.

MGC 508 Molecular Genetics Practicum (Lab)

Cr Hr: 2 **Grad Scheme: Letter**

Students will develop an understanding of general molecular biology methods, sample requirements, set up, molecular genetic techniques such as DNA isolation, PCR, multiplex PCR, Southern blotting, analysis of results and development of accuracy estimates.

MGC 509 Introduction to Anatomy & Physiology (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

An introduction to the structure and function of human body systems, such as the cardiovascular, musculoskeletal, respiratory, nervous, digestive, renal, reproductive and endocrine systems, including metabolism and homeostasis.

MGC 510 Observational Clinic Rotation (Clin)

Cr Hr: 2 **Grad Scheme: Letter**

In their second semester, students will have the opportunity to observe in wide variety of specialty clinics to learn first-hand about some of the clinical issues faced by individuals/families with these genetic conditions. Students are expected to attend two half-day clinics per week.

MGC 511 Medical Genetics Clinic Practicum (Clin)

Cr Hr: 3 **Grad Scheme: Letter**

In the third semester, students will gain practical experience performing supervised counselling for patients referred to the medical genetics clinic for a variety of health concerns. Students will be responsible for researching the reason for referral, establishing a management plan, obtaining all necessary and available historical information, eliciting and constructing a pedigree, and presenting the patient to the attending physician. Students will have increasing responsibility for counselling patients in clinic, under the supervision of a staff genetic counsellor and/or geneticist.

MGC 512 Prenatal Clinic Practicum (Clin)

Cr Hr: 2 **Grad Scheme: Letter**

This rotation will provide students with practical experience performing genetic counselling for patients referred for prenatal diagnosis.

MGC 513 Advanced Medical Genetics Clinic Practicum (Clin)

Cr Hr: 2 **Grad Scheme: Letter**

This 8 wk. rotation, in the students second year, provides them with an opportunity to further develop and refine their genetic counselling skills. Students will perform supervised genetic counselling for patients referred for a variety of health concerns. Students will have increasing responsibility for counselling including results follow-up and counselling letters.

MGC 514 Ultrasound Clinic Practicum (Clin)

Cr Hr: 2 **Grad Scheme: Letter**

This 8 wk. rotation will provide students with practical experience performing genetic counselling for patients referred for prenatal diagnosis of fetal anomalies on ultrasound.

MGC 515 Islam & Genetic Counselling (Subj)

Cr Hr: 2 **Grad Scheme: Letter**

This course will deal with an exploration of the teachings of Islam as they apply to the practice of genetic counseling within the Kingdom of Saudi Arabia. This course will also introduce students to the basic principles and methods of analysis from ethical theories applicable to contemporary moral problems in biomedical research and professional practice. Course content consists of; Foundations of Bioethics: ethical theories, moral principles, and medical decisions; Ethics of Termination: abortion; impaired infants; euthanasia and physician-assisted suicide; Teachings of Islam as they apply to the practice of genetic counseling within the Kingdom of Saudi Arabia.

MGC 516 Cytogenetics Laboratory Practicum (Lab)

Cr Hr: 2 **Grad Scheme: Letter**

Students will develop an understanding of general cytogenetic laboratory methods, sample requirements and set up, timing, harvesting, slide preparation and analysis. Under the supervision of a technologist, students will perform and complete chromosome analysis on a sample of their own blood (students may request use of another specimen if they wish). Observation of molecular cytogenetic techniques will provide students with an understanding of the process necessary to perform fluorescence in-situ hybridization analysis (FISH).

4.4 Master of Nanoscience & Nanotechnology

MNT 500 Master's Research Thesis (Subj)

Cr Hr: 9 **Grad Scheme: Letter**

MNT 502 Nanobiotechnology (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Classification and categories of nanodiagnostic technologies. Types of nanoparticles and nanotag biolabels. Types of Nanobiosensors. DNA-based nanobiosensors. Diagnosis of diseases using nanobiosensors. Nanoformulation of drugs and their delivery with nanocarriers. Regenerative nanomedicine. Characterization of nanobiosystems. Biomimetic nanotechnology. Ecological advantages and risks of nanotechnology.

MNT 503 Special Topics in Nanomedicine (Subj)

Cr Hr: 3 **Pre-req. MNT 510, MNT 530** **Grad Scheme: Letter**

An in-depth study of a selected topic in Nanomedicine. Topics are chosen according to the interests of students and faculty.

MNT 504 Biosensors & Lab-on-a-Chip (Subj)

Cr Hr: 3 **Pre-req. MNT 510, MNT 530** **Grad Scheme: Letter**

To provide students with advanced, state of the art, knowledge of bioelectronics, biosensors and associated electronic interfaces, bio-analytical chemistry, biomedical imaging, micro fabricated biosensor systems, and lab-on-a-chip technologies.

MNT 510 Fundamentals of Nanoscience & Nanotechnology (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course focuses on the fundamentals of nanoscience such as the basic properties of nanoparticles, structural control of nanoparticles, characterization methods for nanostructured materials, characteristics and behavior of nanoparticles, Environmental and safety issues with nanoparticles.

MNT 511 Renewable Energy Storage Systems (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

The course offers an overview of Energy Storage technologies. A special focus is given to technologies that can be utilized at grid scale for renewable energy systems. Both the theory and the applied technologies of direct electric, electromechanical, and electrochemical energy storage systems are covered. Technologies include pumped hydroelectric, fly-wheel, compressed air, Nickel Metal hydride, Sodium-Sulfur, capacitors, and magnetic energy storage. The coverage of these technologies relates them to their application scope of power quality, bridging power, and energy management. In addition, design factors are addressed including efficiency computations and cost per unit storage capacity.

MNT 512 Polymer Nanocomposites (Subj)

Cr Hr: 3 **Pre-req. MNT 510, MNT 530** **Grad Scheme: Letter**

This is introductory course in polymer nanocomposites will focus on materials, manufacturing methods, characterization, and applications. It will include different types of nanomaterials that are commonly used in modifying the polymer matrix composites.

MNT 513 Topics in Nanomaterials Science (Subj)

Cr Hr: 3 **Pre-req. MNT 510, MNT 530** **Grad Scheme: Letter**

An in-depth study of a selected topic in materials sciences and nanomaterials. Topics are chosen according to the interests of students and faculty.

MNT 520 Applications of Nanoscience in Nanotechnology (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course focuses on various applications of nanotechnologies such as: Catalysis; surface area of nanoparticles and porous materials. Carbon nanostructures; Nanodevices and Nanomedicine.

MNT 530 Experimental Techniques in Nanotech - I (Core)

Cr Hr: 3 **Grad Scheme: Letter**

The courses will focus on a variety of instrumental methods and techniques commonly applied to the characterization of nanomaterials. Particular attention will be placed on the theory behind the measurements, instrument safety, sample preparation and data analysis/interpretation. Experimental Techniques in part one, Experimental Techniques in Nanoscience I (MNT530) will focus on X-ray, optical and electron characterization techniques.

MNT 540 Experimental Techniques in Nanotech - II (Core)

Cr Hr: 3 **Prereq. MNT 510, MNT520** **Grad Scheme: Letter**

The courses will focus on a variety of instrumental methods and techniques commonly applied to the characterization of nanomaterials. Particular attention will be placed on the theory behind the measurements, instrument safety, sample preparation and data analysis/interpretation. Part two, Experimental Techniques in Nanoscience II (MNT 540), will cover morphological and physical properties characterization tools.

4.5 Master of Public Health

MPH 500 Principles of Biostatistics (Core)

Cr Hr: 3 **Grad Scheme: Letter**

The main purpose of this course is to introduce selected important topics in bio statistical concepts and its utility to public health students and to train them to use statistical software to perform data analysis, draw graphs, and report results.

MPH 501 Capstone [Research Project] (Core)

Cr Hr: 6 **Grad Scheme: Letter**

MPH 502 Principles of Epidemiology (Core)

Cr Hr: 3 **Grad Scheme: Letter**

The main purpose for this course is to teach MPH students the basic principles and methods of epidemiology, including disease (outcome) measures, measures of association, study design options, bias, and confounding so that they become critical consumers of the public health literature.

MPH 503 Environmental & Occupational Health (Core)

Cr Hr: 3 **Grad Scheme: Letter**

The main objective of this course is to teach the MPH students the basic principles of environmental health and the sources of hazards to human health that exist within the Saudi environment. This knowledge allows the students to develop strategies that effectively intervene to alleviate and potentially on the long run, prevent adverse health effects caused by environmental agents and conditions prevalent in the Kingdom.

MPH 504 Communicable Diseases (Core)

Cr Hr: 3 **Grad Scheme: Letter**

MPH 505 Non Communicable Disease (Core)

Cr Hr: 3 **Grad Scheme: Letter**

MPH 506 Social & Behavioural Determinants of Health (Core)

Cr Hr: 3 **Grad Scheme: Letter**

The main purpose of this course is to teach the MPH students the basic principles of the field of social and behavioral determinants of health including the theoretical & methodological approaches to the study of social determinants of health, the role of social determinants in the health of individuals and society, and present evidence for social determinants of health and their relationship to health outcomes.

MPH 507 Advanced Biostatistics (Subj)

Cr Hr: 3 **(Pre-req. MPH 500)** **Grad Scheme: Letter**

MPH 508 Advanced Epidemiology (Subj)

Cr Hr: 3 **Pre-req. MPH 502** **Grad Scheme: Letter**

MPH 509 Regression Analysis (Subj)

Cr Hr: 3 Pre-req. MPH 500 Grad Scheme: Letter

MPH 510 Principles of Mass Gathering Health (Subj)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

The main purpose of this course is to describe and discuss the public health principles of Hajj as an event of mass gathering. Additional objectives include discussing the dynamics of the Hajj event, its boundaries, dates and available contingencies, define the main elements of the Incident Command System, describing the responsibilities of the various services participating in the preparation, monitoring, and response during Hajj, and finally summarizing interdependence of various services health and safety related to engineering, and health communications.

MPH 511 Principles of Disaster Management (Subj)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

MPH 512 Emerging Infections & Infectious Diseases Management (Subj)

Cr Hr: 3 Pre-req. MPH 505, MPH 502 Grad Scheme: Letter

MPH 513 Health Care Policy (Subj)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

The main purpose of this course is to provide the MPH students with a framework for understanding, developing and analyzing a range of healthcare policy issues. The course begins by introducing an approach for analyzing any public healthcare policy issue. It will explore how policy formation will impact access, quality, costs, as well as medical innovation. It will also discuss policy related issue such as health insurance.

MPH 514 Quality Assurance in Public Health (Subj)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

MPH 515 Health Care Management (Subj)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

The main purpose of this course is to develop the knowledge themes that management of healthcare depends on including leadership perspectives, healthcare policy, ethics and legal aspects of healthcare. The development of such themes allows the MPH students to apply them in real life situations.

MPH 516 Survival Analysis (Elect)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

MPH 517 Categorical Data Analysis (Elect)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

MPH 518 Ethics in Research (Elect)

Cr Hr: 3 Grad Scheme: Letter

MPH 519 Public Health and Healthcare Systems in KSA (Elect)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

MPH 520 Health Economics (Elect)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

MPH 521 Health Informatics (Elect)

Cr Hr: 3 Pre-req. MPH 500, MPH 502 Grad Scheme: Letter

MPH 522 Global Health (Elect)

Cr Hr: 3 Grad Scheme: Letter

Global Health with a concentration on the developing world and emerging economies (LMIC) is an introduction to the major health issues of LMIC nations, social determinants of health, models for addressing health disparities, innovations for improving health, health and human rights and the role of international organizations in improving global health. Students will explore the major demographic and economic changes, causes of morbidity and mortality, review factors which influence these outcomes, look at health systems, examine the role of human rights and analyze strategies to improve health and recommendation sustainable solutions.

MPH 523 Research Design (Elect)

Cr Hr: 3 Pre-req. MPH 500 Grad Scheme: Letter

MPH 524 Nutrition (Elect)

Cr Hr: 3 Grad Scheme: Letter

4.6 Master of Radiological & Imaging Sciences

MRS 500 Radiation Counting Statistics (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course is designed to review the fundamental principles of probability and statistics. The course cover formal in-classroom lectures, self-directed learning with guided tutorials, and statistical analysis sessions. At the conclusion of the course, students will have developed necessary skills to understand and perform basic statistical analysis of radiation counting and biomedical research data and interpretation.

MRS 501 RIS Research Project (Core)

Cr Hr: 6 **Grad Scheme: Letter**

The intent of this project is to enable to the student to learn to pursue a chosen topic through a literature search on a topic approved by the graduate advisor, collection and analysis of data, project report preparation and defense. Actual submission to a journal will be encouraged, but not required. Although this course officially begins in second year, the trainees are encouraged to identify a project topic and supervisor in their first year so that they are able to begin their research project in the winter of their second year. The Project Advisor and one other faculty member will evaluate the written project submission. The written project report submission will be worth 70% of the overall letter grade assigned to the student, the remaining 30% will be assigned to the oral defense of the project report.

MRS 502 Radiological Research (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course is requires students to work in groups on a hypothetical research grant application in the general area of their research interest based on a list of case studies provided by the instructor. Upon completion of the course students will be able to: prepare a comprehensive literature review on a specific research area; write concise project objectives; expand on project objectives by developing a salient methodology; propose a management plan to coordinate a project; write a detailed budget estimate; explain (briefly) the expected results; and develop a short CV.

MRS 503 Ethics in Radiology (Core)

Cr Hr: 2 **Grad Scheme: Letter**

This course is designed to introduce students to the basic principles of ethical theories applicable to exposing humans to radiation, a known carcinogen. I will also discuss ethics of biomedical research and professional practice, including scope and code of practice in each radiologic profession as set by its respective professional organization.

MRS 504 - Radiological and Imaging Sciences I (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course discusses basic sciences of radiological professions including physics, radiation interactions, instrumentation, data capture, processing and management.

MRS 505 Radiological and Imaging Sciences II (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This course will deal with radiological imaging modalities: conventional and digital radiography, mammography, and interventional radiology. Computer tomography, bone densitometry, magnetic resonance imaging and ultrasound imaging. Image storage and

transmission systems PACS, teleradiology.

MRS 506 Topics in Medical Imaging (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This is the first of three required courses for all students in the program. The course is designed to review ad survey all diagnostic medical imaging modalities, their physical principles and their clinical applications. Examples include: digital radiography, fluoroscopy, sonography, magnetic resonance imaging, computed tomography and interventional procedures.

MRS 507 Topics in Radiation Therapy (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This is the second of a series of three required courses for all students in the program. The course is designed to review ad survey all radiation therapy modalities, their physical principles and their clinical applications. Examples include: brachytherapy, external beam therapy including advance methods like cyberknife, IMRT and IGRT.

MRS 508 Topics in Nuclear Medicine (Core)

Cr Hr: 3 **Grad Scheme: Letter**

This is the second of three required course for all students in the program. The course is designed to review ad survey all nuclear medical imaging and therapeutic modalities, their physical principles and their clinical applications. Examples include: planar nuclear imaging, SPECT/CT and PET/CT as well as radionuclidic therapy applications.

MRS 509 RIS Seminar (Core)

Cr Hr: 1 **Grad Scheme: Letter**

The course aims to train the students for in-classroom research presentation in preparation for their oral defenses. In doing so, they will be asked to research the literature on current developments in the radiological and imaging sciences, prepare slide presentations, write brief reports and present their slide to peers in the classroom.

MRS 510 Academic Program Management (Core)

Cr Hr: 3 **Grad Scheme: Letter**

Orientation to academic program directorship, faculty and staff management, student affairs, faculty and academic affairs, the higher education system in the KSA, USA and other examples and how colleges and universities work. Self-study preparation, applying for and maintaining accreditation, site visits, etc. Introduction to the meaning and concepts of serving as radiological and imaging sciences faculty. Topics include scholarship, advisement, teaching plus faculty recruitment, retention, and development. Principles and practice of effective pedagogy, curriculum development and evaluation in radiological and imaging sciences.

MRS 511 Faculty Development (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Pedagogical orientation to academic programs, faculty and staff management, student affairs, faculty and academic affairs, and the higher education system in the KSA. Principles and practice of effective pedagogy, curriculum development and evaluation in radiological and imaging sciences. Outcome assessments, benchmarking.

MRS 512 RIS Instruction & Assessment (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

RIS instruction and assessment includes principles and practice of effective pedagogy, curriculum development and evaluation in radiological and imaging sciences. Outcome assessments, benchmarking.

MRS 513 RIS Academic Program Accreditation (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Application for and maintenance of clinical professional accreditation of clinical operations. Emphasis on the role of the radiological administrator. Principles and practice of effective pedagogy, curriculum development and evaluation in radiological and imaging sciences.

MRS 514 Radiologic Financial Management (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

This course is designed to survey the field of finance and provide the foundation in relation to the health sciences industry. Topics include sources of business and financial information, financial statement analysis, the time value of money, the nature and measurement of risk, financial institutions, investments and corporate finance.

MRS 515 Personnel Management in Radiology (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

This course provides an in-depth review of case studies in contemporary, diverse workforce issues in a variety of health care environments. Students examine current human resource theories and models and published studies on personnel management issues. They then develop simulations and formulate innovative solutions for recruiting, training, and retaining health care personnel.

MRS 516 Clinical Accreditation & QM (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Application for and maintenance of clinical professional accreditation of clinical operations, i.e, ACR and ACNAHL. Emphasis on the role of the radiological administrator. Students will learn to view quality from a variety of functional perspectives and in the process, gain a better understanding of the problems associated with improving quality, also quality tools utilized in service and international/ environments.

MRS 517 Professional Development (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

MRS 518Ultrasound Physics (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Presents general acoustic principles including sound wave parameters, energy transfer, through wave propagation, pulsed and continuous wave generation and parameters, surface reflection processes, and transducer construction. Discusses beam profile consideration and an introduction to A-mode, B-mode, and M-mode. Emphasizes applied principles of physics, knobology, and instrumentation relative to ultrasound. Discussion of properties of sound and presents advanced concepts including computer technology and the instrumentation used to create and store the ultrasound image, and introduction to fluid dynamics, spectral, color and amplitude Doppler. Emphasizes advanced principles of physics, knobology, acoustical artifacts, bioeffects/safety and quality assurance relative to ultrasound.

MRS 519 Sonography Cross-Sectional Anatomy (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Introduces gross anatomic structures and abnormalities of cranial, neck, thoracic, abdominal and pelvic regions relative to diagnostic ultrasound. Presents correlations to cadaver slides as well as CT and MRI images.

MRS 520 Abdominal Sonography (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Presents normal and pathophysiological abdominal anatomy, physiology, related vasculature, scanning techniques and protocols regarding the abdominal sonographic examination.

MRS 521Pelvic Sonography (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Presents female pelvic anatomy, physiology, pathophysiology, related vasculature, scanning techniques and protocols regarding the pelvic sonographic examination. Reviews the anatomy and physiology of reproduction. Presents normal and abnormal first trimester sonography.

MRS 522 Obstetrical Sonography (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Presents obstetrical applications of diagnostic ultrasound. Reviews the anatomy and physiology of fetal development. Presents normal and abnormal second and third trimester sonography. Emphasizes obstetrical measurements and fetal dynamics.

MRS 523 Clinical Sonography (Subj)

Cr Hr: 3 **Grad Scheme: Letter**

Students perform sonographic procedures during clinical rotations at affiliate sites under the supervision of designated clinical instructors. Evaluation of cognitive, effective and psychomotor skills is based on competency in scanning protocols and techniques, professionalism and proficiency in patient care. Provides supervised clinical practice of obstetrical and gynecological sonography in a clinical setting.

5. Curricula & Study Plans

5.1 Master Degree in Business Administration (MBA)

Curriculum

Credit Hours Required for a Master of Business Administration (MBA)

Type of Courses	Compulsory	Elective	Total
Core	24	-	24
Subject	-	-	-
Electives	-	18	18
Total	24	18	42

Core Courses (24 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MBA 511	Quantitative Analysis	3	-
MBA 513	Managerial Economics	3	MBA 511
MBA 510	Managerial Accounting	3	MBA 511
MBA 514	Organizational Behavior	3	-
MBA 512	Marketing Management	3	-
MBA 516	Managerial Finance	3	MBA 514
MBA 522	Operations Strategy	3	MBA 511
MBA 519	Strategic Management	3	6 core courses

Elective Courses (18 Cr Hr)

Course No.	Course Name	Cr.	Prerequisite
MBA 515	Research Methodology	3	MBA 511
MBA 530	Managing Strategic Business Projects	3	MBA 511
MBA 534	Leading Organizational Change	3	MBA 514
MBA 538	Entrepreneurship and Innovation	3	MBA 514, MBA 513
MBA 541	HR planning, Recruitment & Selection	3	MBA 518
MBA 546	Comparative Management	3	MBA 514
MBA 547	Contemporary International Management Issues	3	MBA 514
MBA 558	Value Innovation Strategy	3	MBA 538
MBA 543	Internet Marketing Strategy	3	MBA 512
MBA 544	Financial Statement Analysis & Security Valuation	3	MBA 510
MBA 535	Applied Business Research Project	3	MBA 511
MBA 520	Applied Management Skills		-
MBA 560	Healthcare Management	3	-
MBA 518	Human Resource Management	3	MBA 514
MBA 545	Independent Study	3	-
MBA 548	Independent Study	2	-
MBA 590	Real Estate Analysis	3	MBA 513
MBA 550	Service Marketing	3	MBA 512

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
MBA 511	Quantitative Analysis	3	-	MBA 510	Managerial Accounting	3	MBA 511
MBA 513	Managerial Economics	3	MBA 511	MBA 514	Organizational Behavior	3	-
Elective		3		Elective		3	
Elective		3		Elective		3	
	TOTAL	12			TOTAL	12	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
MBA 512	Marketing Management	3	-	MBA 522	Operations Strategy	3	MBA 511
MBA 516	Managerial Finance	3	MBA 514	MBA 519	Strategic Management	3	6 core courses
Elective		3		Elective		3	
	TOTAL	9			TOTAL	9	

5.2 Master Degree in Biomedical Sciences (MBS)

5.2.1 Analytical Biochemistry

Curriculum

Credit Hours Required for a Masters of Biomedical Sciences

Type of Courses	Compulsory	Elective	Total
Core	9	-	9
Subject	15	-	15
Research Thesis	9	-	9
Free Electives	-	-	-
Total	**33**	**-**	**33**

Core Courses (9 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
REC 502	Biostatistics	3	
REC 503	Research Methodologies	3	
REC 504	Biomedical Ethics	3	-

Subject Courses (15 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MBS 500	Basics of Molecular & Cell Biology	3	
MBS 505	Advanced Biochemistry	3	
MBS 551	OMICS techniques and their applications	3	
MBS 552	Advanced analytical Biochemistry	3	
MBS 553	Analytical techniques for Clinical Biochemistry	3	

Core and Subject courses:	24
Master's Research Thesis (REC 500)	9
TOTAL CREDIT HOURS REQUIRED	**33**

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 502	Biostatistics	3		REC 504	Biomedical Ethics	3	-
REC 503	Research Methodologies	3		MBS 551	OMICS techniques and their applications	3	
MBS 500	Basics of Molecular & Cell Biology	3		MBS 552	Advanced analytical Biochemistry	3	
	TOTAL	9			TOTAL	9	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 500	Research Thesis A	cc (0)		REC 500	Research Thesis B	9	
MBS 553	Analytical techniques for Clinical Biochemistry	3					
MBS 505	Advanced Biochemistry	3					
	TOTAL	6			TOTAL	9	

5.2.2 Biotechnology

Curriculum

Credit Hours Required for a Masters of Biomedical Sciences

Type of Courses	Compulsory	Elective	Total
Core	9	-	9
Subject	15	-	15
Research Thesis	9	-	9
Free Electives	-	-	-
Total	**33**	**-**	**33**

Core Courses (9 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
REC 502	Biostatistics	3	
REC 503	Research Methodologies	3	
REC 504	Biomedical Ethics	3	-

Subject Courses (15 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MBS 500	Basics of Molecular & Cell Biology	3	
MNT 502	Nano biotechnology	3	
MBS 505	Advanced Biochemistry	3	
MBS 541	Analytical Biotechnology	3	
MBS 542	Techniques of Biotechnology	3	

Core and Subject courses:	24
Master's Research Thesis (REC 500)	9
TOTAL CREDIT HOURS REQUIRED	**33**

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 502	Biostatistics	3		REC 504	Biomedical Ethics	3	-
REC 503	Res Methodologies	3		MNT 502	Nano biotechnology	3	
MBS 500	Bas Molec Cell Biology	3		MBS 541	Analytical Biotechnology	3	
	TOTAL	**9**			**TOTAL**	**9**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 500	Research Thesis A	cc (0)		REC 500	Research Thesis B	9	
MBS 542	Techniq Biotechnology	3					
MBS 505	Adv Biochemistry	3					
	TOTAL	**6**			**TOTAL**	**9**	

5.2.3 Clinical Embryology & Reproductive Biology

Curriculum

Credit Hours Required for a Masters of Biomedical Sciences

Type of Courses	Compulsory	Elective	Total
Core	9	-	9
Subject	15	-	15
Research Thesis	9	-	9
Free Electives	-	-	-
Total	**33**	**-**	**33**

Core Courses (9 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
REC 502	Biostatistics	3	
REC 503	Research Methodologies	3	
REC 504	Biomedical Ethics	3	-

Subject Courses (15 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MBS 500	Basics of Molecular & Cell Biology	3	
MBS 527	Practical Molecular Biology	2	
MBS 521	Reproductive Biology and Embryology	2	
MBS 522	Introduction to Assisted Reproduction	2	
MBS 523	Infertility and Reproductive Medicine	2	
MBS 524	Semen analysis and processing/Andrology	2	
MBS 525	Advanced Assisted Reproduction	2	

Core and Subject courses:	24
Master's Research Thesis (REC 500)	9
TOTAL CREDIT HOURS REQUIRED	**33**

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 502	Biostatistics	3		REC 504	Biomedical Ethics	3	-
REC 503	ResMethodologies	3		MBS 527	Pract Molecular Biol	2	
MBS 500	Bas Molec Cell Biology	3		MBS 521	Repr Biology Embryol	2	
				MBS 522	Intro Assisted Reprod	2	
	TOTAL	**9**			**TOTAL**	**9**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 500	Research Thesis-A	cc (0)		REC 500	Research Thesis-B	9	
MBS 523	Infert Reprod Med	2					
MBS 524	Sem anal proc/Androl	2					
MBS 525	Adv Assisted Reprod	2					
	TOTAL	**6**			**TOTAL**	**9**	

5.2.4 Infection Control

Curriculum

Credit Hours Required for a Masters of Biomedical Sciences

Type of Courses	Compulsory	Elective	Total
Core	9	-	9
Subject	18		18
Research Thesis	9	-	9
Free Electives	-		
Total	36		36

Core Courses (9 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
REC 502	Biostatistics	3	
REC 503	Research Methodologies	3	
REC 504	Biomedical Ethics	3	-

Subject Courses (18 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MBS 531	Basics of Microbiology	3	
MBS 532	Fundamentals of Epidemiology and Surveillance	3	
MBS 533	Infection Control Program Design & Management	3	
MBS 534	Environmental management	3	
MBS 535	Patient care proc. & evid. based infection control pract	3	
MBS 536	Competencies in Inf Control (Pract /Clinical in Hospital)	3	

Core and Subject courses:	27
Master's Research Thesis (REC 500)	9
TOTAL CREDIT HOURS REQUIRED	**36**

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
RESC 501	Statistics I	3	Math XX	RESC 502	Res Methodologies	3	RESC 501
RESC 503	Biomedical Ethics	3		MBS 533	Infection Control Progr Design & Management	3	
MBS 531	Basics of Microbiology	3		MBS 534	Environ management	3	
MBS 532	Fund of Epid & Surveill	3					
	TOTAL	**12**			**TOTAL**	**9**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 500	Research Thesis-A	cc (0)		REC 500	Research Thesis-B	9	
MBS 535	Patient care proc & evid based inf control pract	3					
MBS 536	Compet in Inf Control (Pract /Clin in Hosp)	3					
	TOTAL	**9**			**TOTAL**	**9**	

5.2.5 Molecular & Cell Biology

Curriculum

Credit Hours Required for a Masters of Biomedical Sciences

Type of Courses	Compulsory	Elective	Total
Core	9	-	9
Subject	15	-	15
Research Thesis	9	-	9
Free Electives	-	-	-
Total	**33**	**-**	**33**

Core Courses (9 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
REC 502	Biostatistics	3	
REC 503	Research Methodologies	3	
REC 504	Biomedical Ethics	3	-

Subject Courses (15 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MBS 500	Basics of Molecular & Cell Biology	3	
MBS 501	Topics in Integrated & System Biology	3	
MBS 502	Methods in Molecular & Cellular Biology	3	MBS 500
MBS 505	Advanced Biochemistry	3	Biochemistry
MBS 503	Signal Transduction I	3	MBS 500

Core and Subject courses:	24
Master's Research Thesis (REC 500)	9
TOTAL CREDIT HOURS REQUIRED	**33**

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
RESC 501	Statistics I	3	Math XX	RESC 502	Res Methodologies	3	RESC 501
RESC 503	Biomedical Ethics	3		MBS 501	Topics in Integrated & System Biology	3	
MBS 500	Basics of Molecular & Cell Biology	3		MBS 502	Methods in Molec & Cellular Biology	3	MBS 500
	TOTAL	**9**			**TOTAL**	**9**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 500	Research Thesis A	cc (0)		REC 500	Research Thesis B	9	
MBS 505	Adv Biochemistry	3	Biochem				
MBS 503	Signal Transduct I	3	MBS 500				
	TOTAL	**6**			**TOTAL**	**9**	

5.3 Master Degree in Genetic Counselling (MGC)

Curriculum

Credit Hours Required for a Masters of Genetic Counselling

Type of Courses	Compulsory	Elective	Total
Subject	19	-	19
Practicums & Clinical Rotations	17		17
Project	6	-	6
Clinical Internship	0		0
Total	**42**	**-**	**42**

Subject Courses (19 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
REC 503	Research Methodology	3	-
MGC 500	Intro to Population 7 Medical Genetics	2	-
MGC 502	Topics in Genetic Counseling I	2	-
MGC 503	Topics in Genetic Counseling II	2	-
MGC 504	The Genetic Basis of Inherited Disease	2	-
MGC 505	Cancer Genetic Counseling	2	-
MGC 507	Psychosocial Asp of Genetic Counseling	2	-
MGC 509	Introduction to Anatomy & Physiology	2	-
MGC 515	Genetic Counseling & Islam	2	-

Practicums & Clinical Rotations (17 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MGC 506	Biochemical & Newborn Screening Lab Practicum	2	
MGC 508	Molecular Genetics Practicum	2	
MGC 510	Observational Clinic Rotation	2	
MGC 511	Medical Genetics Clinic Practicum	3	
MGC 512	Prenatal Clinic Practicum	2	
MGC 513	Advanced Medical Genetics Clinic Practicum	2	
MGC 514	Ultrasound Clinic Practicum	2	
MGC 516	Cytogenetics Laboratory Practicum	2	

Subject and Clinical courses:	36
Master's Research Project (MGC 501)	6
Clinical Internship (MGC 517)	0
TOTAL CREDIT HOURS REQUIRED	**42**

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
REC 503	Research Method	3	-	MGC 505	Cancer Gen Counseling	2	-
MGC 500	Intro Pop & Med Gen	2	-	MGC 507	Psyc Asp Gen Counseling	2	-
MGC 502	Top in Gen Counseling I	2	-	MGC 509	Intro Anat & Physiology	2	-
MGC 503	Top in Gen Counseling II	2	-	MGC 515	Gen Counseling & Islam	2	-
MGC 504	Gen Basis Inher Disease	2	-	MGC 506	Bioch& Newb Scr Lab Prac	2	
	TOTAL	**11**			**TOTAL**	**10**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course No.	Course Name	Cr.	Pre-req	Course No	Course Name	Cr	Pre-req
MGC 508	Mol Gen Practicum	2		MGC 514	Ultrasound Clinic Prac	2	
MGC 510	Obs Clinic Rotation	2		MGC 516	Cytogenetics Lab Prac	2	
MGC 511	Med Gen Clinic Prac	3		MGC 501	Research Project	6	
MGC 512	Prenatal Clinic Prac	2					
MGC 513	Adv Med Gen Cl Pr	2					
	TOTAL	**11**			**TOTAL**	**10**	

5.4 Master Degree in Nanoscience & Nanotechnology (MNT)

5.4.1 Nano materials for Energy & Environmental Applications

Curriculum

Credit Hours Required for a Masters of Nanoscience & Nanotechnology

Type of Courses	Compulsory	Elective	Total
Core	12	-	12
Subject	12	-	12
Research Thesis	9	-	9
Total	**33**	**-**	**33**

Core Courses (12 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
MNT 510	Introduction of Nanoscience and Nanotechnology I	3	
MNT 530	Experimental Techniques in Nanotech - I	3	
MNT 520	Introduction to Nanoscience in Nanotechnology II	3	
MNT 540	Experimental Techniques in Nanotech - II	3	MNT 510, MNT530

Subject Courses (9 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MNT 511	Renewable Energy Storage Systems	3	
MNT 512	Polymer Nanocomposites	3	MNT 510, MNT530
MNT 513	Topics in Nanomaterials Science	3	MNT 510, MNT530

Choose one Subject Course from below (3 Credit Hours)**:**

Course No.	Course Name	Cr.	Prerequisite
MNT 502	Nano biotechnology	3	
MNT 503	Special topic in Nanomedicine	3	MNT 510, MNT530
MNT 504	Biosensors and Lab on a chip	3	MNT 510, MNT530

Core and Subject courses:	24
Master's Research Thesis (REC 500)	9
TOTAL CREDIT HOURS REQUIRED	**33**

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course	**Course Name**	**Cr.**	**PreR**	**Course**	**Course Name**	**Cr**	**Pre-req**
MNT 510	Intr Nanosci & Nanotech I	3		MNT 520	Intr Nanosci Nanotech II	3	
MNT 530	Exp Techn in Nanotech I	3		MNT 540	Exp Techn Nanotech - II	3	MNT 510 MNT 530
MNT 511	Ren Energy Storage Syst	3		MNT 512	Polym Nanocomposites	3	MNT 510 MNT 530
	TOTAL	**9**			**TOTAL**	**9**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course	**Course Name**	**Cr.**	**Pre-req**	**Course**	**Course Name**	**Cr**	**Pre-req**
REC 500	Research Thesis A	CC(0)		REC 500	Research Thesis B	9	
MNT	Subject	3					
MNT 513	Topics Nanomat Sci	3	MNT510, MNT530				
	TOTAL	**6**			**TOTAL**	**9**	

5.4.2 Nanomedicine & Nanodiagnostics

Curriculum

Credit Hours Required for a Masters of Nanoscience & Nanotechnology

Type of Courses	Compulsory	Elective	Total
Core	12	-	12
Subject	12	-	12
Research Thesis	9	-	9
Total	**33**	**-**	**33**

Core Courses (12 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
MNT 510	Intro Nanoscience and Nanotechnology I	3	
MNT 530	Experimental Techniques in Nanotech - I	3	
MNT 520	Intro Nanoscience in Nanotechnology II	3	
MNT 540	Experimental Techniques in Nanotech - II	3	MNT 510, MNT530

Subject Courses (9 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MNT 502	Nano biotechnology	3	
MNT 503	Special topic in Nanomedicine	3	MNT 510, MNT530
MNT 504	Biosensors and Lab on a chip	3	MNT 510, MNT530

Choose one Subject Course from below (3 Credit Hours)**:**

Course No.	Course Name	Cr.	Prerequisite
MNT 511	Renewable Energy Storage Systems	3	
MNT 512	Polymer Nanocomposites	3	MNT 510, MNT530
MNT 513	Topics in Nanomaterials Science	3	MNT 510, MNT530

Core and Subject courses:	24
Master's Research Thesis (MNT 500)	9
TOTAL CREDIT HOURS REQUIRED	**33**

Suggested Study Plan

First Year / Fall Semester				**First Year/Winter Semester**			
Course	**Course Name**	**Cr.**	**PreR**	**Course**	**Course Name**	**Cr**	**Pre-req**
MNT 510	Intr Nanosci & Nanotech I	3		MNT 520	Intr Nanosci Nanotech II	3	
MNT 530	Exp Techn in Nanotech I	3		MNT 540	Exp Techn Nanotech - II	3	MNT 510 MNT 530
MNT 502	Nano biotechnology	3		MNT 503	Special topic Nanomed	3	MNT 510 MNT 530
	TOTAL	**9**			**TOTAL**	**9**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course	**Course Name**	**Cr.**	**Pre-req**	**Course**	**Course Name**	**Cr**	**Pre-req**
REC 500	Research Thesis A	CC(0)		REC 500	Research Thesis B	9	
MNT	Subject	3					
MNT 504	Biosens Lab on chip	3	MNT510, MNT530				
	TOTAL	**6**			**TOTAL**	**9**	

5.5 Master Degree in Public Health (MPH)

5.5.1 Biostatistics & Epidemiology

Curriculum

Credit Hours required for a Masters of Public Health: courses option

Type of Courses	Compulsory	Elective	Total
Core	18	-	18
Subject	9	-	9
Elective	-	6	6
Practicum	3	-	3
Capstone	6	-	6
Seminar	1	-	1
Total	**37**	**6**	**43**

Core Courses (18 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
MPH 500	Principles of Biostatistics	3	
MPH 502	Principles of Epidemiology	3	
MPH 503	Environmental and Occupational Health	3	
MPH 504	Communicable Diseases	3	
MPH 505	Non Communicable Disease	3	
MPH 506	Social & Behavioral Determinants of Health	3	

Subject Courses (9 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MPH 507	Advanced Biostatistics	3	MPH 500
MPH 508	Advanced Epidemiology	3	MPH 502
MPH 509	Regression Analysis	3	MPH 500

Elective Courses (Students choose 6 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MPH 516	Survival Analysis	3	MPH 500, MPH 502
MPH 517	Categorical Data Analysis	3	MPH 500, MPH 502
MPH 518	Ethics in Research	3	
MPH 519	Public Health and Healthcare Systems in KSA	3	MPH 500, 502
MPH 520	Health Economics	3	MPH 500. 502
MPH 521	Health Informatics	3	MPH 500, 502
MPH 523	Research Design	3	MPH 500, 502

Core and Subject courses:	27	
Elective courses	6	
Practicum:	3	
Capstone (Research Project) MPH 501:	6	
Seminar	1	
TOTAL CREDIT HOURS REQUIRED	**43**	

Suggested Study Plan

First Year / Fall Semester				First Year/Winter Semester			
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**Pre-req**
MPH 500	Principles of Biostatistics	3		MPH 505	Non Communicable Dis	3	
MPH 502	Principles Epidemiology	3		MPH 506	Soc Behav Deter Health	3	
MPH 503	Environ Occupat Health	3		MPH 507	Advanced Biostatistics	3	MPH 500
MPH 504	Communicable Diseases	3		MPH 508	Advanced Epidemiology	3	MPH 502
	TOTAL	**12**			**TOTAL**	**12**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**Pre-req**
MPH 509	Regression Analysis	3	MPH 500		Practicum	3	
MPH	Elective	3		MPH 501	Capstone	6	
MPH	Elective	3					
	TOTAL	**9**			**TOTAL**	**9**	

5.5.2 Mass Gathering

Curriculum

Credit Hours required for a Masters of Public Health: courses option

Type of Courses	Compulsory	Elective	Total
Core	18	-	18
Subject	9	-	9
Elective	-	6	6
Practicum	3	-	3
Capstone	6	-	6
Seminar	1	-	1
Total	**37**	**6**	**43**

Core Courses (18 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
MPH 500	Principles of Biostatistics	3	
MPH 502	Principles of Epidemiology	3	
MPH 503	Environmental and Occupational Health	3	
MPH 504	Communicable Diseases	3	
MPH 505	Non Communicable Disease	3	
MPH 506	Social & Behavioral Determinants of Health	3	

Subject Courses (9 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MPH 510	Principles of Mass Gathering Health	3	MPH 500, 502
MPH 511	Principles of Disaster Management	3	MPH 500, 502
MPH 512	Emerging Infect & Infect Dis Management	3	MPH 505, 502

Elective Courses (Students can choose 6 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MPH 523	Research Design	3	MPH 500
MPH 524	Nutrition	3	
MPH 518	Ethics in Research	3	
MPH 519	Public Health & Healthcare Syst in KSA	3	MPH 500, 502
MPH 520	Health Economics	3	MPH 500. 502
MPH 521	Health Informatics	3	MPH 500, 502
MPH 522	Global Health	3	

Core and Subject courses:	27
Elective courses	6
Practicum:	3
Capstone (Research Project) MPH 501:	6
Seminar	1
TOTAL CREDIT HOURS REQUIRED	**43**

Suggested Study Plan

	First Year / Fall Semester				First Year/Winter Semester		
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**Pre-req**
MPH 500	Principles of Biostatistics	3		MPH 505	Non Communicable Dis	3	
MPH 502	Principles Epidemiology	3		MPH 506	Soc Behav Deter Health	3	
MPH 503	Environ Occupat Health	3		MPH 510	Princ Mass Gath Health	3	MPH 500, 502
MPH 504	Communicable Diseases	3		MPH 511	Princ Disaster Manag	3	MPH 500, 502
	TOTAL	**12**			**TOTAL**	**12**	
	Second Year / Fall Semester				**Second Year/ Winter Semester**		
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**Pre-req**
MPH 512	Em Infect Dis Manag	3	MPH505,502		Practicum	3	
MPH	Elective	3		MPH 501	Capstone	6	
MPH	Elective	3					
	TOTAL	**9**			**TOTAL**	**9**	

5.5.3 Health Policy

Curriculum

Credit Hours required for a Masters of Public Health: courses option

Type of Courses	Compulsory	Elective	Total
Core	18	-	18
Subject	9	-	9
Elective	-	6	6
Practicum	3	-	3
Capstone	6	-	6
Seminar	1	-	1
Total	**37**	**6**	**43**

Core Courses (18 Credit Hours)

Course	Name	Cr	Prerequisite
MPH 500	Principles of Biostatistics	3	
MPH 502	Principles of Epidemiology	3	
MPH 503	Environmental and Occupational Health	3	
MPH 504	Communicable Diseases	3	
MPH 505	Non Communicable Disease	3	
MPH 506	Social & Behavioral Determinants of Health	3	

Subject Core Courses (9 Credit Hours)

Course	Name	Cr	Prerequisite
MPH 513	Health Policy	3	MPH 500, 502
MPH 514	Quality Assurance in Public Health	3	MPH 500, 502
MPH 515	Health Systems Management	3	MPH 500, 502

Elective Courses (Students choose 6 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MPH 523	Research Design	3	MPH 500
MPH 524	Nutrition	3	
MPH 518	Ethics in Research	3	
MPH 519	Public Health and Healthcare Systems in KSA	3	MPH 500, 502
MPH 520	Health Economics	3	MPH 500. 502
MPH 521	Health Informatics	3	MPH 500, 502
MPH 522	Global Health	3	
Core and Subject courses:		27	
Elective courses		6	
Practicum:		3	
Capstone (Research Project) MPH 501:		6	
Seminar		1	
TOTAL CREDIT HOURS REQUIRED		**43**	

Suggested Study Plan

	First Year / Fall Semester				First Year/Winter Semester		
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**Pre-req**
MPH 500	Principles of Biostatistics	3		MPH 505	Non Communicable Dis	3	
MPH 502	Principles Epidemiology	3		MPH 506	Soc Behav Deter Health	3	
MPH 503	Environ Occupat Health	3		MPH 513	Health Policy	3	MPH 500, 502
MPH 504	Communicable Diseases	3		MPH 514	Qual Assur Publ Health	3	MPH 500, 502
	TOTAL	**12**			**TOTAL**	**12**	
	Second Year / Fall Semester				**Second Year/ Winter Semester**		
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**Pre-req**
MPH 515	Health Sys Manag	3	MPH500,2		Practicum	3	
MPH	Elective	3		MPH 501	Capstone	6	
MPH	Elective	3					
	TOTAL	**9**			**TOTAL**	**9**	

5.6 Master Degree in Radiological and Imaging Sciences (MRS)

5.6.1 Radiologic Education

Curriculum

Credit Hours required for a Masters of Radiological & Imaging Sciences

Type of Courses	Compulsory	Elective	Total
Core	24	-	24
Subject	12	-	12
Project	6	-	6
Total	**42**	**-**	**42**

Core Courses (24 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
MRS 500	Radiation Counting Statistics	3	
MRS 502	Radiological Research	3	
MRS 503	Ethics in Radiology	2	
MRS 504	Radiological And Imaging Sciences I	3	
MRS 505	Radiological And Imaging Sciences II	3	
MRS 506	Topics in Medical Imaging	3	
MRS 507	Topics in Radiation Therapy	3	
MRS 508	Topics in Nuclear Medicine	3	
MRS 509	RIS Seminar	1	

Subject Courses (12 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MRS 510	Academic Program Management	3	
MRS 511	Faculty Development	3	
MRS 512	RIS Instruction & Assessment	3	
MRS 513	RIS Academic Program Accreditation	3	

Core and Subject courses:	36
RIS Research Project (MRS 501)	6
TOTAL CREDIT HOURS REQUIRED	**42**

Suggested Study Plan

First Year / Fall Semester				First Year/Winter Semester			
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**PreR**
MRS 500	Radiation Counting Statistics	3		MRS 503	Ethics in Radiology	2	
MRS 502	Radiological Research	3		MRS 506	Topics Med Imaging	3	
MRS 504	Radiol & Imaging Sciences I	3		MRS 507	Topics Rad Therapy	3	
MRS 505	Radiol &Imaging Sciences II	3		MRS 508	Topics Nuclear Med	3	
				MRS 509	RIS Seminar	1	
	TOTAL	**12**			**TOTAL**	**12**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course	**Name**	**Cr.**	**Pre-req**	**Course**	**Name**	**Cr**	**PreR**
MRS 510	Academic Program Management	3		MRS 513	RIS Acad Prog Accr	3	
MRS 511	Faculty Development	3		MRS 501	Project	6	
MRS 512	RIS Instruction & Assessment	3					
	TOTAL	**9**			**TOTAL**	**9**	

5.6.2 Radiologic Management

Curriculum

Credit Hours required for a Masters of Radiological & Imaging Sciences

Type of Courses	Compulsory	Elective	Total
Core	24	-	24
Subject	12	-	12
Project	6	-	6
Total	**42**	**-**	**42**

Core Courses (24 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
MRS 500	Radiation Counting Statistics	3	
MRS 502	Radiological Research	3	
MRS 503	Ethics in Radiology	2	
MRS 504	Radiological And Imaging Sciences I	3	
MRS 505	Radiological And Imaging Sciences II	3	
MRS 506	Topics in Medical Imaging	3	
MRS 507	Topics in Radiation Therapy	3	
MRS 508	Topics in Nuclear Medicine	3	
MRS 509	RIS Seminar	1	

Subject Courses (12 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MRS 514	Radiologic Financial Management	3	
MRS 515	Personnel Management in Radiology	3	
MRS 516	Clinical Accreditation and QM	3	
MRS 517	Professional Development	3	

Core and Subject courses:	36
RIS Research Project (MRS 501)	6
TOTAL CREDIT HOURS REQUIRED	**42**

Suggested Study Plan

First Year / Fall Semester				First Year/Winter Semester			
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**PreR**
MRS 500	Radiation Counting Statistics	3		MRS 503	Ethics in Radiology	2	
MRS 502	Radiological Research	3		MRS 506	Topics Med Imaging	3	
MRS 504	Radiol & Imaging Sciences I	3		MRS 507	Topics Rad Therapy	3	
MRS 505	Radiol &Imaging Sciences II	3		MRS 508	Topics Nuclear Med	3	
				MRS 509	RIS Seminar	1	
	TOTAL	**12**			**TOTAL**	**12**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course	**Name**	**Cr.**	**Pre-req**	**Course**	**Name**	**Cr**	**PreR**
MRS 514	Radiologic Financial Management	3		MRS 517	Prof Development	3	
MRS 515	Pers Management in Radiology	3		MRS 501	Project	6	
MRS 516	Clinical Accreditation and QM	3					
	TOTAL	**9**			**TOTAL**	**9**	

5.6.3 Ultrasound

Curriculum

Credit Hours required for a Masters of Radiological & Imaging Sciences

Type of Courses	Compulsory	Elective	Total
Core	24	-	24
Subject	12	-	12
Project	6	-	6
Total	**42**	**-**	**42**

Core Courses (24 Credit Hours)

Course No.	Course Name	Cr	Prerequisite
MRS 500	Radiation Counting Statistics	3	
MRS 502	Radiological Research	3	
MRS 503	Ethics in Radiology	2	
MRS 504	Radiological And Imaging Sciences I	3	
MRS 505	Radiological And Imaging Sciences II	3	
MRS 506	Topics in Medical Imaging	3	
MRS 507	Topics in Radiation Therapy	3	
MRS 508	Topics in Nuclear Medicine	3	
MRS 509	RIS Seminar	1	

Subject Courses (12 Credit Hours)

Course No.	Course Name	Cr.	Prerequisite
MRS 518	Ultrasound Physics	3	
MRS 519	Sonography Cross-Sectional Anatomy	3	
MRS 520	Abdominal Sonography	3	
MRS 521	Pelvic Sonography	3	
MRS 522	Obstetrical Sonography	3	
MRS 523	Clinical Sonography	3	

Core and Subject courses:	36
RIS Research Project (MRS 501)	6
TOTAL CREDIT HOURS REQUIRED	**42**

Suggested Study Plan

First Year / Fall Semester				First Year/Winter Semester			
Course	**Name**	**Cr.**	**PreR**	**Course**	**Name**	**Cr**	**PreR**
MRS 500	Radiation Counting Statistics	3		MRS 503	Ethics in Radiology	2	
MRS 502	Radiological Research	3		MRS 506	Topics Med Imaging	3	
MRS 504	Radiol & Imaging Sciences I	3		MRS 507	Topics Rad Therapy	3	
MRS 505	Radiol &Imaging Sciences II	3		MRS 508	Topics Nuclear Med	3	
				MRS 509	RIS Seminar	1	
	TOTAL	**12**			**TOTAL**	**12**	
Second Year / Fall Semester				**Second Year/ Winter Semester**			
Course	**Name**	**Cr.**	**Pre-req**	**Course**	**Name**	**Cr**	**PreR**
MRS	Subject	3		MRS	Subject	3	
MRS	Subject	3		MRS 501	Project	6	
MRS	Subject	3					
	TOTAL	**9**			**TOTAL**	**9**	