Student's Handbook

Program Title: Health Informatics

Name of Department: Public Health

College of Applied Medical Sciences

Majmaah University, Majmaah, Riyadh KSA

Department of Public Health

قسم الصحة العامة

Message from the Head of the Department

The Public Health Department at the College of Applied Medical Sciences contains Health Informatics program, which has become the backbone of health institutions that are looking for quality and efficiency through the optimal use of health information technologies. Also, it provides traditional courses as well as extensive experience in actual computer laboratories.

Moreover, The Department of Public Health aims to prepare and qualify students with theoretical knowledge and practical skills that qualify them to obtain a Bachelor's degree in Public Health and work as qualified health professionals and observers in all areas of public health. This would contribute to solve many of the health problems facing different societies.

Program's lectures and labs provide students with a substantial knowledge base as well as fundamental skills and techniques. In addition, students are actively involved in discussions related to health informatics throughout their study at the program.

Finally, in different programs included in Public Health Department, all the students are expected to develop understanding of public health principles, basic skills and professionalism. The Public Health Department staff participates in a wide variety of activities within the department and professional community.

Head of the Department
Dr. Saleh Abdullah Aloyuni

About The Department

This Department is concerned with the promotion of Public health of the community through the development of research and analysis tools, in order to find out the causes of diseases and, consequently; improve public health in the community. It has for objective to ensure suitable environment for physical, mental and social human health. This would be achieved through the assessment and monitoring population groups at risk, identifying problems and health priorities, and thereafter; drawing the necessary policies and regulations to deal with these problems and health priorities in order to guarantee adequate health care, including preventive care for all segments of the society.

Relevance of the Program

The program mission clearly outlines the three functions through which we serve the community which are the education and production of future healthcare professionals, the direct and indirect healthcare services, and the research that will eventually improve health care.

The vision, mission, and values are all directly related to our community needs and the role that we serve in the community in terms of medical education, research and healthcare. The undergraduate program's mission clearly identifies the changing nature of healthcare needs of the Saudi community. These complies with Majmaah university Mission and goals. With a rapidly growing population and diversity of nationalities and ethnic backgrounds medical practice is challenging. With increasing awareness and modernization, issues of health prevention and education are becoming increasingly important.

Excellency in designing and executing the health informatics applications and electronic portfolio for developing the medical care and scientific research services.

Preparation graduates with competitive technical skills in the field of health informatics through distinct learning environment to serve the community and to support scientific research.

Through innovative education, world class research, and high quality healthcare we can achieve the vision of MU by contributing in building the knowledge based economy that our country greatly needs. In response to the program mission to prepare the students for the future challenges and needs for the Saudi community lot of stress is given on learning skills, professionalism, and health informatics.

# Organizational Structure of the Department
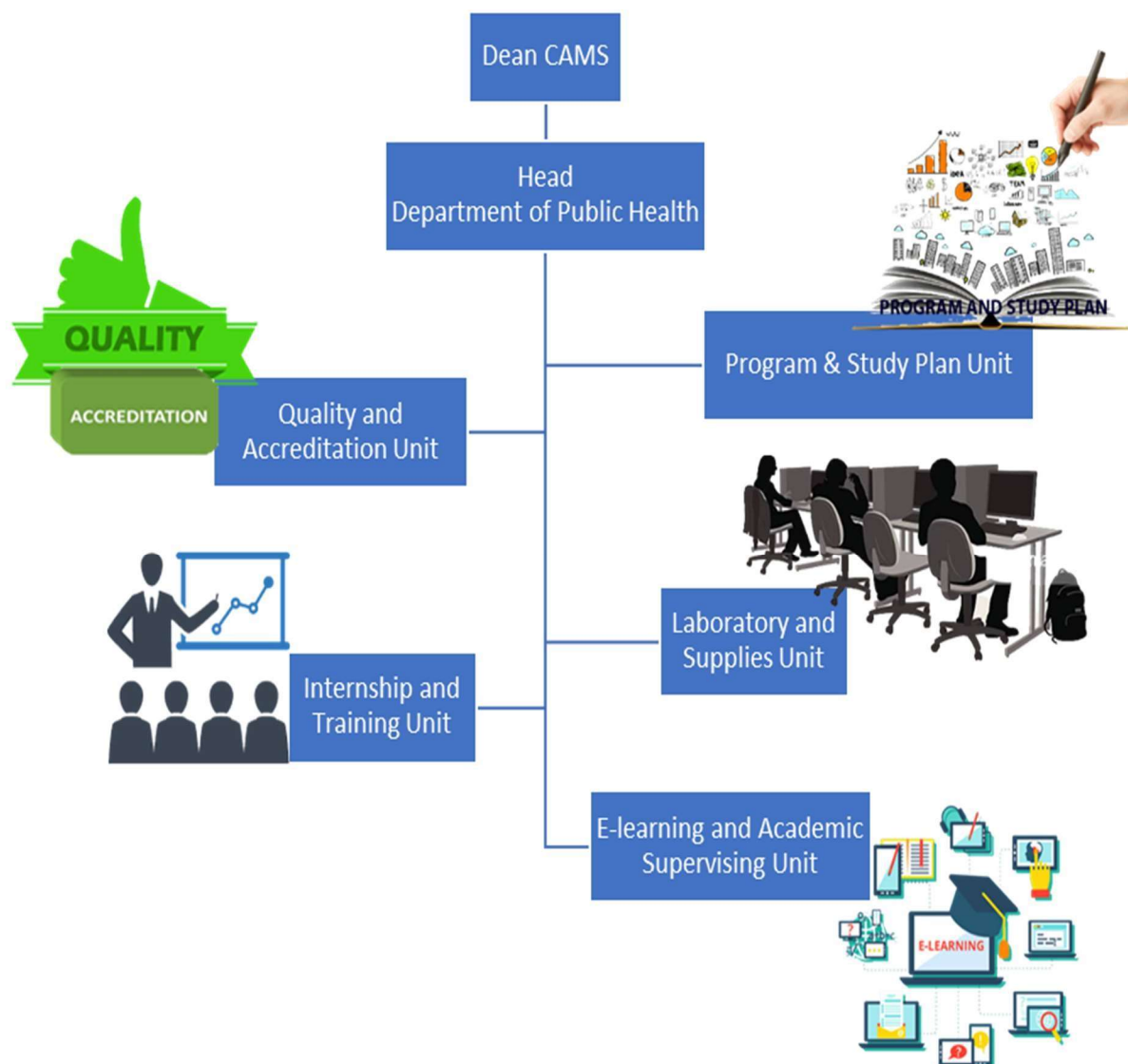
Aim of getting Bachelor's in Health Informatics?

In a health informatics degree program, students learn how to develop IT systems that process and store data specifically related to healthcare organizations that rely on electronic health records. In this way, the degree blends skills relating to computer science and healthcare administration, allowing students the freedom to pursue various career paths in IT and healthcare. Whatever career path students decide to pursue, a health informatics degree helps applicants stand out in their field. While in school, students may also make important professional connections through their peers or professors. Some programs may also help students find internships or job opportunities upon graduation.

What is the career prospects of getting a Bachelor's in Health Informatics?

Because a health informatics degree covers both technology management and healthcare administration, graduates are prepared for many careers. Students can enter careers designed specifically for healthcare informatics graduates, like working as a health information technician, but they can also explore other areas of the healthcare industry, such as healthcare administration. While most healthcare informatics graduates end up working in the healthcare industry, their place of employment may vary depending on the job. Some graduates work in hospitals or private clinics. Others work for nursing homes, rehabilitation centers, or health insurance companies.
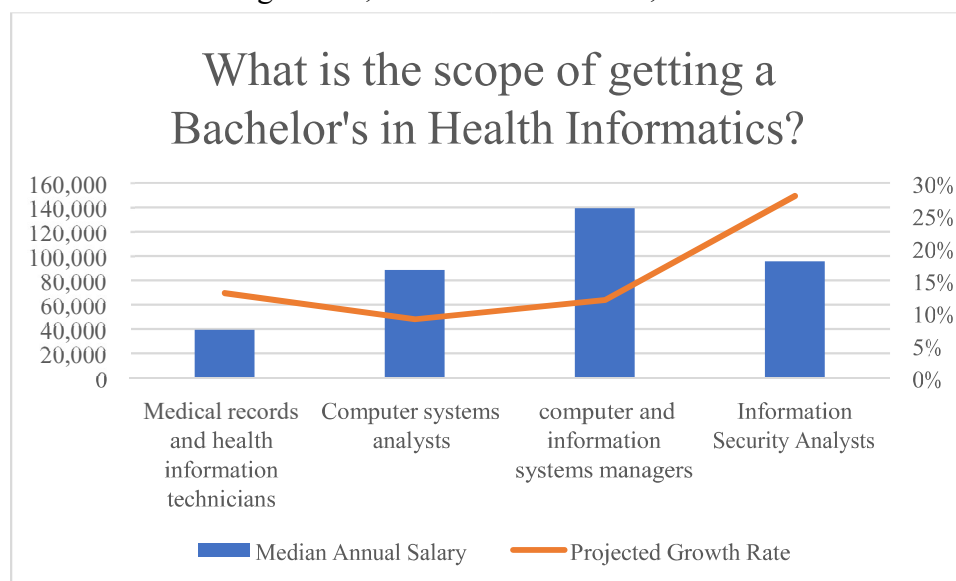
Program Mission:

Qualifying distinguished cadres in the fields of health informatics through advanced educational programs that contribute to scientific research and achieve the requirements of the labor market.

Program Vision:

Leadership in health informatics through qualifying national competencies for developing health services and supporting the applied research.

Program Objective:

1. Articulate the proper informatics management tools for health organization.
2. Identify information and data needs of research projects or program users and stakeholders with health organization.
3. Describe the information system development, procurement and implementation needs that meet the public health program needs within health organization.
4. Design and monitor the security management system of patient records.

Program Learning outcome (Course Learning Outcome):

Domain	Code	Student Learning Outcomes
A	a1	The student will be able to describe basic procedures for applying various management tools and techniques in a safe and efficient manner.
	a2	The student will able to demonstrate a comprehensive and well-founded knowledge.
	a3	The student will be able to recognize the underlying principles and concepts from various disciplines.
B	b1	The student will able to implement solutions for technical problems which ensure confidentiality, security, and integrity.
	b2	The student will able to evaluate the healthcare delivery system and the impact of social, cultural, economic, and environmental factors.
	b3	The student will able to develop strategies (plans) for improving healthcare delivery.
	b4	The student will develop the process of critical thinking to support the evidence-based practices.
C	c1	The student will able to apply the disciplines code of ethics.
	c2	The student will able to demonstrate interpersonal skills of effective listening, negotiating, persuasion and presentation.
	c3	The student will able to perform effectively within a team environment, including leadership, and team building.
D	d1	Student will be able to use media and technology to gather information, record observations in written or electronic form.
	d2	The student will able to apply statistical techniques for implementing the healthcare quality improvement.

Study Plan (Curriculum)

1- Compulsory and Elective Courses

Courses	Type	Total of Credit Hours	Percentage from the total credit Hours in the study plan (%)
University	Compulsory	0	0%
	Elective	12	9.1%
College	Compulsory	2	1.5%
	Elective	4	3%
Department	Compulsory	77	58.3%
	Elective	4	3%
	Hospital practice	4	3%
Preparatory year		29	22 %
Free Courses		0	0%
Total Sum and Percentages		132	100%

2- Preparatory Year* Courses (If any):

First Semester

Course Code	Course Number	Course Title	T	P	Tr	CrH	Number & Code of Prerequisite	Number & Code of Co-requisite
PENG	111	English (1) for Preparatory Year	2	6	0	8		
PMTH	112	Introduction to Mathematics (1)	2	0	0	2		
PCOM	113	Computer Skills	1	1	0	2		
PSSC	114	Learning and Communication Skills	1	1	0	2		
Total			6	8	0	14		

Second Semester								
Course Code	Course Number	Course Title	Distribution of Credit Hours				Number & Code of Prerequisite	Number & Code of Co-requisite
			T	P	Tr	CrH		
PENG	121	English (2) for Preparatory Year	2	4	0	6		
PENG	122	English for Medical Specialties	1	1	0	2		
PCHM	123	Introduction to Chemistry	1	1	0	2		
PPHS	124	Physics for Health Purposes	1	1	0	2		
PBIO	126	Biology Science	2	1	0	3		
Total			7	8	0	15		

* accounted within the credit hours for the academic program

3- University Courses			
Course Code	Course Number	Course Title	The number of Credit Hours
Student select 3 courses (6 Credit hours)			
SALM	101	Introduction to Islamic culture	2
SALM	102	Islam and community-building	2
SALM	103	Economic System in Islam	2
SALM	104	The foundations of the political system in Islam	2
Student select 1 course (2 Credit hours)			
ARAB	101	Language skills	2
ARAB	102	Arabic writing	2
Student select 2 courses (4 Credit hours)			
SOCI	101	Contemporary societal issues	2
ENG	101	English	2
ENT	101	Entrepreneurship	2
FCH	101	Family and Children	2
HAF	101	Basics Health and Fitness	2
LHR	101	Regimes and human rights	2
VOW	101	Volunteering	2
Total			12

4- College Compulsory Courses			
Course Code	Course Number	Course Title	The number of Credit Hours
CAMS	233	Introduction to Biostatisticis	2
		Total	2

5- College Elective Courses			
Course Code	Course Number	Course Title	The number of Credit Hours
		Student select 2 courses (4 Credit hours)	
CAMS	232	Medical Terminology	2
CAMS	231	Emergency care	2
CAMS	234	The quality of health care	2

Student's Handbook (Dept. of Public Health)

6- Department Compulsory Courses

Course Code	Course Number	Course Title	The number of Credit Hours
HIF	231	Basic Physiology	2
HIF	232	Fundamentals to Anatomy	2
HIF	233	Calculus	3
HIF	234	Introduction to Public Health Informatics	2
HIF	235	Introduction to Hospital System and Organization	2
HIF	236	Principles of nutrition	2
HIF	241	Quality improvement in health care	2
HIF	242	Healthcare database I	2
HIF	243	Epidemiology	2
HIF	244	Electronic Health Records	2
HIF	245	Applied Mathmatics	3
HIF	246	Disease Mapping and Surveillance	2
HIF	351	Linear algerbra	3
HIF	352	Healthcare database II	2
HIF	353	Public Health Policy and Society	2
HIF	354	Information Technology Governance	2
HIF	355	Healthcare billing and coding	2
HIF	356	Introduction to computer programing in healthcare	3

6- Department Compulsory Courses

Course Code	Course Number	Course Title	The number of Credit Hours
HIF	361	Survey of Disease and Treatment	2
HIF	362	Computer Applications in Hospital	2
HIF	363	Discrete Mathematics	2
HIF	364	Healthcare System Analysis and Design	2
HIF	365	Data Transmission and Computer networks	3
HIF	366	Healthcare Informatics	3
HIF	471	Research Methodology	3
HIF	472	Minor Project	3
HIF	474	Information System Application Development	3
HIF	475	Data Mining for Healthcare Management	3
HIF	481	Health Information Service Administration	3
HIF	482	Health Economics and Comparative Health System	2
HIF	484	Major Project	3
HIF	485	Data Security and Human Ethics	3
Total			77

Course Code	Course Number	Course Title	The number of Credit Hours
7- Department Elective Courses: The student must choose 4 credit Hours from the following:		
HIF Elective Course at Level 7 The student must choose **2 credit** Hours from the following		
HIF	476	Image Processing	2
HIF	477	Clinical decision support system	2
HIF	478	Selected topics in health informatics I	2
HIF Elective Course at Level 8 The student must choose **2 credit** Hours from the following		
HIF	486	Artificial Intelligence	2
HIF	487	Clinical Trials	2
HIF	488	Selected topics in health informatics II	2

8- Free Courses			
Course Code	Course Number	Course Title	The number of Credit Hours
		Not applicable	
9- Training Courses			
Course Code	Course Number	Course Title	The number of Credit Hours
HIF	473	Hospital Practice I	2
HIF	483	Hospital Practice II	2
Total			4

Study Plan (Curriculum)

Legend: Mandatory, Elective, Mandatory
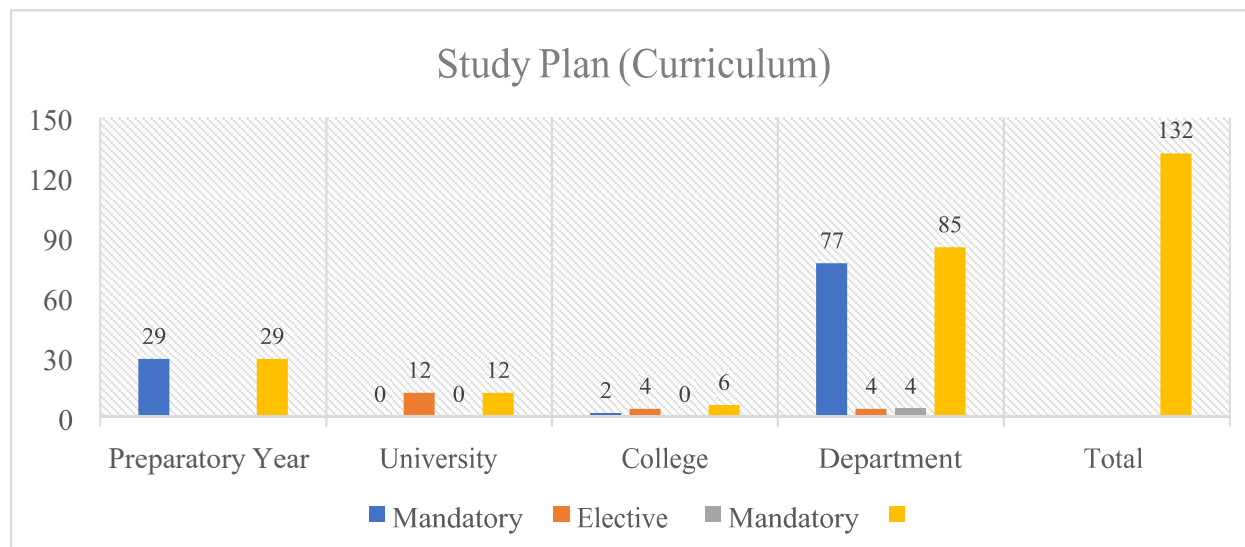
Distribution of courses at different Levels

(T-Theory, P-Practical, C-Clinical, -Tr-Training, CH-Credit Hour)

Course Code	Course Number	Course Title	First Level				Number & Code of Prerequisite (Co-Requisite)	Name of Prerequisite (Co-Requisite)
			Distribution of Credit Hours					
			T	P	Tr	CrH		
PENG	111	English (1) for Preparatory Year	2	6	0	8	------	------
PMTH	112	Introduction to Mathematics (1)	2	0	0	2	------	------
PCOM	113	Computer Skills	1	1	0	2	------	------
PSSC	114	Learning and Communication Skills	1	1	0	2	------	------
Total			6	8	0	14		

Course Code	Course Number	Course Title	Second Level				Number & Code of Prerequisite (Co-Requisite)	Name of Prerequisite (Co-Requisite)
			Distribution of Credit Hours					
			T	P	Tr	CrH		
PENG	121	English (2) for Preparatory Year	2	4	0	6	------	------
PENG	122	English for Medical Specialties	1	1	0	2	------	------
PCHM	123	Introduction to Chemistry	1	1	0	2	------	------
PPHS	124	Physics for Health Purposes	1	1	0	2	------	------
PBIO	126	Biology Science	2	1	0	3	------	------
Total			7	8	0	15		

Third Level

Course Code	Course Number	Course Title	T	P	Tr	CrH	Number & Code of Prerequisite (Co-Requisite)	Name of Prerequisite (Co-Requisite)
HIF	231	Basic Physiology	1	1	0	2	PBIO 126	Biology Science
HIF	232	Fundamentals to Anatomy	1	1	0	2	PBIO 126	Biology Science
HIF	233	Calculus	3	0	0	3	PMTH 112	Introduction to Mathematics
HIF	234	Introduction to Public Health Informatics	2	0	0	2	------	------
HIF	235	Introduction to Hospital System and Organization	2	0	0	2	------	------
HIF	236	Principles of nutrition	2	0	0	2	------	------
CAMS	233	Biostatistics	2	0	0	2	------	------
MU1	MU***	MU Elective Course	2	0	0	2	------	------
Total			**15**	**2**	**0**	**17**		

Fourth Level

Course Code	Course Number	Course Title	T	P	Tr	CrH	Number & Code of Prerequisite (Co-Requisite)	Name of Prerequisite (Co-Requisite)
HIF	241	Quality improvement in health care	2	0	0	2	------	------
HIF	242	Healthcare database I	1	1	0	2	------	------
HIF	243	Epidemiology	2	0	0	2	HIF 234	Introduction to Public health
HIF	244	Electronic Health Records	1	1	0	2	HIF 235	Introduction to System and Hospital Organization
HIF	245	Applied Mathmatics	3	0	0	3	HIF 233	Calculus
HIF	246	Disease Mapping and Surveillance	1	1	0	2	------	------
MU2	MU***	MU Elective Course	2	0	0	2	------	------
CAMS	***	College Elective Course	2	0	0	2	------	------
Total			**14**	**3**	**0**	**17**		

| Fifth Level								
Course Code	Course Number	Course Title	Distribution of Credit Hours				Number & Code of Prerequisite (Co-Requisite)	Name of Prerequisite (Co-Requisite)
			T	P	Tr	CrH		
HIF	351	Linear algerbra	3	0	0	3	HIF 245	Applied Mathmatics
HIF	352	Healthcare database II	1	1	0	2	HIF 242	Healthcare database I
HIF	353	Public Health Policy and Society	2	0	0	2	HIF 235	Introduction to Hospital System and Organization
HIF	354	Information Technology Governance	1	1	0	2	HIF 244	Electronic Health Records
HIF	355	Healthcare billing and coding	1	1	0	2	HIF 241	Quality improvement in health care
HIF	356	Introduction to computer programing in healthcare	2	1	0	3	------	------
MU3	***MU	MU Elective Course	2	0	0	2	------	------
CAMS	*****	College Elective Course	2	0	0	2	------	------
Total			14	4	0	18		

Sixth Level								
Course Code	Course Number	Course Title	Distribution of Credit Hours				Number & Code of Prerequisite (Co-Requisite)	Name of Prerequisite (Co-Requisite)
			T	P	Tr	CrH		
HIF	361	Survey of Disease and Treatment	2	0	0	2	HIF 246	Disease Mapping and Surveillance
HIF	362	Computer Applications in Hospital	1	1	0	2	HIF 356	Introduction to Computer Programing in Healthcare
HIF	363	Discrete Mathematics	2	0	0	2	HIF 351	Linear algerbra
HIF	364	Healthcare System Analysis and Design	1	1	0	2	HIF 355	Healthcare billing and coding
HIF	365	Data Transmission and Computer networks	2	1	0	3	HIF 356	Introduction to computer programing in healthcare
HIF	366	Healthcare Informatics	2	1	0	3	HIF 354	Information Technology Governance
MU4	MU***	MU Elective Course	2	0	0	2	------	------
MU5	MU***	MU Elective Course	2	0	0	2	------	------
Total			14	4	0	18		

Eighth Level								
Course Code	Course Number	Course Title	Distribution of Credit Hours				Number & Code of Prerequisite (Co-Requisite)	Name of Prerequisite (Co-Requisite)
			T	P	Tr	CrH		
HIF	481	Health Information Service Administration	2	1	0	3	HIF 475	Data Mining for Healthcare Management
HIF	482	Health Economics and Comparative Health System	2	0	0	2	HIF 474	Information System Application Development
HIF	483	Hospital Practice II	0	0	2	2	HIF 473	Hospital Practice I
HIF	484	Major Project	0	3	0	3	HIF 472	Minor Project
HIF	485	Data Security and Human Ethics	2	1	0	3	HIF 475	Data Mining for Healthcare Management
HIF	48*	HIF Elective Course	1	1	0	2	------	------
Total			7	6	2	15		

Seventh Level								
Course Code	Course Number	Course Title	Distribution of Credit Hours				Number & Code of Prerequisite (Co-Requisite)	Name of Prerequisite (Co-Requisite)
			T	P	Tr	CrH		
HIF	471	Research Methodology	1	2	0	3	------	------
HIF	472	Minor Project	0	3	0	3	------	------
HIF	473	Hospital Practice I	0	0	2	2	------	------
HIF	474	Information System Application Development	2	1	0	3	HIF 366	Healthcare Informatics
HIF	475	Data Mining for Healthcare Management	2	1	0	3	HIF 366	Healthcare Informatics
HIF	47*	HIF Elective Course	1	1	0	2	------	------
MU6	MU***	MU Elective Course	2	0	0	2	------	------
Total			8	8	2	18		

Prerequisites for courses at different levels
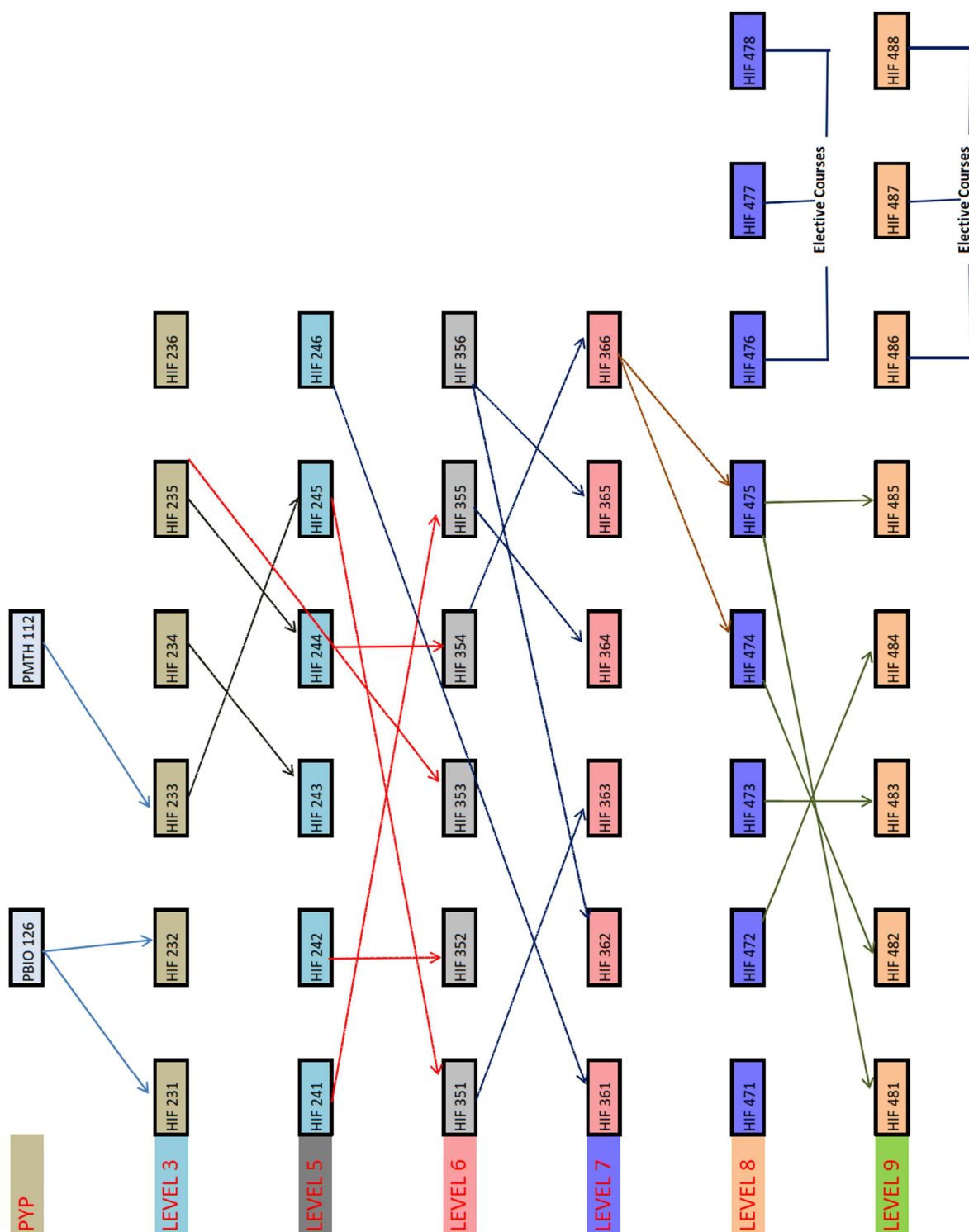
Prerequisites for Admission to the Program

The following requirements have been stipulated for the admission of the new student:

- An applicant for admission must have a Saudi Secondary School Certificate -Science Section (SSSCSS) or its equivalent. The secondary school certificate should not be more than five years old and the Rector of the University may give exemption from this condition.
- Must have an Aptitude Test Certificate (ATC) administered by the National Center for Assessment in Higher Education.
- The minimum qualifying scores in SSSCSS & ATC tests are: A total equivalent percentage of 75% (based on 30% from the SSSCSS + 30% from the ATC + 40% from cumulative basic Science of SSSCSS).
- Must not have been dismissed from another university for disciplinary reasons.
- When applicants exceed availability, priority is given to the students with higher grades.

Distribution of Students among Various Fields of Applied Medical Sciences:

Before starting any program at CAMS, all students study a common preparatory year. After completing the preparatory period with a minimum GPA of 2.75/5, the students are distributed to various programs of Applied Medical Sciences, so that they can start their designated program requirements in level three. The distribution process to the various programs at CAMS is carried out according to the interest of the students and the capacity of programs. When applicants exceed availability, priority is given to the students with higher grades. The final status of all students is then submitted to the Deanship of Admission and Registration within a pre-specified period each semester.

Registration Procedure:

The student is automatically registered at the beginning of each semester for a number of credit hours according to his academic standing. Students with GPA of 2.0 are eligible to register up to 14 credit hours, while those of 4.5 GPA or above are eligible for up to 20 units as a maximum. Students register online (through the E-Register system. All restrictions are programmed, however if the student needs to override any of these restriction he needs the approval of his advisor and sometimes the department head's approval.

Withdrawal:

The student has the right to withdraw from an academic semester within the withdrawal period announced in the academic calendar for that semester. No withdrawal is allowed during the last five weeks before the final examination. The college vice dean for academic affairs must approve the withdrawal request after reviewing the authenticity of the student's reasons for withdrawal.

Attendance and Completion Requirements

The student has the right to withdraw from an academic semester within the withdrawal period announced in the academic calendar for that semester. No withdrawal is allowed during the last five weeks before the final examination. The college vice dean for academic affairs must approve the withdrawal request after reviewing the authenticity of the student's reasons for withdrawal.

A. Attendance

Considering that regular course attendance is necessary for academic success, MU University requires that students should attend at least 75% of the lectures and practical. Students failing to meet this requirement in any of the courses will be prohibited from attending the final examination of that course and will have an F (Fail) grade in that course. Furthermore, the student who is absent in the final examination of a course(s) will not be given a substitute examination, except for a valid reason accepted by the college council.

B. Progression from year to year.

The HIF, similar to all other programs at MU, follows the semester system. Two semesters are offered in each academic year (each semester is called a level). The duration of each semester is fifteen weeks excluding examinations, in addition there is an optional 8-weeks summer semesters.

The B.Sc. is a four year program, which consists of a three semester preparatory period at CAMS, six semesters in the HIF Program, and one year of internship after completion of the course work. HIF courses are seldom taught during summer semester. Teaching during summer is in fact administrated whenever faculty is available; at least 20 students are enrolled in the course or with at least one graduating student regardless of the number of students enrolled.

C. Examination and Grading System:

The examination and grading system of the program abides by the following regulations:

- Success in a course is usually based on the combination of a grade awarded for the course work, plus a grade for the final examination.
- Each course will have a total of 100 points, and these are distributed as follows: 60% for the course work (quizzes, assignments, homework, and midterm exams, practical) and 40%for the final examination.
- The passing mark in each course is 60% out of the total.

The program grading system follows the requirements at MU, which is based on a maximum of 5 as shown in the following.

Grading system at MU

Letter Grade	Numerical	Point Average
A+	95-100	5.0
A	90-less than 95	4.75
B+	85-less than 90	4.5
B	80-less than 85	4.0
C+	75-less than 80	3.5
C	70-less than 75	3.0
D+	65-less than 70	2.5
D	60-less than 65	2.0
F	Below 60	1.0

A student's grade point average is determined by dividing the cumulative point value of all courses attempted by the number of units in the student's semester schedule. An example is the following hypothetical student's report having five courses in a particular semester is shown in the following table:

Grade Point Average (an example)

Course	Credit Hours	Letter Grade	Point Average	Grade Point (Credit Hours × Point Average)
1	2	A	4.75	9.5
2	3	C	3	9
3	3	F	1	3
4	4	B+	4.5	18
5	3	D	2	6
Total	15			45.5

This student's semester grade point average GPA is (45.5/15) = 3.03. Similarly, for all the semesters taken, the Cumulative Grade Point Average (CGPA) is calculated. The cumulative grade point value is translated into performance standing as shown in the following table: Cumulative Grade Point Average

Grade Range	Standing
4.50 upwards	Excellent
3.75- 4.50	Very Good
2.75- 3.75	Good
2.00- 2.75	Pass
Less than 2.00	Fail

Scholastic Probation:

All students at MU University are required to maintain a grade point average of at least 2.0 out of 5.0. Those who fail to maintain this average are placed on scholastic probation and are given two semesters in which they must attain a GPA of 2.0. If this condition is not met within the two semesters of probation, the student may then be dismissed from his studies at the College of Applied Medical Sciences. One last opportunity of a third semester to raise the average can be given, after review of the academic record by the academic supervisor and approval of college council, to those who can attain the 2.0 GPA if they study 12 credit hours and score B average in all (48 points).

D. Program completion or graduation requirements.

To obtain the Bachelor's degree in HIF, the student must successfully complete 131 credit hours (36 courses including the preparatory year courses). In order to ensure that the student completed the course work, the electronic system (EduGate) is available to both the student and program management for checking. After ensuring that a student has completed all the course work, the program management allows the student to start a one year (48 weeks, 0 credit hours) compulsory internship.

After the student successfully completes the internship and after obtaining a release form from Deanship of Admission and Registration, he would be eligible for obtaining his Bachelor's degree certificate.

Student Academic Counseling

The academic regulations are the framework and rules of a study course. This legal document describes how the Health Informatics program is structured, how students are assessed and what requirements have to be fulfilled to successfully graduate with a Bachelor degree.

Academic Advising is an essential and central element in the educational system, it is an objective response to the economic, humanitarian and social variables built into the system and philosophy of education, as well as being responsive to the needs of the student to Communicate with university education, which represents a necessary national development to achieve humanity innovation and excellence requirements.

Tasks of the Academic Advising Unit Coordinator There is an academic advising unit in each faculty headed by a member of the faculty staff. Such coordinator has the following tasks:

1. General supervision of the work of academic advisors and follow up the cases referred to him/her.
2. Welcome new students on the first day of study and introduce them to the university regulations.

3. Allocate students in a fair manner between faculty staff taking into consideration all psychological, social and linguistic factors.

4. Receive reports about students' issues in addition to the reports sent by the academic advisors, solve their problems or refer them to Vice Dean for Academic Affairs or to Dean if needed.
5. Organize counselling meetings, seminars and workshops to advance the academic advising efforts.
6. Facilitate the tasks of the academic advisors and prepare students' files and forms.
7. Discuss with the faculty council (the Dean or heads of departments) all new developments related to students and suggest solutions and ways for development.

Internship/Field Experience

Health informatics program has concentrated upon the practical aspects of the field. This can be seen from strong collaboration with external constituents such as employers, alumni, and advisory board members. An important component of the HIF curriculum is a one-year non-credit mandatory internship that the students experience after completing all their course work. The internship serves as a buffer period for students to merge into the work area. During this internship, the students gain valuable practical training in biomedical industrial environment and biomedical units of hospitals. Most student outcomes can be attained from the assessment of internship year

The department assigns a faculty member who acts as a point of contact for the overall arrangement and supervision of the internship for all interns. However, the interns are primarily supervised by a supervisor from the work area who is mainly responsible for the evaluation of the intern at the end of the internship program. An intern, with the co-ordination of the departmental internship supervisor, can choose to have more than one work areas during the one-year internship program. For each period, an evaluation report is mandatory. CAMS has a standard intern evaluation reporting form, which is used by the field supervisor to evaluate the intern. The intern evaluation report is based on nine key performance indicators.

The table below shows the relation between those indicators and the student outcomes:

No.	Performance Indicator	SOs
1	Professional commitments: Regularity & Timeliness in job, reporting and communicating with supervisor, Dedication & Sincerity in job) Conduct & Behavior: Interpersonal Skills, Personal Relations	3.3
2	Work Report & Achievements	4.1
3	Knowledge & Understanding of assigned jobs	2.2
4	Necessary skills acquired to address the HIF process	2.1
5	Analyzing Capacity: Decision Making, Problem Solving, Program Development, Graph & figures, Data Flow Diagrams, ER Diagrams, Software Manuals)	2.3
6	Quality consciousness: Commitment for quality in work	3.4
7	Intuitiveness & Enthusiasm: Self-learning motivation , Focus to Goal	3.2
8	Organizing & Leadership traits	3.1
9	Understanding social impact of HIF	1.1

Certificate

1. A certificate is issued on passing the Bachelor examination, in accordance with the respective sample contained in the attachment to the general examination regulations of the College of Applied Medical Sciences, Majmaah University. The Bachelor examination certificate has to include the modules completed and final grades attained during the semester.
2. On successful completion of the Bachelor examination, the academic degree "Bachelor of Science", abbreviated, "B. Sc." is awarded.

Module Description

English (1) for Preparatory Year- PENG 111

The purpose of this course is to enable students to comprehend spoken English in extended conversation containing some unfamiliar words in familiar contexts, participate in increasingly extended conversations about topics beyond survival or routine activities, differentiate between fact and fiction in simplified reading material and some authentic material using a variety of word analysis skills to determine the meaning of new words, and organize relevant ideas and appropriate details into one or more clearly organized paragraph in a report or personal correspondence

Introduction to Mathematics (1) - PMTH 112

The purpose of this course Introducing some basic math concepts ,study some different ways to solve the linear equations, study some different ways to solve the nonlinear equations, Study Some Concepts in the analytic geometry, Discussing the functions Characteristics, Discussing some kinds of special functions (exponential and logarithmic functions)

Computer Skills - PCOM 113

This course covers the basic concepts of computing literacy, and introduces operating systems and various important software packages for word processing, spreadsheets, and presentations. It also touches on some of the Internet concepts and services including the Web and the electronic mail.

Communication & Learning skills - PSSC114

This course aims at improving the society via directing the affective knowledge toward the youth. We hope that the course will have a deep effect on the young students who are the potential future leaders, and this will be achieved by enriching their skills, knowledge and attitude. Thus, the course focuses on the importance of the youth's participation ineffective and positive activities to build their abilities to activate their role of decision making and establish solid communication channels among them in the deferent areas and social experience of the community

English (2) for Preparatory Year - PENG 121

The purpose of this course is to develop students' receptive and productive language skills and sub-skills. It also aims to enable students to comprehend spoken English in extended conversation containing some unfamiliar words in familiar contexts, participate in increasingly extended

conversations about topics beyond survival or routine activities, differentiate between fact and fiction in simplified reading material and some authentic material using a variety of word analysis skills to determine the meaning of new words, and organize relevant ideas and appropriate details into one or more clearly organized paragraph in a report or personal correspondence.

English for Medical Specialties - PENG 122

The purpose of this course is to enable students to be able to divide, analyze, pronounce, and spell medical terms, to name the body systems and their functions. Also it enables student to identify the planes of the body and to recognize main idea sentence in academic writing and o be able to communicate by using medical language

Introduction in Chemistry - PCHM 123

The main purpose of the course is to give the students of medical disciplines the basics of chemistry science and to improve their skills in this field.

Physics for Health Purposes - PPHS 124

This course covers the basic concepts of physics, gives an introduction to the students to deal with the physical equations so that the students can link the concept of physical and mathematical methods for its own account, in addition to increasing the cognitive side of the students about his/her physical phenomena and process applications.

Biology Science - PBIO 126

Biology will provide students with a solid foundation in the fundamental concepts and knowledge base of modern biology and help students develop the skills that are integral to the process of science. This course prepares students for their upper-level courses by emphasizing on the development of student's scientific process skills, laboratory techniques, and an understanding of the fundamental principles of living organisms. Students explore biological science as a process, cell structure and function, cell types, organelles and macromolecules, enzymes, and an introduction to metabolism; comparison between catabolism and anabolism and studying cellular respiration as an example on catabolism. Students will also take the opportunity to understand the main concepts of cell division and cell cycle through comparison between mitosis and meiosis, the relation of meiosis to sexual reproduction.

Basic of Physiology - HIF 231

This course involves a detailed study of the physiology of the various systems of the body at a microscopic and macroscopic level, with an emphasis on the musculoskeletal, neurological and cardiopulmonary systems. The student should be able to describe the structure and function of the various system of the body

Basic of Anatomy HIF 232

This is an introductory course in systemic gross anatomy. Structures of the integumentary, musculoskeletal, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, and urogenital will be examined.

Calculus - HIF 233

The main objective of this to provide the fundamental knowledge of differential calculus, Integral Calculus and differential equation. The course contents the following topics mathematical modellings of the function, Limit and Continuity, Derivatives, applications of the derivatives in health informatics, Integration and differential equation.

Introduction to Public Health Informatics - HIF 234

This course provides an overview of the importance of public health informatics and its role in public health. "Public health informatics is the systematic application of information, computer science, and technology to public health practice, research, and learning. The course covers key components of public health informatics, the role of the informatician in public health practice, and the difference between the application of informatics and information technology in public health.

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Introduction to Hospital System and Organization - HIF 235

This course provides an overview of the evolution, structure and current issues in the health care system. It examines the unique features of health care as a product, and the changing relationships

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between patients, physicians, hospitals, insurers, employers, communities, and government. The course examines three broad segments of the health care industry: payers, providers and suppliers

Principles of nutrition - HIF236

This course provides an integrated overview of the physiological requirements and functions of protein, energy, and the major vitamins and minerals that are determinants of health and diseases in human populations.

Quality Improvement in Health Care - HIF 241

This course provides the fundamental concepts of quality management in health care systems and the essential tools, to measure and analyze a system, evaluate problems, and implement necessary changes to improve system performance. You will study system model theory in health care and utilize critical thinking to create changes in your own organization to improve client care, patient safety and essential services. Therefore, you will be utilizing your personal experience in assignments, to create a more meaningful student experience, useful in your future endeavors.

Healthcare Database I - HIF 242

This course covers relation database theory and database-web systems with applications to health care. The students are expected to develop a working knowledge of design, implementation, administration and maintenance of small to medium relational database systems. The students will also be exposed to current technology for deployment, use and administration of relational databases through the Internet.

Epidemiology - HIF 243

The course includes the basic concepts of epidemiology and biostatistics as applied to public health problems. Emphasis is placed on the principles and methods of epidemiologic investigation, appropriate summaries and displays of data, and the use of classical statistical approaches to describe the health of populations. This course introduces the basic principles and methods of epidemiology, with an emphasis on critical thinking, analytic skills, and application to clinical practice and research.

Electronic Health Records – HIF 244

Electronic Health Records (EHRs) are application systems that automate the activities of healthcare clinicians including physicians, nurses, physician assistants, and healthcare administrative staff. This course will focus on real-world use and deployment of EHRs through readings, hands-on labs and case studies.

Applied Mathematics - HIF 245

The course aim is threefold, to provide the knowledge of basic math for performing the accurate dosage calculation rather than the problem-solving method used in calculation. To provide the sound knowledge of metric system to prevent them from the medication errors. This course provides the understanding of descriptive and inferential statistics. The students are also able to understand the graphical and numerical presentation.

Disease Mapping and Surveillance - HIF 246

This course includes systematic collection, analysis, interpretation, and dissemination of data for use in prioritizing, planning, implementing, and evaluating health programs, activities. The course will focus on the fundamental processes and procedures which are utilized to investigate and track infectious and communicable diseases as well as non-infectious chronic diseases.

Linear Algebra - HIF 351

This course aims to provide the understanding of matrices and linear algebra, which is useful in health informatics. The course content the topics: Matrix algebra, Vector Spaces, Linear Transformation, Eigenvalues and Eigenvectors and Applications of the linear algebra.

Healthcare Database II - HIF 352

This course deals with the usage as well as concepts of design and architecture of databases. In covering the concepts, theorems, algorithms and proofs relevant to different aspects (design, architecture and implementation) are covered. The general approach is go through design, architecture (storage and indexes), core features (transactions, concurrency), and specialized database usage (data-mining, data-warehousing, distributed databases). The practical work done in the course goes through usage of some advanced SQL features and the implementation of some algorithms and coding of internals of an actual database system.

Public Health Policy and Society - HIF 353

This course examines how social, behavioral, historical and political factors influence public health in community, national, and global contexts. This course includes how health is influenced by factors such as age, gender, culture, race/ethnicity, social class, and geography. Public health problems and their solutions are analyzed considering individual risk factors as well as larger structural forces, and the rights of the individual versus the welfare of the public. Students will study the ways our understandings of health and well-being shape, and are shaped by, the health care system, our own values, and our assumptions.

Information Technology Governance – HIF 354

The course presents an integrated approach to IT governance by guiding the participant through a comprehensive IT Governance framework and roadmap and its major components, which addresses the following goals: • Strategic alignment of IT with the business • Responsible utilization of assets and resources • Ensures that IT delivers on its plans and commitments • Establishes and/or improves accountability of all constituents • Manages risks and contingencies proactively • Improves IT accountability, audit-ability, compliance, performance and maturity

Healthcare billing and coding - HIF 355

This course covers the basics of coding, exploration of the ICD-9-CM and CPT manuals, examination of specialty areas such as cardiology, and obstetrics/gynecology, radiology, pathology, and lab work.

Introduction to Computer Programing in Healthcare - HIF 356

This course introduces the students to the fundamentals of logic formulation together with their implementation in the C++ programming language. It introduces students to structured, top-down programming design and implementation. This course should serve as a foundation of programming for students in the HIS program. Topics to be covered; Introduction to computers and basic programming concepts and constructs, Simple control structures for decision making and repetition: if…else and while statements, arrays, Pointers and strings.

Survey of Disease and Treatment - HIF 361

Overview of medical and psychosocial aspects of chronic diseases including issues of disability management.

Computer Applications in Hospital - HIF 362

Introduction to medical data concepts, medical data acquisition, medical data storage, medical data Input Output Storage, DICOM image format and types, Image Compressions, medical Informatics, Introduction to Database Concepts Database Applications–HIS Introduction to PACS, PACS software for patient data Organization, Data Structure for medical System.

Discrete Mathematics - HIF 363

This course includes the following topics:

1) Elementary logic and Set theory: Simple and compound statements, Logical connectives, Truth tables, Basic logic laws, Operations on sets, Basic laws of set theory, Cartesian product of sets.

2) Methods of proof: Proof Strategy, Direct Method, the Contrapositive Method, the Contradiction Method, Mathematical Induction, and Structural Induction.

3) Relations: Basic definitions on relations, Binary relations and their types, Equivalence relation and set partition, Partial Ordering.

4) Algorithms: Algorithms, Examples of Algorithms, Complexity of Algorithms, Recursive Definitions, Recursive Algorithms.

5) Integers and Algorithms: Integers and Division, The Division Algorithm, Congruencies, Representation of Integers, Integers Algorithms, The Euclidean Algorithm, Applications.

6) Principles of Counting: The Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Generalized Permutations and Combinations, Algorithms for generating Permutations and Combinations, Binomial Coefficients.

Healthcare System Analysis and Design - HIF 364

This course is concerned with the fundamental knowledge, methods and skills needed to analyze, design and implement computer-based systems. It addresses the role of the systems analyst, and the techniques and technologies used. It includes systems development life cycle, project management skills, requirement analysis and specification, logical and physical design, prototyping, system validation, deployment, human factors, and postimplementation review.

Data Transmission and Computer Networks - HIF 365

This course introduces students to evolution trend of computer networks. It also helps students in understanding the procedure of transmitting data over the network and how to resolve the conflicting issues arising in the course of transmission. This course provides with practical knowledge and hands-on experience in transmitting data over the network. Topics to be covered ;Introduction to computer networks, Network architecture, OSI reference model, Transmission media, Transmission Impairments, Data encoding; Data Link: Error Detection, Medium Access

control Protocols and standards, MAC Addressing, Link layer Switches, LAN standards & Devices: Ethernet and IEEE standards for LANs, Wireless networks; Network Layer: Virtual circuit and Datagram Networks, Router Structure, The Internet Protocol (IP), Routing Algorithms, Broadcasting and Multicasting; Transport Layer: TCP and UDP services, designs, and performance, Principles of Reliable Data Transfer; Application layer: The Web and HTTP, FTP, Electronic Mail, and DNS.

Healthcare Informatics - HIF 366
This module deals with the resources, devices and methods required to optimize the acquisition, storage, retrieval and use of information in health. It will introduce students to the field of health informatics and gives them a feel for the process of developing health informatics solutions.

Research Methodology - HIF 471
This course describes the introduction to methods and techniques of research in informatics and the topics include basic terminology of research, qualitative, quantitative methods, and basic research design and data analysis techniques. In addition, the course will use to provide a statistic course especially for health science measures using techniques and data structures relevant to clinical investigation. This course introduces the student to methods of scientific research in the health professions by studying common experimental designs and critically analyzing published

research questions, design appropriate research paradigms, search the literature, and prepare preliminary research proposal.

Minor Project - HIF472
The student dissertation should be directed to problem solving in the field of bioinformatics as far as possible. Under the advice and guidance of a department mentor, honors students will identify and carry out a research project relevant to the field of bioinformatics and healthcare study. The senior project will be judged and graded by three department members chaired by the honors mentor.

Hospital Practice I - HIF 473
This course provides basic information concerning ethical and legal behavior in a health care environment. Patient care principles, radiation protection measures. This course should consign

with the theoretical background of the technical procedures, bioinformatics as well, Subsequent hands-on experience is provided under the direct supervision.

Information System Application and Development - HIF 474

This course is intended to provide students with the chance to develop small-sized information systems using the most current systems analysis, design tools, methodologies ,application development and user interface environments. Projects should reflect real-life problems and be developed as small team projects.

Data Mining for Healthcare Management - HIF 475

An introductory course to data mining and knowledge discovery in health care. Methods for mining health care databases and synthesizing task-oriented knowledge from computer data and prior knowledge are emphasized. Topics include fundamental concepts of data mining, data preprocessing, classification and prediction (decision trees, attributional rules, Bayesian networks), constructive induction, cluster and association analysis, knowledge representation and visualization, and an overview of practical tools for discovering knowledge from medical data. These topics are illustrated by examples of practical applications in health care.

Image Processing - HIF 476

Introduction to digital Image processing system. Study of Image types and Image Processing Techniques, Resolution – Different grey level resolution Dimensionality of the digital Image, examples of image Processing System. Image Transforms and Types. Application of Image transforms. How it is used to analyze the medical images. Image Enhancement Techniques and Types of grey level transformation. Study of Image Histogram Concept of Image compression.

Study the need for Image compression. How the data is compressed to transmit from one point to another point. Image compression technique Introduction to video.

Clinical decision support system - HIF 477

The general aim of the course is that the students should acquire sufficient knowledge and skills to be able to participate in the requirements engineering, the development, the introduction, the improvement and the evaluation of methods that provide clinical decision support actively and

explain how these methods can be implemented in information system while considering interoperability, organizational, ethical and legal aspects.

Selected topics in health informatics I - HIF 478

Computers and information technology are improving and changing healthcare education, research, and clinical practice. Informatics faculty and researchers from the CAMS and affiliated institutions present their research findings as well as discuss their views of national developments in their respective disciplines.

Health Information Service Administration - HIF 481

This course provides a foundation in Health Services Administration. The course introduces the student to the structure and functions of the Health Care System. The health care system in the community and its environment are examined to determine how they affects Health Services Administration. Topics to be covered include: overview of the Health Care System (private and public sectors), interface between Public Health and Health Care System, various health care delivery structures, health care workforce, health care resources, types of health services, financing of health services and health care coverage, meeting the health care needs of special populations, and critical issues in health services. The student will conduct a community health system analysis.

Health Economics and comparative health system - HIF 482

This course provides a foundation in Health Services Administration. The course introduces the student to the structure and functions of the Health Care System. The health care system in the community and its environment are examined to determine how they affects Health Services Administration. Topics to be covered include: overview of the Health Care System (private and public sectors), interface between Public Health and Health Care System, various health care delivery structures, health care workforce, health care resources, types of health services, financing of health services and health care coverage, meeting the health care needs of special populations, and critical issues in health services. The student will conduct a community health system analysis.

Hospital Practice II - HIF 483

This course provides basic information concerning ethical and legal behavior in a health care environment. Patient care principles, radiation protection measures. This course should consign with the theoretical background of the technical procedures, bioinformatics as well, Subsequent hands-on experience is provided under the direct supervision.

Major Project - HIF484

The graduation dissertation should be directed to problem solving in the field of bioinformatics as far as possible. Under the advice and guidance of a department mentor, honors students will identify and carry out a research project relevant to the field of bioinformatics and healthcare study. The senior project will be judged and graded by three department members chaired by the honors mentor. This course is required for Honors recognition and may be repeated for up to six credit hours. Pre-requisite: Permission of the department chair and completion of an approved project prospectus

Data Security and Human Ethics - HIF 485

Information Security is a comprehensive study of the principles and practices of computer system security including operating system security, network security, and software security. Topics include security models, mechanisms and policies for usage, availability, integrity and secrecy, Operating system mechanisms and models for mandatory controls, data models, concepts and mechanisms for database and software security, basic cryptography (private and public) and its applications, security in computer distributed systems, networks, control and prevention of viruses, and other malicious programs. incidence response, disaster recovery, physical security, and forensics

Artificial Intelligence - HIF486

Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. Although AI has been studied for more than half a century, we still cannot make a computer that is as intelligent as a human in all aspects. However, we do have many successful applications. In some cases, the computer equipped with AI technology can be even more intelligent than us. The Deep Blue system which defeated the world chess champion is a well-known example.

Clinical trials - HIF487

Medical informatics for clinical research and clinical practice, advanced literature searching, storage and organization of medical information, data management, designing data collection

form, construct databases, data quality control, data validation, data dictionary. Big data management and analysis.

Selected topics in health informatics II - HIF488

Computers and information technology are improving and changing healthcare education, research, and clinical practice. Informatics faculty and researchers from the CAMS and affiliated institutions present their research findings as well as discuss their views of national developments in their respective disciplines.

You know that you are the best,
leave aside the rest,
Go out there and have your say.

ALL THE VERY BEST

Do well!

GOOD
LUCK