

FACULTY OF NATURAL SCIENCES

CENTRE FOR PHYSICAL EDUCATION, HEALTH AND SPORTS SCIENCE

(MPEHSS): MASTER OF PHYSICAL EDUCATION, HEALTH & SPORTS SCIENCE (EVENING) 1-YEAR DEGREE PROGRAM (2-SEMESTER) CH-54

Pre-requisite:- BPEHSS degree or equivalent. Pre-Entry/ Aptitude Tests

1ST Semester		C.H
PEHSS 650	Philosophy of Physical Education	3
PEHSS 652	Nutrition for Sports	3
PEHSS 654	Test, Measurement and Evaluation in Physical Education	3
PEHSS 656	Sports Injuries & Management	3
PEHSS 658	Research Methods in Physical Education	3
PEHSS 660	Research Project	2

Practicals		C.H
PEHSS 651	Specialization in Selected Games (Outdoor & Indoor)	4
PEHSS 653	Specialization in Selected Events of Track & Field	3
PEHSS 655	Specialization in Selected Gymnastics (Apparatus & Floor Work)	3

2ND Semester		C.H
PEHSS 662	Sports Psychology	3
PEHSS 664	Physiology of Sports	3
PEHSS 666	Sports Medicine	3
PEHSS 668	Administration and Management in Physical Education	3
PEHSS 670	Research Project (Evaluation + Viva-Voce)	2
PEHSS 672	Comprehensive Viva-Voce	3

Practicals		C.H
PEHSS 661	Specialization in Selected Games (Outdoor & Indoor)	4
PEHSS 663	Specialization in Selected Events of Track & Field	3
PEHSS 665	Specialization in Selected Events of Gymnastics (Apparatus & Floor Work)	3

CENTER FOR ENVIRONMENTAL SCIENCE

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-72

The 2- year M.Sc. study is spread over 18 credit hours coursework in each semester, with 10 CH research project in the final semester; the Project report/ dissertation of 10,000 words is to be submitted by the end of the 4th semester for evaluation.

Pre-requisite: B.Sc Pass/ Hons (or its equivalent) degree in any science subject, with second class, Pre- Entry Test.

PREVIOUS

First Semester		C.H
ENVS 500	Introduction to Environmental Science	3
ENVS 502-503	General Ecology	3+1
ENVS 504-505	Health Safety and Environment	3+1
ENVS 508	Environmental Analytical Techniques	3
ENVS 510	Earth and Environment	2

Second Semester		C.H
ENVS 512	Environmental Pollution & Control Technologies	3
ENVS 514-515	Environmental Chemistry	3+1
ENVS 516-517	Environmental Monitoring (Air, Water, Soil & Noise)	3+1
ENVS 518-519	Eco-Toxicology	3+1
ENVS 520	Wildlife, Forest and Wetland Management	3

FINAL

Third Semester		C.H
ENVS 622	Population Dynamics and the Environment	3
ENVS 624	Natural Resources Economics	3
ENVS 626	Environmental Planning & Legislation	3
ENVS 628	Environment and Social Development	3
ENVS 630	Project Management	2

Fourth Semester		C.H
ENVS 632	Air Pollution and Meteorology	3
ENVS 634	Water Resources Management	3
ENVS 636-637	Geographical Information System and Remote Sensing	3+1
ENVS 638	Natural Resources, their Management & Conservation	3
ENVS 640	Environmental Impact Assessment	3
ENVS 642	Compulsory Research Project	10

INSTITUTE OF BIOCHEMISTRY

**MASTER OF SCIENCE (M.Sc) IN BIOCHEMISTRY 2-YEAR DEGREE PROGRAM
(4-SEMESTER) CH-68**

Pre-requisite: Bachelor degree (B.Sc.) with Chemistry and any biological Science subject preferably with Biochemistry with minimum 50% score.

A. Courses Requirements for 1st & 2nd semester (M.Sc. Prev.)

First Semester		C.H	Second Semester		C.H
BIOC 500-501	Biomolecules-I	3+1	BIOC 510	Bioenergetics	2
BIOC 502-503	Biomolecules-II	3+1	BIOC 512-513	Introduction to Computer	
BIOC 504-505	Cell and Molecular Biology	3+1		3+1 Skills & Biostatics	
BIOC 506-507	Human Physiology	2+1	BIOC 514	Metabolism	4
BIOC 508	Biosafety & Ethics	2	BIOC 516-517	Plant Biochemistry	2+1
			BIOC 518-519	Biochemical Techniques-I	1+3

B. Courses Requirements for 3rd & 4th semester (M.Sc. Final).

Third Semester		C.H	Fourth Semester		C.H
BIOC 600-601	Nutritional Biochemistry	2+1	BIOC 622	Current Trends in	2
BIOC 602-603	Bioinformatics	1+2		Biochemistry	
BIOC 604-605	Industrial Biochemistry	2+1	BIOC 624	Immunochemistry	2
BIOC 606	Research Planning & Report Writing	2	BIOC 626	Biotechnology	2
			BIOC 628	Proteomics	3
BIOC	Elective - I	3	BIOC	Elective - I	3
BIOC	Elective - II	3	BIOC	Elective - II	3
			BIOC 644	Comprehensive	
			Viva	2	

Elective Courses:

Assignment of the courses will depend upon the current needs and the faculty specialization. The course contents will include the current state of knowledge in the specific field and will be based on review of research publications. The detailed course contents will be laid out by the tutor in consultation with the faculty of the Institute.

Research Project / Internship:

The students, who opt the Research Project/Internship, will undertake practical training in an approved food industry or research organization. He/she will maintain a daily diary duly signed by the industrial/research supervisor and submit a written report. At the end of the internship, the student will be evaluated by a committee on the basis of his/her performance in the industry/research organization, final written report and oral presentation.

LIST OF ELECTIVE COURSES FOR M.Sc. (SEMESTER-I)

NOTE: The Students of M.Sc. Final (Semester-I) have to opt. any TWO (02) of the following Elective courses.

ELECTIVE – I & ELECTIVE – II

01. BIOC. 608, Biochemistry of Pesticides
02. BIOC. 610, Clinical Biochemistry
03. BIOC. 612, Food Processing and Preservation
04. BIOC. 614, Industrial Processing of Edible Oils & Sugar
05. BIOC. 616, Neurochemistry
06. BIOC. 618, Phytotherapeutic Agents
07. BIOC. 620, Metabolic Disorders

LIST OF ELECTIVE COURSES FOR M.Sc. FINAL (SEMESTER-II)

NOTE: The Students of M.Sc. Final (Semester-II) have to opt. any TWO (02) of the following Elective courses.

ELECTIVE – III & ELECTIVE – IV

01. BIOC. 630, Meat Sciences
02. BIOC. 632, Xenobiotics
03. BIOC. 634, Biochemical aspects of Hematology
04. BIOC. 636, Research Project / Internship
05. BIOC. 638, Milling Backing and Quality Assurance
06. BIOC. 640, General Virology
07. BIOC. 642, Advanced Enzymology

INSTITUTE OF BIOTECHNOLOGY & GENETIC ENGINEERING

MASTER OF SCIENCE IN BIOTECHNOLOGY 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-66

Pre-requisite: Bachelor degree in Chemistry and any biological science subject, with a minimum of 45% score: Pre-Entry Test.

PREVIOUS

First Semester		C.H
BIOT 500-501*	Fundamentals of Biotechnology	2+1
BIOT 502-503	Organic & Physical Chemistry	3+1
BIOT 504-505	Cell & Molecular Biology	2+1
BIOT 506-507	Biological Chemistry	3+1
BIOT 508-509	Biostatistics application in Biotechnology	2+1

Second Semester		C.H
BIOT 510-511	Fermentation Biotechnology	3+1
BIOT 512-513	Basic Microbiology	2+1
BIOT 514-515	Molecular Genetics	2+1
BIOT 516-517	Metabolism	3+1
BIOT 518-519	Computer Applications in Biotechnology	2+1

FINAL

Third Semester		C.H
BIOT 600-601	Genetic Engineering	3+1
BIOT 602-603	Tools & Techniques in Biotechnology	3+1
BIOT 604-605	Agriculture & Food Biotechnology	2+1
BIOT 606-607	Animal Cell & Tissue Culture	2+1
BIOT 608-609	Enzyme Technology	2+1

Fourth Semester		C.H
BIOT 610	Research Methodology	3
BIOT 612-613	Biodiversity & Environment Biotechnology	2+1
BIOT 614-615	Plant Cell & Tissue Culture	2+1
BIOT 616-617	Medical Biotechnology	2+1
BIOT 618	Biotechnology Business Application	3
BIOT 619	Research Project in lieu of Practicals & optional subject	3
BIOT 620	Comprehensive Viva Voce	2

* odd numbercourses are labs

DR. M.A. KAZI INSTITUTE OF CHEMISTRY

M.Sc. IN CHEMISTRY 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-72

This program is open to students who have obtained 2- year B.Sc. (Pass) degree with Chemistry and Mathematics. Candidates who possess B.Sc. (Pass) degree without obtaining one of optional subject of Chemistry are not eligible for admission. The courses during the first 2 semesters outlined here are general advanced level courses. The final two semesters provide opportunity for specialization in any of the fields i.e. Analytical, Inorganic, Organic or Physical Chemistry.

Pre-Requisite B.Sc. (Pass) degree with optional as above; Pre-Entry Test.

Note: Letter "P" indicate M.Sc. (Pass) course numbers. Chemistry requirements for 1st & 2nd semester (CH 36).

PREVIOUS

First Semester		C.H	Second Semester		C.H
CHEM 500P-501P	Inorganic Chemistry	3+1	CHEM 510P-511P	Inorganic Chemistry	3+1
CHEM 502P-503P	Organic Chemistry	3+1	CHEM 512P-513P	Organic Chemistry	3+1
CHEM 504P-505P	Physical Chemistry	3+1	CHEM 514P-515P	Physical Chemistry	3+1
CHEM 506P-507P	Analytical Chemistry	3+1	CHEM 516P-517P	Analytical Chemistry	3+1
CHEM 508P	Chemistry in Industry	2	CHEM 518P	Chemistry in Industry	2

FINAL

Chemistry requirements for Third & Fourth semester (CH 36): Select any one of the fields "A" to "D" for specialization.

A. ANALYTICAL CHEMISTRY

Third Semester		C.H	Fourth Semester		C.H
CHEM 600P	Spectroscopic Methods	4	CHEM 606P	Hyphenated Techniques	4
CHEM 602P	Electrochemical Methods	4	CHEM 608P	Advanced Chromatography	4
CHEM 604P	Nuclear Techniques	4	CHEM 610P	Atomic Emission Spectroscopy	4

CHEM 605P	Advanced Practical	4	CHEM 611P	Advanced Practical/ Project	4
			CHEM 612P	Comprehensive Examination	4

B. INORGANIC CHEMISTRY

Third Semester		C.H	Fourth Semester		C.H
CHEM 620P	Instrumental Methods of Analysis	4	CHEM 626P	Organometallic Chemistry	4
CHEM 622P	Reaction Mechanism & Bonding Anomalies	4	CHEM 628P	Magnetochemistry	4
CHEM 624P	Application of Inorganic Compounds OR Bio-Inorganic Chemistry	4	CHEM 630P	Nuclear Chemistry	4
CHEM 625P	Advanced Practical	4	CHEM 631P	Advanced Practical/ Project	4
			CHEM 632P	Comprehensive Examination	4

C. ORGANIC CHEMISTRY

Third Semester		C.H	Fourth Semester		C.H
CHEM 640P	Reaction Mechanism	4	CHEM 646P	Natural Products Chemistry	4
CHEM 642P	Molecular Rearrangements	4	CHEM 648P	Lipids, Proteins & Synthetic Drugs	4
CHEM 644P	Spectroscopy	4	CHEM 650P	Application of Organic Chemistry	4
CHEM 645P	Advanced Practical	4	CHEM 651P	Advanced Practical/ Project	4
			CHEM 652P	Comprehensive Examination	4

D. PHYSICAL CHEMISTRY

Third Semester		C.H	Fourth Semester		C.H
CHEM 660P	Polymer Chemistry	4	CHEM 666P	Radiation Chemistry	4
CHEM 662P	Spectroscopy	4	CHEM 668P	Surface Chemistry	4
CHEM 664P	Thermodynamics & Electrochemistry	4	CHEM 670P	Chemical Kinetics	4
CHEM 665P	Advanced Practical	4	CHEM 671P	Advanced Practical/ Project	4
			CHEM 672P	Comprehensive Examination	4

* Odd number courses are Labs.

INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGY

MASTER OF INFORMATION TECHNOLOGY (MIT) 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-60

Pre-requisite: BSIT (Pass) candidates from affiliated colleges with minimum 50% aggregate marks or 2.0 CGPA, pre-entry test.

PREVIOUS

First Semester		C.H	Second Semester		C.H
MIT 610	Theory of Operating Systems	3	MIT 620	Human Resource Management	2
MIT 612	Design and Analysis of Algorithms	3	MIT 622	Mobile Cellular Communication & WAP	2+1
MIT 614-615	Client Server Technology	2+1	MIT 624	Organizational Behavior	2
MIT 616-617	Software Engg. Project Management	2+1	MIT 626-527	Multimedia Technology	2+1
MIT 618	IP Telephony	3	MIT 628	Real Time Systems	3
			MIT 630	Micro-Computing Systems	2

FINAL

Third Semester		C.H	Fourth Semester		C.H
MIT 710	Compiler Construction	3	MIT 720	e-Commerce	3
MIT 712	Human Computer Interaction	3	MIT 722	Data warehouse and Mining	3
MIT 714	Design of Real Time Softwares	3	MIT 724	Programming Languages	3
MIT 716	Advanced Data Base System	3	MIT 726	Project	6
MIT 718-719	Internetworking Protocols	2+1			

MASTER OF SCIENCE IN ELECTRONIC COMMERCE (M.SC. E-COMMERCE) 1-YEAR DEGREE PROGRAM (2-SEMESTERS) CH-35

Pre-requisite B.Sc (Hons) Communication Technology/Telecommunications, Computer Technology or Electronics, BCIT//BCS, BS (IT), MSc (Computer Science) and B.E. Electronics/Computer System Engineering, with 50% minimum aggregate marks.

In this program various technologies associated with e-commerce will be studied, in order to develop an understanding of how organizations can utilize these technologies in the achievement of business benefits. The course will guide through:

- Introduction, definition and business goals
- The internet, internet tools and the internet industry
- World-wide web concepts, technology and applications
- The e-commerce environment and technologies, security and legal issues.

First Semester		C.H	Second Semester		C.H
EC 610-611	Internetworking Protocols	3+1	EC 620	Browser-based Interactive Systems	3
EC 612-613	Multimedia Systems	3+1	EC 621	E-Commerce Support Tools	3
EC 614-615	Commercial Website Design	3+1	EC 622	Advanced E-Commerce	3
EC 616	Internet Information	3	EC 623	Project and Thesis	5

EC 617	Management Electronic Commerce, Introduction and Issues	3	
EC 619	Web Server Techniques	3	

M.Sc IN MULTIMEDIA TECHNOLOGY 1 YEAR DEGREE PROGRAM (2-SEMESTER) CH-35

Pre-requisite: B.Sc (Hons) Communication Technology/ Telecommunications/ Computer Technology, Electronics, BS (IT/BCS, M.Sc (Computer Science) and B.E Electronics/ Computer System Engg/ Electrical Engg., with 45% minimum aggregate marks.

The aim of the M.Sc in Multimedia Technology is to provide education in the fundamentals of computing and digital communications as applied to multimedia systems and networks, while introducing some background in the management of IT. This will be coupled with significant practical components in both the hardware and software aspects of digital communications.

First Semester			Second Semester		
		C.H			C.H
MT 610-611	Digital networks and Protocols	3+1	MT 620	Information and Project Management	3
MT 612-613	Multimedia Systems	3+1	MT 622	Virtual Reality	3
MT 614-615	Digital Audio and Video	3+1	MT 624	Formal Methods and Software Engg:	3
MT 616	Information and coding	3	MT 626	Digital Image Processing	3
MT 618	Digital Communication	3	Mt 628	Project 5	3

M.Sc IN TELEMEDICINE AND E-HEALTH (EVENING) 2-YEAR DEGREE PROGRAM CH-40

Pre-requisite: MBBS, BDS, B-Pharmacy, BS/BSC Medical Technology/ Bio-Technology/ Biochemistry/ Microbiology/Telecommunication/ Computer Science/ Software Engineering/Information Technology, Physiology and BE Computer Systems, Electronics, Zoology and Botany.

First Semester			Second Semester		
		C.H			C.H
TMED 510-511	Healthcare Informatics Knowledge, Information and Data	2+1	TEMD 522-523	Communication and Networks	2+1
TEMD 514-515	Telemedicine Devices	2+1	TEMD 524-525	Knowledge Discovery and Data mining	2+1
TEMD 516-517	Clinical Systems	2+1	TEMD-526	Information Processing in Healthcare	3
TEMD-518	Telemedicine and e-Health	3	TEMD-527	Healthcare Information Resources Management	3
TEMD-520	Remote Healthcare	3	TEMD-528	Patient Informatics	3
Third & Fourth Semester					C.H
Students will carry out research project work					
TEMD-618	Research Project				8

Note: The students who complete courses of two semesters only, will be awarded **Diploma in Telemedicine and e- Health** and the students who opt for one year research project, after two-semester taught courses, will be awarded **M.Sc in Telemedicine and e-Health** on successful completion.

POSTGRADUATE DIPLOMA IN INFORMATION TECHNOLOGY 1-YEAR DIPLOMA PROGRAM (2-SEMESTER) CH-40

Pre-requisite: B.Com, B.B.A, B.Sc (Pass) Physics, Mathematics, Statistics, Chemistry, Functional Mathematics, B.E all disciplines with minimum 45% aggregate marks.

First Semester			Second Semester		
		C.H			C.H
PGD 510-511	Introduction to Information Technology	3+1	PGD 522-523	Object Oriented Programming	3+1
PGD 512-513	Fundamentals of Algorithm and C	3+1	PGD 524-525	Data Communication and Networking	3+1
PGD 514-515	Digital Electronics	3+1	PGD 526-527	Introduction to Database	2+1
PGD 516-517	Introduction to Operating systems	2+1	PGD 528-529	Visual Programming	3+1
PGD 518	Fundamental of Mathematics	3	PGD 530	Calculus	3
PGD 520	Financial Accounting	2	PGD 532	Fundamentals of Management	2

Note: In case the number of students seeking admission in any discipline is less than 20, then the classes will not be started.

INSTITUTE OF MATHEMATICS & COMPUTER SCIENCE

M.A./M.Sc. IN MATHEMATICS 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-68

This Masters Program provides opportunity to students to acquire specialization in order to meet specific career requirements, specially in teaching. The program is particularly significant for students with 2 year B.A./ B.Sc. Pass degree from the affiliated colleges where specialized subject experts are generally wanting. The Masters program of 4 semester duration for B.A. / B.Sc. (Pass) candidates who join as students of M.Sc. (Previous) has been designed accordingly. Pre-requisite; B.Sc./ B.A. (Pass) degree with Mathematics as one of the elective subjects. Pre-entry Test.

M.Sc. (PREVIOUS)

<i>First Semester</i>			<i>Second Semester</i>		
		<i>C.H</i>			<i>C.H</i>
MATH 500	Real Analysis-I	3	MATH 506	Real Analysis-II	3
MATH 501	Algebra-I	3	MATH 507	Algebra-II	3
MATH 502	Complex Analysis	3	MATH 508	Measure Theory	3
MATH 503	Analytical Dynamics	3	MATH 510	Numerical Methods	3
MATH 504	Differential Equations	3	MATH 511	Algebraic Topology	3
			MATH 517	Graph Theory	

M.Sc. (FINAL)

<i>Third Semester</i>			<i>Fourth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
MATH 601	Functional Analysis	3	MATH 600	Computer Programming	3
MATH 602	Numerical Analysis	3	MATH 606	Methods of Mathematical Physics	3
MATH 603	Mathematical Statistics & Probability	3	MATH 608	Optimization Techniques	3
MATH 605	Operations Research	3	MATH 610	Econometrics	3
			MATH 612	Tensor Analysis	3
			MATH 613	Integral Equations	3
			MATH 651	Comprehensive Viva Voce	2

Elective Subjects:

- | | |
|----------------------------------|----------------------------|
| 01. Algebra | 02. Research Methodology |
| 03. Ring Theory | 04. Theory Modules |
| 05. Homological Algebra | 06. Combinatorics |
| 07. Graph Theory | 08. Approximation |
| 09. Automata Theory | 10. Control Theory |
| 11. Statistical Mechanics | 12. Solid Mechanics |
| 13. Quantum Mechanics | 14. Astrology |
| 15. Business Mathematics | 16. Computer Graphics |
| 17. Computational Fluid Dynamics | 18. Finite Element Methods |
| 19. Queuing Theory | |

MCS MASTER OF COMPUTER SCIENCE: 2-YEAR DEGREE PROGRAM (FOUR SEMESTER) CH-60

Pre-requisite: BCS 3-year candidates from affiliated Colleges with at least 45% marks: Pre-Entry Test.

PREVIOUS

<i>First Semester</i>			<i>Second Semester</i>		
		<i>C.H</i>			<i>C.H</i>
COMP 601	System Programming	3	COMP 604	Simulation & Modeling/ Elective-II	3
COMP 603	Parallel and Distributed Processing	3	COMP 606	Expert System/ Elective-III	3
COMP 605	Visual Programming	3	COMP 608	Computer Vision/ Elective-IV	3
COMP 607	Modern High Level Programming Language Elective-I	3	COMP 610	Computer Interfacing/ Elective-V	3
COMP 609	Computer Networks	3	COMP 612	Multimedia & Hypermedia System/ Elective-VI	3

FINAL

<i>Third Semester</i>			<i>Fourth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
COMP 701	Theory of Computation	3	COMP 702	Theory of Programming Languages	3
COMP 703	Web Engineering	3	COMP 704	Software Project Management	3
COMP 705	Object Oriented Analysis and Design	3	COMP 706	Data Warehousing and Data Mining	3
COMP 707	Advanced Database System	3	COMP 708	Project Report	4
COMP 709	Advanced Operating System/ Elective-VII	3	COMP 710	Comprehensive Viva-Voce	2

Elective Subjects:

- | | |
|---|--|
| 01. Modern High Level Programming Languages | 02. Computer Vision |
| 03. Computer Interfacing | 04. Multimedia and Hypermedia System |
| 05. Advanced Operating Systems | 06. Network Security |
| 07. Network Programming | 08. Software Development Methodologies |
| 09. Mobile Communications | 10. Neural Networking |
| 11. Cryptography | 12. Data compression algorithms |
| 13. Advanced Computer Architecture | |

NOTE: 1. The Director may revise/modify list of Electives depending on the market requirement/ advancement in the subject and availability of expert faculty.

2.Details of the course contents can be obtained from the office of the IMCS

M . S c . C O M P U T E R S C I E N C E : 2 - Y E A R D E G R E E P R O G R A M (4 - S E M E S T E R) C H - 6 8

Pre-requisite:- (1) Pre-entry Test (2) B.Sc. (Pass) with Mathematics (Pure) and Physics or Statistics (3) BA/B.Com/BS with H.S.C (Pre-Medical Group) or Equivalent with one year P.G.D. in Computer science. (4) BE (excluding Software/Commuter Systems/IT). (5) BS with H.S.C Pre-Engineering Group (excluding Software/Commuter Systems/IT) with minimum 2nd Class.

A. Core courses Requirements:

M.Sc. (PREVIOUS)

First Semester			Second Semester		
		C.H			C.H
CS 501-503	Introduction to Computer	3+1	CS 551	System Analysis and Design	3
CS 504	Operations Research	3	CS 552-553	Data Structures	3+1
CS 509	Numerical Analysis	3	CS 555	Programming Language	3
CS 510-511	C Programming	3+1		Concepts	
CS 507	Digital Logic & Design	3	CS 556	Computer Architecture	3
			CS 559-560	Object Oriented	3+1
				Programming - JAVA	

FINAL

Third Semester			Fourth Semester		
		C.H			C.H
CS 602	Discrete Mathematics	2	CS 650	Artificial Intelligence	3
CS 603	Operating Systems	3	CS 651	Data Communication and	3
CS 607-608	Database Management	3+1		Network	
	System		CS 654	Formal Languages and	2
CS 609-610	Introduction to Software	3+1		Automata Theory	
	Engineering		CS 657-658	Web Programming	2+1
CS 611-612	Visual Programming	3+1	CS 655	Software Project	4
			CS 656	Viva Voce	2

Note: details of the course contents can be obtained from the office of the IMCS

INSTITUTE OF PHYSICS

M.SC. IN PHYSICS 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-66

Pre-requisite; H.S.C. Pre-Engineering, 2-years B.Sc. (Pass) with Physics, Mathematics (PURE) & Chemistry / Statistics as optional subjects; Pre- Entry Test.

PREVIOUS

First Semester			Second Semester		
		C.H			C.H
PHYS 500	Methods of Mathematical	3	PHYS 508	Methods of Mathematical	3
	Physics-I			Physics-II	
PHYS 501	Modern Physics Lab-I	1	PHYS 509	Modern Physics Lab-II	1
PHYS 502	Classical Mechanics	3	PHYS 510	Thermal & Statistical	3
PHYS 503	Spectroscopy Lab	1		Physics	
PHYS 504	Electrodynamics-II	3	PHYS 511	Statistical Physics Lab	1
PHYS 505	Computer Programming	1	PHYS 512	Electrodynamics II	3
	Lab		PHYS 513	Computer Programming	1
PHYS 506	Electronics	3		Lab	
PHYS 507	Electronics Lab	1	PHYS 514	Digital Electronics	3
			PHYS 515	Digital Electronics Lab	1

FINAL

Third Semester			Fourth Semester		
		C.H			C.H
PHYS 600	Solid State Physics-I	3	PHYS 608	Solid State Physics-II	3
PHYS 601	Solid State Physics Lab	1	PHYS 609	Lasers and X-Rays Lab	1
PHYS 602	Atomic & Molecular	3	PHYS 610	Nuclear Physics	3
	Physics		PHYS 611	Nuclear Physics Lab	1
PHYS 603	Atomic & Molecular	1	PHYS 612	Quantum Mechanics II	3
	Physics Lab		PHYS 613	Computer Programming	1
PHYS 604	Computational Physics /	3		Lab	
	Medical Physics-I		PHYS 614	Condensed Matter &	3
PHYS 605	Computational Physics	1		Materials Physics / Health	
	Lab / Medical Physics Lab			Physics/ High Energy	
PHYS 606	Quantum Mechanics-I	3		Physics / Plasma Physics	
PHYS 607	Detector Development Lab	1	PHYS 614*	Medical Physics-II	3
			PHYS 615	Health Physics Lab /	1
				Medical Physics Lab	
			PHYS 620	Comprehensive Viva Voce	2

- Note:**
1. PHY:614* is compulsory only for PHY:604* and not allowed to opt PHY: 614; others may opt any one of PHY: 614.
 2. Courses bearing even and odd numbers are theory and practical respectively

INSTITUTE OF PLANT SCIENCES

M.Sc. IN BOTANY 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-72

Pre-requisite: B.Sc. (Pass) degree with Botany as one of the elective subjects; Pre-Entry Test.

First Semester		C.H
BOTN 512-513	Plant Anatomy	2+1
BOTN 514-515	Biodiversity & Conservation	2+1
BOTN 516-517	Plant Biochemistry	2+1
BOTN 518-519	Plants Ecology – I	2+1
BOTN 520-521	Plant Physiology	2+1
BOTN 522-523	Research Methodology & Phytotechnology/Kitchen Garden	2+1
ENGL 540	Remedial English	
Second Semester		C.H
BOTN 500-501	Biostatistics	2+1
BOTN 502-503	Bacteriology & Virology	2+1
BOTN 504-505	Phycology & Bryology	2+1
BOTN 506-507	Mycology & Plant Pathology	2+1
BOTN 508-509	Diversity of Vascular Plants	2+1
BOTN 510-511	Plant Systematics	2+1
ENGL 541	Remedial English	

Third Semester		C.H
BOTN 612-613	Genetics - II	2+1
BOTN 614-615	Special Paper – I*	3+1
BOTN 616-617	Special Paper – II*	3+1
BOTN 618	Research Project	4
BOTN 620	Comprehensive Viva Voce	3
Fourth Semester		C.H
BOTN 600-601	Molecular Biology	2+1
BOTN 602-603	Paleobotany & Palynology	2+1
BOTN 604-605	Plant Ecology - II	2+1
BOTN 606-607	Plant Physiology – I	2+1
BOTN 608-609	Genetics – I	2+1
BOTN 610-611	Environmental Biology	2+1

*Special paper will be offered according to the expertise available in the Institute.

PGD IN MEDICINAL PLANTS 1-YEAR DIPLOMA PROGRAM (TWO SEMESTER) CH-30

Pre-requisite: B.Sc. (with Botany as an elective subject) BS (Botany), B.Pharm, M.B.B.S. and B.Sc. (Forestry) with minimum 45% aggregate marks.

First Semester		C.H
DMP 101	Elements of Herbology	3
DMP 102	Ethnomedicinal Studies & Medicinal Plants	2
DMP 103	Raw Material Resources & Collection, Primary Healthcare & Herbs	3
DMP 104	Phytotechnology & Pharmacological Screening of Herbal Drugs	3
DMP 105	Practical Courses on Identification of Medical Plants, Phytochemistry, Processing & Value	3
Second Semester		C.H
DMP 201	Herbal Raw Material Processing & their Products	3
DMP 202	Quality Control & Phytochemical Method Project Work	3
DMP 203	Project Work	3
DMP 204	Practical Course on Herbal Classical Drug Preparation, Quality Control	3

DEPARTMENT OF FRESH WATER BIOLOGY & FISHERIES

M.Sc. IN FRESH WATER BIOLOGY AND FISHERIES 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-66

Pre-requisite: B.Sc. (Pass) with Botany- Zoology/ Botany/ Chemistry/ Zoology- Chemistry as elective subjects.

A. M.Sc. (Previous) requirements:

FWBF 500 to FWBF 515 as per 5th & 6th Semester of BS Program

AND

FWBF 600 to FWBF 618 as per 7th & 8th Semester of BS Program

Optional for other major subjects

DEPARTMENT OF GEOGRAPHY

M.SC. IN GEOGRAPHY 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-66

Pre-requisite: Bachelor (Pass) degree in any subject.

	<i>C.H</i>	<i>Lab courses</i>	<i>C.H</i>		
GG 500	Geomorphology	3	GG 501	Identification of Rocks and Minerals	1
GG 502	Climatology	3	GG 503	Interpretation of Weather Maps	1
GG 504	Oceanography	3	GG 505	El. Cartographic Techniques	1
GG 506	Economic Geography	3	GG 507	El. Quantitative Techniques	1
GG 508	Biogeography	3	GG 509	Map Projection (Lab)	1
GG 510	Soil Geography	3	GG 511	Cartographic Techniques & Comp. Tech.	1
GG 512	Settlement Geography	3	GG 513	Instrumental Surveying	1
GG 514	Coastal Morphology	3	GG 515	Advanced Quantitative Techniques	1
	OR				
GG 516	Political Geography	3			

AND GG 600 to GG 640 as for final year B.S. (Geography) above

DEPARTMENT OF PHYSIOLOGY

M.Sc. IN PHYSIOLOGY 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-60

Pre-requisite:- B.Sc. (Pass) with Botany/ Zoology/ Microbiology/Biochemistry/Fresh water Biology/Chemistry OR after passing 2nd year BS with Physiology as Minor subject.

PREVIOUS

<i>First Semester</i>	<i>C.H</i>	<i>Second Semester</i>	<i>C.H</i>
PHSL- Functional Anatomy & Physiology-I	N.C	PHSL Functional Anatomy & Physiology-II	N.C
PHSL 500-501 Molecular Biology	2+1	PHSL 510-511 Endocrinology	2+1
PHSL 502-503 Cardiovascular System	2+1	PHSL 512-513 Reproductive & Developmental Physiology	2+1
PHSL 504-505 Pulmonary Physiology	2+1	PHSL 514-515 Physiology of Special Senses	2+1
PHSL 506-507 Renal Physiology	2+1	PHSL 516-517 Comparative Animal Physiology	2+1
PHSL 508-509 Gastroenteropancreatic Physiology	2+1	PHSL 518-519 Toxicology	2+1

FINAL

<i>Third Semester</i>	<i>C.H</i>	<i>Fourth Semester</i>	<i>C.H</i>
PHSL 600-601 Pharmacology	2+1	PHSL 610-611 Patho – Physiology	2+1
PHSL 602-603 Environmental Physiology	2+1	PHSL 612-613 Behavioral Physiology	2+1
PHSL 604-605 Physiology of Health, Fitness & Exercise	2+1	PHSL 614-615 Haematology	2+1
PHSL 606-607 Physiological Biotechnology	2+1	PHSL 616 Internship / Project	4
PHSL 608 Research Methodology	3	PHSL 618 Comprehensive Viva voce	2

NC* = Non Credit

DEPARTMENT OF STATISTICS

M.Sc. IN STATISTICS: 2-YEAR DEGREE PROGRAM(4-SEMESTER)CH-70

Pre-requisite:-B.Sc. (Pass) degree with Mathematics/ Statistics as elective subject.

M.Sc. (Prev.)

<i>1st Semester</i>	<i>C.H</i>	
STAT 500	Statistical Methods-I	3
STAT 501	Statistical Methods-I (Lab.)	1
STAT 502	Probability & Probability Distributions-I	3
STAT 503	Probability & Probability Distributions-I (Lab.)	1
STAT 504	Sampling and Survey Methods-I	3
STAT 505	Sampling and Survey Methods-I (Survey/Lab.)	2
STAT 506	Data Processing & Statistical Computing-I	3

STAT 507	Data Processing & Statistical Computing-I (Lab.)	1
2nd Semester		C.H
STAT 508	Statistical Methods-II	3
STAT 509	Statistical Methods-II (Lab.)	1
STAT 510	Probability & Probability Distributions –II	3
STAT 511	Probability & Probability Distributions –II (Lab.)	1
STAT 512	Sampling and Survey Methods-II	3
STAT 513	Sampling and Survey Methods-II (Survey/Lab.)	2
STAT 514	Data Processing & Statistical Computing-II	3
STAT 515	Data Processing & Statistical Computing-II (Lab.)	1

M.Sc. (Final)

3rd Semester		C.H
STAT 600	Statistical Inferences-I	3
STAT 601	Statistical Inferences-I (Lab.)	1
STAT 602	Regression Analysis & Econometrics-I	3
STAT 603	Regression Analysis & Econometrics-I (Lab.)	1
STAT 604	Design of Experiment-I	3
STAT 605	Design of Experiment-I (Survey/Lab.)	2
STAT 606	Time Series Analysis & Forecasting-I	3
STAT 607	Time Series Analysis & Forecasting-I (Lab.)	1

4th Semester		C.H
STAT 608	Statistical Inferences-II	3
STAT 609	Statistical Inferences-II (Lab.)	1
STAT 610	Regression Analysis & Econometrics-II	3
STAT 611	Regression Analysis & Econometrics-II (Lab.)	1
STAT 612	Design of Experiment-II	3
STAT 613	Design of Experiment-II (Survey/Lab.)	2
STAT 614	Time Series Analysis & Forecasting-II	3
STAT 615	Time Series Analysis & Forecasting-II (Lab.)	1
STAT 616	Research Project (in lieu of Comp. Viva-Voce)	2

* odd number courses are Labs

M.SC. IN ACTUARIAL SCIENCES:2-YR DEGREE PROGRAM (4-SEMESTER) CH 67

M.Sc. Actuarial sciences will contain a total of 67 Credit Hours out of which 64 (16+16+16+16) will comprise course work in the four (04) semester and 03 Credit Hours for Report Writing & Comprehensive Viva-Voce.

Eligibility

The eligibility criteria for admission in M.Sc. Actuarial Science:

Graduate students with 50% Marks in Mathematics, Statistics, Computer Science, B.Com, B.B.A and relevant subjects.

M.Sc. (Prev.)

1st Semester		C.H
ACTU 500	Statistical Methods-I (Th.) (Compulsory)	3
ACTU 501	Statistical Methods-I (Lab.) (Compulsory)	1
ACTU 502	Mathematical Probability & Statistics-I (Th.)(Compulsory)	3
ACTU 503	Mathematical Probability & Statistics-I (Lab.)(Compulsory)	1
ACTU 504	Economics-I (Th.)(Optional)	3
ACTU 505	Economics-I (Lab.)(Optional)	1
ACTU 506	Asset and Liability Management-I (Th.)(Major)	3
ACTU 507	Asset and Liability Management-I (Lab.)(Major)	1

2nd Semester		C.H
ACTU 508	Statistical Methods-II (Th.)(Compulsory)	3
ACTU 509	Statistical Methods-II (Lab.) (Compulsory)	1
ACTU 510	Mathematical Probability & Statistics-II (Th.)(Compulsory)	3
ACTU 511	Mathematical Probability & Statistics-II (Lab.)(Compulsory)	1
ACTU 512	Economics-II (Th.)(Optional)	3
ACTU 513	Economics-II (Lab.)(Optional)	1
ACTU 514	Asset and Liability Management-II (Th.)(Major)	3
ACTU 515	Asset and Liability Management-II (Lab.)(Major)	1

M.Sc. (Final)

3rd Semester		C.H
ACTU 600	Actuarial Risk Management-I (Introd.) (Th.) (Major)	3
ACTU 601	Actuarial Risk Management-I (Introd.) (Lab.)(Major)	1
ACTU 602	Life Contingencies and Life Tables-I (Th.)(Compulsory)	3
ACTU 603	Life Contingencies and Life Tables-I (Lab.)(Compulsory)	1
ACTU 604	Financial Economics-I (Th.)(Compulsory)	3

ACTU 605	Financial Economics-I (Lab.)(Compulsory)	1
ACTU 606	Stochastic Processes (Th.)(Optional)	3
ACTU 607	Stochastic Processes (Lab.)(Optional)	1
4th Semester		C.H
ACTU 608	Actuarial Risk Management-II (Introd.) (Th.) (Major)	3
ACTU 609	Actuarial Risk Management-II (Introd.) (Lab.)(Major)	1
ACTU 610	Life Contingencies and Life Tables-II (Th.)(Compulsory)	3
ACTU 611	Life Contingencies and Life Tables-II (Lab.)(Compulsory)	1
ACTU 612	Financial Economics-II (Th.)(Compulsory)	3
ACTU 613	Financial Economics-II (Lab.)(Compulsory)	1
ACTU 614	Survival Model (Th.)(Optional)	3
ACTU 615	Survival Model (Lab.)(Optional)	1
ACTU 616	Report Writing & Comprehensive Viva-Voce (Compulsory)	3

DEPARTMENT OF ZOOLOGY

M.Sc. (PASS) ZOOLOGY 2-YEAR DEGREE PROGRAM (4-SEMESTER) CH-66

Pre-requisite: -B.Sc. (Pass) degree with Zoology as one of the elective subjects. Pre-Entry Test.

M.Sc. (Previous)

First Semester		C.H
ENG	Remedial English	NC
ZOOL 500-501	General Biochemistry	3+1
ZOOL 502-503	Cell & Molecular Biology	3+1
ZOOL 504-505	Physiology	3+1
ZOOL 506-507	Animal Behaviour	2+1
PSYC 522	Psychology	2

Second Semester		C.H
ENG	Remedial English	NC
ZOOL 508-509	Biological Techniques	1+2
ZOOL 510-511	Evolution & Principles of Systematics	2+1
ZOOL 512-513	Developmental Biology	3+1
ZOOL 514-515	Genetics	3+1
ZOOL 516	Wildlife & Conservation Biology	2

M.Sc. (Final)

Third Semester		C.H
ZOOL 600-601	Environmental Biology	3+1
ZOOL 602-603	Zoogeography & Palentontology	2+1
ZOOL 604-605	Special Paper-I	2+1
ZOOL 606-607	Special Paper-II	3+1
ZOOL 608	Synopsis & Research Methodology	2
Fourth Semester		C.H
ZOOL 610-611	Bioinformatics & Biotechnology	3+1
ZOOL 612-613	Immunology & Economic Zoology	2+1
ZOOL 614-615	Special Paper-III	2+1
ZOOL 616-617	Special Paper-IV	3+1
ZOOL 618	Research Project	3