

## FACULTY OF NATURAL SCIENCES

### CENTRE FOR PHYSICAL EDUCATION, HEALTH AND SPORTS SCIENCE

#### BS HEALTH & PHYSICAL EDUCATION: 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-134

Pre-requisite: HSC with 45% marks. The individual who possesses Sports Skills will be given preference. Pre-Entry Test from SUTC, Physical Fitness and Aptitude Test by the Centre is mandatory on next day of the test. Academic Session starts in January and ends in December.

#### FIRST YEAR

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
ENG 300	English	3
IS 302	Islamic Studies or Ethics for Non-Muslims	2
CS 306	Computer Skills	3
PEHSS 310	Foundation of Physical Education	3
PEHSS 312	Basic Human Anatomy (Th.)	3
PEHSS313	Basic Human Anatomy (Lab.)	1
PEHSS 315	Skills in Table Tennis, Squash & Tennis Games	1
PEHSS 317	Skills in Athletics Track events (Sprints)	1
PEHSS 319	Skills in Gymnastic (Floor work)	1

<b>2<sup>nd</sup> Semester</b>		<b>C.H</b>
ENG 302	English	3
PS 304	Pakistan Studies	2
STAT 308	Statistics	3
PEHSS 320	Introduction to Physiology (Th.)	2
PEHSS321	Introduction to Physiology (Lab.)	1
PEHSS 322	Sports First Aid (Th.)	3
PEHSS 323	Sports First Aid (Lab.)	1
PEHSS 325	Skill in Badminton, Net Ball and Hand Ball Games	1
PEHSS 327	Skills in Athletics (Throws events)	1
PEHSS 329	Skills in Gymnastics (Floor Work)	1

#### SECOND YEAR

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
ENG 400	English	3
PEHSS 410	Media and Sport (Th.)	2
PEHSS 411	Media and Sport (Lab.)	1
PEHSS 412	Human Biology	3
PEHSS 414	Introduction to Psychology	3
PEHSS 415	Skills in Basket ball, Foot ball, Shooting ball games	1
PEHSS 417	Skills in Athletics Track events (Long Races)	1
PEHSS 419	Skills in Gymnastics (Apparatus Work)	1

<b>2<sup>nd</sup> Semester</b>		<b>C.H</b>
ENG 402	English	3
PEHSS 420	Health Education(Community Health, Hygiene, Nutrition) (Th.)	2
PEHSS421	Health Education(Community Health, Hygiene, Nutrition) (Lab.)	1
PEHSS 422	Sports Sociology	3
PEHSS 423	Skill in Hockey, Cricket & Volley Ball Games	1
PEHSS 424	Curriculum Development in Physical Education	3
PEHSS 425	Skills in Athletics (Jumps events)	1
PEHSS 427	Skills in Gymnastics (ApparatusWork)	1

#### THIRD YEAR

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
PEHSS 500	Introduction to Sports Injuries	3
PEHSS 502	Psychology & Sports Science	3
PEHSS 504	Sports Management	3
PEHSS 506	Science of Track and Field	3
PEHSS508	Health Education (Epidemiology of Communicable & Non-communicable Diseases)	2
PEHSS 510	Quantitative Research Methods in Physical Education	2
PEHSS 511	Skills of Gymnastics Floor (Advanced)	1
PEHSS 513	Specialization in Selected(Optional) Games and Athletics	1

<b>2<sup>nd</sup> Semester</b>		<b>C.H</b>
PEHSS 512	Traumatology & Rehabilitation (Th.)	2
PEHSS 515	Traumatology & Rehabilitation (Lab.)	1
PEHSS 514	Physical Education for Special Population	3
PEHSS 516	Bio Mechanics of Sports	3
PEHSS 518	Rules & Techniques of Games & Sports (Th.)	2
PEHSS 519	Rules & Techniques of Games & Sports (Lab.)	1
PEHSS 520	Qualitative Research Methods in Physical Education	2

PEHSS 521	Teaching Methods and Demonstration	2
PEHSS 523	Skills of Gymnastics Floor (Advanced)	1
PEHSS 525	Specialization in Selected (Optional) Games and Athletics	1

#### FOURTH YEAR

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
PEHSS 600	Sports Medicine	3
PEHSS 602	Test, Measurement & Evaluation in Physical Education	3
PEHSS 606	Nutrition for Sports	3
PEHSS 627	Skills of Gymnastics Apparatus (Advanced)	1
PEHSS 629	Specialization in Selected( <b>Optional</b> ) Games and Athletics	1
PEHSS 631	Internship/ Projects Work	2
PEHSS 633	Research Project& Viva-Voce (Quantitative)	2

<b>2<sup>nd</sup> Semester</b>		<b>C.H</b>
PEHSS 610	Application of Medicine in Sports	3
PEHSS 612	Financial Administration & Planning	3
PEHSS 614	Physiology of Sports (Th.)	3
PEHSS 615	Physiology of Sports (Lab.)	1
PEHSS 635	Skills of Gymnastics Apparatus (Advanced)	1
PEHSS 637	Specialization in Selected( <b>Optional</b> ) Games and Athletics	1
PEHSS 639	Research Project and Viva-Voce(Quantitative)	3
PEHSS 641	Comprehensive Viva-Voce	2

#### **BPEHSS: BACHELOR OF PHYSICAL EDUCATION, HEALTH & SPORTS SCIENCE, (EVENING) 1 YEAR DEGREE PROGRAM (2-SEMESTER) CH-62**

Pre-requisite:- B.A. / B.Sc. / B.Com. from any HEC recognized University; Preference will be given to Candidates with evidence of participation in National Provincial/intervarsity/ Intercollegiate/ District level sports competitions. Physical fitness and Aptitude test is mandatory. PET, PTI, and Sports Officers, working at Public or Private sector institutions having 3<sup>rd</sup> Division may also apply.

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
PEHSS 550	Foundation of Physical Education	3
PEHSS 552	Research Project	3
PEHSS 554	Science of Track and Field	3
PEHSS 556	Basic Anatomy & Physiology	3
PEHSS 558	Curriculum Development in Physical Education	3
PEHSS 560	Environmental Science	3

<b>Practicals</b>		<b>C.H</b>
PEHSS 551	Skill in Games & Sports (outdoor & Indoor)	3
PEHSS 553	Skill in Athletics (Track and Field)	3
PEHSS 555	Skill in Gymnastic (Apparatus and Floor work)	3
PEHSS 557	Teaching Methods and Lesson Planning	3

<b>2<sup>nd</sup> Semester</b>		<b>C.H</b>
PEHSS 562	Physical Education for Handicapped	3
PEHSS 564	Studies in Health Education	3
PEHSS 566	Biomechanics of Sports	3
PEHSS 568	Rules of Games & Sports	3
PEHSS 570	Research Method in Physical Education	3
PEHSS 572	Research Project (Evaluation +Viva Voce)	3
PEHSS 574	Comprehensive Viva Voce	2

<b>Practicals</b>		<b>C.H</b>
PEHSS 561	Skills in Games & Sports (Outdoor & Indoor)	3
PEHSS 563	Skills in Athletics (Track and Field)	3
PEHSS 565	Skills in Gymnastic (Apparatus & Floor)	3
PEHSS 567	Teaching Methods & Lesson Planning	3

## CENTER FOR ENVIRONMENTAL SCIENCE

#### **BS IN ENVIRONMENTAL SCIENCES 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-134**

Pre-requisite: H.S.C. (Pre-Engineering/ Pre-Medical/ General Sciences) with at least 45% aggregate marks

#### **FIRST YEAR**

<b>First Semester</b>		<b>C.H</b>
ENGL 300	Remedial English-I	3
PAK 300	Pakistan Studies	2
MATH 300	Mathematics	3
ES 310/311	Introduction to Environmental Sciences (Major)	3+1
CHEM 320/321	Chemistry-I Compulsory (Minor)	2+1
Minor 320/321	Geology/Microbiology/Zoology/Botany/Geography/ Fresh Water Biology/	2+1

Statistics/Physics/Bio Chemistry/ Bio Technology/Physiology (Minor)		
<b>Second Semester</b>		<b>C.H</b>
MATH 301	Mathematics	3
ENGL 301	Remedial English-II	3
IS/ETH 301	Islamic Studies/ Ethics	2
ES 312/313	Aquatic pollution and control (Major)	3+1
Minor 322/323	Chemistry-II Compulsory (Minor)	2+1
Minor 322	Geology/Microbiology/Zoology/Botany/Geography/ Fresh Water Biology/ Statistics/Physics/Bio Chemistry/ Bio Technology/Physiology (Minor)	2+1

## SECOND YEAR

<b>Third Semester</b>		<b>C.H</b>
ENGL 400	English Compulsory –I	3
CIVIL 400	Civilization	2
Comp 400	Computer Sciences (N.C)	0
ES 410-411	Fundamental of Ecology (Major)	3+1
Minor 420-421	Chemistry –III (Compulsory)	2+1
Minor 420-421	Geology/Microbiology/Zoology/Botany/Geography/ Fresh Water Biology/ Statistics/Physics/Bio Chemistry/ Bio Technology/Physiology (Minor)	2+1

<b>Fourth Semester</b>		<b>C.H</b>
ENG 401	English (Compulsory)-II	3
ES 401	Environmental Sciences (Compulsory)	2
STAT 401	Statistics (N.C)	0
ES 412-413	Environmental Sampling and Instrumentation (Major)	3+1
Minor 422-423	Chemistry –IV ((Minor) (Compulsory)	2+1
Minor 422-423	Geology/Microbiology/Zoology/Botany/Geography/ Fresh Water Biology/ Statistics/Physics/Bio Chemistry/ Bio Technology/Physiology (Minor)	2+1

## THIRD YEAR

<b>Fifth Semester</b>		<b>C.H</b>
BIO 500	Biodiversity & Nature Conservation Theory	3
AQUA 502/503	Aquatic Culture	3+1
MAN 504/505	Solid Waste Management	3+1
MICRO 506/507	Environmental Microbiology	3+1
MICRO 508	Introductory Economics and Sustainable Theory	3

<b>Sixth Semester</b>		<b>C.H</b>
GIS 510/511	GIS Processing Computer	3+1
ECO. 512/513	Applied Ecology	3+1
TECH 514/515	Analytical Technique in Environmental Sciences	3+1
EN PAK 516	Environmental Profile of Pakistan	3
URBAN 518	Urban Planning & Management	3

## FOURTH YEAR

<b>Seventh Semester</b>		<b>C.H</b>
LAW 600	Environmental Laws & Policies Theory	3
EED 602	Energy, Environment & Development Policies Theory	3
RAC 604	Risk Assessment and Communication	3
EI A 608	Environmental Impact Assessment	3
PHY 610	Geo Physics Theory	3

<b>Eighth Semester</b>		<b>C.H</b>
HSE 620/621	Health, Safety & Environment	3+1
WRM 622	Water Resource Management Theory	3
AQUA 624	Agro-Ecology Theory	3
RP 626	Research Project	4
COMP 628	Comprehensive Viva	2

# CENTRE FOR PURE AND APPLIED GEOLOGY

## BS GEOLOGY 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136

Pre-requisite; H.S.C. (Pre-Engineering/ Pre-Medical/ General Science) with at least 45% aggregate marks.

## FIRST YEAR

<b>First Semester</b>		<b>C.H</b>
ENGL 300	English- I	3
ISST/ETH300	Islamic Studies/Ethics	2

GEOL310-311	General Geology	4
PHY/CHEM/	Physics/Chemistry/Geography (Optional)	3
GEOG 320-321		
MATH/PHSL/STAT/	Functional/Applied Mathematics/Physiology/Statistics/Geography/ Zoology	3
GEOG/ZOOL 320-321		

<b>Second Semester</b>		<b>C.H</b>
ENGL 301	English- II	3
IST/ETH.301	Islamic Studies/Ethics	2
PHY/CHEM/	Physics/Chemistry/ Geography(Optional)	3
GEOG 322-323		
MATH/PHSL/STAT/	Functional/Applied Mathematics/Physiology/Statistics/Geography/ Zoology	3
GEOG/ZOOL 322-323		
GEOL312-313	Petrology and Geomorphology	4

## SECOND YEAR

<b>Third Semester</b>		<b>C.H</b>
ENGL 400	Communication Skill (English- III)	3
CIVIZ 400	Civilization	2
PHY/CHEM/	Physics/Chemistry/ Geography (Optional)	3
GEOG 420-421		
MATH/PHSL/STAT/	Applied Mathematics/Physiology/Statistics/Geography/Zoology	3
GEOG/ZOOL 420-421		
GEOL 410-411	Palaeontology	3
GEOL 412-413	Stratigraphy	3

<b>Fourth Semester</b>		<b>C.H</b>
ENGL 401	Tech Report Writing English- IV	3
EVIS 401	Environmental Sciences	2
PHY/CHEM/	Physics/Chemistry/ Geography-I (Optional)	3
GEOG 422-423		
MATH/PHSL/STAT/	Applied Mathematics/Physiology/Statistics/Geography/Zoology	4
GEOG/ZOOL 422-423		
GEOL 414-415	Crystallography, Optical Mineralogy & Petrography	3
GEOL 402	Geological Field Work-I	2

## THIRD YEAR

<b>Fifth Semester</b>		<b>C.H</b>
GEOL 500-501	Geo Tectonics	3
GEOL 502-503	Structural Geology	3
GEOL 504-505	Sedimentology	3
GEOL 506-507	Geochemistry	3
GEOL 508-509	Mineralogy	3
GEOL 510-511	Igneous & Metamorphic Petrology	3

<b>Sixth Semester</b>		<b>C.H</b>
GEOL 512-513	Geophysics	3
GEOL 514-515	Sequence Stratigraphy	3
GEOL 516-517	Remote Sensing & GIS	3
GEOL 518-519	Field Geology & Sedimentary Petrology	3
GEOL 520-521	Economic Geology	3
GEOL 522	Geological Field Work-II	3

## FOURTH YEAR

<b>Seventh Semester</b>		<b>C.H</b>
GEOL 600-601	Geology of Pakistan	3
GEOL 602-603	Petroleum Geology	3
GEOL 604-605	Environmental Geology	3
GEOL 606-607	Engineering Geology	3
GEOL 608-609	Hydrogeology	3
GEOL 610-611	Micropaleontology & Bio-Stratigraphy	3

<b>Eighth Semester</b>		<b>C.H</b>
GEOL612-613	Special Paper-I	4
GEOL614-615	Special Paper-II	4
GEOL 616	Thesis+ Field Work	4
GEOL 617	Comprehensive Viva Voce	2

# INSTITUTE OF BIOCHEMISTRY

## BS IN BIOCHEMISTRY 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136

Pre-requisite: H.S.C. With Pre-Medical Group: Pre-Entry Test.

### FIRST YEAR

<i>First Semester</i>			<i>Second Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENG 300	English-I	3	ENG 301	English-II	3
PKST 300	Pakistan Studies	2	ISST/ETHS 301	Islamic Studies	2
MATHS 300	Mathematics	3	MATHS 301	Statistics	3
BIOC 310-311	Introductory Biochemistry	3+1	BIOC 312-313	Cell Biology	3+1
CHEM 320-321	Organic Chemistry	2+1	CHEM322-323	In organic Chemistry	2+1
	Minor (Compulsory)			Minor (Compulsory)	
MBIO/GENT/ PHSL 320-321	Microbiology-I/Genetics-I/ Physiology-I	2+1	MBIO/ GENT 322-323	Microbiology-II/ Genetics-II/Physiology-II	2+1
	Minor (Supporting)			Minor (Supporting)	

### SECOND YEAR

<i>Third Semester</i>			<i>Fourth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENG 400	English-III	3	ENG 401	English-IV	3
CIVZ 400	Civilization-III	2	ENVS 401	Environmental Science	2
STAT 400-401	Introduction to Computer Skills & Bio-Statistics-I	2+1	STAT 401-402	Introduction to Computer Skills & Bio-Statistics-II	2+1
BIOC410- 411	Carbohydrates	3+1	BIOC 412-413	Lipids 3+1	3+1
CHEM 420-421	Physical Chemistry	2+1	CHEM422-423	Analytical Chemistry	2+1
	Minor (Compulsory)			Minor (Compulsory)	
SOCI/MRKT/ EDUC 420	Sociology-I/Marketing (Communication)/Science Teaching Methods-I	2	SOCI/MRKT/ EDUC 422	Sociology-II/Marketing-II (Management)/Science Teaching Methods-II	2
	Minor (Supporting)			Minor (Supporting)	

### THIRD YEAR

<i>Fifth Semester</i>			<i>Sixth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
BIOC 500-501	Amino Acids & Proteins	3+1	BIOC 510	Bioenergetics	2
BIOC 502-503	Molecular Biology	3+1	BIOC 512	Biomembrane & Cell Signaling	3
BIOC 504-505	Enzymology	2+1	BIOC 514	Metabolism	4
BIOC 506-507	Human Physiology	2+1	BIOC 516-517	Plant Biochemistry	2+1
BIOC 508	Bio-Safety & Ethics	2	BIOC 518-519	Biochemical Techniques	3+1

### FOURTH YEAR

<i>Seventh Semester</i>			<i>Eighth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
BIOC 600-601	Nutritional Biochemistry	2+1	BIOC 622	Current Trends in Biochemistry	2
BIOC 602-603	Bioinformatics	1+2	BIOC 624	Immunochemistry	2
BIOC 604-605	Industrial Biochemistry	2+1	BIOC 626	Biotechnology	2
BIOC 606	Research Planning & Report Writing	2	BIOC 628	Proteomics	3
BIOC	Elective – I	3	BIOC	Elective – III	2
BIOC	Elective-II	3	BIOC	Elective–IV(Research Project)	3
			BIOC 6444	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 BS PART-IV (SEMESTER-VII)

**NOTE:** The Students of BS. Part-IV (Semester-VII) 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 BS PART-IV (SEMESTER-VIII)**

**NOTE:** The Students of BS. Part-IV (Semester-VIII) 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

**BS IN NUTRITION & FOOD TECHNOLOGY 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136**

Pre-requisite: H.S.C. with Pre-Medical Group: Pre-Entry Test.

A. General Requirements:

**FIRST YEAR**

<b>First Semester</b>		<b>C.H</b>
ENG 300	English-I	3
PKST 300	Pakistan Studies	2
MATHS 300	Mathematics-I	3
NUFT 310-311	Introduction to Food Science & Technology	2+1
BIOC 320-321	Biochemistry – I	2+1
MBIO/GENT 320-321	Microbiology / Genetics / Health Education	2+1

<b>Second Semester</b>		<b>C.H</b>
ENG 301	English-II	3
ISST/ETHS 301	Islamic Studies	2
MATH 301	Mathematics-II	3
NUFT312-313	Physical Properties of Food	2+1
BIOC 320-321	Biochemistry – II	2+1
MBIO/GENT 320-321	Microbiology/Genetics/Health Education	2+1

**SECOND YEAR**

<b>Third Semester</b>		<b>C.H</b>
ENG 400	English-III	3
CIVZ 400	Civilization	2
STAT 400-401	Introduction to Computer Skills & Bio-Statistics	2+1
NUFT410-411	Food Chemistry	3+1
BIOC 420-421	Biochemistry-III	2+1
SOCI/MRKT/EDUC 420	Sociology/Marketing/Science Teaching Methods	2

<b>Fourth Semester</b>		<b>C.H</b>
ENG 401	English-IV	3
ENVS401	Environmental Science	2
STAT 402-403	Introduction to Computer Skills & Bio-Statistics	2+1
NUFT412-413	Food Processing & Preservation	3+1
BIOC 422-423	Biochemistry-IV	2+1
SOCI/MRKT/EDU 422	Sociology/Marketing/ Science Teaching Methods	2

**THIRD YEAR**

<b>Fifth Semester</b>		<b>C.H</b>
NUFT500-501	Food Enzymology	3+1
NUFT502-503	Food Microbiology	3+1
NUFT 504	Food Toxicology	2
NUFT506-507	Beverage, Confectionary & Snack Foods	2+1
NUFT508-509	Food Analysis & Sensory Evolution	2+1

<b>Sixth Semester</b>		<b>C.H</b>
NUFT510-511	Meat, Poultry & Fish Processing	3+1
NUFT512-513	Dairy Technology	3+1
NUFT 514	Post-harvest	2
NUFT516-517	Baking Science & Technology	2+1
NUFT518-519	Milling of Cereals & Cereal Technology	2+1

**FOURTH YEAR**

<b>Seventh Semester</b>		<b>C.H</b>
NUFT600	Preparation of Research Project & Scientific Writing	3
NUFT602-603	Oil, Fats & Sugar Technology	3+1
NUFT 604	Food Additives	3
NUFT 606	Food Plant Design & Layout	2
NUFT	Elective – I	2+1
NUFT	Elective-II	2+1

<b>Eighth Semester</b>		<b>C.H</b>
NUFT 622	Starch Chemistry & Technology	3
NUFT 624	Food Safety & Factory Laws	3
NUFT 626	Food Packing	2
NUFT 628	Food Quality Assurance Management	2
NUFT	Elective – III	3
NUFT	Elective - IV (Research Project)	3
NUFT 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 BS PART-IV (SEMESTER-VII)**

**NOTE: The Students of BS Part - IV (Semester-VII) have to opt. any TWO (02) of the following Elective courses.**

#### **ELECTIVE – I & ELECTIVE - II**

01. BIOC. 608, Recent Advances in Food Science and Technology
02. BIOC. 610, Genetically Modified Foods
03. BIOC. 612, Food Biotechnology
04. BIOC. 614, Principles of Nutrition Therapy
05. BIOC. 616, Nutrition & Chronic Illness

#### **LIST OF ELECTIVE COURSES FOR BS PART-IV (SEMESTER-VIII)**

**NOTE: The Students of BS Part - IV (Semester-VIII) have to opt. any TWO (02) of the following Elective courses.**

#### **ELECTIVE – III & ELECTIVE – IV**

01. BIOC. 630, Research Project / Internship
02. BIOC. 632, Food Industrial Waste Management
03. BIOC. 634, Marine Foods
04. BIOC. 636, Nature's Pharmacy
05. BIOC. 638, Clinical Skills for Nutritional Therapy

#### **DIPLOMA IN FOOD ANALYSIS: 1- YEAR (2 SEMESTER) PROGRAM (25)**

The syllabus is made to fulfill these objectives containing theory papers, practical research and project work with laboratory experience.

Pre-requisite: H.S.C. with Pre-Medical Group

<b>First Semester</b>		<b>C.H</b>	<b>Second Semester</b>		<b>C.H</b>
DFA 300	Introduction to Food Science & Technology	2	DFA 306	Food Additives	2
DFA 302	Food Chemistry	2	DFA 303	Food Safety & Quality control	2
DFA 304	Food Analysis-I	2	DFA310	Food Analysis – II	2
DFA 305	Practicals	4	DFA	Practicals	4
			DFA 312	Project Work / Internship	3
			DFA 313	Comprehensive Viva	2

## **INSTITUTE OF BIOTECHNOLOGY & GENETIC ENGINEERING**

### **BS (GENETICS): 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136**

Pre-requisite: H.S.C. Pre-Medical or General Science group with Biology, Pre-Entry Test.

#### **FIRST YEAR**

<b>First Semester</b>		<b>C.H</b>
ENGL 300	English	3
PKST 302	Pakistan Studies	2
MATH 304	Mathematics	3
GENT 310-311	Cell Biology	3+1

350-351	Minor-I, Theory & Practical	2+1
352-353	Minor-II, Theory & Practical	2+1
PHSL/MICB/BIOC/ BOTN/ ZOO/FWBF 320-321	Physiology/Microbiology/Biochemistry/Botany/Zoology/ Fresh Water Biology & Fisheries	2+1

<b>Second Semester</b>		<b>C.H</b>
ENGL 301	English	3
ISST 302	Islamic Studies	2
MATH 306	Mathematics	3
GENT 312-313	Fundamentals of Genetics	3+1
356-357	Minor-I, Theory & Practical	2+1
358-359	Minor-II, Theory & Practical	2+1
PHSL/MICB/BIOC/BOTN/ ZOO/FWBF 322-323	Physiology/Microbiology/Biochemistry/Botany/Zoology/ Fresh Water Biology & Fisheries	2+1

## SECOND YEAR

<b>Third Semester</b>		<b>C.H</b>
ENGL 400	English	3
CIVZ 400	Civilization	2
GENT 410-411	Molecular Genetics	3+1
450-451	Minor-I, Theory & Practical	2+1
452-453	Minor-II, Theory & Practical	2+1
PHSL/MICB/BIOC/BOTN/ ZOO/FWBF 420-421	Physiology/Microbiology/Biochemistry/Botany/Zoology/ Fresh Water Biology & Fisheries	2+1

<b>Fourth Semester</b>		<b>C.H</b>
ENGL 401	English	3
ENVS 401	Environmental Sciences	2
GENT 412-413	Principles of Breeding	3+1
456-457	Minor-I, Theory & Practical	2+1
458-459	Minor-II, Theory & Practical	2+1
PHSL/MICB/BIOC/BOTN/ ZOO/FWBF 422-423	Physiology/Microbiology/Biochemistry/Botany/Zoology/ Fresh Water Biology & Fisheries	2+1

## THIRD YEAR

<b>Fifth Semester</b>		<b>C.H</b>
GENT 500-501	Fundamentals of Biotechnology	3+1
GENT 502-503	Cytogenetics	2+1
GENT 504-505	Biochemistry-I	3+1
GENT 506-507	Microbial Genetics	2+1
GENT 508-509	Computer Applications in Genetics	2+1

<b>Sixth Semester</b>		<b>C.H</b>
GENT 510-511	Fermentation Biotechnology	3+1
GENT 512-513	Biochemistry-II	3+1
GENT 514-515	Quantitative & Population Genetics	2+1
GENT 516-517	Evolution and Biodiversity	2+1
GENT 518-519	Human Genetics	2+1

## FOURTH YEAR

<b>Seventh Semester</b>		<b>C.H</b>
GENT 600-601	Genetic Engineering	3+1
GENT 602-603	Tools & Techniques in Genetics	3+1
GENT 604-605	DNA Finger printing & Mol. Diagnostics	2+1
GENT 606-607	Induced Mutagenesis	2+1
GENT 608-609	Enzyme Technology	2+1

<b>Eights Semester</b>		<b>C.H</b>
GENT 610	Developmental and Behavioral Genetics	3
GENT 612	Approaches to Scientific Investigation	3
GENT 614	Advanced Genetics	3
GENT 615	Research Project or optional courses	4
GENT 616	Comprehensive Viva Voce	2

Any two subjects may be selected in lieu of Research Project.

### Optional Subjects:-

	<b>C.H</b>



GENT 618	Germplasm Resources	2
GENT 620	Cell & Tissue Culture	2
GENT 622	Aqua Culture	2
GENT 624	Gene Technology	2
GENT 626	Genomic	2
GENT 628	Bioinformatics	2

### BS BIOTECHNOLOGY 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136

**Pre-requisite:** H.S.C. Pre-Medical or General Science group with biology, Pre-Entry Test.

#### FIRST YEAR

<i>First Semester</i>			<i>Second Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENGL 300	English-I	3	ENGL-301	English-II	3
ISST 300	Islamic Studies/Ethics	2	PKST-301	Pakistan Studies	2
MATH 300	Mathematics-I	3	MATH-301	Mathematics-II	3
BIOT 310	Cell Biology	3	CHEM 322	Chemistry	2
BIOT 311	Cell Biology	1	CHEM 323	Chemistry	1
CHEM 320	Chemistry	2	BIOT 314	Elements of Biotechnology	3
CHEM 321	Chemistry	1	BIOT 315	Elements of Biotechnology	1
BIOT 312	Plant Diversity	2	BIOT 316	Animal Diversity	2
BIOT 313	Plant Diversity	1	BIOT 317	Animal Diversity	1

#### SECOND YEAR

<i>Third Semester</i>			<i>Fourth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENGL 400	English-III	3	ENGL 401	English-IV	3
ISST 400	Civilization	2	BIOT 414	Ecosystem & Environment	2
CHEM 420	Chemistry	2	BIOT 415	Ecosystem & Environment	1
CHEM 421	Chemistry	1	CHEM 422	Chemistry	2
BIOT 410	Genetics	2	CHEM 423	Chemistry	1
BIOT 411	Genetics	1	STAT 400	Biostatistics	2
BIOT 412	Pharmaceutical Biotechnology	2	STAT 401	Biostatistics	1
BIOT 414	Basic Microbiology	2	BIOT 416	Molecular Genetics	3
BIOT 415	Basic Microbiology	1	BIOT 417	Molecular Genetics	1
			BIOT 418	Business Applications in Biotechnology	2

#### THIRD YEAR

<i>Fifth Semester</i>			<i>Sixth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
BIOT 500	Fundamentals of Biotechnology	3	BIOT 510	Industrial Biotechnology	3
BIOT 501	Fundamentals of Biotechnology	1	BIOT 511	Industrial Biotechnology	1
BIOT 506	Biological Chemistry	3	BIOT 516	Metabolism	3
BIOT 507	Biological Chemistry	1	BIOT 517	Metabolism	1
BIOT 520	Marine Biotechnology	2	BIOT 518	Computer Applications in Biotechnology	2
BIOT 521	Marine Biotechnology	1	BIOT 519	Computer Applications in Biotechnology	1
BIOT 522	Immunology	2	BIOT 528	Microbial Genetics	2
BIOT 523	Immunology	1	BIOT 529	Microbial Genetics	1
BIOT 526	Bioinformatics	2	BIOT 530	Proteomics and Genomics	2
BIOT 527	Bioinformatics	1			

#### FOURTH YEAR

<i>Seventh Semester</i>			<i>C.H</i>
BIOT 600	Genetic Engineering		3
BIOT 601	Genetic Engineering		1
BIOT 602	Tools and Techniques in Biotechnology		3
BIOT 603	Tools and Techniques in Biotechnology		1
BIOT 604	Agriculture and Food Biotechnology		2
BIOT 605	Agriculture and Food Biotechnology		1
BIOT 606	Animal Cell and Tissue Culture		2
BIOT 607	Animal Cell and Tissue Culture		1
BIOT 608	Protein and Enzyme Technology		2
BIOT 609	Protein and Enzyme Technology		1

<i>Eights Semester</i>			<i>C.H</i>
BIOT 610	Research Methodology		3
BIOT 614	Plant Cell and Tissue Culture		2
BIOT 615	Plant Cell and Tissue Culture		1
BIOT 616	Medical Biotechnology		2
BIOT 617	Medical Biotechnology		1
BIOT 619	Thesis/ Research Project (Partial) in lieu of 3 Practicals		3

	(BIOT-615, 617, 623)	
BIOT 620	Comprehensive Viva voice	2
BIOT 622	Hydroponics	2
BIOT 623	Hydroponics	1
BIOT 624	Biosafety and Bioethics	2

## DR. M.A. KAZI INSTITUTE OF CHEMISTRY

**BS CHEMISTRY (MORNING & EVENING) 4-YEAR DEGREE PROGRAM**  
**(8-SEMESTER) CH-144**

Pre-requisite: H.S.C. with Pre-Medical or Pre-Engineering Group: Pre-Entry Test.

### FIRST YEAR

<i>First Semester</i>		<i>C.H</i>
ENGL-300	English-I	3
PKST-300	Pakistan Studies	2
MATH-300	Mathematics-I	3
CHEM310-311	Analytical Chemistry	2+1
PHYS320-321	Supporting-I (Compulsory) Paper-I Physics-I	2+1
<b>For Pre-Medical</b>		
ZOOL/BOT/PHSL/	Supporting-II (Optional) Paper-II	
FWBF 320-321	Zoology/Botany/Physiology/Fresh Water Biology & Fisheries	2+1
<b>For Pre-Engineering</b>		
STAT/GEOG/	Supporting-II (Optional) Paper-II	
GEOL 320-321	Statistics/Geography/Geology	2+1

<i>Second Semester</i>		<i>C.H</i>
ENGL 301	English-II	3
ISST/ETHS301	Islamic Studies/Ethics	2
MATH 301	Mathematics-II	3
CHEM312-313	Physical Chemistry	3+1
<b>For Pre-Medical</b>		
ZOOL/BOT/PHSL/	Supporting-II (Optional) Paper-II	
FWBF 322-323	Zoology/Botany/Physiology/Fresh Water Biology & Fisheries	2+1
<b>For Pre-Engineering</b>		
STAT/GEOG/	Supporting-II (Optional) Paper-II	
GEOL 322-323	Statistics/Geography/Geology	2+1

### SECOND YEAR

<i>Third Semester</i>		<i>C.H</i>
ENGL 400	English-III	3
MATH 400	Mathematics-III	3
CIVIZ 400	Civilization	2
CHEM410-411	Inorganic Chemistry	3+1
PHYS420-421	Supporting-I (Compulsory) Paper-III Physics-III	2+1
<b>For Pre-Medical</b>		
ZOOL/BOT/PHSL/	Supporting-II (Optional) Paper-III	
FWBF 420-421	Zoology/Botany/Physiology/Fresh Water Biology & Fisheries	2+1
<b>For Pre-Engineering</b>		
STAT/GEOG/	Supporting-II (Optional) Paper-III	
GEOL 420-421	Statistics/Geography/Geology	2+1

<i>Fourth Semester</i>		<i>C.H</i>
ENGL 401	English-IV	3
ENV 401	Environmental Sciences	2
MATH 401	Mathematics-IV	3
COMP 401	Computing in Chemistry	NC
CHEM412-413	Organic Chemistry	3+1
PHYS 422-423	Supporting-I (Compulsory) Paper-IV Physics-IV	2+1
<b>For Pre-Medical</b>		
ZOOL/BOT/PHSL/	Supporting-II (Optional) Paper-IV	
FWBF 422-423	Zoology/Botany/Physiology/Fresh Water Biology & Fisheries	2+1
<b>For Pre-Engineering</b>		
STAT/GEOG/	Supporting-II (Optional) Paper-IV	
GEOL 422-423	Statistics/Geography/Geology	2+1

**THIRD YEAR**

<i>Fifth Semester</i>		<i>C.H</i>	<i>Sixth Semester</i>		<i>C.H</i>
CHEM 500-501	Inorganic Chemistry	3+1	CHEM 510-511	Inorganic Chemistry	3+1
CHEM 502-503	Organic Chemistry	3+1	CHEM 512-513	Organic Chemistry	3+1
CHEM 504-505	Physical Chemistry	3+1	CHEM 514-515	Physical Chemistry	3+1
CHEM 506-507	Analytical Chemistry	3+1	CHEM 516-517	Analytical Chemistry	3+1
CHEM 508	Chemistry in Industry	2	CHEM 518	Chemistry in Industry	2

**FOURTH YEAR**

Choose any one of the field "A" to "D" for specialization during Seventh & Eighth Semester

**A. ANALYTICAL CHEMISTRY**

<i>Seventh Semester</i>		<i>C.H</i>	<i>Eighth Semester</i>		<i>C.H</i>
CHEM 600	Spectroscopic Methods	4	CHEM 606	Hyphenated Techniques	4
CHEM 602	Electrochemical Methods	4	CHEM 608	Advanced Chromatography	4
CHEM 604	Nuclear Techniques	4	CHEM 610	Atomic Emission Spectroscopy	4
CHEM 605	Advanced Practical	4	CHEM 611	Advanced Practical/ Project	4
			CHEM 612	Comprehensive Examination	4

**B. INORGANIC CHEMISTRY**

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

**C. ORGANIC CHEMISTRY**

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

**D. PHYSICAL CHEMISTRY**

<i>Seventh Semester</i>		<i>C.H</i>	<i>Eighth Semester</i>		<i>C.H</i>
CHEM 660	Polymer Chemistry	4	CHEM 666	Radiation Chemistry	4
CHEM 662	Spectroscopy	4	CHEM 668	Surface Chemistry	4
CHEM 664	Thermodynamics & Electrochemistry	4	CHEM 670	Chemical Kinetics	4
CHEM 665	Advanced Practical	4	CHEM 671	Advanced Practical/ Project	4
			CHEM 672	Comprehensive Examination	4

\* Odd number courses are Labs.

## INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGY

### INFORMATION TECHNOLOGY – BS (IT): 4-YEAR DEGREE PROGRAM (8-SEMESTER) (MORNING AND EVENING) CH-136

Pre-requisite: H.S.C Pre- Engineering / Pre-Medical / Commerce / General Science with Physics and Computer background, with at least 45% aggregate marks, Pre-Entry Test.

**FIRST YEAR**

<i>First Semester</i>		<i>C.H</i>	<i>Second Semester</i>		<i>C.H</i>
ENG 300	English I (Composition and Comprehension)	3	ENG 301	English II (Communication Skills)	3
PS 303	Pakistan Studies	1	PS 302	Islamic Studies/Ethics	2
ITEC 310-311	Basic Electronics	3+1	..... 303	Elective I -Non Technical	2
ITEC 312-313	Programming Fundamentals	3+1	ITEC 318-319	Electronic Circuit Design	3+1
ITEC 314-315	Introduction to Information Technology	3+1	ITEC 320-321	Object Oriented Programming Paradigm	3+1
ITEC 316	Calculus and Analytical Geometry	3	ITEC 322	Linear Algebra	3

**SECOND YEAR**

<b>Third Semester</b>		<b>C.H</b>	<b>Fourth Semester</b>		<b>C.H</b>
ENG 400	English III (Technical and Business Writing)	3	ITEC 418	Discrete Structures	3
..... 402	Elective II - Non Technical	2	ITEC 420-421	Computer Organization and Assembly Programming	3+1
ITEC 410-411	Digital Logic and Computer Architecture	3+1	ITEC 422	Information Systems	3
ITEC 412-413	Java Programming	3+1	ITEC 424	System Analysis and Design	3
ITEC 414-415	Data Structures and Algorithms	3+1	ITEC 426	Probability and Statistics	3
ITEC 416-417	Telecommunication Systems	2+1	ITEC 428-429	Computer Graphics	2+1

**THIRD YEAR**

<b>Fifth Semester</b>		<b>C.H</b>	<b>Sixth Semester</b>		<b>C.H</b>
ITEC 510	Organizational Behavior	3	ITEC 520-521	Operating Systems	3+1
ITEC 512-513	Introduction to Software Development	2+1	ITEC 522-523	Wireless Communication and Protocols	2+1
ITEC 514-515	Database Systems	2+1	ITEC 524-525	Advance Database Systems	2+1
ITEC 516-517	Computer Communication and Networks	2+1	ITEC 526-527	Multimedia Technology	2+1
ITEC 518-520	Web Systems & Technologies	2+1	ITEC 528-529	System and Network Administration	2+1

**FOURTH YEAR**

<b>Seventh Semester</b>		<b>C.H</b>	<b>Eighth Semester</b>		<b>C.H</b>
ITEC 610	System Integration & Architecture	3	ITEC 620-621	Fundamentals of Mobile & Pervasive Computing	3+1
ITEC 612-613	Distributed Computing	3+1	ITEC 622	Professional Practice	3
ITEC 614	Human Computer Interaction	3	ITEC 624	Project	6
ITEC 615	Network Management and Security	3			
ITEC 616	Computer Vision and Image Processing	3			

**List of Electives Courses - Non Technical (2)**

- |  |                                       |
|--|---------------------------------------|
| 01. Foundation of Physical Education (HPE)   | 02. Health Education (HPE)            |
| 03. Basic Concepts of Psychology (PSY)       | 04. Civilization (CIV)                |
| 05. Principles of Economics (ECON)           | 06. Natural Resources Management (DS) |
| 07. Personality Theories (PSY)               | 08. Industrial Psychology (PSY)       |
| 09. Introduction to Behavioral Sciences (PA) | 10. Total Quality Management (PA)     |
| 11. Introduction to Sociology (SOC)          | 12. Fundamentals of Criminology (CRM) |
| 13. Philosophy (PHLO)                        | 14. Environmental Science (ENVS)      |

**Note:** Elective Courses are offered on the availability of faculty.

**BS (SOFTWARE ENGINEERING) – BS (SE): 4-YEAR DEGREE PROGRAM (8-SEMESTER)(MORNING & EVENING) CH-136**

Pre-requisite: H.S.C Pre- Engineering or General Science group with Mathematics, Physics and Computer background, with at least 45% aggregate marks, Pre- Entry Test.

**FIRST YEAR**

<b>First Semester</b>		<b>C.H</b>	<b>Second Semester</b>		<b>C.H</b>
ENG 300	English I (Composition and Comprehension)	3	ENG 301	English II(Communication Skills)	3
PS 303	Pakistan Studies	1	IS 302	Islamic Studies/Ethics	2
SENG 310-311	Basic Electronics	3+1	... 305	Elective I - Non Technical	2
SENG 312-313	Programming Fundamentals	3+1	SENG 318-319	Electronics Circuit Design	3+1
SENG 314-315	Introduction to Information Technology	2+1	SENG 320-321	Object Oriented Programming Paradigm	3+1
SENG 316	Calculus and Analytical Geometry	3	SENG 322	Linear Algebra	3

**SECOND YEAR**

<b>Third Semester</b>		<b>C.H</b>	<b>Fourth Semester</b>		<b>C.H</b>
ENG 400	English III (Technical and Business Writing)	3	SENG 418	Discrete Structure	3
..... 402	Elective II - Non Technical	2	SENG 420-421	Computer Organization and Assembly Language	2+1
SENG 410-411	Digital Logic and Computer Architecture	3+1	SENG 424	System Analysis and Design	3
SENG 412-413	Java Programming	3+1	SENG 426	Probability and Statistics	3
SENG 414-415	Data Structures and Algorithms	2+1	SENG 428	Software Construction	2+1
			SENG 430	Computer Graphics	2+1

**THIRD YEAR**

<b>Fifth Semester</b>			<b>Sixth Semester</b>		
		<b>C.H</b>			<b>C.H</b>
SENG 510-511	Software Requirement Engineering	3	SENG 522	Software Quality Assurance	3
SENG 512	Data Security and Encryption	3	SENG 524-525	Advance Database Management System	2+1
SENG 514-515	Data Base Systems	2+1	SENG 526	Software Engineering Economics	3
SENG 516-517	Computer Communication and Networks	2+1	SENG 528-529	Operating Systems	3+1
SENG 518	Formal Methods	3	SENG 530	Artificial Intelligence	3
SENG 520-521	Web Engineering	2+1	SENG 532-533	Software Testing and Development	2+1

**FOURTH YEAR**

<b>Seventh Semester</b>			<b>Eighth Semester</b>		
		<b>C.H</b>			<b>C.H</b>
SENG 610-611	Distributed Computing	3+1	SENG 620-621	Fundamentals of Mobile and Pervasive Computing	3+1
SENG 612	Design Patterns	2+1	SENG 622	Professional Practices	3
SENG 614	Human Computer Interaction	3	SENG 624	Project	6
SENG 616	Software Design and Architecture	2+1			
SENG 618	Software Project Management	2+1			

**List of Electives Courses - Non Technical (2)**

- |  |                                       |
|--|---------------------------------------|
| 01. Foundation of Physical Education (HPE)   | 02. Health Education (HPE)            |
| 03. Basic Concepts of Psychology (PSY)       | 04. Civilization (CIV)                |
| 05. Principles of Economics (ECON)           | 06. Natural Resources Management (DS) |
| 07. Personality Theories (PSY)               | 08. Industrial Psychology (PSY)       |
| 09. Introduction to Behavioral Sciences (PA) | 10. Total Quality Management (PA)     |
| 11. Introduction to Sociology (SOC)          | 12. Fundamentals of Criminology (CRM) |
| 13. Philosophy (PHLO)                        | 14. Environmental Science (ENVS)      |

**Note:** Elective Courses are offered on the availability of faculty.

**BS (TELECOMMUNICATION TECHNOLOGY) – BS (TC) 4-YEAR DEGREE PROGRAM (8-SEMESTER) (MORNING) CH-136**

Pre-requisite: H.S.C Pre- Engineering or General Science group with Mathematics, Physics and Computer background, with at least 45% aggregate marks, Pre- Entry Test.

**FIRST YEAR**

<b>First Semester</b>			<b>Second Semester</b>		
		<b>C.H</b>			<b>C.H</b>
ENG 300	English I (Composition and Comprehension)	2	ENG 301	English II (Communication Skills)	2
PS 303	Pakistan Studies	1	PS 302	Islamic Studies/Ethic	2
TELE 310-311	Circuit Analysis	3+1	TELE 318-319	Electronics Devices	3+1
TELE 312-313	Introduction to Information Technology	3+1	TELE 320-321	Digital Electronics	3+1
TELE 314-315	Computer Programming C++	3+1	TELE 322-323	Telecommunication Systems	2+1
TELE 316-318	Calculus and Analytical Geometry	3	TELE 324-325	Linear Algebra and Differential Equations	3

**SECOND YEAR**

<b>Third Semester</b>			<b>Fourth Semester</b>		
		<b>C.H</b>			<b>C.H</b>
ENG 400	English III (Technical and Business Writing)	2	TELE 420-421	Wave Propagation and Antenna	2+1
TELE 410-411	Digital Logic Design	3+1	TELE 422-423	Data Communications and Computer Networks	3+1
TELE 412-413	Advanced Computer Programming	2+1	TELE 424	Complex Variable & Transforms	3
TELE 414	Probability & Statistics	3	TELE 426-427	Measurement and Instruments	2+1
TELE 416	Electromagnetic Field & Theory	3	TELE 428-429	Optoelectronics	2+1
TELE 418-419	Analog Communication	2+1	TELE 430-431	Computer Organization & Assembly Programming	3+1

**THIRD YEAR**

<b>Fifth Semester</b>			<b>Sixth Semester</b>		
		<b>C.H</b>			<b>C.H</b>
TELE 510	Signal and Systems	3	TELE 522	Microwave Engineering	3
TELE 512-513	Digital Communication	2+1	TELE 524	Digital Signal Processing	3
TELE 514-515	Microcontrollers and Embedded Systems	2+1	TELE 526-527	IP Telephony	2+1
TELE 516	Communication Protocols	3	TELE 528	Telecom Transmission and Switching Techniques	3
TELE 518	Network Management & Security	3	TELE 530-531	Control Systems	2+1
			TELE 532	Telecommunication	2

TELE 520	Engineering Management	3	Policies and Regulations
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#### FOURTH YEAR

<i>Seventh Semester</i>			<i>Eighth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
TELE 610-611	Mobile and Wireless Communications	2+1	TELE 620	Radar Systems	3
TELE 612-613	Satellite Communication	2+1	TELE 622	Spread Spectrum Communications	3
TELE 614-615	Multimedia Systems	2+1	TELE 624	Project	6
TELE 616	Telecom Networks Management	2			
TELE 618-619	Optical Fiber Communication	3+1			

#### BS (ELECTRONICS) – BS (EL): 4-YEAR DEGREE PROGRAM (8-SEMESTER) (MORNING) CH-136

Pre-requisite: H.S.C Pre- Engineering or General Sciences with Mathematics, Physics and Computer background, with at least 45% aggregate marks, Pre- Entry Test.

#### FIRST YEAR

<i>First Semester</i>			<i>Second Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENG 300	English I (Functional) English	2	ENG 301	English II (Communication Skills)	2
PS 303	Pakistan Studies	1	IS 302	Islamic Studies/Ethics	2
ELEC 310-311	Basic Electronics	3+1	ELEC 320	Computer Aided Engineering Drawing	1
ELEC 312-313	Computer Programming C++	2+1	ELEC 322	Linear Algebra and Differential Equations	3
ELEC 314-315	Introduction to Information Technology	3+1	ELEC 324-325	Semiconductor Material and Devices	3+1
ELEC 316	Calculus and Analytical Geometry	3	ELEC 326	Engineering Mechanics	2
ELEC 318-319	Electronic Workshop	1+1			

#### SECOND YEAR

<i>Third Semester</i>			<i>Fourth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENG 400	English III (Technical and Business Writing)	3	ELE 420-421	Digital Logic Design	3+1
ELE 410-411	Digital Electronics	2+1	ELE 422	Complex Variable and Transform	3
ELE 412-413	Electronic Devices & Circuits	3+1	ELE 424	Electromagnetic Field and Theory	3
ELE 414-415	Advance Computer Programming	2+1	ELE 426-427	Telecommunication systems	2+1
ELE 416	Engineering Statistics	3	ELE 428-429	Optoelectronics	2+1
ELE 418-419	Electrical Machines	2+1	ELE 430	Computer Architecture	3

#### THIRD YEAR

<i>Fifth Semester</i>			<i>Sixth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ELE 510	Signal and Systems	3	ELE 522	Numerical Methods	3
ELE 512-513	Data Communications & Computer Networks	3+1	ELE 524	Microprocessor Interfacing And Microcontrollers	2+1
ELE 514-515	Integrated Circuits	2+1	ELE 526-527	Measurement and Instruments	2+1
ELE 516	Engineering Management	3	ELE 528	Network Analysis	3
ELE 518-519	Wave Propagation and Antenna	2+1	ELE 530	Digital Signal Processing	3
ELE 520-521	Microprocessor Architecture	3+1	ELE 532-533	Power Electronics	2+1
	Assembly Programming				

#### FOURTH YEAR

<i>Seventh Semester</i>			<i>Eighth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ELE 610	Embedded System Design	3	ELE 620	FPGA based System Design	3
ELE 612	Control Systems	2+1	ELE 624	Robotics	3
ELE 614	Computer Vision and Image Processing	3	ELE 630	Project	6
ELE 616-617	VLSI Design	3			
ELE 618-619	Mobile and Wireless Communications	2+1			

# INSTITUTE OF MATHEMATICS & COMPUTER SCIENCE

## BS (MATHEMATICS) 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136

Pre-requisite: H.S.C. Pre-Engineering/General Science group with Mathematics / Arts Group with Mathematics as elective subject; Pre-Entry Test.

### FIRST YEAR

<b>First Semester</b>		<b>C.H</b>
ENGL 300	English I	3
ISST/ETHS 300	Islamic Studies/Ethics	2
ENVS/PHSL/FACC 300	Environmental Sciences/Physiology/Organizational Behavior/ Financial Accounting	2+1
MATH 310	Mathematics-I	3
MATH 320	Applied Mathematics-I	3
PHYS/CHEM/GEOG/ GEOL 320-321	Physics/Chemistry/Geography/Geology - I	2+1
<b>Second Semester</b>		<b>C.H</b>
ENGL 301	English-II	3
PKST 301	Pakistan Studies	2
ENVS/PHSL/FACC 302	Environmental Sciences/Physiology/Organization Behavior / Financial Accounting	3
MATH 321	Mathematics- II	4
MATH 322	Applied Mathematics- II	3
PHYS/CHEM/GEOG/ GEOL 322-323	Physics/Chemistry/Geography/Geology-II	2+1

### SECOND YEAR

<b>Third Semester</b>		<b>C.H</b>
ENGL 400	English-III	3
MATH 410	Mathematics- III	3
MATH 412	Mathematics- IV	3
MATH 420	Applied Mathematics- III	3
PHYS/CHEM/ PHYS/CHEM/GEOG/ GEOL 420-421	Physics/Chemistry/Geography/Geology-III	2+1

<b>Fourth Semester</b>		<b>C.H</b>
ENGL 401	English IV	3
MATH 414	Mathematics- V	3
MATH 416	Mathematics- VI	3
MATH 422	Applied Mathematics- IV	3
PHYS/CHEM/ GEOG/GEOL 422-423 ENVS 401	Physics/Chemistry/Geography/Geology-IV Environmental Science	2+1

### THIRD YEAR

<b>Fifth Semester</b>		<b>C.H</b>	<b>Sixth Semester</b>		<b>C.H</b>
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	Algebraic Topology	3
MATH 504	Differential Equation	3	MATH 511	Numerical Analysis- I	3
			MATH 517	Graph Theory	3

### FOURTH YEAR

<b>Seventh Semester</b>		<b>C.H</b>	<b>Eights Semester</b>		<b>C.H</b>
MATH 600	Functional Analysis	3	MATH 606	Methods of Mathematical Physics	3
MATH 601	Mathematical Statistics & Probability	3	MATH 607	Optimization Techniques	3

MATH 603	Rings & Fields	3	MATH 608	Econometrics	3
MATH 604	Numerical Analysis- II	3	MATH 609	Tensor Analysis	3
MATH 605	Operations Research	3	MATH 610	Integral Equations	3
			MATH 611	Numerical Solution of P.D.E	3
			MATH 612	Comprehensive Viva Voce	2

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

## COMPUTER SCIENCE PROGRAMS

### BS COMPUTER SCIENCE (MORNING & EVENING): 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136

Pre-requisite; H.S.C. Pre-Engineering, Pre- Medical, Commerce (including General Science : Student who studied Maths as a subject of General Science Group will be treated as Pre-Engineering while those who studied Biology will be taken as Pre-Medical), Maths., Physics and Commerce background with at least 45% aggregate marks. Pre-Entry Test.

#### FIRST YEAR

First Semester			Second Semester		
		C.H			C.H
ENGL 300	Remedial English-I	3	ENGL 301	Remedial English-II	3
PKST 300	Pakistan Studies	2	ISST/ ETHS 301	Islamic Studies/ Ethics	2
MATH 300	Calculus & Ana Geom. (P.E)/ Algebra & Elementary Trigonometry (P.M)	3	MATH 301	Differential Equations & Vector Analysis (P.E)	3
COMP 309-310	Introduction to Computer Science	3+1		Basic Calculus & Analytical Geo. of 2D (P.M)	
COMP 311-312	Computer Programming (C Language)	3+1	BUAD 301	Financial Accounting & Management	3
COMP 313	Basic Electronics	3	COMP 314-315	Fundamentals of Algorithms	3+1

#### SECOND YEAR

Third Semester			Fourth Semester		
		C.H			C.H
MATH 400	Linear Algebra & Analytical Geom. of 3D (P.E)/Calculus & Trigonometry (P.M)	3	BUAD 401	Human Resource Management	3
COMP 410	Data Structure	3	MATH 401	Advanced Calculus & Integral Transforms (P.E)/ Linear Algebra & Analytical Geom. of 3 D (P.M)	3
COMP 411-412	Object-Oriented Programming (Java)	3+1	COMP 414-415	Computer Organization & Assembly Language	3+1
COMP 413	Discrete Mathematics	3	COMP 416	Database System	3
COMP 421	Statistics & Probability	3	COMP 417-418	Digital Logic Design	3+1

#### THIRD YEAR

Fifth Semester			Sixth Semester		
		C.H			C.H
COMP 500-507	Software Engineering	3+1	COMP 511	Data Communication	3
COMP 501	Computer Architecture	3	COMP 512	Computer Graphics	3
COMP 502	Numerical Analysis	3	COMP 513	Automata Theory	3
COMP 504	DBA Oracle SQL/Developer Oracle SQL	3	COMP 514	Analysis of Algorithms	3
COMP 505	DBA Oracle Fundamental-I/ Developer Oracle PL/SQL	3	COMP 515	DBA Oracle Fundamental-II/ Developer Form-I and Form-II	3
COMP 506	Operations Research		COMP 516	DBA Oracle Performance Tuning/Developer Oracle Reports	3

#### FOURTH YEAR

Seventh Semester			Eighth Semester		
		C.H			C.H
COMP 600	Operating System	3	COMP 611	Web Programming/ (Elective-I)	3+1
COMP 601-602	Visual Programming	3+1	COMP 612	Scientific Modelling & Simulation / (Elective-II)	3
COMP 603	Compiler Construction	3	COMP 613	Software Project	6
COMP 604-605	Computer Networks	3+1	COMP 614	Comprehensive Viva Voce	2
COMP 606	Artificial Intelligence	3			

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

## INSTITUTE OF MICROBIOLOGY

### BS IN MICROBIOLOGY 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136

Pre-requisite; H.S.C. with Pre-Medical Group: Pre-Entry Test

#### FIRST YEAR

First Semester			Second Semester		
		C.H			C.H
ENGL 300	English-I	3	ENGL 301	English-II	3
PKST 300	Pakistan Studies	2	ISST/ETHS 301	Islamic Studies/Ethics	2
MATH 300	Mathematics-I	3	MATH 301	Mathematics-II	3
MICB310-311	General Microbiology-I	2+1	MICB 312-313	General Microbiology-II	2+1



PHSL320-321	Fundamentals of Physiology-I	2+1	PHSL 322-323	Human Physiology-II	2+1
BIOCHEM 320-321	Biochemistry/ Botany/ Zoology	2+1	BIOCHEM 322- 323	Biochemistry/ Botany/ Zoology	2+1

### SECOND YEAR

Third Semester			Fourth Semester		
		C.H			C.H
ENGL 400	English-III	3	ENGL 401	English-IV	3
CIVZ 400	Civilization & Culture	2	ENVS 401	Environmental Sciences	2
MICB 410-411	General Immunology	3+1	MICB 412-413	Microbial Taxonomy	3+1
PHSL 420-421	Human Physiology	2+1	PHSL 422-423	Human Physiology	2+1
BIOCHEM 420-421	Biochemistry/ Botany/ Zoology	2+1	BIOC 422-423	Biochemistry/ Botany/ Zoology	2+1

### THIRD YEAR

Fifth Semester			Sixth Semester		
		C.H			C.H
MICB 500-501	Microbial Anatomy & Physiology	3+1	MICB 508-509	General Virology	3+1
MICB 502-503	Bacterial Genetics	3+1	MICB 510-511	Bio-Statistics	3+1
MICB 504-505	Mycology	3+1	MICB 512-513	Environmental Microbiology	3+1
MICB 506-507	Soil Microbiology	3+1	MICB 514-515	Microbial Diagnostic Chemistry	3+1

### FOURTH YEAR

**Specialization: Choose any one of the field "A" or "B" during Seventh & Eighth semester.**

#### A. CLINICAL MICROBIOLOGY

Seventh Semester			Eighth Semester		
		C.H			C.H
MICB 600-601	Epidemiology	3+1	MICB 610-611	Immunobiology	3+1
MICB 602-603	Medical Bacteriology	3+1	MICB 612-613	Medical Virology	3+1
MICB 604-605	Dermatology	3+1	MICB 614-615	Antimicrobial Agents	3+1
MICB 606-607	Clinical Hematology & Parasitology	3+1	MICB 616-617	Clinical Bacteriology	3+1
MICB 608-609	Molecular Biology & Genetic Engineering	3+1	MICB 618	Mini Research Project & Viva Voce	4

#### B. INDUSTRIAL MICROBIOLOGY

Seventh Semester			Eighth Semester		
		C.H			C.H
MICB 620-621	Food and Dairy Microbiology	3+1	MICB 630-631	Fermentation Biotechnology	3+1
MICB 622-623	Pharmaceutical Microbiology	3+1	MICB 632-633	Principles & Applications of Biotechnology	3+1
MICB 624-625	Cell and Molecular Biology	3+1	MICB 634-635	Cell & Tissue Culture Technology	3+1
MICB 626-627	Microbial Enzyme Technology	3+1	MICB 636-637	Bioinformatics and Protein Structure Function	3+1
MICB 628-629	Introductory Microbial Technology	3+1	MICB 638	Mini Research Project & Viva Voce	4

## INSTITUTE OF PHYSICS

### BS (PHYSICS): 4-YEAR DEGREE PROGRAM 8-SEMESTER CH-136

Pre-requisite: H.S.C. Pre-Engineering/General Science Group with Maths & Physics, and Pre- Entry Test.

#### FIRST YEAR

First Semester			Second Semester		
		C.H			C.H
ENGL 300	English-I	3	ENGL 301	English-II	3
PKST 300	Pakistan Studies	2	ISST/ETHS 301	Islamic Studies/Ethics	2
MATH 300	Mathematics-I (Compulsory)	3	MATH 301	Mathematics-II	3
PHYS 310-311	Mechanics-I, Waves & Optics	3+1	PHYS 312-313	Mechanics-II & Thermodynamics	3+1
MATH 320	Applied Mathematics-I (Optional)	3	MATH 322	Applied Mathematics-II	3
STAT 320-321	Statistics-I (Optional)	2+1	STAT 322+323	Statistics-II	2+1
CHEM/GEOL 320-321	Chemistry/Geology (Optional)	2+1	CHEM/GEOL 322-323	Chemistry/Geology	2+1

#### SECOND YEAR

Third Semester			Fourth Semester		
		C.H			C.H
ENGL 400	English-III	3	ENGL 401	English-IV	3
CIVZ 400	Civilization	2	ENVS 401	Environmental Science	2

PHYS 410-411	Electricity & Magnetism-I Modern Physics-I	3+	PHYS 412-413	Electricity & Magnetism-II Modern Physics-II	3+1
MATH 420	Applied Mathematics-III	3	MATH 422	Applied Mathematics-IV	3
STAT 420-421	Statistics-III	2+1	STAT 422-423	Statistics-IV	2+1
CHEM/GEOL420	Chemistry/ Geology	2	CHEM/GEOL 422	Chemistry/Geology	2

### THIRD YEAR

Fifth Semester			C.H			Sixth Semester			C.H		
PHYS 500	Methods of Mathematical Physics-I	3	PHYS 508	Methods of Mathematical Physics-II	3	PHYS 501	Modern Physics Lab-I	2	PHYS 509	Modern Physics Lab-II	1
PHYS 502	Classical Mechanics	3	PHYS 510	Thermal & Statistical Physics	3	PHYS 503	Spectroscopy Lab	1	PHYS 511	Statistical Physics Lab	1
PHYS 504	Electrodynamics-I	3	PHYS 512	Electrodynamics-II	3	PHYS 505	Computer Programming Lab	1	PHYS 513	Computer Programming Lab	1
PHYS 506-507	Electronics	3+1	PHYS 514-515	Digital Electronics	3+1						

### FOURTH YEAR

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

Note:1 PHYS: 614\* is compulsory only for PHYS: 604\* and not allowed to opt PHYS: 614, others may opt any one of PHYS: 614.

## INSTITUTE OF PLANT SCIENCES

### BS (BOTANY): 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136

Pre-requisite; H.S.C. with Pre-Medical Group: Pre-entry Test

#### FIRST YEAR

First Semester			C.H		
ENGL 300	English-I (Functional English)	3	PKST 300	Pakistan Studies	2
MATH 300	Mathematics	3	BOTN 302-303	Diversity of Plants (Major I)	3+1
ZOOL 320-321	Zoology (Minor I)	2+1	FWBF/PHSL 320-321	Fresh Water Biology & Fisheries (Minor-I Optional)/ Physiology (Minor-I Optional)	2+1
Second Semester			C.H		
ENGL 301	English-II (Communication Skills)	3	ISST/ ETHS 301	Islamic Studies/Ethics	2
ENVS 301	Environmental Science	3	BOTN 304-305	Plant Systematics, Anatomy & Development/Embryology- Major II	3+1
ZOOL 322-323	Zoology (Minor II)	2+1	FWBF/PHSL 322-323	Fresh Water Biology & Fisheries/ Physiology (Minor-II Optional)	2+1

#### SECOND YEAR

Third Semester			C.H		
ENGL 400	English-III (Technical report writing and presentation skills)	3	CIVIZ 400	Civilization	2
COMP 400	Introduction to computer	2+1	BOTN 402-403	Cell Biology, Genetics & Evolution-Major III	2+1
ZOOL 420-421	Zoology (Minor III)	2+1	FWBF/PHSL 420-421	Fresh Water Biology & Fisheries/ Physiology (Minor-III Optional)	2+1

<b>Fourth Semester</b>		<b>C.H</b>
BOTN 404-405	Plant Physiology and Ecology-Major IV	2+1
BOTN 406-407	Biodiversity and Conservation- Major V	2+1
BOTN 408-409	Biostatistics	2+1
BOTN 410	Research Methodology	2
ZOOL 422-423	Zoology (Minor IV)	2+1
FWBF/PHSL 422-423 Fresh Water Biology & Fisheries/ Physiology (Minor IV Optional)		2+1

### THIRD YEAR

<b>Fifth Semester</b>		<b>C.H</b>	<b>Sixth Semester</b>		<b>C.H</b>
BOTN 500-501	Bacteriology & Virology	2+1	BOTN 510-511	Plant Anatomy	2+1
BOTN 502-503	Phycology & Bryology	2+1	BOTN 512-513	Genetics I	2+1
BOTN 504-505	Mycology & Plant Pathology	2+1	BOTN 514-515	Plant Biochemistry-I	2+1
BOTN 506-507	Diversity of Vascular Plants	2+1	BOTN 516-517	Plant Ecology-I	2+1
BOTN 508-509	Plant Systematics	2+1	BOTN 518-519	Plant Physiology-I	2+1

### FOURTH YEAR

<b>Seventh Semester</b>		<b>C.H</b>	<b>Eighth Semester</b>		<b>C.H</b>
BOTN 600-601	Molecular Biology	3+1	BOTN 608-609	Plant Physiology-II	2+1
BOTN 602-603	Plant Biochemistry-II	2+1	BOTN 610-611	Genetics-II	2+1
BOTN 604-605	Plant Ecology-II	2+1	BOTN 612-613	Environmental Biology	3+1
BOTN 606-607	Elective (Special-I)	3+1	BOTN 614-615	Elective (Special-II)	3+1
BOTN 616	Research Project/ Internship	4	BOTN 617	Comprehensive Viva Voce	3

### BS (FORESTRY): 4-YEAR EVENING DEGREE PROGRAM (8-SEMESTER) CH-136

Pre-requisite: H.S.C. With Pre-Medical Group: Pre-entry Test

### FIRST YEAR

<b>First Semester</b>		<b>C.H</b>	<b>Second Semester</b>		<b>C.H</b>
ENGL 300	English-I	3	ENGL 301	English-II	3
PKST 300	Pakistan Studies	2	ISST/ ETHS 300	Islamic Studies/ Ethics	2
MATH 300	Mathematics-I (PM)	3	FRST 302	Forest Economic	3
FRST 310-311	Dendrology	3+1	FRST 320-321	Forest Environment & Ecology	3+1
FRST 312-313	Forest Biodiversity & Conservation	2+1	FRST 322-323	Tree Anatomy	2+1
FRST 314-315	Soil Sciences	2+1	FRST 324-325	Plant Biochemistry	2+1

### SECOND YEAR

<b>Third Semester</b>		<b>C.H</b>	<b>Fourth Semester</b>		<b>C.H</b>
ENGL 301	English-III	3	ENGL	Communicative English	3
FRST	Geography & World Forestry System	2	FRST	GIS & Remote Sensing	2
FRST	Forest Statistics	3	FRST	Environmental Science	3
FRST 410-411	Genetics & Tree Breeding	3+1	FRST 420-421	Tree Physiology	3+1
FRST 412-413	Forest Pathology & Entomology	2+1	FRST 422-423	Forest Resources of Pakistan	2+1
FRST 414-415	Rangeland Management	2+1	FRST 424-425	Wild Life Management	2+1

### THIRD YEAR

<b>Fifth Semester</b>		<b>C.H</b>	<b>Sixth Semester</b>		<b>C.H</b>
FRST 500-501	Forest Products & Utilization	2+1	FRST 512-513	Tree Breeding & Improvement	2+1
FRST 502-503	Agroforestry	2+1	FRST 514-515	Principles & Practices in Silviculture	2+1
FRST 504-505	Sericulture, Apiculture & Lac Culture	2+1	FRST 516-517	Nursery Management	2+1
FRST 506-507	Forest Medicinal & Aromatic Plants	2+1	FRST 518-519	Saline Forestry	2+1
FRST 508-509	Forest Biotechnology	2+1	FRST 520-521	Tree Seed Technology	2+1
FRST 510-511	Wood Science & Technology	2+1	FRST 522-523	Forest Ethnobotany	2+1

### FOURTH YEAR

<b>Seventh Semester</b>		<b>C.H</b>
FRST 600-601	Forest Protection	2+1
FRST 602-603	Forest & Rangeland Management	2+1
FRST 604-605	Practices in Silviculture	2+1
FRST 606-607	Fertility of Forest Soils & Nutrients Management	2+1
FRST 608-609	Logging & Ergonomics	2+1
FRST 610-611	Forest Surveying & Roads	2+1
<b>Eighth Semester</b>		<b>C.H</b>
FRST 612-613	Forest Biometrics	2+1

FRST 614-615	Research Techniques in Forestry	2+1
FRST 616-617	Forest Surveying & Landscaping	2+1
FRST 618-619	Forest Management Policy and Legislation	2+1
FRST 620	Research Project	4
FRST 621	Comprehensive Viva Voce	3

## DEPARTMENT OF ANTHROPOLOGY & ARCHAEOLOGY

### BS ANTHROPOLOGY & ARCHAEOLOGY 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-146

Pre-requisite: H.S.C. with Pre-Engineering / Pre-Medical/General Science Group; Pre-entry Test.

#### Combined BS I & II Anthropology and Archaeology

##### FIRST YEAR

<i>First Semester</i>			<i>Second Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENGL300	English	2	ENGL 301	English	2
PKST 300	Pakistan Studies	2	ISST/ETHS 301	Islamic Studies / Ethics	2
COMP 300	Computer Skills	2	COMP 301	Computer Skills	2
ANTH 310	Introduction to Anthropology (Major)	4	ANTH 312	Kinship and Social Organization (Major)	4
ARCH 320	Introduction to Archaeology (Major)	4	ARCH 322	Introduction to Prehistoric Archaeology (Major)	4
GEOG 322	Human Geography / Geology (Minor)	3	GEOG 322	Environmental Geography (Minor)	3

##### SECOND YEAR

<i>Third Semester</i>			<i>Fourth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENGL 400	English	2	ENG 401	English	2
CIVZ 400	Civilizations	2	STAT 401	Statistical Analysis of Field Data	2
STAT 400	Statistics	3	PSYL 401	Human Psychology	2
ANTH 410	Theories in Anthropology (Major)	4	ANTH 412	Economics Anthropology (Major)	4
ARCH 420	Field Archaeology (Major)	4	ARCH 422	Theories in Archaeology (Major)	4
SOCL 420	Sociology (Minor)	2	SOCL 422	Sociology of Pakistan (Minor)	2

#### BS ANTHROPOLOGY (OPTION)

##### THIRD YEAR

<i>Fifth Semester</i>			<i>Sixth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ANTH 500	Political Anthropology	4	ANTH 510	Anthropology of South Asia	4
ANTH 502	Medical Anthropology	3	ANTH 512	Ethnological Study of Pakistan	4
ANTH 504	Anthropology of Religion	3	ANTH 514	Urban Anthropology	4
ANTH 506	Cultural Anthropology	4	ANTH 516	Anthropology of Art and Music	3
ANTH 508	Linguistic Anthropology	4	ANTH 518	Women and Development	3

##### FOURTH YEAR

<i>Seventh Semester</i>			<i>Eighth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ANTH 600	Applied Anthropology	3	ANTH 610	Research Design and Review of Relevant Literature	4
ANTH 602	Social Change & Development	4	ANTH 611	Field Data Collection	6
ANTH 604	Migration and Globalization	3	ANTH 612	Seminar	2
ANTH 606	Philosophical Anthropology	3	ANTH 613	Thesis	4
ANTH 608	Research Methodology	3	ANTH 614	Defense	2

#### BS ARCHAEOLOGY (OPTION)

##### THIRD YEAR

<i>Fifth Semester</i>			<i>Sixth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ARCH 500	Methods and Techniques in Archaeology	4	ARCH 510	Art and Architecture of Mesopotamia	3
ARCH 502	World Civilizations-I	4	ARCH 512	World Civilization-II	4
ARCH 504	Art and Architecture of South Asia	4	ARCH 514	Indus Civilization	4
ARCH 506	Prehistory of South Asia	3	ARCH 516	Ancient Religions of Pakistan and India	3

ARCH 508	Museum Study	3	ARCH 518	Research Methodology	4
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#### FOURTH YEAR

Seventh Semester			Eighth Semester		
		C.H			C.H
ARCH 600	Indus Civilization Craft & Technology	4	ARCH 610	Internship with report writing and presentation in a Seminar	4
ARCH 602	Archaeological Thoughts	3	ARCH 611	Field Data Collection	6
ARCH 604	Muslim Architecture of South Asia	3	ARCH 612	Seminar	2
ARCH 606	Environmental Archaeology	3	ARCH 613	Thesis	4
ARCH 608	Cultural Heritage Management	3	ARCH 614	Defense	2

## DEPARTMENT OF FRESH WATER BIOLOGY & FISHERIES

### BS FRESH WATER BIOLOGY & FISHERIES: 8-SEMESTER PROGRAM (136)

Pre-requisite; H.S.C. with Pre-Medical Group: Pre-Entry Test

#### FIRST YEAR

First Semester			Second Semester		
		C.H			C.H
ENGL 300	English I	3	ENGL 301	English- II	3
PKST 300	Pakistan Studies	2	ISST/ETHS 301	Islamic Studies/Ethics	2
MATH 300	Mathematics- I	3	MATH 301	Mathematics- II	3
ZOOL 320-321	Zoology	2+1	FWBF 312-313	Hydrobiology	3+1
FWBF 310-311	Ichthyology (Optional)	3+1	ZOOL 322-323	Zoology	2+1
CHEM/BIOC/	Chemistry/	2+1	FWBF 352-353	Aquatic Ecology	
PHSL 320-321	Biochemistry/ Physiology		(Optional)	2+1	
			CHEM/BIOC/	Chemistry/	2+1
			PHSL 322-323	Biochemistry/Physiology	

#### SECOND YEAR

Third Semester			Fourth Semester		
		C.H			C.H
ENGL 400	English- III	3	ENGL 401	English- IV	3
CIVZ 400	Civilization	2	ENVS 400	Environmental Science	2
FWBF 410-411	Ichthyology - II	3+1	FWBF 414-415	Fishery Biology	3+1
FWBF 412-413	Pond Culture	3+1	FWBF 414-415	Fishery Technology	3+1
FWBF 450-451	Fish Farming (Optional)	3+1	ZOOL 422-423	Zoology	2+1
CHEM/BIOC/	Chemistry/	2+1	CHEM/BIOC/	Chemistry/	2+1
PHSL 420-421	Biochemistry/Physiology		PHSL 422-423	Biochemistry/Physiology	

#### THIRD YEAR

Fifth Semester			Sixth Semester		
		C.H			C.H
FWBF 500-501	Fish Systematics	3+1	FWBF 508-509	Fish Anatomy	3+1
FWBF 502-503	Ecology	3+1	FWBF 510-511	Limnology	3+1
FWBF 504-505	Zooplankton	3+1	FWBF 512-513	Freshwater	
FWBF 506-507	Algology	3+1	Invertebrates	3+1	
			FWBF 514-515	Aquatic Bacteria & Fungi	3+1

#### FOURTH YEAR

Seventh Semester			Eighth Semester		
		C.H			C.H
FWBF 600-601	Phytoplankton	3+1	FWBF 608-609	Fish Culture	3+1
FWBF 602-603	Biology of Fish Growth	3+1	FWBF 610-611	Fisheries Biology	3+1
FWBF 604-605	Water Pollution	3+1	FWBF 612-613	Fisheries Technology	3+1
FWBF 606-607	Fish Nutrition	3+1	FWBF 614-615	Specialization	3+1
			FWBF 616	Comprehensive Viva	3+1

**Specialization:** -Any one to be offered CH-(3+1)

- i. Water Quality Management
- ii. Ecotoxicology
- iii. Fisheries Science
- iv. Aquaculture
- v. Lake Management

Specialization Curricula for 8th Semester.

\*Odd numbered courses are Lab courses/Practicals

## DEPARTMENT OF GEOGRAPHY

### BS (GEOGRAPHY): 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-134

Pre-requisite: H.S.C. with Pre-Engineering / Pre-Medical/General Science Group; Pre-entry Test.

#### FIRST YEAR

First Semester		C.H	Second Semester		C.H
ENGL 300	English I	3	ENGL 301	English II	3
PKST 300	Pakistan Studies	2	ISST/ETHS 301	Islamic Studies/Ethics	2
MATH 300	Mathematics I	3	MATH 301	Mathematics II	3
GEOG 310-311	Physical Geography I	3+1	GEOG 312-313	Physical Geography II	3+1
GEOL 320-321	Geology	2+1		Minor-I (Optional)	3
	Minor-I (Optional)	3		Minor-II (Minor)	3
	Minor-II (Optional)	3			

#### SECOND YEAR

Third Semester		C.H	Fourth Semester		C.H
ENGL 400	English III	3	ENGL 402	English- IV	3
CIVZ 400	Civilization	2	ENVS 402	Environmental Science	2
GEOG 410	Human Geography	3	GEOG 412	Human Geography-II	3
GEOG 411	Map Interpretation (Lab)	1	GEOG 413	Diagrams & Distribution	1
	Minor-I (Optional)	3		Maps (Lab)	
	Minor-II (Minor)	3		Minor-I (Optional)	3
				Minor-II (Minor)	3

#### THIRD YEAR

Fifth Semester		C.H	Sixth Semester		C.H
GEOG 500	Geomorphology	3	GEOG 508	Biogeography	3
GEOG 501	Identification of Rocks & Minerals Lab	1	GEOG 509	Soil Analysis (Lab)	1
GEOG 502	Climatology	3	GEOG 510	Soil Geography	3
GEOG 503	Interpretation of Weather Map Lab	1	GEOG 511	Adv. Cartographic Techniques Lab	1
GEOG 504	Oceanography	3	GEOG 512	Settlement Geography	3
GEOG 505	Water Analysis	1	GEOG 513	Instrumental Surveying Lab	1
GEOG 506	Economic Geography	3	GEOG 514	Coastal Morphology OR	
GEOG 507	EL. Quantitative Techniques Lab	1	516	3	
			GEOG 515	Advanced Quantitative Techniques Lab	1
			GEOG 516	Political Geography	3

#### FOURTH YEAR

Seventh Semester		C.H	Eighth Semester		C.H
GEOG 600	Environmental Geography	3	GEOG 620	Geographic Thought	3
GEOG 601	Research Method Lab	2	GEOG 621	Landform: Field Work Lab.	2
GEOG 602	Regional Geography of South Asia	3		OR 623 OR 625	
GEOG 603	Topographic Map Int.	1	GEOG 622	Geography of Pakistan	3
GEOG 604	Desert Morphology OR 606	3	GEOG 623	Urban Land use Survey Lab OR 625	
GEOG 605	Adv. Cartography Lab	2	GEOG 624	Hydro Geography OR 626	3
GEOG 606	Population Geography		GEOG 625	Rural Land use Survey	
GEOG 607	Computer Application Lab	1	GEOG 626	Agricultural Geography	
GEOG 608	Plant Geography OR 610	3	GEOG 627	Remote Sensing Lab	1
GEOG 610	Urban Geography OR 612		GEOG 628	Manufacturing Geography or	
GEOG 612	Rural Geography		630	3	
			GEOG 629	GIS Lab	1
			GEOG 630	Zoo Geography	
			GEOG 640	Comprehensive Viva Voce	2

## DEPARTMENT OF PHYSIOLOGY

Pre-requisite: H.S.C. with Pre-Medical Group, Pre-Entry Test

#### FIRST YEAR

First Semester		C.H	Second Semester		C.H
ENGL 300	English I	3	ENGL 301	English- II	3
PKST 300	Pakistan Studies	2	ISST/ETHS 301	Islamic Studies / Ethics	2
STAT/MATH 300	Biostatistics-II/ Mathematics- I	3	STAT/MATH 301	Biostatistics-II / Mathematics- II	3
PHSL 310-311	Cell Biology I	2+1	PHSL 314-315	Cell Biology-II	2+1
PHSL 312-313	Functional Anatomy & Physiology-I	2+1	PHSL 316-317	Functional Anatomy & Physiology- II	2+1
BIOC 320-321	Biochemistry-I	2+1	BIOC 322-323	Biochemistry-II	2+1
ZOO/FWB/BIOT/ IPS 320-321	Functional Anatomy & Physiology-I	2+1	ZOOL/FWB/ BIOT IPS 322-323	Functional Anatomy & Physiology II	2+1

**SECOND YEAR**

<i>Third Semester</i>			<i>Fourth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENGL 400	English- III	3	ENGL 401	English- IV	3
CVZ 400	Civilization	2	ENVS 401	Environmental Science	2
PHSL 410-411	Physiology of blood & body fluids	2+1	PHSL 414	Introduction to Bioinformatics	2
PHSL 412-413	Plant Physiology	2+1	PHSL 416-417	Neuro-muscular Physiology	2+1
BIOC 420-421	Biochemistry-III	2+1	PHSL 418-419	Principles of Immunology	2+1
ZOOL/FWB/BIOT/IPS 420-421	Cell Biology	2+1	BIOC 422-423	Biochemistry-IV	2+1
			ZOO/FWB/BIOT/IPS 422-423	General Physiology	2+1

**THIRD YEAR**

<i>Fifth Semester</i>			<i>Sixth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
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

**FOURTH YEAR**

<i>Seventh Semester</i>			<i>Eighth Semester</i>		
		<i>C.H</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 and Exercise	2+1	PHSL 614-615	Hematology	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

**BS (MEDICAL LABORATORY TECHNOLOGY) (MLT) 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-136**

Pre-requisite: H.S.C. with Pre-Medical Group, Pre-Entry Test

**FIRST YEAR**

<i>First Semester</i>			<i>Second Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENG 300	English-I	3	ENG 300	English-II	3
PKST 300	Pakistan Studies	2	ISST 300	Islamic Studies	2
MLT 301	Biostatistics	3	MLT 310-311	Cell Biology-II	2+1
MLT 302-303	Cell Biology-I	2+1	MLT 312-313	General Microbiology	2+1
MLT 304-305	Functional Anatomy & Physiology-I	2+1	MLT 314-315	Functional Anatomy & Physiology-II	2+1
MLT 306-307	Laboratory Techniques-I	2+1	MLT 316-317	Laboratory Techniques-II	2+1
MLT 308-309	Bio-Chemistry-I	2+1	MLT 318-319	Bio-Chemistry-II	2+1

**SECOND YEAR**

<i>Third Semester</i>			<i>Fourth Semester</i>		
		<i>C.H</i>			<i>C.H</i>
ENG 400	ENGLISH-III	3	ENG 400	ENGLISH-IV	3
MLT 400-401	Applied Microbiology	2+1	MLT 410	Principles of Toxicology	3
MLT 402-403	General Pathology	2+1	MLT 412-413	Clinical Pathology	2+1
MLT 404-405	Hematology-I	2+1	MLT 414-415	Hematology-II	2+1
MLT 406	Physiology of Body Fluids	3	MLT 416-417	Immunology	2+1
MLT 408-409	Molecular Biology	2+1	MLT 418-419	Computer Application in Laboratory	2+1

**THIRD YEAR**

<b>Fifth Semester</b>		<b>C.H</b>	<b>Sixth Semester</b>		<b>C.H</b>
MLT 500-501	Serology and Blood Banking	2+1	MLT 510-511	Endocrine and Hormone Assay-II	2+1
MLT 502-503	Endocrine and Hormone Assay-I	2+1	MLT 512	Bio-analytical Techniques	3
MLT 504-505	Histo-Pathological Techniques-I	2+1	MLT 514-515	Chemical Pathology	2+1
MLT 506-507	Community Medicine & epidemiology	2+1	MLT 516-517	Laboratory Management	2+1
MLT 508-509	Clinical Chemistry-I	2+1	MLT 518	Molecular Diagnosis	3

**FOURTH YEAR**

<b>Seventh Semester</b>		<b>C.H</b>	<b>Eighth Semester</b>		<b>C.H</b>
MLT 602	Behavioral Sciences	3	MLT 610	Laboratory Internship / House Job	12
MLT 604	Research Methodology	3			
MLT 606	Research Project	9			
MLT 608	Comprehensive Viva-Voce	3			

**DEPARTMENT OF STATISTICS****BS (STATISTICS): 4-YEAR DEGREE PROGRAM(8-SEMESTER) CH-136**

Pre-requisite:- H.S.C. with Pre-Engineering/ General Science Group with Maths & Physics. Pre- Entry Test.

**FIRST YEAR**

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
ENGL 300	English I	3
ISST/ETHS 300	Islamic Studies/Ethics	2
MATH 300	Mathematics I (P.E)	3
STAT 310	Statistics I	3
STAT 311	Statistics I (Lab.)	1
COMP 320	Computer Fundamental	2
COMP 321	Computer Fundamental (Lab.)	1
ECON 320	Basic Economics- I	3

<b>2<sup>nd</sup> Semester</b>		<b>C.H</b>
ENGL 301	English- II	3
PKST 301	Pakistan Studies	2
MATH 301	Mathematics- II (P.E)	3
STAT 312	Statistics- II	3
STAT 313	Statistics- II (Lab.)	1
COMP 322	Computer Application	2
COMP 323	Computer Application (Lab.)	1
ECON 322	Basic Economics- II	3

**SECOND YEAR**

<b>3<sup>rd</sup> Semester</b>		<b>C.H</b>
ENGL 400	English- III	3
CIVZ 400	Civilization	2
STAT 410	Applied Statistics I	3
STAT 411	Applied Statistics I (Lab.)	1
COMP 420	Computer Skills/Programming	2
COMP 421	Computer Skills/Programming (Lab.)	1
BUAD/PUAD 420	Business/Public Administration	3

<b>4<sup>th</sup> Semester</b>		<b>C.H</b>
ENGL 401	English- IV	3
ENVS 401	Environmental Science	2
STAT 412	Applied Statistics II	3
STAT 413	Applied Statistics II (Lab.)	1
COMP 422	Computer Skills/Programming	2
COMP 423	Computer Skills/Programming (Lab.)	1
SOCL/PSYC 422	Sociology/Psychology	3



### THIRD YEAR

<b>5<sup>th</sup> Semester</b>		<b>C.H</b>
STAT 500	Decision Theory (Optional)	3
STAT 501	Decision Theory (Optional) (Lab.)	1
STAT 502	Probability & Probability Distribution-I	3
STAT 503	Probability & Probability Distribution-I (Lab.)	1
STAT 504	Population Studies- I (Optional)	3
STAT 505	Population Studies- I (Optional) (Lab.)	1
STAT 506	Design and Analysis of EXP-I	3
STAT 507	Design and Analysis of EXP-I (Lab.)	2
<b>6<sup>th</sup> Semester</b>		<b>C.H</b>
STAT 508	Linear Model & Reg. Analysis (Optional)	3
STAT 509	Linear Model & Reg. Analysis (Optional) (Lab.)	1
STAT 510	Probability & Probability Distribution-II	3
STAT 511	Probability & Probability Distribution-II (Lab.)	1
STAT 512	Population Studies- II (Optional)	3
STAT 513	Population Studies- II (Optional) (Lab.)	1
STAT 514	Design and Analysis of EXP.- II	3
STAT 515	Design and Analysis of EXP.- II (Lab.)	2

### FOURTH YEAR

<b>7<sup>th</sup> Semester</b>		<b>C.H</b>
STAT 600	Statistical inference I	3
STAT 601	Statistical inference I (Lab.)	1
STAT 602	Sampling & Survey Method I	3
STAT 603	Sampling & Survey Method I Survey/Lab.	2
STAT 604	Regression Analysis & Econometrics (Optional)	3
STAT 605	Regression Analysis & Econometrics (Optional) (Lab.)	1
STAT 606	Data Processing & Stat. Computing (Optional)	3
STAT 607	Data Processing & Stat. Computing (Optional) (Lab.)	1

<b>Eighth Semester</b>		<b>C.H</b>
STAT 608	Statistical inference- II	3
STAT 609	Statistical inference- II (Lab.)	1
STAT 610	Sampling & Survey Method II	3
STAT 611	Sampling & Survey Method II Survey/Lab.	2
STAT 612	Operation Research (Optional)	3
STAT 613	Operation Research (Optional) (Lab.)	1
STAT 614	Stochastic Process/ Time Series Analysis & Forecasting (Optional)	3
STAT 615	Stochastic Process/ Time Series Analysis & Forecasting (Optional) (Lab.)	1
STAT 616	Comprehensive Viva	2

\* odd number courses are Labs

### Specializations

In view of the rapid expansion in the discipline, the department offers opportunity to study any field of specialization as optional subject. The fields identified here and the courses listed under each are to be opted and studied both by BS 4-Year students from 5th semester onward as well as MSc. Statistics student's Program (Credit Hours 70)

### Statistics

#### THIRD YEAR

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
STAT 500	Statistical Methods-I	3
STAT 501	Statistical Methods-I (Lab.)	1
STAT 502	Probability and Probability Distributions-I	3
STAT 503	Probability and 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

<b>2<sup>nd</sup> Semester</b>		<b>C.H</b>
STAT 508	Statistical Methods-II	3
STAT 509	Statistical Methods-II (Lab.)	1
STAT 510	Probability and Probability Distributions-II	3
STAT 511	Probability and 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

#### FOURTH YEAR

<b>3<sup>rd</sup> Semester</b>		<b>C.H</b>
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	Operation Research	3
STAT 605	Operation Research (Survey/Lab.)	2
STAT 606	Time Series Analysis & Forecasting-I	3
STAT 607	Time Series Analysis & Forecasting-I (Lab.)	1

<b>4<sup>th</sup> Semester</b>		<b>C.H</b>
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 Experiment-II	3
STAT 613	Design 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 CVV)	2

#### Operations Research

#### THIRD YEAR

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
STAT 500	Statistical Methods-I	3
STAT 501	Statistical Methods-I (Lab.)	1
STAT 502	Probability and Probability Distributions-I	3
STAT 503	Probability and 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

<b>2<sup>nd</sup> Semester</b>		<b>C.H</b>
STAT 508	Statistical Methods-II	3
STAT 509	Statistical Methods-II (Lab.)	1
STAT 510	Probability and Probability Distributions-II	3
STAT 511	Probability and 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

#### FOURTH YEAR

<b>3<sup>rd</sup> Semester</b>		<b>C.H</b>
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	Operations Research	3
STAT 605	Operations Research (Survey/Lab.)	2
STAT 606	Stochastic Process	3
STAT 607	Stochastic Process (Lab.)	1

<b>4<sup>th</sup> Semester</b>		<b>C.H</b>
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 (Survey/Lab.)	2
STAT 612	Human Resources Management-II	3
STAT 613	Human Resources Management-II (Lab.)	1
STAT 614	Queuing Models	3
STAT 615	Queuing Models (Lab.)	1
STAT 616	Research Project (in lieu of Viva- Voce)	2

## Population Sciences

### THIRD YEAR

<b>1<sup>st</sup> Semester</b>		<b>C.H</b>
STAT 500	Statistical Methods-I	3
STAT 501	Statistical Methods-I (Lab.)	1
STAT 502	Probability and Probability Distributions-I	3
STAT 503	Probability and 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

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

### FOURTH YEAR

<b>3<sup>rd</sup> Semester</b>		<b>C.H</b>
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	Population Studies (PS)	3
STAT 605	Population Studies (PS) (Lab.)	1
STAT 606	Techniques of Demographic Analysis (PS)	3
STAT 607	Techniques of Demographic Analysis (PS) (Survey/Lab.)	2

<b>4<sup>th</sup> Semester</b>		<b>C.H</b>
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	Population and Environment (PS)	3
STAT 613	Population and Environment (PS) (Survey/Lab.)	2
STAT 614	Nuptiality & Fertility (PS)	3
STAT 615	Nuptiality & Fertility (PS) (Lab.)	1
STAT 616	Research Project (in lieu of Viva-Voce)	2

\* odd number courses are Labs

## DEPARTMENT OF ZOOLOGY

### BS (ZOOLOGY): 4-YEAR DEGREE PROGRAM (8-SEMESTER) CH-133

Pre-requisite:- H.S.C. with Pre-Medical,/ General Science Biology Group, Pre-Entry Test

#### FIRST YEAR

<b>First Semester</b>		<b>C.H</b>
ENGL 300	English I (Compulsory)	3
PKST 300	Pakistan Studies	
(Compulsory)	2 2	
MATH 300	Mathematics (Compulsory)	3
ZOOL 310-311	Principle of	
AnimalLife	3+1	
BOTN 320-321	Botany	2+1
PHYSO/FWBF/	Physiology/F-WBiology/Chemistry/Biochemistry	
	2+1	2+1
CHEM/ BIOCHEM		
320-321		
<b>Second Semester</b>		<b>C.H</b>
ENGL 301	English- II (Compulsory)	3
ISST/ETHS 301	Islamic Studies/ Ethics(Compulsory)	2
BIOSTA 306-307	Biostatistics (Compulsory)2+1	
ZOOL 312- 313	Principle of Animal	
Life	3+1	
BOTN 322- 323	Botany	2+1
PHYSO/FWBF/CHEM/	Physiology/F-WBiology/Chemistry/ Biochemistry	
	2+1	2+1
BIOCHEM 322-323		

**SECOND YEAR**

<b>Third Semester</b>		<b>C.H</b>
ENGL 400	English- III (Compulsory)	3
COMP 406-407	Introduction to Computer (Compulsory)	2+1
ZOOL 410- 411	Animal Diversity : Invertebrates	3+1
BOTN 420- 421	Botany	2+1
PHYSO/FWBF/CHEM/ 2+1	Physiology/F-WBiology/Chemistry/ Biochemistry	2+1
BIOCHEM 322-323		
<b>Fourth Semester</b>		<b>C.H</b>
ENGL 401	English- IV (Compulsory)	3
ZOOL 412- 413	Animal Diversity-II : Vertebrates	3+1
ZOOL 414- 415	Animal Form & Function-I3+1	
ZOOL 416- 417	Animal Form & Function-II3+1	
BOTN 422- 423	Botany	2+1

**THIRD YEAR**

<b>Fifth Semester</b>		<b>C.H</b>
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

<b>Sixth Semester</b>		<b>C.H</b>
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

**FOURTH YEAR**

<b>Seventh Semester</b>		<b>C.H</b>
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
<b>Eighth Semester</b>		<b>C.H</b>
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