

## 1. BIOCHEMISTRY

### M.Sc. /M.Sc. Ag. (Biochemistry)

#### Core Courses (14 credits)

BBC-500	Chemistry of Biomolecules	3(3-0-0)
BBC-510	Biochemical Techniques	3(1-0-2)
BBC-530	Enzymology	3(2-0-1)
BBC-600	Master's Seminar	1
BBC-640	Intermediary Metabolism-I	2(2-0-0)
BBC-641	Intermediary Metabolism-II	2(2-0-0)

#### Basic Supporting Courses (8 credits)

BBM-500	General Microbiology	3(3-0-0)
BMB-535	Techniques in Cell Biology	2(0-0-2)
BMB-520	Fundamentals of Molecular Biology	3(3-0-0)

#### Optional/ Minor Courses (8 credits)

8

#### Thesis Research (20 credits)

BBC-690	Master's Thesis Research	20
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**Total 50**

### Ph.D. (Biochemistry)

#### Core Courses (10 credits)

BBC-710	Advanced Techniques in Biochemistry	2(0-0-2)
BBC-730	Advanced Enzymology	2(2-0-0)
BBC-740	Advanced Biochemistry and Molecular Biology	3(3-0-0)
BBC-765	Current Topics in Biochemistry	1(1-0-0)
BBC-788	Doctoral Seminar-I	1
BBC-789	Doctoral Seminar-II	1

#### Basic Supporting Courses (6 credits)

BMB-540	Molecular Genetics and Breeding	3(3-0-0)
BPS-561	Statistical Method	3(2-0-1)

#### Optional Courses (4 credits)

4

#### Minor Courses (10 credits)

10

#### Thesis Research (45 credits)

BBC-790	Ph.D. Thesis Research	45
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**Total 75**

#### Compulsory Courses for Minor for Other Disciplines

BBC-501	General Biochemistry	3(3-0-0)
BBC-505	Basic Techniques in Biochemistry	1(0-0-1)
BBC-640	Intermediary Metabolism-I	2(2-0-0)
BBC-641	Intermediary Metabolism-II	2(2-0-0)

#### List of Post Graduate Courses of the Department

BBC-500	Chemistry of Biomolecules	3(3-0-0)
BBC-501	General Biochemistry	3(3-0-0)
BBC-505	Basic Techniques in Biochemistry	1(0-0-1)

BBC-510	Biochemical Techniques	3(1-0-2)
BBC-530	Enzymology	3(2-0-1)
BBC-600	Master's Seminar	1
BBC-601	Special Problem	1-2
BBC-620	Food and Nutritional Biochemistry	2(2-0-0)
BBC-640	Intermediary Metabolism I	2(2-0-0)
BBC-641	Intermediary Metabolism II	2(2-0-0)
BBC-645	Plant Biochemistry	3(3-0-0)
BBC-651	Animal Biochemistry	3(3-0-0)
BBC-655	Carbon and Nitrogen Metabolism	2(2-0-0)
BBC-690	Master's Thesis Research	20
BBC-710	Advanced Techniques in Biochemistry	2(0-0-2)
BBC-730	Advanced Enzymology	2(2-0-0)
BBC-740	Advanced Biochemistry and Molecular Biology	3(3-0-0)
BBC-750	Biochemistry and Molecular Probes	2(2-0-0)
BBC-751	Biomembranes	2(2-0-0)
BBC-756	Biochemistry of Biotic and Abiotic Stresses	3(3-0-0)
BBC-760	Functional Genomics, Proteomics and Metabolomics	3(3-0-0)
BBC-765	Current Topics in Biochemistry	1(1-0-0)
BBC-788	Doctoral Seminar-I	1
BBC-789	Doctoral Seminar-II	1
BBC-790	Ph.D. Thesis Research	45

## 2. BIOLOGICAL SCIENCES

### M.Sc. (Botany)

#### Core Courses (12 credits)

BBB-500	Plant Diversity I	3(2-0-1)
BBB-501	Plant Diversity II	3(2-0-1)
BBB-525	Angiosperms: Diversity and Resource Utilization	3(2-0-1)
BBB-535	Plant Ecology	2(2-0-0)
BBB-600	Master's Seminar	1

#### Basic Supporting Courses (10 credits)

BPY-602	Principles of Plant Physiology	4(3-0-1)
BBC-501	General Biochemistry	3(3-0-0)
AGP-550	Principles of Cytogenetics	3(2-0-1)

#### Optional/ Minor Courses (8 credits)

8

#### Thesis Research (20 credits)

BBB-690	Master's Thesis Research	20
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**Total 50**

### Ph.D. (Botany)

#### Core Courses (9 credits)

BBB-651	Plant Taxonomy	3(2-0-1)
BBB-705	Plants in Extreme Habitats	2(2-0-0)
BBB-710	Rhizosphere Biology	2(2-0-0)
BBB-788	Doctoral Seminar – I	1
BBB-789	Doctoral Seminar – II	1

#### Basic Supporting Courses (7 credits)

BPY-605	Hormonal Regulation of Plant Growth and Development	3(2-0-1)
BPS-661	Experimental Statistics	4(3-0-1)

#### Optional Courses (4 credits)

4

#### Minor Courses (10 credits)

10

#### Thesis Research (45 credits)

BBB-790	Ph.D. Thesis Research	45
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**Total 75**

#### Compulsory Courses for Minor for Other Disciplines

BBB-525	Angiosperms: Diversity and Resource Utilization	3(2-0-1)
BBB-535	Plant Ecology	2(2-0-0)

#### List of Courses of the Department

BBB-400	Fundamentals of Biology	4(3-0-1)
BBB-500	Plant Diversity – I	3(2-0-1)
BBB-501	Plant Diversity – II	3(2-0-1)
BBB-510	Plant Morphology and Anatomy	2(1-0-1)
BBB-520	Angiosperms, Systematics and Economic Botany	3(2-0-1)

BBB-525	Angiosperms: Diversity and Resource Utilization	3(2-0-1)
BBB-530	Fundamentals of Ecology	3(2-0-1)
BBB-535	Plant Ecology	2(2-0-0)
BBB-540	Plant Embryology	2(1-0-1)
BBB-545	Biology of Plant Reproduction	2(1-0-1)
BBB-599	Mycology	3 (2-0-1)
BBB-600	Master's Seminar	1
BBB-601	Special Problem	2
BBB/ BBE-613	Biodiversity : Concepts and Management Practices	2(2-0-0)
BBB-615	Advanced Mycology	3 (2-0-1)
BBB-620	Introductory Mycology	3(2-0-1)
BBB-625	Mycology–I	3(2-0-1)
BBB-626	Mycology–II	3(2-0-1)
BBB-630	Myco-Physiology	3(2-0-1)
BBB-651	Plant Taxonomy	3(2-0-1)
BBB-690	Master's Thesis Research	20
BBB-705	Plants in Extreme Habitats	2(2-0-0)
BBB-710	Rhizosphere Biology	2(2-0-0)
BBB-720	Economic Botany	3(3-0-0)
BBB-721	Ethnobotany	2(2-0-0)
BBB-730	Recent Advances in Biosystematics	2(2-0-0)
BBB-750	Plant Molecular Taxonomy	2(2-0-0)
BBB-788	Doctoral Seminar–I	1
BBB-789	Doctoral Seminar–II	1
BBB-790	Ph.D. Thesis Research	45

**Note: Course of 400 series is remedial course of the department**

### 3. CHEMISTRY

#### M.Sc. Chemistry

##### Core Courses (17 credits)

BPC-531	Organic Chemistry	3(3-0-0)
BPC-600	Master's Seminar	1
BPC-623	Advanced Inorganic Chemistry	2(2-0-0)
BPC-631	Mechanism of Organic Reactions	2(2-0-0)
BPC-639	Spectroscopic Methods of Analysis	3(2-0-1)
BPC-641	Physical Chemistry	3(2-0-1)
BPC-651	Analytical Chemistry	3(1-0-2)

##### Basic Supporting Courses (5 credits)

BBC-501	General Biochemistry	3(3-0-0)
BPC-615	Radio Chemistry	2(1-0-1)

##### Optional/ Minor Courses (8 credits)

8

##### Thesis Research (20 credits)

BPC-690	Master's Thesis Research	20
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**Total 50**

#### M.Sc. Ag/ M. Sc. Agricultural Chemicals

##### Core Courses (16 credits)

BPC-531	Organic Chemistry	3(3-0-0)
BPC-600	Master's Seminar	1
BPC-606	Synthetic Agrochemical for Insect and Mite Management	3(2-0-1)
BPC-607	Synthetic Agrochemical for Fungi and Nematode Management	3(2-0-1)
BPC-608	Synthetic Agrochemical for Weed Management	3(2-0-1)
BPC-614	Spectroscopic and Chromatographic Techniques	3(2-0-1)

##### Basic Supporting Courses (6 credits)

BBC-501	General Biochemistry	3(3-0-0)
APP-606	Principles of Plant Disease management	3(2-0-1)

##### Optional/ Minor Courses (8 credits)

##### Thesis Research (20 credits)

BPC-690	Master's Thesis Research	20
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**Total 50**

##### Remedial/ non gradial courses

APP-401	Introductory Plant Pathology (For B. Sc. PCM)	3(2-0-1)
BPC-500	General Chemistry (For B. Sc. Ag)	4(3-0-1)
APA-503	Principles and Production of Weed Management (For B.Sc. Ag.)	3(2-0-1)

#### Ph.D. Agricultural Chemicals

##### Core Courses (11 credits)

BPC-701	Advances in Agrochemicals	3(2-0-1)
BPC-721	Special Topics in Inorganic Chemistry	2(2-0-0)

BPC-741	Selected Topics in Physical Chemistry	2(2-0-0)
BPC-743	Special Topics in Agrochemicals	2(0-0-2)
BPC-788	Doctoral Seminar-I	1
BPC-789	Doctoral Seminar-II	1
<b>Basic Supporting Courses (4 credits)</b>		
BBC-640	Intermediary Metabolism –I	2(2-0-0)
BBC-641	Intermediary Metabolism –II	2(2-0-0)
<b>Optional Courses (5 credits)</b>		<b>5</b>
<b>Minor Courses (10 credits)</b>		<b>10</b>
<b>Thesis Research (45 credits)</b>		
BPC-790	Ph.D. Thesis Research	45
<b>Total</b>		<b>75</b>

### **Compulsory Courses for Minor for Other Disciplines**

#### **Chemistry**

BPC-531	Organic Chemistry	3(3-0-0)
BPC-623	Advanced Inorganic Chemistry	2(2-0-0)
BPC-641	Physical Chemistry	3(2-0-1)

#### **Agricultural Chemicals**

BPC-606	Synthetic Agrochemical for Insect and Mite Management	3(2-0-1)
BPC-607	Synthetic Agrochemical for Fungi and Nematode Management	3(2-0-1)
BPC-608	Synthetic Agrochemical for Weed Management	3(2-0-1)

### **Minor courses from department of Biochemistry/ Entomology/ Plant Pathology/ Soil Science etc.**

#### **List of Post Graduate Courses of the Department**

BPC-500	General Chemistry	4(3-0-1)
BPC-503	Methods of Pesticides Analysis for Quality Control	2(1-0-1)
BPC-504	Formulation Chemistry	2(1-0-1)
BPC-505	Introduction to Agrochemicals	2(2-0-0)
BPC-512	Radioisotopic Techniques in Mechanical Engineering	1(0-0-1)
BPC-531	Organic Chemistry	3(3-0-0)
BPC-532	Chemistry of Dyes and Pigments	3(2-0-1)
BPC-533	Chemistry of Fibers	3(2-0-1)
BPC-534	Preparation and Identification of Organic Compounds	2(0-0-2)
BPC-600	Master's Seminar	1
BPC-601	Special Problem	1-2
BPC/BBE-602	Environmental Chemistry	3(2-0-1)
BPC-606	Synthetic Agrochemical for Insect and Mites Management	3(2-0-1)
BPC-607	Synthetic Agrochemical for Fungi and Nematode Management	3(2-0-1)
BPC-608	Synthetic Agrochemical for Weed Management	3(2-0-1)

BPC-614	Spectroscopic and Chromatographic Techniques	3(2-0-1)
BPC-615	Radio Chemistry	2(1-0-1)
BPC-616	Use of Radioisotopes in Research	2(1-0-1)
BPC-621	Inorganic Chemistry-I	3(2-0-1)
BPC-622	Inorganic Chemistry-II	2(2-0-0)
BPC-623	Advanced Inorganic Chemistry	2(2-0-0)
BPC-624	Coordination Chemistry	2(2-0-0)
BPC-625	Quantitative Inorganic Analysis	2(1-0-1)
BPC-631	Mechanism of Organic Reactions	2(2-0-0)
BPC-632	Heterocyclic chemistry	3(3-0-0)
BPC-638	Organic Synthesis	3(1-0-2)
BPC-639	Spectroscopic Methods of Analysis	3(2-0-1)
BPC-641	Physical Chemistry	3(2-0-1)
BPC-643	Biophysical Chemistry	2(1-0-1)
BPC-644	Advance Physical Chemistry	3(3-0-0)
BPC-651	Analytical Chemistry	3(1-0-2)
BPC-653	Green Chemistry	2(2-0-0)
BPC-660	Chemistry of Polymers	3(2-0-1)
BPC-661	Medicinal Chemistry	3(3-0-0)
BPC-690	Master's Thesis Research	20
BPC-701	Advances in Agrochemicals	3(2-0-1)
BPC-702	Research Techniques in Agrochemicals	2(0-0-2)
BPC-703	Recent Advances in Pesticides Formulations	2(2-0-0)
BPC-711	Spectroscopic and Separation Methods	3(3-0-0)
BPC-721	Special Topics in Inorganic Chemistry	2(2-0-0)
BPC-731	Advance Organic Chemistry	2(2-0-0)
BPC-732	Chemistry of Bioactive Natural Products	2(2-0-0)
BPC-741	Selected Topics in Physical Chemistry	2(2-0-0)
BPC-743	Special Topics in Agrochemicals	2(0-0-2)
BPC-761	Chemistry of Nanomaterials	2(2-0-0)
BPC-788	Doctoral Seminar-I	1
BPC-789	Doctoral Seminar-II	1
BPC-753	Research Methodology in Chemistry	2(1-0-2)
BPC-790	Ph.D. Thesis Research	45

## 4. ENVIRONMENTAL SCIENCE

### M.Sc./M.Sc. (Ag) (Environmental Science)

#### Core Courses (15 credits)

BBE-500	Physical Environment	2(2-0-0)
BBE-600	Master's Seminar	1
BBE/BPC-602	Environmental Chemistry	3(2-0-1)
BBE-612	Ecosystem Analysis	3(2-0-1)
BBE-621	Environmental Pollution	2(2-0-0)
BBE-631	Resource and Energy Conservation	2(1-0-1)
BBE-642	Environmental Monitoring	2(1-0-1)

#### Basic Supporting Courses (6 credits)

BPS-561	Statistical Methods	3(2-0-1)
AAM-650	Remote Sensing Applications in Agriculture	3(2-0-1)

#### Optional/ Minor Courses (9 credits)

**9**

#### Thesis Research (20 credits)

BBE-690	Master's Thesis Research	20
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### Ph.D. (Environmental Science)

#### Core Courses (9 credits)

BBE-722	Air and Water Pollution	2(2-0-0)
BBE-732	Environmental Waste Utilization	2(2-0-0)
BBE-742	Environmental Impact Assessment and Management	3(2-0-1)
BBE-788	Doctoral Seminar I	1
BBE-789	Doctoral Seminar II	1

#### Basic Supporting Courses (7 credits)

BBC-501	General Biochemistry	3(3-0-0)
BPC-702	Research Techniques in Agrochemicals	2(0-0-2)
BBM-721	Current Topics in Soil Microbiology	2(2-0-0)

#### Optional Courses (4 credits)

**4**

#### Minor Courses (10 credits)

**10**

#### Thesis Research (45 credits)

BBE-790	Ph.D. Thesis Research	45
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**Total      75**

#### Compulsory Courses for Minor for other Disciplines

BBE-612	Ecosystem Analysis	3(2-0-1)
BBE-621	Environmental Pollution	2(2-0-0)

#### List of Courses of the Department

BBE-500	Physical Environment	2(2-0-0)
BBE-511	Ecophysiology	3(3-0-0)
BBE-513	Social Environment and Human Ecology	2(2-0-0)
BBE-600	Master's Seminar	1
BBE-601	Special Problem	1



BBE/BPC- 602	Environmental Chemistry	3(2-0-1)
BBE-611	Environmental Physiology	2(1-0-1)
BBE-612	Ecosystem Analysis	3(2-0-1)
BBB/BBE-613	Biodiversity: Concepts and Management Practices	2(2-0-0)
BBE-621	Environmental Pollution	2(2-0-0)
BBE-622	Ecotoxicology	2(1-0-1)
BBE-631	Resource and Energy Conservation	2(1-0-1)
BBE-642	Environmental Monitoring	2(1-0-1)
BBE-644	Experimentation in Environmental Sciences	2(0-0-2)
BBE-645	Biodegradation and Waste Treatment Design	2(2-0-0)
BBE-651	Environmental Biotechnology	2(0-0-0)
BBE-690	Master's Thesis Research	20
BBE-722	Air and Water Pollution	2(2-0-0)
BBE-732	Environmental Waste Utilization	2(2-0-0)
BBE-742	Environmental Impact Assessment and Management	3(2-0-1)
BBE-788	Doctoral Seminar-I	1
BBE-789	Doctoral Seminar-II	1
BBE-790	Ph.D. Thesis Research	45

## 5. MATHEMATICS, STATISTICS AND COMPUTER SCIENCE

### M.Sc. (Mathematics)

#### Core Courses (16 credits)

BPM-532	Differential Geometry and Tensors	3(3-2-0)
BPM-533	Topology	3(3-2-0)
BPM-534	Complex Analysis	3(3-2-0)
BPM-536	Abstract Algebra	3(3-2-0)
BPM-600	Master's Seminar	1
BPM-635	Functional Analysis	3(3-2-0)

#### Basic Supporting Courses (6 credits)

TCE-540	Fluid Mechanics	3(2-0-1)
BPS-669	Operations Research	3(3-1-0)

#### Optional/ Minor Courses (8 credits)

**8**

#### Thesis Research (20 credits)

BPM-690	Master's Thesis Research	20
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**Total            50**

### Ph.D. (Mathematics)

#### Core Courses (14 credits)

BPM-713	Boundary Value Problems	3(3-2-0)
BPM-731	Advanced Analysis	3(3-2-0)
BPM-732	Integral Transforms and Z-transforms	3(3-2-0)
BPM-737	Special Functions	3(3-2-0)
BPM-788	Doctoral Seminar-I	1
BPM-789	Doctoral Seminar-II	1

#### Basic Supporting Courses (3 credits)

BPS-672	Mathematical Statistics	3(3-1-0)
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#### Optional Courses (3 credits)

3

#### Minor Courses (10 credits)

10

#### Thesis Research (45 credits)

BPM-790	Ph.D. Thesis Research	45
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**Total            75**

### M.Sc. (Agricultural Statistics)

#### Core Courses (17 courses)

BPS-571	Probability Theory and Distributions	2(2-2-0)
BPS-572	Design of Experiments-I	4(2-0-2)
BPS-574	Sampling Techniques-I	3(2-0-1)
BPS-576	Estimation and Statistical Hypotheses Testing	4(3-1-1)
BPS-577	Multivariate Analysis and Official Statistics	3(2-0-1)
BPS-600	Master's Seminar	1

#### Basic Supporting Courses (5 credits)

BPM-501	Linear Algebra and Advanced Calculus	3(3-2-0)
BPM-502	Introduction to Computers and Programming	2(1-0-1)

<b>Optional/ Minor Courses (8 credits)</b>	<b>8</b>
<b>Thesis Research (20 credits)</b>	
BPS-690      Master's Thesis Research	20
<b>Total</b>	<b>50</b>

**List of Post Graduate Courses**

**Mathematics**

BPM-501	Linear Algebra and Advanced Calculus	3(3-2-0)
BPM-511	Mechanics and Variational Principles	3(3-2-0)
BPM-531	Real Analysis	3(3-2-0)
BPM-532	Differential Geometry and Tensors	3(3-2-0)
BPM-533	Topology	3(3-2-0)
BPM-534	Complex Analysis	3(3-2-0)
BPM-535	Differential Equations	3(3-2-0)
BPM-536	Abstract Algebra	3(3-2-0)
BPM-600	Master's Seminar	1
BPM-601	Special Problem	1
BPM-602	Special functions and Integral Equations	2(2-1-0)
BPM-604	Difference, Differential Equations and Topology	3(3-2-0)
BPM-607	Transformations and Calculus of Variations	2(2-1-0)
BPM-635	Functional Analysis	3(3-2-0)
BPM-681	Mathematical Methods	3(3-1-0)
BPM-690	Master's Thesis Research	20
BPM-711	Mathematical Modeling	3(3-2-0)
BPM-713	Boundary Value Problems	3(3-2-0)
BPM-731	Advanced Analysis	3(3-2-0)
BPM-732	Integral Transforms and Z-Transforms	3(3-2-0)
BPM-734	Differentiable Manifolds	2(2-1-0)
BPM-737	Special Functions	3(3-2-0)
BPM-788	Doctoral Seminar –I	1
BPM-789	Doctoral Seminar –II	1
BPM-790	Ph.D. Thesis Research	45

**Statistics**

		Pre-Requisite Course	
BPS-561*	Statistical Methods	-	3(2-0-1)
BPS-571	Probability Theory and Distributions	-	2(2-2-0)
BPS-572	Design of Experiments I	-	4(2-0-2)
BPS-573	Design of Experiments II	BPS 572	3(2-0-1)
BPS-574	Sampling Techniques I	-	3(2-0-1)
BPS-575	Sampling Techniques II	BPS 574	3(2-0-1)
BPS-576	Estimation and Statistical Hypotheses Testing	BPS-571	4(3-1-1)
BPS-577	Multivariate Analysis and Official Statistics	BPS 576	3(2-0-1)
BPS-600	Master's Seminar		1

BPS-601	Special Problem		1
BPS-606	Computer Applications in Biometrics	BPS-561/BPS-661	2(0-0-2)
BPS-661*	Experimental Statistics	-	4(3-0-1)
BPS-662	Advanced Experimental Designs	-	3(2-0-1)
BPS-663	Linear Models	BPS 571	2(2-1-0)
BPS-669	Operations Research	-	3(3-1-0)
BPS-671	Theory of Sampling	-	3(2-0-1)
BPS-672	Mathematical Statistics	-	3(3-1-0)
BPS-681	Data Analysis and Forecasting	-	3(3-1-0)
BPS-690	Master's Thesis Research		20

\* Only one of the Course from BPS 561 and BPS 661 will be included in the course programme.

### **Computer Science**

BPM-502	Introduction to Computers and Programming		2(1-0-1)
BPM/TEC-503	Discrete Mathematical Structures		3(3-2-0)
BPM-504	Data Processing		3(2-0-1)
BPM-538	Relational Data Base Management System		3(2-1-1)
BPM-540	Design and Analysis of Algorithm		3(3-2-0)
BPM-551	Foundation of Theoretical Computer Science		3(3-2-0)
BPM-552	Programming Language Concepts		3(3-2-0)
BPM-553	Expert Systems		3(3-2-0)
BPM-600	Master's Seminar		1
BPM-601	Special Problem		1
BPM-605	Use of Computer Software		2(0-0-2)
BPM-611	Boundary Value Problems, Integral Equations and Numerical Analysis		3(3-2-0)
BPM-615	Computational Fluid Dynamics		3(3-2-0)
BPM-621	Numerical Techniques for Computers		3(3-2-0)
BPM-622	Numerical Solution of Partial Differential Equations		3(3-2-0)
BPM-623	Computer Networks		2(1-1-1)
BPM-641	Object Oriented Programming		3(2-1-1)
BPM-642	Structured Programming Languages		3(2-1-1)
BPM-651	Computer Graphics		2(1-0-1)
BPM-652	Elements of Computer Operating Systems		3(2-0-1)
BPM-653	Principles of Compiler Design		4(4-2-0)
BPM-655	Management Information System		3(2-0-1)
BPM-682	Numerical Methods		3(3-1-0)
BPM-683	Computer Application in Numerical Methods		3(0-0-3)

### **Remedial Courses**

BPS-401	Probability Theory		2(2-1-0)
BPS-402	Statistical Inference		3(2-0-1)
BPS-403	Experimental Designs and Sampling Methods		3(2-0-1)
BPS-404	Applied Statistics and Regression Analysis		3(2-0-1)
BPM-409	Basic Mathematics		4(4-2-0)

## Minor Packages for other Departments/ Majors

### List of Post Graduate Courses for Minor in Mathematics (8-10 credits)

BPM-501	Linear Algebra and Advanced Calculus	3(3-2-0)
BPM-511	Mechanics and Variational Principles	3(3-2-0)
BPM-531	Real Analysis	3(3-2-0)
BPM-532	Differential Geometry and Tensors	3(3-2-0)
BPM-533	Topology	3(3-2-0)
BPM-534	Complex Analysis	3(3-2-0)
BPM-535	Differential Equations	3(3-2-0)
BPM-536	Abstract Algebra	3(3-2-0)
BPM-602	Special functions and Integral Equations	2(2-1-0)
BPM-604	Difference, Differential Equations and Topology	3(3-2-0)
BPM-607	Transformations and Calculus of Variations	2(2-1-0)
BPM-635	Functional Analysis	3(3-2-0)
BPM-681	Mathematical Methods	3(3-1-0)
BPM-711	Mathematical Modeling	3(3-2-0)
BPM-713	Boundary Value Problems	3(3-2-0)
BPM-731	Advanced Analysis	3(3-2-0)
BPM-732	Integral Transforms and Z-Transforms	3(3-2-0)
BPM-734	Differentiable Manifolds	2(2-1-0)
BPM-737	Special Functions	3(3-2-0)

### (B). List of Post Graduate Courses for Minor in Statistics (8-10 credits)

		Pre-Requisite	
BPS-561*	Statistical Methods	-	3(2-0-1)
BPS-571	Probability Theory and Distributions	-	2(2-2-0)
BPS-572	Design of Experiments I	-	4(2-0-2)
BPS-573	Design of Experiments II	BPS 572	3(2-0-1)
BPS-574	Sampling Techniques I	-	3(2-0-1)
BPS-575	Sampling Techniques II	BPS 574	3(2-0-1)
BPS-576	Estimation and Statistical Hypotheses Testing	BPS-571	4(3-1-1)
BPS-577	Multivariate Analysis and Official Statistics	BPS 576	3(2-0-1)
BPS-606	Computer Applications in Biometrics	BPS-561/ BPS-661	2(0-0-2)
BPS-661*	Experimental Statistics	-	4(3-0-1)
BPS-662	Advanced Experimental Designs	-	3(2-0-1)
BPS-663	Linear Models	BPS 571	2(2-1-0)
BPS-669	Operations Research	-	3(3-1-0)
BPS-671	Theory of Sampling	-	3(2-0-1)
BPS-672	Mathematical Statistics	-	3(3-1-0)
BPS-681	Data Analysis and Forecasting	-	3(3-1-0)

\* Only one of the Course from BPS 561 and BPS 661 will be included in the course programme.

**(C). List of Post Graduate Courses for Minor in Computer Science (8-10 credits)**

BPM-502	Introduction to Computers and Programming	2(1-0-1)
BPM-503	Discrete Mathematical Structures	3(3-2-0)
BPM-504	Data Processing	3(2-0-1)
BPM-538	Relational Data Base Management System	3(2-1-1)
BPM-540	Design and Analysis of Algorithm	3(3-2-0)
BPM-551	Foundation of Theoretical Computer Science	3(3-2-0)
BPM-552	Programming Language Concepts	3(3-2-0)
BPM-553	Expert systems	3(3-2-0)
BPM-605	Use of Computer Software	2(0-0-2)
BPM-611	Boundary Value Problems, Integral Equations and Numerical Analysis	3(3-2-0)
BPM-615	Computational Fluid Dynamics	3(3-2-0)
BPM-621	Numerical Techniques for Computers	3(3-2-0)
BPM-622	Numerical Solution of Partial Differential Equations	3(3-2-0)
BPM-623	Computer Networks	2(1-1-1)
BPM-641	Object Oriented Programming	3(2-1-1)
BPM-642	Structured Programming Languages	3(2-1-1)
BPM-651	Computer Graphics	2(1-0-1)
BPM-652	Elements of Computer Operating Systems	3(2-0-1)
BPM-653	Principles of Compiler Design	4(4-2-0)
BPM-655	Management Information System	3(2-0-1)
BPM-682	Numerical Methods	3(3-1-0)
BPM-683	Computer Application in Numerical Methods	3(0-0-3)

## 6. MICROBIOLOGY

### M.Sc. Microbiology/M.Sc. (Ag.) Microbiology

#### Core Courses (14 credits)

BBM-500	General Microbiology	3(3-0-0)
BBM-506	Microbial Physiology and Metabolism	2(2-0-0)
BBM-507	Microbial Biotechnology	3(3-0-0)
BBM-510	Microbiological Techniques	2(0-0-2)
BBM-600	Master's Seminar	1
BBM-645	Microbial Genetics	3(2-0-1)

#### Basic Supporting Courses (7 credits)

BBC-501	General Biochemistry	3(3-0-0)
BBC-505	Basic Techniques in Biochemistry	1(0-0-1)
BPC-614	Spectroscopic and Chromatographic Techniques	3(2-0-1)

#### Optional/ Minor Courses (9 credits)

9

#### Thesis Research (20 credits)

BBM-690	Master's Thesis Research	20
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**Total 50**

### Ph.D. Microbiology

#### Core Courses (13 credits)

BBM-640	Industrial Microbiology	2(2-0-0)
BBM-710	Research Techniques in Microbiology	2(0-0-2)
BBM-721	Current topics in Soil Microbiology	2(2-0-0)
BBM-725	Microbial Diversity and Taxonomy	3(3-0-0)
BBM-730	Advanced Microbial Physiology	2(2-0-0)
BBM-788	Doctoral Seminar-I	1
BBM-789	Doctoral Seminar-II	1

#### Basic Supporting Courses (3 credits)

BBC-740	Advanced Biochemistry and Molecular Biology	3(3-0-0)
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#### Optional Courses (4 credits)

4

#### Minor Courses (10 credits)

10

#### Thesis Research (45 credits)

BBM-790	Ph.D. Thesis Research	45
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**Total 75**

### List of Post Graduate Courses of the Department

BBM-500	General Microbiology	3(3-0-0)
BBM-506**	Microbial Physiology and Metabolism	2(2-0-0)
BBM-507**	Microbial Biotechnology	3(3-0-0)
BBM-510*	Microbiological Techniques	2(0-0-2)
BBM-600	Master's Seminar	1
BBM-601	Special Problem	1-2
BBM-610***	Application of Microbial Methods	2(0-0-2)

BBM-640****	Industrial Microbiology	2(2-0-0)
BBM-645**	Microbial Genetics	3(2-0-1)
BBM-651**	Yeast	2(1-0-1)
BBM-690	Master's Thesis Research	20
BBM-710*	Research Techniques in Microbiology	2(0-0-2)
BBM-721*	Current Topics in Soil Microbiology	2(2-0-0)
BBM-725*	Microbial Diversity and Taxonomy	3(3-0-0)
BBM-730*	Advanced Microbial Physiology	2(2-0-0)
BBM-731**	Advances in Microbial Technology	1(1-0-0)
BBM-740**	Microbial Enzyme Technology	2(2-0-0)
BBM-788	Doctoral Seminar-I	1
BBM-789	Doctoral Seminar-II	1
BBM-790	Ph.D. Thesis Research	45

- Note:
- \* prerequisite course BBM-500 General Microbiology
  - \*\* prerequisite course BBM-500 General Microbiology/BBC-501 General Biochemistry
  - \*\*\* prerequisite course BBM-500 General Microbiology/BBM-510 Microbiological Techniques
  - \*\*\*\* prerequisite course BBM-500 General Microbiology/BBM-610 Application of Microbial Methods



## 7. MOLECULAR BIOLOGY AND GENETICS ENGINEERING

### M.Sc. Ag./M.V.Sc. (Molecular Biology and Biotechnology)

#### Core Courses (12 credits)

BMB-520	Fundamentals of Molecular Biology	3 (3-0-0)
BMB-560	Immunology and Molecular Diagnostics	2 (2-0-0)
BMB-570	Introduction to Bioinformatics	3 (2-1-0)
BMB-600	Master's Seminar	1
BMB-610	Principles in Genetic Engineering	3 (3-0-0)
BMB-615	Techniques in Genetic Engineering	3 (0-0-3)

#### Basic Supporting Courses (6 credits)

BBM-500	General Microbiology	3(3-0-0)
BBC-501	General Biochemistry	3(3-0-0)

#### Optional Courses (9 credits)

9

#### Thesis Research (20 credits)

BMB-690	Master's Thesis Research	20
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**Total            50**

### Ph.D. (Molecular Biology and Biotechnology)

#### Core Courses (12 credits)

BMB-710	Advanced Molecular Biology	2 (2-0-0)
BMB-720	Advances in Genetic Engineering	3 (2-0-1)
BMB-730	Advances in Functional Genomic and Proteomics	3 (3-0-0)
BMB-735	Immunological Applications in Biotechnology	2 (1-0-1)
BMB-788	Doctoral Seminar-I	1
BMB-789	Doctoral Seminar-II	1

#### Basic Supporting Courses (5 credits)

BPC-631	Mechanism of Organic Reactions	2(2-0-0)
BBC-740	Advanced Biochemistry and Molecular Biology	3 (3-0-0)

#### Optional Courses (3 credits)

3

#### Minor Courses (10 credits)

10

#### Thesis Research (45 credits)

BMB-790	Ph.D. Thesis Research	45
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**Total            75**

#### Compulsory Courses for Minor for Other Disciplines

BMB-520	Fundamentals of Molecular Biology	3 (3-0-0)
BMB-610	Principles in Genetic Engineering	3 (3-0-0)

#### List of Post graduate courses of the Department

BMB-510	Principles of Biotechnology	2(2-0-0)
BMB-520	Fundamentals of Molecular Biology	3(3-0-0)
BMB-530	Molecular Cell Biology	3(3-0-0)
BMB-535	Techniques in Cell Biology	2(0-0-2)

BMB-540	Molecular Genetics and Breeding	3(3-0-0)
BMB-545	Techniques in Molecular Biology	2(0-0-2)
BMB-550	Concept in Genomics and Proteomics	2(2-0-0)
BMB-560	Immunology and Molecular Diagnostic	2(2-0-0)
BMB-570	Introduction to Bioinformatics	3(2-0-1)
BMB-575	Biosafety, IPR and Bioethics	1(1-0-0)
BMB-600	Master's Seminar	1
BMB-601	Special Problem	2
BMB-610	Principles in Genetic Engineering	3(3-0-0)
BMB-615	Techniques in Genetic Engineering	3(0-0-3)
BMB-620	Microbial/ Industrial Biotechnology	2(2-0-0)
BMB-625	Plant Tissue Culture and Genetic Transformation	3(1-0-2)
BMB-630	Animal Biotechnology	2(2-0-0)
BMB-635	Animal Cell Culture: Principles and Applications	3(1-0-2)
BMB-640	Nano-Biotechnology	2(2-0-0)
BMB-650	Crop Biotechnology	2(2-0-0)
BMB-690	Master's Thesis Research	20
BMB-710	Advanced Molecular Biology	2(2-0-0)
BMB-715	Computer Applications in Molecular Modeling	2(0-0-2)
BMB-720	Advances in Genetic Engineering	3(2-0-1)
BMB-730	Advances in Functional Genomics and Proteomics	3(3-0-0)
BMB-735	Immunological Applications in Biotechnology	2(1-0-1)
BMB-740	Advances in Microbial Biotechnology	3(3-0-0)
BMB-750	Advances in Crop Biotechnology	3(3-0-0)
BMB-760	Advances in Animal Biotechnology	3(3-0-0)
BMB-785	Advances in Cell and Tissue Culture Technology	2(2-0-0)
BMB-788	Doctoral Seminar-I	1
BMB-789	Doctoral Seminar-II	1
BMB-790	Ph.D. Thesis Research	45

## 8. PHYSICS

### M.Sc. (Physics)

#### Core Courses (20 credits)

BPP-510	Mathematical Methods of Physics	2(2-1-0)
BPP-511	Classical Mechanics and Relativity	2(2-1-0)
BPP-512	Electromagnetism	2(2-1-0)
BPP-520	Quantum Mechanics	2(2-1-0)
BPP-525	Spectroscopy	2(2-1-0)
BPP-551	Statistical Mechanics	2(2-1-0)
BPP-552	Solid State Physics	2(2-1-0)
BPP-560	Nuclear Physics	2(2-1-0)
BPP-570	Experimental Physics	3(0-0-3)
BPP-600	Master's Seminar	1

#### Basic Supporting Courses (2 credits)

BPM-502	Introduction to Computer and Programming	2(1-0-1)
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#### Optional/ Minor Courses (8 credits)

8

#### Thesis Research (20 credits)

BPP -690	Master's Thesis Research	20
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**Total 50**

### Ph.D.(Physics)

#### Core Courses (12 credits)

BPP-711	Advanced Classical Mechanics	2(2-0-0)
BPP-720	Advanced Quantum Mechanics	2(2-0-0)
BPP-750	Advanced Statistical Mechanics	2(2-0-0)
BPP-751	Advanced Solid State Physics	2(2-0-0)
BPP-760	Advanced Nuclear Physics	2(2-0-0)
BPP-788	Doctoral Seminar-I	1
BPP-789	Doctoral Seminar-II	1

#### Basic Supporting Courses (3 credits)

BPM-621	Numerical Techniques for Computers	3(3-2-0)
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#### Optional Courses (5 credits)

5

#### Minor Courses (10 credits)

10

#### Thesis Research (45 credits)

BPP-790	Ph.D. Thesis Research	45
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**Total 75**

#### Minor courses for other Disciplines (8-10 credits)

BPP-534	Agro Meteorological Instrumentation	3(2-0-1)
BPP-550	Statistical Thermodynamics	2(2-1-0)
BPP-620	Introduction to Quantum Mechanics	2(2-1-0)
BPP-650	Advanced Kinetic Theory of Gases	2(2-1-0)
BPP-651	Thermodynamics of Irreversible Process	2(2-1-0)
BPP-652	Elements of Statistical Mechanics	2(2-1-0)
BPP-653	Solid State Physics and Material Science	2(2-1-0)

### List of Post Graduate Courses in Physics of the Department

BPP-401	Physics for Agro meteorologists	3(2-0-1)
BPP-432	Introduction to Modern Physics	3(2-1-1)
BPP-510	Mathematical Methods of Physics	2(2-1-0)
BPP-511	Classical Mechanics and Relativity	2(2-1-0)
BPP-512	Electromagnetism	2(2-1-0)
BPP-520	Quantum Mechanics	2(2-1-0)
BPP-525	Spectroscopy	2(1-1-1)
BPP-530	Electronics	2(1-1-1)
BPP-534	Agro Meteorological Instrumentation	3(2-0-1)
BPP-550	Statistical Thermodynamics	2(2-1-0)
BPP-551	Statistical Mechanics	2(2-1-0)
BPP-552	Solid State Physics	2(2-1-0)
BPP-560	Nuclear Physics	2(2-1-0)
BPP-570	Experimental Physics	3(0-0-3)
BPP-600	Master's Seminar	1
BPP-601	Special Problem	1-2
BPP-604	Solar Energy Physics	2(2-0-0)
BPP-620	Introduction to Quantum Mechanics	2(2-1-0)
BPP-625	Advanced Spectroscopy	2(2-0-0)
BPP-630	Introduction to Linear and Digital Integrated Circuits-I	3(2-0-1)
BPP-631	Introduction to Linear and Digital Integrated Circuits-II	3(2-0-1)
BPP-640	Biophysics-I	3(2-0-1)
BPP-641	Biophysics-II	3(2-0-1)
BPP-652	Elements of Statistical Mechanics	2(2-1-0)
BPP-653	Solid State Physics and Material Science	2(2-1-0)
BPP-661	Nuclear Techniques in Agriculture and Biology	2(2-0-0)
BPP-690	Master's Research	20
BPP-711	Advanced Classical Mechanics	2(2-0-0)
BPP-720	Advanced Quantum Mechanics	2(2-0-0)
BPP-721	Quantum Field Theory and Many Body Techniques	2(2-0-0)
BPP-730	Solid state Electronics	2(2-0-0)
BPP-750	Advanced Statistical Mechanics	2(2-0-0)
BPP-751	Advanced Solid State Physics	2(2-0-0)
BPP-752	Non Linear Optics and Solid state Spectroscopy	2(2-0-0)
BPP-753	Low Temperature Physics	2(2-0-0)
BPP-760	Advanced Nuclear Physics	2(2-0-0)
BPP-788	Doctoral Seminar-I	1
BPP-789	Doctoral Seminar-II	1
BPP-790	Ph.D. Thesis Research	45

**Note: Courses of 400 series are remedial courses of the department**

## M. Sc. (Biophysics)

### Core Courses (16 credits)

BPB-541	Principles of Biophysics	3(3-0-0)
BPB-571	Molecular Biophysical Techniques	3(2-0-1)
BPB-572	Experimental Biophysics	3(0-0-3)
BPB-549	Membrane Biophysics	3(2-0-1)
BPB-555	Biosensor	3(2-0-1)
BPB-600	Master's Seminar	1

### Basic Supporting Courses (6 credits)

BBC-501	General Biochemistry	3(3-0-0)
BMB-520	Fundamentals of Molecular Biology	3(3-0-0)

### Optional/Minor Courses (8 credits)

8

### Thesis Research (20 credits)

BPB-690	Master's Thesis Research	20
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**Total 50**

### Remedial/Non Gradual Courses

#### a. B.Sc. ( Bio/Agric./Biotech.)

BPM-409	Basic Mathematics	4(4-2-0)
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#### b. B.Sc. (PCM) Stream

BBB-400	Fundamental of Biology	4(3-0-1)
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### Compulsory Courses for Minor for Other Discipline

BPB-541	Principles of Biophysics	3(3-0-0)
BPB-549	Membrane Biophysics	3(2-0-1)
BPB-555	Biosensor	3(2-0-1)

### List of the Post Graduate Courses of Biophysics of the Department

BPB-540	Molecular Biophysics	3(3-0-0)
BPB-541	Principles of Biophysics	3(3-0-0)
BPB-542	Molecular Interaction	2(2-0-0)
BPB-545	Quantum Chemistry	3(3-0-0)
BPB-549	Membrane Biophysics	3(2-0-1)
BPB-552	Molecular Designing	2(2-0-0)
BPB-553	Biophotonics	2(2-0-0)
BPB-554	Radiation Biophysics	2(2-0-0)
BPB-555	Biosensor	3(2-0-1)
BPB-558	Molecular Modelling and Drug Designing	2(1-0-1)
BPB-571	Molecular Biophysical Techniques	3(2-0-1)
BPB-572	Experimental Biophysics	3(0-0-3)
BPB-600	Master's Seminar	1
BPB-601	Special Problem	1-2
BPB-690	Master's Thesis Research	20

## 9. PLANT PHYSIOLOGY

### M.Sc. / M.Sc. (Ag.) (Plant Physiology)

#### Core Courses (14 credits)

BPY-600	Master's Seminar	1
BPY-602	Principles of Plant Physiology	4(3-0-1)
BPY-604	Physiological and Molecular Responses of Plants of Abiotic Stresses	3(2-0-1)
BPY-605	Hormonal Regulation of Plant Growth and Development	3(2-0-1)
BPY-611	Mineral Nutrition of Plants	3(2-0-1)

#### Basic Supporting Courses (6 credits)

BPS-561	Statistical Methods	3(2-0-1)
BBC-501	General Biochemistry	3(3-0-0)

#### Optional Courses (10 credits)

10

#### Thesis Research (20 credits)

BPY-690	Master's Thesis Research	20
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**Total 50**

### Ph.D. Plant Physiology

#### Core Courses (12 credits)

BPY-703	Molecular Approaches for Improving Physiological Traits	3(3-0-0)
BPY-704	Advance Techniques in Plant Physiology	2(0-0-2)
BPY-709	Functional Genomics in relation to Physiological Processes	2(2-0-0)
BPY-710	Physiological and Molecular Aspects of Photosynthesis and Nitrogen Metabolism	3(2-0-1)
BPY-788	Doctoral Seminar-I	1
BPY-789	Doctoral Seminar-II	1

#### Basic Supporting Courses (4 credits)

BPS-661	Experimental Statistics	4(3-0-1)
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#### Optional Courses (4 credits)

4

#### Minor Courses (10 credits)

10

#### Thesis Research (45 credits)

BPY-790	Ph.D. Thesis Research	45
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**Total 75**

### Compulsory Courses for Minor for Other Discipline

BPY-602	Principles of Plant Physiology	4(3-0-1)
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### List of Post Graduate Courses of the Department

BPY-601	Speical Problem	1
BPY-602	Principles of Plant Physiology	4(3-0-1)
BPY-603	Plant Developmental Biology-Physiological and Molecular Basis	2(2-0-0)
BPY-604	Physiological and Molecular Responses of Plants to Abiotic Stresses	3(2-0-1)
BPY-605	Hormonal Regulation of Plant Growth and Development	3(2-0-1)
BPY-606	Physiology of Growth, Yield and Modelling	2(1-0-1)
BPY-608	Morphogenesis Tissue Culture and Transformation	3(2-0-1)
BPY-609	Physiology of Crop Plant- Specific Case Studies 2(2-0-0)	
BPY-611	Mineral Nutrition of Plants	3(2-0-1)
BPY-613	Research Techniques in Plant Physiology	2(0-0-2)
BPY-600	Master's Seminar	1
BPY-690	Master's Thesis Research	20
BPY-702	Signal Perceptions, Transduction and Regulation of Physiological Process	2(2-0-0)
BPY-703	Molecular Approaches for Improving Physiological Traits	3(3-0-0)
BPY-704	Advance Techniques in Plant Physiology	2(0-0-2)
BPY-705	Climate Change and Crop Growth	2 (2-0-0)
BPY-706	Post Harvest Physiology	2(2-0-0)
BPY-707	Weed Physiology and Herbicide Action	2(1-0-1)
BPY-708	Seed Physiology	3(2-0-1)
BPY-709	Functional Genomics in reationl to Physiological Processes	2(2-0-0)
BPY-710	Physiological and Molecular Aspects of Photosynthesis and Nitrogen Metabolism	3(2-0-1)
BPY-788	Doctoral Seminar-I	1
BPY-789	Doctoral Seminar-II	1
BPY-790	Ph.D. Thesis Research	45

## 10. SOCIAL SCIENCES AND HUMANITIES

### Courses for Minor for other Disciplines

#### Social Science

BHS-501	Environmental Administration	3(3-0-0)
BHS/AAC-604	Gender Sensitization for Development	3(2-0-1)
BHS/AAC-653	Dynamics of Rural Leadership	2(2-0-0)
BHS/AAC-661	Dynamics of Social Change	2(2-0-0)
BHS/AAC-702	Foundation of Psychology	3(0-0-0)

#### Language

BHS-507	Functional English	2(0-0-2)
BHS-601	Language and Communication	2(1-0-1)
BHS-610	Storage and Retrieval of Scientific Information	1(1-1-0)