

# **IAAS BULLETIN**

## **Course Catalogue of Postgraduate Program**

Tribhuvan University  
Institute of Agriculture and Animal Science  
Rampur, Chitwan, Nepal

**Revised - 2011**

# MASTER OF SCIENCES (M.Sc.) DEGREE PROGRAM

## 1. Definition of the Terms or Phases used in the Bulletin

- 1.1. **Academic year:** a period of one year beginning in the month of Shrawan (July-August) each year.
- 1.2. **Semester:** a period covering start of classes till end of the final exams. It covers a period of 90 effective days of teaching plus two weeks for final examinations.
- 1.3. **Curriculum:** a series of courses designed to provide learning opportunities to meet the requirements for a degree.
- 1.4. **Course:** a unit of instruction to be covered.
- 1.5. **Credit hours (or course credit or credits):** each credit hour represents one hour of lecture or three hour of field or lab work per week throughout a semester.
- 1.6. **Course load:** the number of credit hours a student registers in a semester

## 2. Degree Name

- 2.1. Master of Science in Agriculture (M.Sc.Ag.) with Major in (name of the major subject)
- 2.2. Master of Science in Animal Science (M.Sc.An.Sc.) with Major in (name of the major subject)
- 2.3. Master of Science in Aquaculture (M.Sc.Aqua.)
- 2.4. Master of Veterinary Science (M.V.Sc.) with Major in (name of the major subject)

## 3. Duration of Degrees

The normal duration is two years.

## 4. System of Education

- 4.1. Semester system.
- 4.2. There will be two semesters; the 1<sup>st</sup> and the 2<sup>nd</sup>, per academic year.

## 5. Academic Session

### 5.1. First Semester

- 5.1.1. Classes begin - Shrawan (July - August)
- 5.1.2. Final exams - Mansir (November - December)

### 5.2. Second Semester

- 5.2.1. Classes begin - Poush (December - January)
- 5.2.2. Final exams - Baishakh (April - May)

## 6. Number of Seats

The number of students to be admitted per year to each major department will be based on available human resource and facilities.

## 7. Admission Requirements

### 7.1. Open Competition

- 7.1.1 For M.Sc.Ag. degree an application must have earned a B.Sc.Ag. or equivalent degree; for M.Sc.An.Sc., an application must have a B.Sc.Ag. or B.Sc.An.Sc., or B.V.Sc. & A.H. or equivalent degree ; for M.Sc. Aquaculture, an application must have a B.Sc.Ag., B.Sc.An.Sc., B.V.Sc. & A.H., B.Sc. Aqua., M.Sc. Zoology or equivalent degree; and for M.V.Sc. degree, an applicant must have a B.V.Sc. & A.H. or equivalent degree.
- 7.1.2. The candidate must have graduate from an Institution where undergraduate teaching medium is English.
- 7.1.3. The candidate must have graduated in the 2nd division or above, or an equivalent grade at the undergraduate level.
- 7.1.4. The candidate must pass the entrance examination conducted by the Institute in the given year.
- 7.1.5. Final selection will be based on the merit list of the entrance examination.

### 7.2. In-service Candidate from IAAS

- 7.2.1. Must meet the requirements started in the Sections 7.1.1., 7.1.2. and 7.1.3.
- 7.2.2. Must be officially nominated.

### 7.3. In-service Candidate from an Agency within Nepal

- 7.3.1. Must meet the requirements started in the Sections 7.1.1., 7.1.2. and 7.1.3.
- 7.3.2. Must be officially nominated.
- 7.3.3. Must have a letter of financial sponsorship.

### 7.4. Candidates from Other Countries

- 7.4.1. Must meet the requirements started in the Sections 7.1.1., 7.1.2. and 7.1.3.
- 7.4.2. Must have a proof of financial support.

## 8. Admission Procedure

- 8.1. Properly filed out applications forms, required fees, and the certified copies of the academic certificates and transcripts along with three copies of recent passport size photo of the candidate should be submitted to the Postgraduate Program (PGP), IAAS, Rampur, Nepal, prior to the deadline.

- 8.2. The deadline for all admission documents, for officially nominated candidates are foreign students, to reach the Postgraduate Program office will be determine by Postgraduate Program Committee.
- 8.3. The deadline for application, entrance examination, and admission will be advertised each year. The list of the selected candidates who appear for the entrance test will be posted at the institute. The selected candidates should submit their original Transfer/College Leaving Certificate and Character Certificate from the Institution last attended. Candidates who complete undergraduate requirements from other universities are required to submit migration certificate for their registration at the Tribhuvan University.

## 9. Residential Requirement and Time Limit

All the students must meet the residential requirement of at least one and half years. Maximum time allowed for a completion of the M.Sc. degree from the date of the first enrollment is five academic years. A student must enroll in each semester till his/her requirement are completed. If the student is unable to enroll on due date he/she/ will be fined. However, three months time will be given for final hardbound thesis submission in the subsequent semester beyond which he/she has to register for semester.

## 10. Types of Courses

- 10.1. Departmental courses: These are the courses offered primarily by the major department or closely related department.
- 10.2. Basic courses: These are the courses in Statistics, Plant or Crop Physiology, Biochemistry and Technical Writing.
- 10.3. Interdepartmental courses: These are the same courses taught by more than one department.
- 10.4. Seminar: There will be two seminars, each weighing 1 credit hour. The first seminar normally will be on research proposal while the second seminar will be on research findings.
- 10.5. Thesis research: This refers to development of research proposal, planning and conducting experiments, data collection, data analysis, and interpretation of the findings. A student will receive Satisfactory/Unsatisfactory grade for thesis research.

## 11. Course Code

The numbers assigned in each course code represent the followings.

- 700 series in general : Postgraduate courses
- 799 : Seminar
- 800 : M.S. Thesis

## 12. Credit Hour Requirement

- 12.1. All students admitted to M.Sc. degree programs must enroll and pass a minimum of 36 credit hours. This includes a minimum of 20 credit hours including thesis research and seminar from the major department. In addition, they also must meet the following credit requirements.
- 12.2. Students admitted to M.Sc. Agriculture with major in plant science disciplines must complete a minimum of 12 credit hours from major departmental courses, 2 credit hour seminar, 6 credit hours thesis Research, 2 Credit hours Technical writing, 3 credit hours each in Statistics, Biochemistry, and Plant or Crop Physiology. The remaining 5 credit hours can be taken from other relevant department (s).

- 12.3. Students admitted to M.Sc. Agriculture with major in social science disciplines must complete a minimum of 12 credit hours from major departmental courses, 2 credit hour seminar, 6 credit hours thesis Research, 2 Credit hours Technical writing, 3 credit hours each in Statistics. The remaining 11 credit hours can be from other relevant departments.
- 12.4. All students admitted to M.Sc. Aquaculture must complete a minimum of 12 credit hours from major departmental courses, 2 credit hour seminar, 6 credit hours thesis Research, 2 credit hours Technical writing, 3 credit hours each in Statistics and Biochemistry. The remaining 8 credit hours can be from other relevant departments.
- 12.5. All students admitted to M.Sc. Animal Science must complete a minimum of 12 credit hours from major departmental courses, 2 credit hour seminar, 6 credit hours thesis Research, 2 credit hours Technical writing, and 3 credit hours each in Statistics and Biochemistry. The remaining 8 credit hours can be from other relevant departments.
- 12.6. All students admitted to M.V.Sc. must complete a minimum of 12 credit hours from major departmental courses, 2 credit hour seminar, 6 credit hours thesis Research, 2 credit hours Technical writing, and 3 credit hours each in Statistics and Biochemistry. The remaining 8 credit hours can be from other relevant departments.
- 12.7. All full time students will enroll in 9-16 credit hours per semester except for the last semester of final graduation where credit hours may be lower. A department will not offer more than 12 credit hours in a semester without prior approval of the Dean.
- 12.8. A Plan of Study with a minimum of 36 credit hours of individual students must be approved by the dean on the recommendation of Major Advisor and Assistant Dean (academic) at the end of first semester.

### 13. Thesis Research

- 13.1. The research topic will be decided jointly by the student and the Major Advisor. The research proposal must be approved by the Advisory Committee and forwarded to the Dean through Assistant Dean (Academic) for final approval. The suggestion of the sponsoring/funding agencies for the thesis research may be considered, if timely made.
- 13.2. All students must get the research proposal approved by the end of the 2nd semester. However, thesis research may be initiated in the second semester if a student passes all the courses enrolled in the first semester.
- 13.3. The student must conduct the research, write the report, and successfully defend it through an open seminar in presence of the member of his/her Advisory Committee who will evaluate the performance and recommend for the award of degree if the student has successfully defended the thesis. The Committee members may ask the student to modify, change or rewrite the thesis, if necessary. The student will be allowed only two chances to pass the thesis defense. If the student fails twice, he/she will be automatically dropped from the program.
- 13.4. Eight copies of the well written hardbound thesis approved by the advisory committee must be submitted to the Dean through the Assistant Dean of the postgraduate program for final approval. Thesis must be prepared according to the guidelines given in the Information Bulletin of Postgraduate Program.
- 13.5. Four copies of the full explanatory abstract, both in English and in Nepali, must be submitted, a copy of which will be sent to the related abstract publisher.

### 14. Advisory System

- 14.1. An Advisory Committee consisting of a Major Advisor and two other members will academically guide a student throughout the post graduate study program. The Major Advisor will also serve as the chairman of the advisory committee.

- 14.2. The Major Advisor will be assigned by the Dean upon recommendation of Assistant Dean of the Postgraduate Program usually prior to the acceptance of a student for admission. In deciding the Major Advisor of a student, the Assistant Dean may seek advice from the chairperson and other faculty members of the related department and may also consider the interest of the student.
- 14.3. If the Major Advisor is not assigned prior to the admission, the assistant Dean of the Postgraduate Program will serve as temporary Major Advisor till a regular Major Advisor is assigned. The Major Advisor will assist the student in setting up an Advisory Committee.
- 14.4. The Major Advisor must be from among the faculty members of the major department at Lecturer or above rank.
- 14.5. The other member will consist of one faculty from the major department and one from outside the department or organizations.
- 14.6. The Major Advisor will have a Ph.D. degree or a M.Sc. degree with additional qualifications of 5 years of teaching experience after receiving M.Sc. degree or with two journal articles or research based book or chapter (other than thesis) published as senior author and has served as a member of the advisory committee of at least one student at postgraduate level.
- 14.7. Qualified scientists from outside IAAS within T.U., other universities, Nepal Agriculture Research Council, Department of Agriculture and Department of Livestock Services of HMG, or from any related national/international institutions may serve on the Advisory committee as a co-advisor or member if approved by the Dean.
- 14.8. The member of the Advisory Committee from the IAAS must be a teaching faculty of postgraduate program at IAAS. The member from outside the IAAS must be a Ph.D. or a M.Sc. with proven records of research experience in the field related to the thesis research of the student. For such a member, prior approval must be taken from the Dean by completing the required form. The role of such a member must be specified while preparing the research proposal.
- 14.9. For being appointed as a Co-advisor, the person must be directly supervising the student in conducting thesis research.

## 15. Attendance Requirement

A student must be regular in the classes. The minimum attendance for theory and practical separately is 85 percent. In special cases, on the recommendation of the advisor and the assistant Dean of the Postgraduate Program, the Dean may allow a minimum of 80 percent attendance.

## 16. Evaluation and Grading

### 16.1. Internal Assessment

All students must pass internal assessment examination(s) according to the schedule given by the course teacher in order to qualify for appearance in the final examination. A student missing out on the internal assessment examination may be allowed to take a makeup test if prior arrangements are made with the course teacher. If prior arrangements are not made with the course teacher, the Assistant Dean of the Postgraduate program may permit a makeup examination under valid reasons. The makeup examination must be completed within 15 days from the scheduled date of missed out examination. There will be no makeup if the final examination is missed out. In this case, the student will have to pass the course(s) under Back Paper Examination in following semesters.

### 16.2. Examination System

Final Examination (Theory and Practical) : External

Internal Assessment : Internal  
Comprehensive : External

16.3. Evaluation of Theory

Internal Assessment  
Written test : 25%  
Assignment(s)/Term paper : 25%  
Final examination : 50%

16.4. Evaluation of Practical

Final examination : 100%

16.5. Passing a Course

16.5.1. A student must pass the final examination both in the theory and in Practical. A student failing in the final examination of either theory or practical or both will be required to re-enroll and pass the course.

16.5.2. Score for passing a course is 50% in all examinations (internal assessment, theory and practical)

16.6. Points for Final Grading of a Course

Final scoring of each credit will be done in 50 points.

16.7. Scholastic requirements

16.7.1. A student failing a course must en-roll and pass it. However, the student passing the internal assessment in a given subject needs not to reappear for internal assessment. The new score will replace the score received in the previous enrollment of the course with an 'R' beside it.

16.7.2. A student failing the same course thrice will automatically dropped out from the postgraduate program.

16.8. Letter Grades

P : In progress (for ongoing research)

S : Satisfactory (for research and other courses to be graded Satisfactory or Unsatisfactory)

US : Unsatisfactory (for research and other courses to be graded Satisfactory or Unsatisfactory)

F : Failed

R : A repeated course

16.9. Passing Division of the Postgraduate Degree

85% and above : Passed with Distinction (Excellent performance)

75 to 84.9% : Passed in the 1st division (Very Good performance)

65 to 74.9% : Passed in the 2nd division (Good performance)

50 to 64.9%	:	Passed in the 3rd division (Fair performance)
Less than 50%	:	Failed (Poor performance)

#### 17. Comprehensive Examination

- 17.1. After successful completion of above 80 percent of the course credit approved in the Plan of Study, a student must pass a written comprehensive examination conducted by the examination division of the Institute. For successful completion of this examination, the student must secure 50% marks. In case of failure, a second chance will be given to the student after at least one month from the first examination. The student, failing even in the second examination will be automatically dropped from the program.
- 17.2. A student can submit thesis to the PG program for examination only after passing the comprehensive examination.

#### 18. Seminar

- 18.1. A student must enroll and present two graduate seminar of one credit each. The first seminar will be usually on the thesis proposal and second on the findings of thesis research. However, only one credit will be registered in a semester.
- 18.2. The student seminar will be evaluated jointly by the seminar teacher and the external examiner. The passing score is 50 percent.

#### 19. Completion of a Degree Program

- 19.1. For completion of a degree program, a student must have:
  - i) Passed all the courses with a minimum of 50 percent in each course, and
  - ii) Successfully conducted the postgraduate thesis research, written an acceptable thesis, and passed all the required examinations.
- 19.2. A student enrolled in a semester who intends to graduate must submit finally hard bound copies of the thesis, signed by all members of his/her advisory committee, to the postgraduate program. The deadline for draft thesis submission for defense is the last working day or a day before admission date for the following semester. The students will be given three months time for final hardbound thesis submission in the following semester. The student failing to do so must enroll in the following semester(s).

#### 20. Dropping a Semester

Once admitted, a student shall not be allowed to drop the semester or course(s). If a student does not appear in the final examination, he/she will be considered as failed in the subject(s) registered in a given semester. A student cannot differ the admission. For valid reason, if a student must misses out a complete semester of instruction with enrollment, the Postgraduate Program Committee may allow re-admission, if prior approval is obtained by the student. Once admitted, no fees, whatsoever, will be refunded if a student decides to quit the academic program.

#### 21. The Postgraduate Program Committee

The Dean will constitute the postgraduate committee. This committee will assist Dean and the PG program on execution and implementation of the M.Sc. degree program. The composition of the committee will be as follows.

Dean	:	Chairman
Assistant Dean (Academic)	:	Member-Secretary



Assistant Deans	:	Members
Campus Chief, Rampur Campus	:	Member
Director of Research	:	Member
Director of Extension	:	Member
Heads of the PG teaching departments	:	Members

## 1. AGRICULTURAL ECONOMICS

Departmental Courses	Credit Hrs
AEC 701 Mathematical Economics	3+0
AEC 702 Microeconomics	3+0
AEC 703 Macroeconomics	3+0
AEC 704 Economics	3+0
AEC 705 Research Methods for Social Sciences	3+0
AEC 706 Economic Growth and Development	2+0
AEC 708 Public Economics	3+0
AEC 709 Agricultural Price Analysis and Policy	3+0
AEC 710 Advanced Forest Management and Economics	3+0
AEC 711 Socioeconomic and Technical Aspects of Irrigation Management	3+0
AEC 712 Project Appraisal and Evaluation	3+0
AEC 713 Financial Management in Agriculture	3+0
AEC 714 Natural Resource Economics	3+0
AEC 715 Economics of Agricultural Marketing	3+0
AEC 716 International Agriculture Trade	3+0
AEC 717 Organization and Management of Agriculture Research and Development	3+0
AEC 718 Agricultural Production Economics	3+0
AEC 719 Agribusiness and Management	3+0
AEC 720 Farm Management Economics	2+1
AEC 721 Statistics for Social Sciences	2+1
AEC 799 M.Sc. Seminar	0+2
AEC 800 M.Sc. Thesis	0+6
AEC 899 Ph.D. Seminar	0+2
AEC 900 Ph.D. Dissertation	0+15

## 2. AGRICULTURAL EXTENSION AND RURAL SOCIOLOGY

Departmental Courses	Credit Hrs
EXT 701 Extension Education	2+0
EXT 702 Social Psychology	2+0
EXT 703 Social and Cultural Change	2+0
EXT 704 Research Methods in Social Sciences	3+0
EXT 705 Group Dynamics and Leadership	2+0
EXT 706 Contemporary Extension Approach	2+0
EXT 708 Development Communication	2+0
EXT 709 Theory Construction	2+0
EXT 710 Adult Education in Agriculture	2+0
EXT 711 Program Planning in Agricultural Extension	2+0
EXT 712 Monitoring and Evaluation of Agricultural Extension Programs	2+0
EXT 713 Administration and Management of Agricultural Extension Programs	2+0
EXT 714 Development Society	2+0
EXT 715 Approaches and Strategies of Rural Development	2+0
EXT 716 Communication and Information Management Systems	2+1
EXT 717 Communication of Innovation	2+0
EXT 718 Cooperatives and Marketing Extension	1+0
EXT 721 Statics for Social Sciences	2+1
EXT 790 Special Problem	0+2
EXT 799 M.Sc. Seminar	0+2
EXT 800 M.Sc. Thesis	0+6
EXT 899 Ph.D. Seminar	0+2
EXT 900 Ph.D. Dissertation	0+15

### 3. AGRONOMY

Departmental Courses	Credit Hrs
AGR 701 Concept of Crop Science	2+1
AGR 702 Cereal crops	2+1
AGR 703 Pulse and Oilseed Crops	2+1
AGR 704 Commercial Crops	2+1
AGR 705 Weed Management	2+1
AGR 706 Seed Technology	2+1
AGR 707 Cropping System	2+1
AGR 708 Crop Management	3+1
AGR 711 Crop Modeling	2+1
AGR 712 Basic of Agricultural System	3+0
AGR 714 Advanced Crop Physiology	2+1
AGR 720 Plant Water Relationship	2+1
AGR 799 M.Sc. Seminar	0+2
AGR 800 M.Sc. Thesis	0+6
AGR 899 Ph.D. Seminar	0+2
AGR 900 Ph.D. Dissertation	0+15

### 4. BASIC SCIENCE AND HUMANITIES

Departmental Courses	Credit Hrs
ENG 701 Technical Writing English	2+0
AST 711 Statistical Methods in Biological Sciences	2+1
AST 713 Design of Experiments	2+1
AST 714 Calculus and Matrix Algebra	3+0
AST 721 Statistical Methods in Social Sciences	2+1
BCH 728 General Biochemistry	2+1

## 5 . ENTOMOLOGY

Departmental Courses	Credit Hrs
ENT 701 Insect Morphology	2+1
ENT 702 Insect Physiology	2+1
ENT 703 Insect Ecology	2+1
ENT 704 Insect Taxonomy	1+2
ENT 705 Insect Pest Management	2+1
ENT 706 Insect Toxicology	2+1
ENT 707 Advanced Insect Physiology	2+1
ENT 708 Advanced Insect Ecology	2+1
ENT 709 Advanced Insect Taxonomy	1+2
ENT 710 Taxonomy of Immature Insects	1+1
ENT 711 Insect Pathology	2+1
ENT 712 History of Entomology	2+0
ENT 713 Introduction of Acarology	2+1
ENT 714 Introduction to Biological Control	2+1
ENT 715 Storage Entomology	2+1
ENT 716 Field Crop Entomology	2+1
ENT 717 Horticulture Entomology	2+1
ENT 718 Medical and Veterinary Entomology	2+1
ENT 719 Insect Vectors of Plant Diseases	2+1
ENT 720 Insect Resistance in Crop Plants	2+0
ENT 721 Pesticide Regulations and Environmental Pollution	2+0
ENT 722 Vertebrate Pest Management	1+1
ENT 723 Food Plants of Silkworm	2+1
ENT 724 Silkworm Breeding and Egg Production	2+1
ENT 725 Advanced Apiculture and Crop Pollination	2+1
ENT 726 Advanced Silkworm Rearing and Disease Management	2+1
ENT 727 Advances in Entomology	2+1
ENT 728 Entomological Techniques	1+1
ENT 799 M.Sc. Seminar	0+2
ENT 800 M.Sc. Thesis	0+6
ENT 899 Ph.D. Seminar	0+2
ENT 900 Ph.D. Dissertation	0+15

## 6 . ENVIRONMENTAL SCIENCE

Departmental Courses	Credit Hrs
PPH 702 Plant Metabolism	2+1
PPH 703 Environmental Plant Physiology	2+1
PPH 705 Physiology of Seed	2+1
PPH 706 Growth and Development	2+1
PPH 707 Plant Growth Regulators	2+1
PPH 708 Plant Nutrition	2+1
PPH 710 Cell Physiology	2+1
PPH 711 Physiology of Biofertilizers and Biological Nitrogen Fixation	2+1
PPH 712 Laboratory Methods in Botany and Plant Physiology	2+0
PPH 714 Advanced Crop Physiology	2+1
PPH 719 Plant Stress Physiology	2+1
PPH 720 Plant Water Relationship	2+1
 (Conservation Ecology)	
COE 701 Conservation Ecology	2+1
COE 702 Microbial Ecology	2+1
COE 703 Ecological Agriculture	2+1
COE 704 Applied Ethnobotany	2+1
COE 705 Natural Resource Management	2+0
COE 706 Wetland Ecology	2+0
COE 707 Biodiversity Management	2+1
COE 708 Agroecotourism	2+0
COE 709 System Analysis and Crop Models	2+0
COE 710 Ecology of Community Forestry	2+0
COE 711 Weed Biology and Ecology	2+0
COE 712 Environmental Impact Assessment	2+0
COE 713 Participatory Innovation Research and Development Studies	2+0
COE 799 M.Sc. Seminar	0+2
COE 800 M.Sc. Thesis	0+6
COE 899 Ph.D. Seminar	0+2
COE 900 Ph.D. Dissertation	0+15

## 7. HORTICULTURE

Departmental Courses	Credit Hrs
HRT 701 Advanced Pomology	2+0
HRT 702 Advanced Olericulture	2+0
HRT 703 Landscape and Ornamental Horticulture	1+1
HRT 704 Horticultural Laboratory Techniques	0+2
HRT 705 Ecological Horticulture	1+0
HRT 706 Growth and Development of Horticultural Crops	2+0
HRT 707 Postharvest Physiology of Horticultural Crops	2+0
HRT 708 Processing and Preservation of Horticultural Crops	1+1
HRT 709 Plant Propagation and Nursery Management	1+1
HRT 710 Plantation Crops, Spices and Condiments	2+0
HRT 711 Potato and Tuber Crops	1+1
HRT 712 Environmental Impact Assessment	2+0
HRT 713 Vegetable Seed Production and Technology	2+1
HRT 714 Plant Genetic Resources	2+0
HRT 715 Breeding of Vegetable Crops	1+1
HRT 716 Breeding of Fruit Crops	1+1
HRT 717 Breeding of Ornamental Plants	1+1
HRT 719 Plant Stress Physiology	2+1
HRT 720 Plant Water Relationship	2+1
HRT 721 Mineral Nutrition of Horticultural Crops	2+0
HRT 722 Tissue Culture of Horticultural Plants	1+1
HRT 723 Plant Biotechnology	3+0
HRT 730 Agroforestry	2+0
HRT 791 Case Studies in Horticultural Crops	0+1
HRT 799 M.Sc. Seminar	0+2
HRT 800 M.Sc. Thesis	0+6
HRT 899 Ph.D. Seminar	0+2
HRT 900 Ph.D. Dissertation	0+15

## 8 . PLANT BREEDING

Departmental Courses	Credit Hrs
PLB 701 Principles of Plant Breeding I	2+1
PLB 702 Principles of Plant Breeding II	2+1
PLB 703 Advanced Genetics and Cytogenetics	2+1
PLB 705 Germplasm Collection, Evaluation and Utilization	2+1
PLB 706 Advanced Plant Breeding	3+0
PLB 707 Molecular Genetics	3+0
PLB 713 Population Genetics	3+0
PLB 715 Quantitative Genetics	3+0
PLB 722 Tissue Culture in Crop Improvement	2+1
PLB 723 Plant Biotechnology	3+0
PLB 799 M.Sc. Seminar	0+2
PLB 800 M.Sc. Thesis	0+6
PLB 899 Ph.D. Seminar	0+2
PLB 900 Ph.D. Dissertation	0+15

## 9 . PLANT PATHOLOGY

Departmental Courses	Credit Hrs
PLP 701 Disease of Field and Plantation Crops	2+1
PLP 702 Disease of Fruits, Vegetable, Spices & Ornamental Plants	2+1
PLP 703 Mycology	3+1
PLP 704 Bacteriology	2+1
PLP 705 Nematology	2+1
PLP 706 Virology	2+1
PLP 707 Plant Pathological Techniques & Plant Disease Diagnosis	0+2
PLP 708 Principles of Plant Pathology	3+0
PLP 709 Chemicals in Plant Disease Control	2+1
PLP 710 Epidemiology of Plant Disease	2+0
PLP 711 Biological and Integrated Plant Disease Management	2+1
PLP 712 Ecology of Soliborne Plant Pathogens	2+1
PLP 713 Seed and Postharvest Pathology	2+1
PLP 714 Disease Resistance in Plants	2+1
PLP 715 Advanced Mycology	2+1
PLP 716 Advanced Bacteriology	1+1
PLP 717 Advanced Nematology	1+1
PLP 718 Advanced Virology	1+1
PLP 719 Advances in Plant Pathology	2+0
PLP 799 M.Sc. Seminar	0+2
PLP 800 M.Sc. Thesis	0+6
PLP 899 Ph.D. Seminar	0+2
PLP 900 Ph.D. Dissertation	0+15



## 10. SOIL SCIENCE

Departmental Courses	Credit Hrs
SSC 701 Soil Physics	1+1
SSC 702 Land Degradation and Watershed Management	3+0
SSC 703 Soil Fertility and Plant Nutrition	2+1
SSC 704 Soil Classification and Mapping	1+1
SSC 705 Chemistry of Soil Fertility	2+0
SSC 706 Soil Microbiology	2+0
SSC 707 Soil, Water and Plant Analysis	0+1
SSC 708 Chemistry of Soil Organic Matter	2+1
SSC 709 Micronutrients in Soil and Plants	2+1
SSC 710 Chemistry of Submerged Soils	2+1
SSC 711 Soil Test and Crop Response	2+1
SSC 712 Land Use Planning and Management	1+1
SSC 713 Pollution of Soil Environment	2+0
SSC 714 Remote Sensing and GIS in Soil and Agriculture	1+1
SSC 799 M.Sc. Seminar	0+2
SSC 800 M.Sc. Thesis	0+6
SSC 899 Ph.D. Seminar	0+2
SSC 900 Ph.D. Dissertation	0+15

## 11. ANIMAL BREEDING

Departmental Courses	Credit Hrs
ANB 701 Animal Research Methodology	3+0
ANB 705 Advanced Ruminant Breeding	2+1
ANB 706 Biotechnological Animal Breeding	3+0
ANB 707 Advanced Poultry Breeding	3+0
ANB 711 Animal Production Physiology	2+1
ANB 718 Animal Endocrinology	3+0
ANB 726 Reproductive Physiology	2+1
ANB 727 Rare Breed of Animal, their Conservation and Utilization	3+0
ANB 790 Special Problem	0+2
ANB 799 M.Sc. Seminar	0+2
ANB 800 M.Sc. Thesis	0+6
ANB 899 Ph.D. Seminar	0+2
ANB 900 Ph.D. Dissertation	0+15

## 12 . ANIMAL NUTRITION AND FODDER PRODUCTION

Departmental Courses	Credit Hrs
ANU 702 Applied Animal Nutrition	2+1
ANU 708 Feedstuff Analysis and Quality Control	2+1
ANU 709 Ruminant Nutrition	2+1
ANU 710 Non-ruminant Nutrition	2+1
ANU 712 Basic of Agriculture System	2+0
ANU 713 Case Study of Livestock Production System of Nepal	0+1
ANU 717 Fodder Production and Pasture Management	2+0
ANU 729 Range Lands and Pastoral Development	3+0
ANU 790 Special Problem	0+2
ANU 799 M.Sc. Seminar	0+2
ANU 800 M.Sc. Thesis	0+6
ANU 899 Ph.D. Seminar	0+2
ANU 900 Ph.D. Dissertation	0+1

## 13 . LIVESTOCK PRODUCTION AND MANAGEMENT

Departmental Courses	Credit Hrs
LPM 703 Advanced Ruminant Management	2+1
LPM 704 Advanced Pig and Poultry Management	2+1
LPM 719 Market Milk and Quality Control	2+1
LPM 720 Commercial Dairy Farming	1+1
LPM 721 Animal Product Technology	2+1
LPM 722 Dairy Cattle Housing and Hygiene	1+1
LPM 723 Poultry Production Technology and Quality Control	2+1
LPM 724 Drought Animal Production	2+1
LPM 725 Domestic Animal Disease	3+0
LPM 790 Special Problem	0+2
LPM 799 M.Sc. Seminar	0+2
LPM 800 M.Sc. Thesis	0+6
LPM 899 Ph.D. Seminar	0+2
LPM 900 Ph.D. Dissertation	0+15

## 14 . ANIMAL SCIENCE WITH SYSTEM LEARNING APPROACH (SLA)

Departmental Courses	Credit Hrs
<b>A. Courses from Major and Other Relevant Departments</b>	
EXT 790 Special Problem: SLA based on workshop/discussion	0+2
ANU 712 Basic of Agricultural Systems	2+0
ANU 713 Case Studies (Livestock Production Systems: Pilot Project)	0+1
EXT 706 Group Dynamics and Leadership	2+0
EXT 708 Development Communication	2+0
AEC 715 Economics of Agriculture Marketing (With emphasis on Livestock Marketing)	3+0
ANU 799 M.Sc. Seminars (two)	0+2
ANU 800 M.Sc. Thesis (Action Research on SLA Related Problems)	0+6
<b>B. Basic Courses</b>	
ENG 701 Technical Writing English	2+0
AST 711 Statistical Methods in Biological Sciences	2+1
BCH 728 General Biochemistry	2+1
<b>C. Courses from Major Department</b>	
A minimum of 12 credit hours courses from major department must be enrolled.	
ANU 799 M.Sc. Seminars	0+2
ANU 800 M.Sc. Thesis	0+6

## 14. ANIMAL SCIENCE (LIVESTOCK EXTENSION)

Departmental Courses	Credit Hrs
<b>A. Courses from Major and Other Relevant Departments</b>	
EXT 701 Extension Education	2+0
EXT 708 Development Communication	2+0
EXT 711 Program Planning in Agricultural Extension	2+0
EXT 712 Monitoring and Evaluation of Agricultural Extension Program	2+0
AEC 715 Economics of Agriculture Marketing (With emphasis on Livestock Marketing)	3+0
LPM 703 Advanced Ruminant Management	2+1
LPM 719 Market Milk and Quality Control	2+1
ANU 702 Applied Animal Nutrition	2+1
ANU 712 Basic of Agricultural Systems	2+0
ANU 713 Case Studies (Livestock Production System of Nepal)	0+1
ANU 790 Special Problem: Based on workshop/discussion	0+2
ANU 799 M.Sc. Seminars (two)	0+2
ANU 800 M.Sc. Thesis	0+6
<b>B. Basic Courses</b>	
ENG 701 Technical Writing English	2+0
AST 711 Statistical Methods in Biological Sciences	2+1
BCH 728 General Biochemistry	2+1
<b>C. Courses from Major Department</b>	
A minimum of 12 credit hours courses from major department must be enrolled.	
ANU 799 M.Sc. Seminars	0+2
ANU 800 M.Sc. Thesis	0+6

## 16. AQUACULTURE

Departmental Courses	Credit Hrs
AQU 701 Fish Biology	2+1
AQU 702 Aquaculture Systems	3+0
AQU 703 Fish Nutrition and Feeding Management	2+1
AQU 704 Water Quality Analyses and Management for Aquaculture	2+2
AQU 705 Hatchery Management and Aquatic Animal Seed Production	2+1
AQU 706 Fisheries management	2+0
AQU 707 Methods for Fish Biology	2+0
AQU 709 Aquatic Animal Health Management	2+1
AQU 790 Special Problem (Aqua-Internship)	0+2
AQU 799 M.Sc. Seminar	0+2
AQU 800 M.Sc. Thesis	0+6
AQU 899 Ph.D. Seminar	0+2
AQU 900 Ph.D. Dissertation	0+15

## 17 . EPIDEMIOLOGY AND VETERINARY PUBLIC HEALTH

Departmental Courses	Credit Hrs
VPH 601 General Epidemiology	2+1
VPH 701 Introduction to Veterinary Public Health	2+1
VPH 702 Environmental Hygiene and Sanitary Microbiology	1+1
VPH 703 Food Hygiene and Toxicology	2+1
VPH 704 Occupational Health	1+0
VPH 705 Advanced Epidemiology	2+1
VPH 706 Biostatistics	1+1
VPH 707 Viral Zoonoses, Recognition, Prevention and Control	1+1
VPH 708 Bacterial Zoonoses, Recognition, Prevention and Control	1+1
VPH 709 Parasitic Zoonoses, Recognition, Prevention and Control	1+1
VPH 710 Food-borne Infections and Intoxication, Prevention and Control	1+0
VPH 711 Herd Health Management and Biosecurity	2+1
VPH 712 Veterinary Economics	2+1
VPH 713 Organic Farming and Bio Products	1+0
VPH 799 M.Sc. Seminar	0+1
VPH 800 M.Sc. Thesis	0+6

## 18 . VETERINARY MEDICINE

Departmental Courses	Credit Hrs
VMC 701 Diseases of Cattle, Horse, Sheep and Goat-I	2+1
VMC 702 Diseases of Cattle, Horse, Sheep and Goat-II	2+1
VMC 703 Metabolic Disease of Cattle, Sheep and Goat	2+1
VMC 704 Diseases of Dog and Cat	2+1
VMC 705 Diseases of Swine	1+0
VMC 706 Infectious Diseases of Horse, Sheep and Goat-I	2+1
VMC 707 Infectious Diseases of Horse, Sheep and Goat-II	2+1
VMC 708 Poultry Diseases	1+1
VMC 709 Diseases of Animals Caused by Toxicant	1+1
VMC 710 Wild Life Medicine	2+1
VMC 711 Advanced Studies in Protozoan Diseases	1+1
VMC 799 M.Sc. Seminar	0+1
VMC 800 M.Sc. Thesis	0+6

## 19 . MICROBIOLOGY

<b>Departmental Courses</b>	<b>Credit Hrs</b>
VMI 701 General Bacteriology	2+1
VMI 702 Systematic Bacteriology	2+1
VMI 703 Veterinary Mycology	2+1
VMI 704 General Virology	2+1
VMI 705 Advanced Immunology	3+0
VMI 706 Systematic Animal Virology	3+1
VMI 707 Principles of Immunology	2+1
VMI 708 Microbial Toxin	2+1
VMI 709 Clinical Microbiology	0+2
VMI 710 Clinical Immunology	0+2
VMI 711 Food Microbiology	2+1
VMI 712 Production and Standardization of Veterinary Biological	2+1
VMI 799 M.Sc. Seminar	0+1
VMI 800 M.Sc. Thesis	0+6

## 20 . VETERINARY PHARMACOLOGY

<b>Departmental Courses</b>	<b>Credit Hrs</b>
VPM 701 Molecular Pharmacology	2+1
VPM 702 Advanced Toxicology	2+1
VPM 703 Pharmacokinetics	2+1
VPM 704 Neuropharmacology	2+1
VPM 705 Advanced Chemotherapy	2+1
VPM 706 Autonomic Pharmacology	2+1
VPM 707 Ethnopharmacology	1+1
VPM 708 Endocrine Pharmacology	2+1
VPM 709 Pharmacology of Autocoids	1+1
VPM 710 Chemotherapy of Parasitic Diseases	1+1
VPM 711 Cardiovascular and Renal Pharmacology	1+1
VPM 712 Pharmacology of Gastrointestinal Tract	1+1
VPM 713 Phamacometrics	0+2
VPM 714 Immunopharmacology	2+1
VPM 715 Nutritional Pharmacology	2+0
VPM 799 M.Sc. Seminar	0+1
VPM 800 M.Sc. Thesis	0+6

## 21 . VETERINARY PARASITOLOGY

<b>Departmental Courses</b>	<b>Credit Hrs</b>
VPA 701 Platyhelminthes	3+1
VPA 702 Nematelminthes	3+1
VPA 703 Protozoology	2+1
VPA 704 Parasitological Techniques	0+3
VPA 705 Immunoparasitology	1+1
VPA 706 Entomology and Acarology	2+1
VPA 707 Parasitic Zoonosis	2+1
VPA 708 Clinical Parasitology	1+2
VPA 709 Poultry Parasitology	1+1
VPA 710 Fish Parasitology	1+1
VPA 799 M.Sc. Seminar	0+1
VPA 800 M.Sc. Thesis	0+6

## 22 . VETERINARY PATHOLOGY

<b>Departmental Courses</b>	<b>Credit Hrs</b>
VPP 701 Advanced Systemic Pathology	2+1
VPP 702 Poultry Pathology	2+1
VPP 703 Advanced Histopathology and Histochemistry	1+2
VPP 704 Advanced Clinical Pathology	1+2
VPP 705 Pathology of Neoplasm	1+2
VPP 706 Pathology of Nutritional Disease	2+1
VPP 707 Laboratory Technique and Diagnosis	0+3
VPP 708 Hematology	1+1
VPP 709 Surgical Pathology	2+1
VPP 710 Parasitic Pathology	1+1
VPP 711 Advanced Pathology of Infectious Disease	2+1
VPP 712 Necropsy Diagnosis	0+1
VPP 799 M.Sc. Seminar	0+1
VPP 800 M.Sc. Thesis	0+6

## 23 . VETERINARY GYNAECOLOGY AND OBSTETRICS

<b>Departmental Courses</b>	<b>Credit Hrs</b>
VGO 701 Advanced Gynaecology	2+1
VGO 702 Advanced Obstetrics I	2+1
VGO 703 Infertility in Domestic Animals	2+1
VGO 704 Genital Diseases in Relation to AI	1+1
VGO 705 Physiopathology of Reproduction in Domestic Animals	2+1
VGO 706 Injuries and Disease in Relation to Parturition	2+1
VGO 707 Gynaecology and Obstetrics of Dog and Cat	2+1
VGO 708 Embryotransfer Technology	1+1
VGO 709 Gynaecology of Sheep, Goat, Pig and Poultry	1+1
VGO 710 Advanced Study of Male and Female Infertility	2+1
VGO 711 Reproductive Endocrinology	2+1
VGO 712 Advanced Obstetrics II	2+1
VGO 713 Techniques in Andrology and Gynaecology	2+1
VGO 799 M.Sc. Seminar	0+1
VGO 800 M.Sc. Thesis	0+6