

BANARAS HINDU UNIVERSITY
INSTITUTE OF AGRICULTURAL
SCIENCES

ORDINANCES GOVERNING
B.Sc.(Ag.), M.Sc.(Ag.) & Ph.D. COURSES

2012-2013

ORDINANCE GOVERNING ADMISSION TO B.Sc.(Ag.) COURSE

This ordinance is prepared in the light of UGC regulation and measures for maintenance of standard in higher education 2010 (vide letter no. F.3-1/2009 dated 30.06.2010) that Agriculture Education will be regulated by Indian Council of Agricultural Research (ICAR)

Item	Definition
1.0	ADMISSION
1.1	MODE OF ADMISSION Admission to the I year of B.Sc. (Ag.) course shall be made on merit, computed on the basis of marks obtained by candidates in a competitive examination called Undergraduate Entrance Test for B.Sc.(Ag.), herein-after abbreviated 'UET-Ag', to be conducted by the Controller of Examinations, Banaras Hindu University on the date and centers to be announced from time to time.
1.2	MINIMUM ELIGIBILITY A candidate shall be eligible for admission to B.Sc.(Ag.), if he/she is physically fit to carry out field work related with agricultural activities and has:
1.2.1	Passed the (10+2)/Intermediate examination in Agriculture or in Science (with Physics, Chemistry and Mathematics/Biology) or any other equivalent examination recognized by the University.
1.2.2	Obtained at least 50% marks in aggregate. For Scheduled Caste/Scheduled Tribe candidates, the eligibility will be as per University rules.
1.2.3	Not crossed 23 years of age on December 31, of the year of admission, (adopted from ICAR guidelines)
1.2.4	Candidates appearing at the respective qualifying examinations shall be eligible to appear at the entrance examination but shall have to provide the proof of passing the said examination as and when called for, prior to their admission.
1.3	NUMBER OF SEATS
1.3.1	123 seats are available for admission to B.Sc. (Ag.) Part I course out of which 15% seats shall be reserved for SC, 7.5% seats for ST and 27% for OBC candidates, as per Govt, of India directives.
1.3.2	1.3.2 SUPERNUMERARY ADMISSIONS
	1.3.2.1 FOREIGN NATIONALS As per University rules existing at the time of admission
1.3.3	1.3.2.2 SONS / DAUGHTERS OF PERMANENT EMPLOYEE OF THE UNIVERSITY As per University rules existing at the time of admission.
1.3.4	1.3.2.3 SUPERNUMERARY ADMISSIONS Fifteen percent seats shall be available for candidates nominated by the I.C.A.R. on the basis of combined admission test conducted by the ICAR for B.Sc. (Ag.) admission.
1.4	SCHEME OF ENTRANCE TEST
	There shall be one paper of 120 minutes duration carrying 300 marks containing 200 multiple choice questions based on +2 courses or equivalent. A candidate will answer 100 questions. The paper shall comprise the following five sections. Sections I and II are compulsory for all candidates whereas from sections III, IV, and V a candidate will answer any one. I. Mental agility - 25 Questions II. Chemistry - 25 Questions III. Physics and Mathematics - 50 Questions IV. Botany and Zoology - 50 Questions V. Agriculture - 50 Questions
1.5	SYLLABUS
	The syllabus for various subjects shall be as that of (+2) examination prescribed by the Central Board of Secondary Education, New Delhi

1.6	MERIT LIST OF ADMISSION
1.6.1	EVALUATION: Three marks shall be awarded for each correct answer whereas one mark shall be deducted for each incorrect answer.
1.6.2	Candidates shall be selected in order of merit on the basis of the aggregate marks secured at the UET- Ag provided that candidate has obtained not less than 35% marks in the aggregate marks of UET-Ag. In case of SC/ST candidates it shall be 30% in aggregate marks of UET-Ag.
1.6.3	In the case of equal marks at the UET-Ag. the <i>inter-se</i> ranking of the candidates shall be decided in the following order: (i) The aggregate marks obtained by the candidates at the qualifying examination recognized for the purpose of appearing in UET-Ag. (ii) If the marks at the above [vice 1.6.3 (i)] examination also happen to be same, the date of birth would be the basis, i.e., the candidate senior in the age would rank higher.
1.6.4	In all matters relating to Admissions, the decision of the Admission Committee, Institute of Agricultural Sciences, shall be final.
1.6.5	No scrutiny/revaluation of the answer books of the UET-Ag. shall be allowed.
1.6.6	The candidates shortlisted for counseling will be informed individually by registered post/ speed post.
1.6.7	A candidate/candidates selected for admission may be referred to a Medical Board for Medical Examination for fitness by the Admission Committee.
1.7	Notwithstanding anything contained in these ordinances, the Entrance Test Notification approved by the Academic Council for the concerned academic year shall be final.

ORDINANCES GOVERNING ADMISSION TO M.Sc.(Ag.) COURSES

	ADMISSION
2.1	MODE OF ADMISSION
	Admission to the M.Sc. (Ag.) courses shall be made on merit computed on the basis of marks obtained by candidates in a competitive examination called Post Graduated Entrance Test for Agriculture, hereinafter abbreviated 'PET-Ag' to be conducted by the Controller of Examinations, Banaras Hindu University, on a date and centers to be announced from time to time.
2.2	ELIGIBILITY
	<p>i (a) Candidates with four years B.Sc. (Ag.) Degree with credit based course programme under the guidelines of ICAR or an equivalent qualification.</p> <p>(b) Candidates with four years B.Sc. (Hort.) Degree with credit based course programme under the guide lines of ICAR will be considered for M.Sc. (Ag) Horticulture only.</p> <p>ii 6.00/10 or 2.5/4, 3.5/5, 4.0/6 OGPA for general candidates. For SC/ST/OBC candidates OGPA of 2.0/4, 3.0/5, 3.5/6 and 5.5/10 as per university guidelines.</p> <p>iii Has not secured more than one III division or equivalent O.G.P.A. in his/her academic career.</p>
2.2.1	Candidates appearing at the respective qualifying examinations shall be eligible to appear at the entrance examination but shall have to provide the proof of their passing the said examination by the date as decided by the university.
2.3	NUMBER OF SEATS
	Total number of seats available is 123 which will be distributed among the 10 departments with the maximum limit of 13 per department. This includes SC (15%), ST (7.5%), OBC (27%) and PC(3%).
2.4	SUPERNUMERARY ADMISSION/WEIGHTAGES
2.4.1	A maximum of two (2) supernumerary admissions in each department may be made from among the candidates who have been awarded fellowship by ICAR on the basis of written test, provided they fulfill the minimum eligibility conditions for admission. Such candidates shall not be required to appear in PET.
2.4.2	A maximum of One (1) supernumerary admission may be made in the Department of Animal Husbandry and Dairying from among the candidates with B.Sc. (A.H.) /B.Sc. (Dairying)/ B.V.Sc. & A.H. or equivalent qualifications holding ICAR Junior Fellowship. Such candidates shall not be required to appear in PET.
2.4.3	ADMISSION OF FOREIGN NATIONALS As per University rules existing at the time of admission
2.4.4	ADMISSION OF B. H.U. EMPLOYEES As per University rules existing at the time of admission
2.4.5	ADMISSION OF SONS/DAUGHTERS OF PERMANENT EMPLOYEES OF THE UNIVERSITY As per University rules existing at the time of admission
2.4.6	Twenty five per cent (25%) supernumerary seats shall be available for admission of candidates on the basis of the All India Combined Examination conducted by the I.C.A.R. for Master's Degree Programme.
2.5	ACADEMIC RECORD RATING Not applicable in the light of entrance examination
2.6	SCHEME OF ENTRANCE EXAMINATION (PET-Ag.) The examination shall comprise one paper of 300 marks of two hour duration consisting of 120 MULTIPLE CHOICE questions.
2.6.1	SYLLABUS FOR THE ENTRANCE EXAMINATION The question paper shall be based on B.Sc. (Ag.) courses generally taught at graduation level as approved by ICAR.
2.7	MERIT LIST FOR ADMISSION
2.7.1	EVALUATION Three marks shall be awarded for each correct answer whereas one mark shall be deducted for each

	incorrect answer
2.7.2	Candidates shall be selected in order of merit on the basis of the aggregate marks secured at the PET-Ag. of that academic session.
2.7.3	In case of equal marks at the PET-Ag the <i>inter-se</i> ranking of the candidates shall be decided in the following order. ii. The OGPA obtained by the candidates at the qualifying examination recognized for the purpose of appearing in the PET-Ag. ii. If the OGPA at the above [vide 2.7.3 (i) examination happen to be the same, the date of birth would be the basis, i.e. , the candidate senior in the age would rank higher.
2.7.4	In all matters relating to M.Sc. (Ag.) admission decision of a Committee comprising the Admission Committee of Institute and the Admission Committee of the respective Department shall be final.
2.7.5	Scrutiny/re-evaluation of the answer books of the PET-Ag shall be done as per university rules.
2.7.6	The candidates shortlisted for counseling will be informed individually by registered post/ speed post/ e-mail/university webpage.
2.7.7	A candidate/candidates selected for admission may be referred to a Medical Board for Medical Examination for fitness by the Admission Committee.
2.8	ALLOCATION OF DISCIPLINE
	The successful candidates on merit basis will be called on a specific date(s) for verification of certificates. Those found eligible shall appear, in order of merit, on the given date and time before the Admission Committee for counseling, where they shall be asked to exercise their choice of the subject. The choice once exercised shall be final and no change shall be allowed even if vacancies arise in any discipline at a later stage.
2.8.1	INSTITUTIONAL PREFERENCE As per University rules.
2.9	Notwithstanding anything contained in these ordinances, the Entrance Test Notification approved by the Academic Council for the concerned academic year shall be final.

ORDINANCES GOVERNING ADMISSION TO Ph.D. COURSES

3.0	<p>ADMISSION</p> <p>Admissions shall be made in the disciplines where M.Sc. (Ag.) courses are being offered and in Agricultural Statistics, Post Harvest & Bio Processing Engineering and Soil & Water Conservation Engineering in the department of Farm Engineering.</p>
3.1	<p>MODE OF ADMISSION</p> <p>The admission to the Ph.D. programme shall be through the Agriculture Research Entrance Test (ARET) conducted along with PET-Ag or through direct admission as prescribed under clause IV.I(b)- Mode of Admission of the Ph.D. Ordinance of the University. In the event of seats remaining vacant after the closer of admission in the first semester candidates may also be admitted in the second semester of the academic year from among the successful candidates of the ARET including those who could not turn up in the first semester.</p>
3.2	<p>ELIGIBILITY</p> <p>A candidate, seeking admission to the Ph.D. programme in the Faculty, shall be required to have passed the qualifying examination in concerned main discipline with credit based course programme securing the minimum 6.5 /10 or 2.5/4 or 3.5/5 or 4.0/6 OGPA for general candidates. For SC/ST/OBC candidates OGPA of 6.0/10, 2.0/4, 3.0/5, 3.5/6 as per university guidelines. A candidate must not have more than one III division or equivalent grade point average in his/her academic career.</p>
3.3	<p>NUMBER OF SEATS</p> <p>The number of students shall be as per university guidelines.</p>
3.3.1	<p>RESERVATIONS</p> <p>Vide clause 1.5 Reservations – of the Ph.D. Ordinance of the University.</p>
3.4	<p>SUPERNUMERARY ADMISSIONS</p> <p>Vide Clause IV. L (b) Direct Admission of the Ph.D. Ordinance of the University</p>
3.5	<p>SCHEME OF ENTRANCE TEST</p> <p>Written Test:</p> <p>(a) A candidate possessing the minimum qualifications with the requisite percentage of marks and academic record as prescribed in Clauses 3.2 supra and Appendix-A shall be eligible to appear in the written test.</p> <p>(b) The written test shall be conducted by the Controller of Examinations normally in the month of May every academic year, the results of which shall be declared ordinarily by the end of June.</p> <p>(c) The test shall be of 2 hour duration, carrying 300 marks, consisting of 100 multiple-choice questions out of which there would be 40 multiple choice questions (Section ‘A’) of general nature to test the knowledge of the candidates in fundamentals and also to test their logical and analytical thinking, quantitative ability, language skills, computer awareness, general knowledge, etc. These questions shall be common to all the candidates appearing for the test in all the disciplines and shall be based on the subjects taught at the intermediate/higher secondary and graduate levels. The remainder of 60 multiple choice questions (Section ‘B’) shall be of specialized nature and discipline specific for each discipline of the Faculty. The candidate shall be required to answer only one such set of 60 questions corresponding to the subject of his/her qualifying degree. These questions shall be of post-graduate level in the concerned subject.</p>
	<p>MERIT LIST FOR INTERVIEW / EVALUATION</p> <p>Three marks shall be awarded for each correct answer whereas one mark shall be deducted for each incorrect answer.</p>

Candidates shall be selected for interview in order of merit on the basis of aggregate marks obtained at the ARET.

ACADEMIC RECORD

Formula for calculating academic index

$M = 45 (X_1 + 0.6 X_2 + 0.25 X_3 + 0.15 X_4)/100$, where postgraduate degree is considered as the qualifying examination and

$M = 90 (X_2 + 0.4 X_3 + 0.3 X_4)/100$, where undergraduate degree is considered as the qualifying examination, where,

M = Marks for the academic record, which shall be an integer. Any fraction in 'M' shall be rounded off to the nearest integer.

X₁ = Percentage of marks obtained at the post-graduate examination,

X₂ = Percentage of marks obtained at the under-graduate examination,

X₃ = Percentage of marks obtained at the intermediate/higher secondary examination, and

X₄ = Percentage of marks obtained at the high school examination.

In case of equal marks at the ARET the inter-se ranking of the candidates shall be decided in the following order.

(c) The OGPA obtained by the candidates at the qualifying examination recognized for the purpose of appearing in the ARET.

ii. If the OGPA at the above, (i) examination happens to be the same, the date of birth would be the basis, i.e., the candidate senior in the age would rank higher.

INTERVIEW

Personal Interview

(a) The Controller of Examinations shall send an alphabetical list of short-listed candidates along with their application forms and also the application forms of ARET exempted candidates who have qualified for direct admission, to the academic section of the Institute.

(b) The academic section of the Institute shall coordinate with each department and after scrutinizing the application forms thoroughly, shall send letters to short-listed candidates to appear in a personal interview, which shall be conducted prior to commencement of a semester.

(c) The personal interview shall be conducted by a committee consisting of the following members:

i) Dean of the Faculty or his/her nominee of the Faculty ----- Chairman

ii) Director of the Institute (in the case where the Faculty is associated with an Institute or his/her nominee of the Institute) ----- Member

(d) Two senior Professors of the Institute/Faculty -----Member(s)

iv) Concerned Head of the Department -----Member

v) Concerned coordinator of Centre ----- Member

vi) Two senior most members of the concerned DRC/SRC/CRC excluding the Head/Coordinator -----Member(s)

vii) One SC teacher -----Member

viii) One ST teacher -----Member

(e) The personal interview shall carry a maximum of 40 marks.

The marks of "Personal Interview" along with marks of "Academic Record" shall be sent by the concerned department/centre to the Controller of Examinations in duplicate. Thereafter the marks obtained by the candidates in ARET would be added by the office of the Controller of Examinations for final computation of the Merit List and a copy would be provided to the concerned department/centre for declaration of final merit list discipline-wise

	<p>by the Faculty. Separate merit lists shall be prepared for the ARET qualified and ARET exempted candidates.</p> <p>The said committee shall recommend to each department the names of selected candidates who are by habit, character and qualifications, fit and proper to be admitted to the Ph. D. Programme, from ARET qualified (depending on the number of total available seats in the department/school) and ARET exempted categories along with their application forms.</p> <p>The Department shall notify the merit list of the selected candidates and shall issue the letter of admission to the candidates.</p> <p>On receipt of the letter of admission, each candidate shall pay the fees as prescribed in Clause XV and complete other official formalities pertaining to admission within three days.</p> <p>The DRC/SRC/CRC shall assign a supervisor to supervise the research work.</p> <p>If required, on the request of the supervisor, the DRC/SRC/CRC shall assign a co-supervisor/external supervisor.</p> <p>The Head of the Department/Coordinator shall send a complete list of the admitted candidates along with the necessary details to the Registrar (Academic) with a copy to the Dean of the Faculty within a week from the date of admission.</p> <p>The records of the merit list of both the ARET qualified candidates and those eligible for direct admission along with their application forms shall be maintained in the Department.</p> <p>If some vacancies arise in a Department/School/Centre for the even semester, the short-listed candidates who could not be admitted in the immediately preceding odd semester may be called for counseling afresh for admission as per procedure laid above.</p> <p>Every candidate shall be registered only at the beginning of each semester.</p> <p>No full-time Ph. D. Scholar shall accept during the period of research any paid assignment apart from Research Fellowships, Research Assistantships, externally funded research project assignments etc provided it is not detrimental to his/her research programme as determined by the DRC/SRC/CRC. A Ph. D. Scholar shall not be permitted to join any other degree course. However, he/she may be permitted to join part-time Diploma or Certificate Course(s) by the DRC/SRC/CRC on the recommendation of the RPC provided it is not detrimental to his/her research programme.</p>
<p>3.6</p>	<p>REGISTRATION</p> <p>Ordinarily the successful candidates shall be registered in the first semester of the Academic year, in order of merit. However, in the event of seats remaining vacant after the close of registration in the first semester candidates may also be registered in the second semester of the academic year from among the successful candidates of the CRET as per Ph.D. Ordinance of the University.</p>
<p>3.7</p>	<p>Notwithstanding anything contained in these ordinances, the Entrance Test Notification approved by the Academic Council for the concerned academic year shall be final.</p>

**Appendix – A Equivalent M. Sc./M. Sc.(Ag.) degrees or allied subjects for
ARET**

Sr. No.	Disciplines of Ph.D.	Proposed
1.	Agricultural Economics	M.Sc./M.Sc.(Ag.) in Agricultural Economics/ Agricultural Economics and Business Management/ Dairy Economics /Livestock Economics or Master of Agri- Business Management(MABM)/ Home Science
2.	Agronomy	M.Sc./M.Sc.(Ag.) in Agronomy / Crop production/Crop Husbandry/ Agro. Forestry
3.	Animal Husbandry & Dairying	M.Sc./M.Sc. (Ag.)in Animal Husbandry & Dairy Science/ Livestock Production and Management/ Animal Nutrition/ Poultry Science/ Dairy Technology/ Animal Genetics & Breeding/ Livestock Products Technology.
4.	Entomology and Agricultural Zoology	M.Sc./M.Sc.(Ag.) in Entomology/ Entomology & Agril. Zoology/ Plant Protection (with major in Entomology).
5.	Extension Education	M.Sc./M.Sc.(Ag.) in Agricultural Extension/ Extension Education/ Dairy Extension/ Communication and Extension/ Home Science.
6.	Genetics and Plant Breeding	M.Sc./M.Sc.(Ag.) in Genetics and Plant Breeding/ Plant Breeding/ Plant Breeding & Genetics/ Genetics.
7.	Horticulture	M.Sc./M.Sc.(Ag.) in Horticulture/ Pomology/ Vegetables Sciences/ Floriculture/ Fruit & Horticultural Technology.
8.	Mycology and Plant Pathology	M.Sc./M.Sc.(Ag.) in Mycology and Plant Pathology/ Plant Pathology/ Plant Pathology & Nematology
9.	Plant Physiology	M.Sc./M.Sc.(Ag.) in Plant Physiology/ Crop Physiology
10.	Soil Science & Agricultural Chemistry	M.Sc./M.Sc.(Ag.) in Soil Science and Agricultural Chemistry/ Soil Science/ Agricultural Chemistry/ Agricultural Chemistry and Soil Science/ Agricultural Physics/ Agricultural Biochemistry/ Agricultural Chemicals

11.	Food Science and Technology	M. Sc./M. Tech. in Food Science/ Food Technology/ Food Engineering/ Dairy Technology/ Dairy Microbiology/ Dairy Chemistry/ Dairy Engineering/ Post-harvest Engineering and Technology/ Bio-Chemical Engineering/ Livestock Products Technology/ Biotechnology/ M. Sc. in Horticulture with specialization in Postharvest Technology.
12.	Agricultural Statistics	M.Sc.(Ag) / M.Sc. in Statistics / Agricultural Statistics
13..	Soil and Water Conservation Engineering	M. Tech. Soil & Water Conservation Engineering.
14.	Post Harvest & Bioprocess Engineering	M. Tech. Process and Food Engineering/ Post Harvest Technology or equivalent disciplines

ORDINANCES GOVERNING CREDIT AND COURSE REQUIREMENTS OF B.Sc.(Ag.)

4.0	RESIDENTIAL REQUIREMENT
	Minimum residential requirement for completion of Bachelor of Sciences (Agriculture) course shall be eight (8) semesters, extendable to a maximum of fourteen (14) semesters in total.
4.1	CREDIT REQUIREMENT
	In order to qualify for the B.Sc. (Ag.) degree a student shall be required to complete 168 credits.
4.1.1	A B.Sc. (Ag.) student shall offer, in each semester, a credit load as prescribed in these ordinances vide Tables 1,2,3 and 4.
4.2	COURSES
4.2.1	A student shall be required to offer three types of courses for completing the credit requirements for the B.Sc. (Ag.) degree: (i) Core courses (ii) Experiential learning courses (20 credits) (iii) RAWE (one module)
4.2.2	The total courses of 168 credits (Core courses 128 credits + Experiential learning courses 20 credits + Rural Agricultural Work Experience 20 credits) shall be compulsory for all B.Sc. (Ag.) students.

Table 1 B.Sc.(Ag.) Pt. I

I Semester		II Semester	
Course No./ Credit	Course Title	Course No. / Credit	Course Title
AGR-111 / 3(2+1)	Principles of Agronomy and Agricultural Meteorology	AEC-121 / 2 (2+0)	Principles of Agricultural Economics
AGR-112 / 2(2+0)	Introductory Agriculture (Ancient Heritage, Agricultural Scenario and Gender Equity in Agriculture)	AGR-121 / 3(2+1)	Water Management
ENG-111 / 3(2+1)	Fundamentals of Soil and Water Conservation Engineering	EXT-121 / 2 (1+1)	Dimensions of Agricultural Extension
GPB-111 / 3 (2+1)	Principles of Genetics	STAT-121 / 2 (1+1)	Statistics
HOR-111 / 3(2+1)	Production Technology of Fruit Crops	COMP-121 / 2 (1+1)	Introduction to Computer Applications
MPP-111 / 4(3 + 1)	Plant Pathogens and Principles of Plant Pathology	HOR-121 / 3(2+1)	Production Technology of Vegetables and Flowers
PPH-111 / 3(2+1)	Crop Physiology	MPP-121 / 3(2+1)	Agricultural Microbiology
		SSC-121 / 3 (2+1)	Introduction to Soil Science

Table 2 B.Sc.(Ag.) Pt. II

I Semester		II Semester	
Course No. / Credit	Course Title	Course No. / Credit	Course Title
AEC-211/2(1+1)	Agricultural Finance and Co-Operation	AEC-221 / 2 (1+1)	Agricultural Marketing, Trade and Prices
AGR-211 / 3(2+1)	Weed Management	AHD-221 / 3(2+1)	Livestock Production & Management
EAZ – 211 / 3(2+1)	Insect Morphology and Systematics	EAZ –221 / 3(2+1)	Insect Ecology and Integrated Pest Management Including Beneficial Insects
EXT-211 / 2 (2+0)	Fundamentals of Rural Sociology and Educational Psychology	ENG-221 / 2 (1+1)	Protected Cultivation and Post Harvest Technology
ENG-211 / 2 (1+1)	Farm Power and Machinery	MPP-221 / 3(2+1)	Diseases of Field Crops and their Management
GPB-211 / 3(2+1)	Principles of Plant Breeding	PPH-221 / 2(1+1)	Environmental Science
HOR- 211 / 3(2+1)	Production Technology of Spices, Aromatic, Medicinal and Plantation Crops	SSC-221 / 3(2+1)	Fertilizes and Agro-Chemicals
SSC-211 / 3(2+1)	Biochemistry	AGR-221 / 2(1+1)	Organic Farming

Table 3 B.Sc.(Ag.) Pt.**III**

I Semester		II Semester	
Course No. / Credit	Course Title	Course No. / Credit	Course Title
AEC-311 / 2 (1+1)	Fundamentals of Agri-Business Management	AEC-321 / 2 (1+1)	Production Economics and Farm Management
AGR-311 / 3(2+1)	Field Crops - I (Kharif)	AGR-321 / 3(2+1)	Field Crops-II(Rabi)
AHD- 311 / 2(1+1)	Introductory Dairy Sciences	AGR-322 / 2 (1+1)	Farming Systems and Sustainable Agriculture
EAZ – 311 / 3(2+1)	Crop Pests and Stored Grain Pests and their Management	EXT-321 / 2 (1+1)	Extension Methodologies for Transfer of Agricultural Technology
EAZ -312 / 2 (1+1)	Introductory Nematology	ENG-321 / 2 (1+1)	Renewable Energy
EXT-311 / 2 (1+1)	Entrepreneurship Development and Communication Skill	GPB-321 / 3(2+1)	Principles of Plant Biotechnology
GPB-311 / 3(2+1)	Breeding of Field / Horticulture Crops	GPB-322 / 3(2+1)	Principles of Seed Technology
HOR-311 / 2(1+1)	Post Harvest Management and Value Addition of Fruits and Vegetables	PPH-321 / 3 (2+1)	Applied Plant Physiology
MPP-311 / 3(2+1)	Diseases of Horticultural Crops and their Management	SSC-321 / 3(2+1)	Soil Chemistry, Soil Fertility and Nutrient Management

B.Sc. (Ag.)Part IV

RAWE MODEL-II

I Semester

Course No.	Course Title	Credit Hrs (T+P)
EXT-411	Village Attachment	4(0+4)
HOR-411	Village Attachment	4(0+4)
AGR-411	Village Attachment	4(0+4)
AHD-411	Village Attachment	4(0+4)
SSC-411	Village Attachment	4(0+4)

Department wise Experiential Learning course of B.Sc.(Ag.)

II Semester

Experiential Learning Modules B.Sc. (Ag.) Part - IV, Semester-II

Module I - Crop Production	
Course code/ Credit Hrs.	Course title
AGR (E) / 421 5(0+5)	Integrated Farming System
AGR(E) / 422 5(0+5)	Water Management (Watershed, Micro-irrigation, Utilization of problematic water)
*GPB (E) / 421 5(0+5)	Seed Production Technology
SSC (E) 421/ 5(0+5)	Bio fertilizer
*Cross listed with AGR	

MODULE –II CROP PROTECTION, APICULTURE & MUSHROOM CULTURE	
Course code/ Credit Hrs.	Course title
EAZ (E) 421 / 5(0+5)	Apiculture
*EAZ (E) 422 / 5(0+5)	Bio-control Agents and Bio-pesticides
MPP (E)-421 / 5(0+5)	Mushroom Culture
**SSC(E)422 / 5(0+5)	Soil and Plant Health Clinic
Cross listed with * MPP ** MPP, EAZ, & PPH	

Module –III: HORTICULTURE	
Course Code/ Credit Hrs.	Course title
HOR(E)-421/ 5(0+5)	Hi-tech Horticulture
HOR (E)-422 / 5(0+5)	Commercial Floriculture
HOR (E)-423 / 5(0+5)	Nursery Management of Horticultural Crops
HOR(E)-424 / 5(0+5)	Commercial Vegetable Production

Module –IV: Basic Science	
Course Code/ Credit Hrs.	Course title
*PPH(E)-421 / 5(0+5)	Plant Tissue Culture
GPB (E)-422 / 5(0+5)	Molecular Breeding
**GPB(E)-423 / 5(0+5)	Microbial Technology
GPB (E)-424 / 5(0+5)	Recombinant DNA Technology
*Cross Listed with GPB & HOR	
** Cross Listed with MPP & SSC	

Module V: Agri-business Management	
Course Code/ Credit Hrs.	Course title
AEC(E)-421 / 5(0+5)	Marketing Management
AEC(E)-422 / 5(0+5)	Financial Management of Agri-business
EXT(E)-421 / 5(0+5)	Project Formulation, Evaluation and Monitoring
EXT(E)-422 / 5(0+5)	Information and Communication Management

Module VI: Bio Processing and Value Addition	
Course Code/ Credit Hrs.	Course title
ENG(E)-421 / 5(0+5)	Processing and Value Addition of Cereals
ENG (E)-422 / 5(0+5)	Processing and Value Addition of Pulses and Oilseeds
*ENG (E)-423 / 5(0+5)	Processing and Value Addition of Fruits, Vegetables and Dairy products
**ENG (E)-424 / 5(0+5)	Processing and Value Addition of Aromatic Plants and Spices
* Cross listed with HOR & FST	
**Cross listed with SSC.	

Note: RAWEP Attachment with a Agro-based Industries: During RAWEP Programme the students will undergo internship in any one of the following industries/ companies/ institutes for a period of 20 weeks (the list is only suggestive, need based/ location specific industries may be included).

- Seed industries / companies
- Fertilizer industries
- Pesticides industries
- Biotechnological industries (Tissue Culture labs)
- Bio pesticides industries
- Commercial nurseries / Landscaping units
- Sericulture units
- Food processing units
- Agricultural finance Institutions/ Banks /Credit Societies etc.
- Non – Governmental organizations

Evaluations of RAWEP Programme

Attendance: Minimum attendance for this programme – 90%

Records: Students shall complete the record work based on daily field observation notebooks and weekly diaries shall be maintained by them.

Evaluation Procedure: The students shall be evaluated by Course Coordinator as well as well as by a designated evaluation Committee.

Note: i) The duration of the RAWEP is 20 weeks with a weightage of 20 credit;

- ii) wherever facility are not available for industrial training and / or agri-clinics, the duration of vocational training may be increased to that extent;
- iii) RAWEP can be implemented either in the VII or VIII semester as per convenience.

RAWE Courses and Experiential Learning

Table 4 B.Sc.(Ag.) Part. IV

I Semester			II Semester		
Course No.	Course Title	Credit 20(0+20)	Module No.	Module Title	Credit 20(0+20)
EXT-411	Village Attachment	4(O+4)	Module I	Crop Production	20(0+20)
HOR-411	Village Attachment	4(O+4)	Module –II	Crop protection, Apiculture & Mushroom Culture	20(0+20)
AGR-411	Village Attachment	4(O+4)	Module –III	Horticulture	20(0+20)
AHD-411	Village Attachment	4(O+4)	Module –IV	Basic Science	20(0+20)
SSC-411	Village Attachment	4(O+4)	Module V	Agri-business Management	20(0+20)
			Module VI	Processing and Value Addition	20(0+20)

ORDINANCES GOVERNING CREDIT AND COURSE REQUIREMENTS OF M. Sc.(Ag.)
(Separate Ordinances for Special Courses will be framed)

5.0	RESIDENTIAL REQUIREMENT
	Minimum residential requirement for Master of Science (Ag.) degree shall be four (4) semesters, extendable to a maximum of Eight (8) semesters in total.
5.1	CREDIT AND COURSE REQUIREMENT
5.1.1	i. Minimum Credit Requirements
	Course work
	Major discipline 20
	Minor disciplines 09
	Supporting subject(s) 05
	Non-Credit compulsory courses (06) 06
	Master Seminar 01
	Master Research 20
	Total 61
	ii. Comprehensive Exam (oral and internal) Non-credit.
	iii. Stat. 501 shall be one of the supporting courses compulsory for all M.Sc. (Ag) Students. This course will be pre-requisite for other statistics courses.
5.2	A student shall opt Minor courses from two disciplines excluding the supporting Statistics course (Stat. 501).
5.3	SEMINAR
	A student shall be required to deliver a seminar. The seminar will be assessed (satisfactory / unsatisfactory) by a committee comprising the Head of the Department, one senior most teacher other than the Head of the Department and the Seminar In-charge. In case the seminar is unsatisfactory the student will deliver the Seminar again in the same semester.
5.4	CREDIT LOAD PER SEMESTER
5.4.1	Credits offered by a student shall be decided by the Chairman of the Advisory Committee.
5.4.2	A student shall offer a minimum of 8 credits and a maximum of 18 credits in each semester including thesis credits.
5.4.3	A student shall offer at least one core course in each of the first four semesters. However, the students of M.Tech. in Agriculture Engineering shall have the option to take up the core courses in first three semester and for thesis work they may be allowed to take up their research in some industry / reputed research Institute as practiced in other Institutions of India (Detail of the courses as per approved syllabus).
5.4.4	The minimum prescribed load shall not be mandatory beyond the first four semesters of study.

ORDINANCES GOVERNING CREDIT AND COURSE REQUIREMENTS OF Ph.D.

6.0	RESIDENTIAL REQUIREMENT
6.1	Minimum residential requirement shall be four (4) semesters, extendable to a maximum of twelve (12) semesters. Under extraordinary circumstances, the RDCU may grant a further extension of two years for the submission of the thesis, for which the candidates shall apply giving the reasons due to which he/she was not able to submit thesis and his/her application is duly forwarded and recommended by the concerned RPC and the DRC. No further extension shall be given under any circumstances.
6.2	COURSE REQUIREMENT
	<p>6.2 CREDIT REQUIREMENT FOR COURSE AND THESIS The Ph.D. programme shall consist of the course work and the research work. Minimum credit requirement for Ph.D. degree shall be 75 credits as prescribed below:-</p> <p>(i) Major discipline (vice 10.2) : 15 credits 500/600 series courses in the discipline where registered. At least 50% of these courses shall be of 600 series</p> <p>(ii) Minor disciplines (vice 10.3) : 9 credits 500/600 series courses, from any two disciplines.</p> <p>(iii) Supporting subjects : 05 Credits</p> <p>(iv) Non-Credit compulsory courses (06) (If a candidate has not offered them at PG Level)</p> <p>(v) Research Plan Proposal Seminar: 0 Credit</p> <p>(vi) Doctoral Seminar: 01 Credit</p> <p>(vii) Pre Submission Thesis Seminar: 0 Credit</p> <p>(viii) Doctoral Research: 45 Credit</p> <p>Total : 75 Credits</p> <p>Minimum one course from major discipline in each semester, including core courses, must be offered during the first four semesters.</p>
6.2.1	Courses below 500 and of PG series shall not be counted count towards the minimum credit requirement of major and minor disciplines and shall, also not be considered for computing OGPA. They may be offered as remedial courses. To qualify, a candidate shall be required to secure a GPA of 6.0 in the course (Detail of the courses as per approved syllabus).
6.3	CREDIT LOAD PER SEMESTER
	RPC of a student shall decide the credit load of each semester subject to a maximum of 18 credits and a minimum of 8 credits including research credits. A candidate will be required to offer at least one core/major course in each of the first four semesters.
6.4	SEMINAR
	A Ph. D student shall deliver seminars as prescribed below to the satisfaction of the Departmental Research Committee and the Members of the RPC.
6.4.1	COURSE SEMINAR
	A student shall be required to deliver a course seminar before the end of the fourth semester. The seminar shall be awarded grades by the Members of DRC and seminar in charge. In case the grades awarded are below the minimum GP prescribed for passing the course, the student will deliver the seminar again in the same semester.
6.4.2	Research Plan Proposal Seminar
	<p>(a) By the end of the second semester the candidate shall submit to the RPC, a research plan proposal generally consisting of preamble, definition of the problem, approaches, results anticipated and references, in about 8 to 10 pages.</p> <p>(b) The RPC and the DRC shall examine the research plan proposal of the candidate and the candidate shall deliver a detailed seminar called “Research Plan Proposal Seminar” before the RPC and the DRC by the end of the second semester. All other teachers and students will be invited to the seminar.</p> <p>(c) The RPC and the DRC, if satisfied with the research proposal and the seminar, shall approve the proposal and the topic of research, and shall forward its recommendation along with the second relevant progress report of the candidate to the Registrar (Academic) with a copy to the Dean.</p> <p>(d) If the RPC and the DRC are not satisfied with quality of the research plan proposal, the candidate shall submit a fresh proposal and deliver the seminar within a time limit specified by the DRC/SRC/CRC (not exceeding three months in any case), and a fresh evaluation shall be done. But, if only the seminar is unsatisfactory, the candidate shall deliver only the seminar again within one month.</p>

	<p>(e) If the candidate fails to submit the research plan proposal by the end of the second semester or the research plan proposal and/or the research plan proposal seminar of the candidate is/are not approved by the DRC even after complying with Clause XI.2 (d) of BHU ordinances, the candidate's admission shall stand cancelled.</p> <p>(f) The minimum time between Research Plan Proposal Seminar and thesis submission will be of three semesters to be counted after completion of the semester in which seminar is given.</p> <p>(g) If a candidate offers thesis credit in the very first semester of his/her admission, he/she will have to deliver/submit his/her Research Plan Proposal Seminar in that very semester.</p> <p>(h) The residential requirement of two years shall be counted on the basis of the semester ending 30th June / 31st December, whichever is applicable (This clause is applicable to Ph.D. students only)</p>
6.4.3	THESIS PRE-SUBMISSION SEMINAR
	This seminar shall be delivered only after the completion of at least three semesters from the semester in which the RPP seminar was delivered and only when the candidate has successfully completed his/her oral and written comprehensive examinations. This seminar shall be based on the research work carried out by the candidate.
6.4.4	The seminars (6.4.2 and 6.4.3) shall be judged as satisfactory / unsatisfactory by the members of the RPC of the candidate and DRC of the department.
6.4.5	If unsatisfactory, the candidate shall be required to deliver it again on a date and time specified by the RPC.

ORDINANCES GOVERNING EVALUATION OF COURSE WORK

7.0	EXAMINATIONS		
	The students achievements shall be evaluated on the basis of their performance in different tests in the form of written and practical examinations, and thesis and viva-voce examination where applicable. The various tests, their number and relative weightage in each semester shall be as follows:		
	Name of Test	No.	Relative Weightage
(i)	Theory and Practical Course		
	(a) Mid-semester Examination	One	30%
	(b) End-semester Examination		
	(i) Theory	One	40%
	(ii) Practical	One	30%
(ii)	Theory or Practical Courses only		
	(a) Mid-semester examination	One	40%
	(b) End-Semester Examination	One	60%
(iii)	Evaluation of B.Sc.(Ag.) Part IV Rural Work oriented Course		
	Name of Test	No.	Relative %
	Field Observation Record (Daily)	Continuous	20
	Mid Term Report	1	20
	Presentation of Final Report	1	40
	Viva	1	20
(iv)	Evaluation of Experiential Learning		
	Name of Test	Relative	
	Attendance	10%	
	Project Proposal	25%	
	Group Discussion	10%	
	Test	10%	
	Final Project Report	25%	
	Viva Internal Conducted by concerned instructor	20%	
	(vi) Evaluation of Non credit compulsory courses Shall be done as other regular credit courses (Midterm and End term).		
7.1	MID-SEMESTER EXAMINATION		
	The mid-semester examination shall be of two hour's duration and shall generally cover 50 percent of the total course.		
7.2	END-SEMESTER EXAMINATION		
	This examination covering the entire subject matter of a course, shall be held at the end of each semester. The duration of the examination shall be of 2 or 3 hrs.		
7.2.1	The End Term Examination shall be confidential and may be internally examined.		
7.2.2	RAWE and Experiential Learning courses shall be examined internally.		
7.2.3	PROJECT REPORT		
	A project report (about 10-15 pages) comprising work on some assignment, visit to centers of research, extension or demonstration work will be submitted by each of the students		
7.2.4	Wherever a study tour has been prescribed in a course, it shall be compulsory and the students(s) will submit a tour report which will form a part of the practical examination comprising of 10 marks.		
7.3	SUBMISSION OF GRADE		
	The Grades shall be sent within 10 days of the conduct of the examinations, and the answer books of all the examinations shall be returned to the Controller of Examinations.		

7.3.1	SIGNIFICANCE OF GRADES							
	The examinations conducted throughout the semester shall be evaluated in numerals assigning 100 marks to each course. The numerical rating shall be converted to ten point system by placing a decimal before the last digit called here-in-after "grade"							
	GRADE For B.Sc.(Ag.)	EXPRESSION	GRADE For M.Sc.(Ag.)/Ph.D	EXPRESSION				
	8.00 and above	Excellent	8.00 and above	Excellent				
	7.00-7.99	Good	7.00-7.99	Good				
	6.00-6.99	Fair	6.00-6.99	Fair				
	5.00-5.99	Pass	Below 6.0	FAIL				
	Below 5.00	FAIL						
7.3.2	EQUIVALENCE OF GRADES IN PERCENT AND AS DIVISION							
	B.Sc.(Ag.)			M.Sc.(Ag.)/ Ph.D				
	Grade x 10.0 = % marks 70% and above = First Division Above 60% but below 70% = Second Division Above 50% but below 60% = Pass Below 50% = Fail			Grade x 10.0 = % marks 70% and above = First Division Above 65% but below 70% = Second Division Below 60% = Fail				
7.4	CALCULATION OF GP, GPA, and OGPA							
	Grade point and overall grade point average shall be calculated as illustrated here under							
	Credits	Marks				Grade		OGPA
	(Theory + practical)	Mid-term	End-term	Pract	Total	Grade	Grade Point (GP)	53.6 ÷ 7 = 7.657
	3 (2+1)	25	33	22	80	8.0	24.0	
	2 (2+0)	28	50	-	78	7.8	15.6	
	2(0+2)	18	-	52	70	7.0	14.0	
	7 (4+3)						53.6	
	Note :- Grade Point (GP) : Grade x Credit Grade Point Average : GP/Credit Over All Grade Point Average (OGPA) : Total GP/Total Credits Grade : Total Marks in a Course / 10							
7.5	MINIMUM GRADE POINT REQUIREMENT FOR PASSING A COURSE / SEMESTER / DEGREE PROGRAMME							
	Minimum grade points required are given below :							
	Passing requirement of	B.Sc.(Ag.)	M.Sc.(Ag.)/Ph.D.					
	A course	5.0	6.0					
	A semester	5.5	6.5					
	An academic year	5.5	6.5					
	Degree Programme	5.5	6.5					
7.5.1	Significance of OGPA							
	B.Sc.(Ag.)	EXPRESSION	M.Sc.(Ag.)/Ph.D	EXPRESSION				
	8.00 and above	Excellent	8.00 and above	Excellent				
	7.00-7.99	Good	7.00-7.99	Good				
	6.00-6.99	Fair	6.50-6.99	Fair				
	5.50-5.99	Pass	Below 6.50	FAIL				
	Below 5.50	FAIL						
7.6	PROMOTION FROM FIRST SEMESTER TO SECOND SEMESTER/CURRENT ACADEMIC YEAR TO THE NEXT ACADEMIC YEAR							
7.6.1	A student who maintains or fails to maintain the minimum prescribed GPA/OPGA (clause 7.5) at the end of I semester of an Academic year shall be promoted to the II semester of that Academic year.							

7.6.2	A student who maintains the minimum prescribed GPA/OGPA (clause 7.5) for each of the semesters at the end of 2nd Semester of an academic year and does not carry a grade of less than 5.0 [for B.Sc. (Ag)] or 6.0 [for M.Sc.(Ag) and Ph.D.] in any course shall be declared to have passed that Academic year and shall be promoted to the next Academic year.		
7.6	Ph.D. students(s) admitted in the second semester shall be promoted to the next semester on the basis of his/her performance (clause 7.5) in the Semester of admission.		
7.7	IMPROVEMENT OF GP/OGPA		
7.7.1	A repeat examination shall be held for both the odd and even semesters at the end of the concerned academic year for those students who have failed in any of the courses taught during one or both of the semesters or have failed to appear in any of the examinations, if otherwise, eligible. Students who could not appear in the examinations shall be required to produce valid reasons for the absence.		
7.7.2	B.Sc.(Ag.) students having OGPA less than 6.5 and M.Sc.(Ag.) and Ph.D. students less than 7.0; and willing to improve their GP/OGPA may also appear in this examination. The repeat examination shall also be evaluated as provided under clause 7.0.		
7.7.3	An M.Sc. (Ag.)/Ph.D. student shall not be allowed to improve his/her GP/OGPA after the Thesis viva-vice examination.		
7.7.4	The weightage of the Repeat examination shall be as under:		
	PARTICULARS OF COURSE	EXAMINATION	
		THEORY	PRACTICAL
	Theory + Practical course	70%	30%
	Theory only	100%	--
	Practical course only	100%
7.7.5	The better of the two grades shall be used in the computation of GP/OGPA, with remark "R"(repeat) on the transcript.		
7.7.6	A repeat examination shall not be held for any of the B.Sc. (Ag.) Part- IV Rural Work Oriented Courses (RAWO) and Experiential Learning courses. In case a candidate fails he /she shall be required to register for a semester and fulfill the requirement.		
7.7.7	Only one chance shall be given to a candidate for improving his/her GP in a course.		
7.7.8	In case a student appearing in the repeat examination vice clause 7.7 supra fails to obtain the minimum prescribed GP/GPA/OGPA he/she shall be declared to have failed in the class where studying.		
7.7.9	The repeat examination shall also be evaluated as provided under clause 7.0.		
7.8	TRANSCRIPT OF A STUDENT		
	The transcript of a student shall indicate: (i) Course number, course title, credit value, grade, GPA/OGPA and comprehensive, seminar, viva-voce and thesis examination reports and the title of the thesis wherever applicable. (ii) A transcript shall be issued for each of the semesters. (iii) Successive transcripts shall carry forward the GPA/OGPA unto the last semester. A combined transcript shall be issued after the completion of the degree programme. (iv) The status of a re-admitted student shall be indicated on the transcript as Re-admitted in the semester where re-admitted. (v) The result shall be indicated as: PASSED /FAILED / PROMOTED as may be applicable. (vi) Course/courses repeated by a candidates shall be indicated by a suffix "(R)". (vii) The transcripts will carry the following formula for the conversion of OGPA into percent marks: % Marks = OGPA X 10		
7.9	MERIT OF A STUDENT		
7.9.1	The merit shall be decided on the basis of OGPA obtained.		
7.9.2	Students having same OGPA shall be bracketed together.		
7.9.3	A student who has improved his/her OGPA by repeating a course/courses or by readmission or by studying extra semester, over and above the minimum prescribed, shall not be eligible for merit.		
7.9.4	A student who has dropped a semester shall also not be eligible for merit.		

**ORDINANCES GOVERNING SPECIAL EXAMINATIONS AND
THESIS WORK OF M. Sc. (Ag.)**

8.0	ADVISORY COMMITTEE FOR M.Sc. (Ag.) STUDENTS
8.1	A student enrolled in Master's degree programme shall be guided by an Advisory Committee comprising three members, two representing the major discipline and one representing the minor discipline.
8.1.1	The Supervisor of the candidate thesis, appointed by the Admission Committee of the Department concerned, shall be the Advisor - Chairman. The Chairman will nominate the other members specified above in consultation with the Head of the Department concerned. However, the member from the minor discipline shall be nominated from such a discipline where the student is going to offer maximum credits.
8.1.2	FUNCTION OF THE ADVISORY COMMITTEE
	The Advisory Committee shall guide the student in the choice of courses in the major, minor disciplines, supporting courses and selection of suitable research problem for thesis and in all other matters relating to his/her academic activities.
8.1.3	The details of the programme of work prepared by the Advisory Committee, shall be submitted to Head of the Department for onward transmission to the Controller Examinations before the end of each Semester.
8.2	COMPREHENSIVE EXAMINATION
	A student shall be eligible to appear in the comprehensive examination as soon as he/she successfully completes at least 75% of his/her course requirement. The examination shall be oral and shall be conducted by the Advisory Committee vide a notification of the Head of the Department. No grades shall be awarded in this examination. The performance will be judged as Satisfactory / Unsatisfactory.
8.2.1	In case the performance of a student is judged unsatisfactory he/she shall be required to appear again after a lapse of at least 8 weeks from the last oral examination.
8.3	THESIS SUPPLICATION
8.3.1	A M.Sc. (Ag.) student shall submit his/her thesis during the fourth semester but on or before 30 th June.
8.3.2	A student submitting his/her thesis after the stipulated date shall be required to register in the current semester with ZERO credits and pay full semester fees.
8.3.3	A student who submits his/her thesis after 30 th June (vice clause 8.3.1 supra) shall be awarded degree of the academic session in which he/she submitted the thesis.
8.3.4	Loose bound thesis, in the standard format as prescribed by the University for Ph.D. programme [clause XIII.2(b) (ii)], along with soft in a CD copy shall be accepted in the office of the Head of the Department for onward transmission of loose bound thesis only to the Controller of Examinations, after the production of an up-to-date "No dues" certificate by the student.
8.3.5	The thesis shall be submitted loose-bound initially which shall be hard-bound after the viva-voce examination.
8.4	THESIS EVALUATION
8.4.1	APPOINTMENT OF EXAMINER (S)
	The M.Sc. (Ag.) thesis shall be evaluated by the Chairman of the Advisory Committee and One External Examiner. The name of External Examiner shall be decided by the Board of Examiners of the Department from a panel of three eminent persons in the subject area proposed by the Chairman,

	Advisory Committee.
8.4.2	The examiners will give a detailed report on the thesis making a clear recommendation whether "Accepted / Rejected / To be Revised".
8.4.3	In case one of the examiners rejects the thesis it will be sent to a third examiner, whose report will be final.
8.4.4	In case the examiner recommends revision, the revised thesis shall be sent to the same examiner for final recommendation.
8.4.5	Re submission will be permitted once only.
8.5	In case the thesis reports are "Satisfactory", viva-voce examination shall be conducted only when he / she has successfully completed all the examinations as per clause 7.5 as well as written and/or oral comprehensive examination (s). The viva-voce examination shall be conducted by the members of the Advisory Committee and the External Examiner who has evaluated the thesis. The examiners shall submit a comprehensive viva-voce report making clear recommendation whether "Satisfactory/Unsatisfactory".
8.5.1	In case the External Examiner who has evaluated the thesis declines to conduct the viva-voce examination, it shall be conducted by the members of the Advisory Committee and another external examiner appointed by the Board of Examiners of the Department.
8.5.2	In case the viva-voce report is "Unsatisfactory" the repeat viva-voce examination shall be conducted vice 8.5 after a lapse of at least 8 (eight) weeks from the last viva-voce examination.
8.5.3	In case the student fails again (8.5.2) he/she shall be declared "Failed" and removed from the rolls of the Institute.
8.6	DECLARATION OF RESULT
	The final result of an M.Sc.(Ag.) student shall only be declared when he/she has successfully completed all the requirements (clauses 7.5, 8.2 and 8.4 <i>supra</i>)

ORDINANCES GOVERNING SPECIAL EXAMINATIONS AND RESEARCH WORK OF Ph. D.

9.0	RESEARCH COMMITTEE																		
	<p>i) Subject to the general superintendence of the Academic Council, the following Committees shall deal with all matters connected with the Ph.D. programme of the University in accordance with these ordinances:</p> <p>a) the Research Degree Committee of the University (RDCU) b) the Departmental/School/Centre Research Committee (DRC/SRC/CRC) c) The Research Programme Committee (RPC)</p>																		
	<p>ii) The RDCU shall consist of the following:</p> <table border="0"> <tr> <td>i) Vice-Chancellor</td> <td>Chairman</td> </tr> <tr> <td>ii) Rector (if any)</td> <td>Member</td> </tr> <tr> <td>iii) Director of the Institute (in case where the faculty is associated with an institute)</td> <td>Member</td> </tr> <tr> <td>iv) Dean of the faculty</td> <td>Member</td> </tr> <tr> <td>v) Heads of the Departments and Coordinators of the Schools/ Centers of the Institute/Faculty</td> <td>Member</td> </tr> <tr> <td>vi) Members of the concerned DRC/ SRC/CRC</td> <td>Member</td> </tr> <tr> <td>vii) Supervisor and Co-Spervisor (if any) of the concerned Ph.D. scholar</td> <td>Member</td> </tr> <tr> <td>viii) Emeritus Scientists/ Emeritus Professors/ Visiting Professors/ Honorary Professors/Adjunct Faculty (if any) in the concerned Faculty.</td> <td>Special Invitees</td> </tr> <tr> <td>ix) Registrar</td> <td>Secretary</td> </tr> </table> <p>In the case of Faculties consisting of a single department, at least two Heads of the Departments from sister Faculties, as recommended by the Dean of the concerned Faculty, shall also be the members of the RDCU.</p> <p>As the Secretary, the Registrar shall convene all the meetings of the RDCU.</p>	i) Vice-Chancellor	Chairman	ii) Rector (if any)	Member	iii) Director of the Institute (in case where the faculty is associated with an institute)	Member	iv) Dean of the faculty	Member	v) Heads of the Departments and Coordinators of the Schools/ Centers of the Institute/Faculty	Member	vi) Members of the concerned DRC/ SRC/CRC	Member	vii) Supervisor and Co-Spervisor (if any) of the concerned Ph.D. scholar	Member	viii) Emeritus Scientists/ Emeritus Professors/ Visiting Professors/ Honorary Professors/Adjunct Faculty (if any) in the concerned Faculty.	Special Invitees	ix) Registrar	Secretary
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	<p>The DRC/SRC/CRC shall consist of the following:</p> <table border="0"> <tr> <td>i) Head of the Department / Coordinator of the School/ Centre</td> <td>Chairman</td> </tr> <tr> <td>ii) All Professors & Research Scientists “C” of the Department/School/ Centre + All Professors of the concerned discipline of the MMV.</td> <td>Member</td> </tr> <tr> <td>iii) One Reader + One Lecturer of the Department School/Centre, according to seniority, by rotation every two years and senior most Research Scientists “B and A” of the Department/ School/Centre + the senior most Faculty member (Reader/Lecturer) of the concerned discipline of the MMV.</td> <td>Member</td> </tr> </table>	i) Head of the Department / Coordinator of the School/ Centre	Chairman	ii) All Professors & Research Scientists “C” of the Department/School/ Centre + All Professors of the concerned discipline of the MMV.	Member	iii) One Reader + One Lecturer of the Department School/Centre, according to seniority, by rotation every two years and senior most Research Scientists “B and A” of the Department/ School/Centre + the senior most Faculty member (Reader/Lecturer) of the concerned discipline of the MMV.	Member												
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iii) One Reader + One Lecturer of the Department School/Centre, according to seniority, by rotation every two years and senior most Research Scientists “B and A” of the Department/ School/Centre + the senior most Faculty member (Reader/Lecturer) of the concerned discipline of the MMV.	Member																		

	<p>(iv) Supervisor and Co-Supervisor (if any) of the concerned Ph.D. scholar Member</p> <p>(v) Emeritus Scientists/Emeritus Professors Member /Visiting Professor Honorary Professors/ Adjunct Faculty (if any) in the concerned Department/School/Centre. Special Invitees</p> <p>Where there are three or less than three teachers in the Department/School/Centre, the DRC / SRC/CRC shall consist of the following:</p> <p>i) The Dean of the concerned Faculty. Chairman</p> <p>ii) All teachers of the Department/School /Centre Member</p> <p>iii) A Senior teacher of a sister Department /School nominated by the Dean in consultation with the Head of the Department/Coordinator of the School. Member</p>
	<p>In case the Centre does not conduct any teaching program at PG level, the Dean of the concerned Faculty shall nominate 04 senior teachers of departments having expertise in to the research areas of the Centre.</p> <p>The DRC/SRC/CRC shall appoint one of its members as Secretary and Convener.</p> <p>The DRC/SRC/CRC shall have powers to co-opt such members of the teaching staff of the concerned/sister Department/School as may be helpful to them in their deliberations.</p> <p>In the case of Faculties consisting of a single department, a senior teacher of sister Faculty recommended by the Dean of the concerned Faculty shall also be a member of the DRC/SRC/CRC.</p> <p>VI.4 The RPC shall consist of the following.</p> <p>i) Supervisor of the concerned Ph.D. Scholar Chairman</p> <p>ii) Co-supervisor (if any) of the concerned Ph.D. Scholar Member</p> <p>iii) A nominee of the Chairman of DRC/SRC /CRC Member</p> <p>iv) One expert in the field from the Department /School Member</p> <p>v) One or two experts from outside Member (s) Department/School of the Faculty</p> <p>Experts mentioned in Clauses VI.4 (iv) and (v) above shall be nominated by the supervisor of the candidate and approved by the DRC/SRC/CRC.</p> <p>In the case of Faculties consisting of a single department, Clause VI.4 (v) shall not be applicable.</p> <p>VI.5. A teacher who is not eligible to guide a Ph.D. scholar as per Clause IX.1 (I) or due to not satisfying the conditions laid down in Clause IX.1 (d) read with Clause IX.1(k) or the one referred under Clause IX.3(c) of these ordinances cannot become a member of any of the research committees mentioned above.</p> <p>VI.6. The DRC/SRC/CRC and RPC shall not make any recommendation that is not in conformity with these ordinances and/or such other directives as may be issued by the RDCU and/or the Academic Council in regard to the Ph.D. programme from time to time.</p>

9.1	GUIDELINES FOR APPOINTMENT OF SUPERVISOR / CO-SUPERVISOR Vide clause IX- Supervisors and Co-Supervisors , of the Ph.D. Ordinance of the University
9.2	TIME PERIOD REQUIREMENTS Vide Clause VIII- Time Period Requirements , of the Ph.D. Ordinance of the University
9.3	Research Programme Committee (RPC)
9.3.1	The RPC shall be constituted as per clause 9.0 of ordinance of the Institute & VI.4 of University ordinance.
9.3.2	The DRC may also appoint a Co-Supervisor on recommendation of the Chairman of the Advisory Committee of the student.
9.3.3	FUNCTIONS OF THE RPC
	The RPC of a Ph.D. student shall: i. Prescribe major, minor, supportive and remedial courses, ii. Finalize research plan proposal of the research work, and. iii. Guide the student in all matters related to his/her academic activities.
9.4	ALLOCATION OF STUDENTS TO A SUPERVISOR
	Allocation of students to a supervisor for guiding thesis shall be done by DRC /CRC/SRC in consultation with the teachers expected to be allotted students for Ph.D. thesis supervision. The DRC /CRC /SRC will allocate students to the teachers, seniority wise going downward until all the eligible teachers have received a minimum of one student.
9.4.1	QUOTA OF Ph.D. STUDENTS UNDER A SUPERVISOR Vide clause IX.2 Quota of Ph.D. Scholars , of the Ph.D. Ordinance of the University.
9.5.2	VACANCY UNDER A SUPERVISOR
	A seat shall be considered vacant only when a student submits his/her thesis or on the expiry of eight semesters from the date of registration / or on the cancellation of his her registration.
9.6	REGISTRATION PERIOD and EXTENSION OF REGISTRATION PERIOD Vide clause VIII - Time period Requirements of Ph.D. Ordinance of the University.
9.7	Research Plan Proposal (RPP)
	Within 15 days from the date of the RPP seminar a student shall submit six copies of a detailed RPP through his/her RPC to the Head of the Department. The RPP shall be considered by the DRC including the Chairman of the RPC of the student. If the RPP is not approved, the candidate shall be asked to deliver the RPP seminar again and submit the revised RPP for reconsideration of the DRC. through his/her RPC . A copy of the approved RPP shall be provided to the student and the supervisor.
9.7.1	Ordinarily a Ph.D. student will start his/her research work only after approval of the Thesis RPP.
9.8	PROGRESS REPORT
	Vide clause XI Performance Evaluation of the Ph.D. Ordinance of the University
9.9	CHANGE OF TOPIC OF RESEARCH
9.9.1	MAJOR CHANGES
	In case of "major" change(s) the Ph.D. student shall be required to submit a fresh RPP and deliver the RPP seminar again. The minimum residential requirement of four semesters for supplication for the thesis for such a candidate shall be counted from the semester in which the revised RPP was approved. However, the maximum residential period shall not exceed 12 semesters counted from the date of his/her admission.
9.9.2	MINOR CHANGE
	In case of a "minor" change the candidate may be allowed to continue research as planned earlier incorporating the change.
9.10	COMPREHENSIVE EXAMINATION
9.10.1	A student shall be eligible to appear in the comprehensive examination as soon as he/she successfully completes at least 75% of his course requirements.
9.10.2	The comprehensive examination shall be written and oral. The written examination shall comprise

	two theory papers one from the major subject and other from the minor fields + supporting courses covering the entire course work. Each paper shall be of 100 marks. A student shall be required to secure at least 60 percent marks in each paper for passing this examination.
9.10.3	The question paper for the written comprehensive examination shall be prepared by the concerned course Instructors who will also examine the answer scripts. This examination shall be arranged by the Chairman in consultation with members of the RPC and the Head of the Department.
9.10.4	On successful completion of the aforesaid examination he/she shall qualify to appear in Oral Comprehensive examination to be conducted by the RPC along with one outside expert member from the major field.
9.10.5	The external examiner shall be appointed by the Dean from a panel of three names submitted by the Chairman of the RPC and approved by the D.R.C.
9.10.6	The examiners shall submit a comprehensive report making clear recommendation as "Satisfactory/Unsatisfactory".
9.10.7	In case the performance of a student is judged "Unsatisfactory" he/she shall be required to appear again, after a lapse of at least 12 weeks from the last oral examination, which will be conducted vide clause 9.10.4.
9.11	THESIS PRE-SUBMISSION SEMINAR - Vide Clause XIII. 1 Pre-Submission Seminar of the Ph.D. ordinance of the University
9.11.1	This seminar shall be delivered only after the completion of at least three semesters from the semester in which the synopsis seminar was delivered and only when the candidate has successfully completed his/her oral and written comprehensive examinations. This seminar shall be based on the research work carried out by the candidate.
9.11.2	A Ph.D. student is not required to be registered in a semester for delivering this seminar.
9.12	THESIS SUPPLICATION Vide clause XIII - Submission of the thesis of the Ph.D. Ordinance of the University
9.12.1	A Ph.D. student will submit his/her thesis only after the expiry of the minimum residential period provided he/she maintains the minimum prescribed OGPA for passing the degree programme, and successfully completed comprehensive examination. The candidate shall be required to have communicated / published in refereed journals, at least two research papers based on his/her research work before submitting the thesis. The reprints/proofs/pre-prints of the papers shall be attached at the end of the thesis. The evidence for submission/acceptance of the papers shall be submitted to the Office of the Deputy Registrar (Academic) at the time of submission of thesis.
9.12.2	A Ph.D. student shall ordinarily supplicate his/her Ph.D. thesis within Six months form the date of the Pre-Submission Seminar. The Ph.D. student will submit: (i) Four Copies of the Thesis (Loose Bound) (ii) Four Copies of the Abstract of the Thesis (iii) Two Copies of the Course Programme approved (iv) A combined Transcript of the courses offered (v) A certificate of the DRC indicating the date of approval of the RPP.
9.13	THESIS EVALUATION Vide clause XIV Examination of the Ph.D. Ordinance of the University.
9.13.1	VIVA-VOCE EXAMINATION Vide Clause XIV.8 Viva-Voce of the Ph.D. Ordinance of the University except that the Viva-Voce Board shall consist of i. The RPC ii. One External Examiner iii. D.R.C. Nominee The Supervisor of the thesis will be Chairman of the Viva-Voce Board.

ORDINANCES DEFINING OTHER TERMS

10.0	ACADEMIC YEAR
	The Academic year shall be divided into two (2) semesters of approximately 120 working days each including examinations.
10.1	FEEES
	Students shall pay fees as prescribed by the University from time to time.
10.2	COURSES/ DISCIPLINES
10.2.1	MAJOR DISCIPLINE
	The particular course in which a student is enrolled shall be his/her major discipline.
10.2.2	MINOR DISCIPLINE
	A related discipline other than the major discipline in which a student offers at least six credit of courses shall constitute his/her minor discipline.
10.2.3	CORE COURSE
	Compulsory course prescribed for all the students of the Major Discipline.
10.2.4	OPTIONAL COURSE
	Courses of the Major discipline that a student can elect on the advice of the RPC.
10.2.5	<p>i. MINOR COURSES Courses of sister discipline that a student admitted to a Major Discipline can elect on the advice of the RPC.</p> <p>ii. SUPPORTING COURSES The subject not related to the major subject. It could be any subject considered relevant for student's research work or necessary for building his overall competence.</p>
10.2.6	OFFERING OF THE SAME COURSE : A student cannot offer the same course again in any degree programme unless failed.
10.2.7	ADDITIONAL COURSE M.Sc.(Ag.)/ Ph.D. student may be advised to take additional courses to make up any deficiency. Such a course shall be called as Additional Course. The grades awarded in such courses shall not be considered for the calculation of GPA/OGPA. However, the student will be required to pass the course. The Additional Courses offered shall appear in their transcript under the title 'Additional Course'.
10.3	REGISTRATION
10.3.1	REGISTRATION IN A SEMESTER
	The students shall be required to pay their fees within 5 days of the admission.
10.3.2	REGISTRATION IN A COURSE
	The students of M.Sc.(Ag.) / Ph.D. shall be required to register for course/courses within 3 days of the start of the semester.
10.4	CANCELLATION OF ADMISSION/REGISTRATION OF A B.Sc.(Ag.) / M.Sc.(Ag.)/ Ph.D. STUDENT

	The Admission of a student is liable to be cancelled on the occurrence of any one of the following: <ul style="list-style-type: none"> i. If he/she fails to deposit fees within 10 days of the start of the semester. ii. If he/she fails to attend classes, and absents continuously for 10 days or more without permission. iii. If a M.Sc. (Ag.) student fails to register in any course / thesis credits in any of the semester(s) unless he/she has dropped that semester(s). iv. If the attendance of a B.Sc.(Ag.)/ M.Sc.(Ag.) student is less than 25% in any semester. v. If the two consecutive progress reports of a Ph.D. student are not satisfactory, or not submitted at all or his/her attendance is less than 75% in any semester / term. vi. On an act of indiscipline as per University rules.
10.5	ABSENCE FROM EXAMINATION
	A candidate who fails to appear at any of the examinations shall be marked absent and awarded ZERO mark in the Examination/s.
10.6	RE-ADMISSION
	Students who have failed to maintain the minimum prescribed GP/GPA/OGPA or who have been detained from appearing in the examination due to shortage of attendance may be readmitted (provided the attendance is more than 25%) on application, if otherwise eligible. A student can be readmitted only once in the same class.
10.6.1	RE ADMISSION OF A FAILED STUDENT
10.6.2	A B.Sc. (Ag.) student shall be readmitted in the same semester of the Academic year where studying and failed. He/ She shall be required to complete the degree programme within the maximum residential period prescribed to be counted from the date of his/her first admission.
10.6.3	A post graduate student (M.Sc. (Ag.)/ Ph.D.) may be readmitted in the current semester. He/ She shall be required to complete the degree programme within the maximum residential period prescribed to be counted from the date of his/her first admission.
10.6.4	READMISSION OF A STUDENT DETAINED FROM APPEARING IN EXAMINATIONS
	Students having at least 25% attendance in aggregate may be readmitted on application. Those having less than 25% attendance shall not be eligible for readmission. A B.Sc. (Ag.) student shall be readmitted in the same semester of the Academic year where detained where as a M.Sc. (Ag.)/Ph.D. student may be readmitted in the current semester.
10.6.5	In case a re-admitted student (readmitted on failure or after detention) fails again at the end of the academic year in the main as well as in the repeat examinations, he/she shall be removed from the rolls of the Institute.
10.7	DROPPING OF A COURSE
	A M.Sc.(Ag.)/Ph.D. student with approval of his/her supervisor and the Head of the Department may drop a course within 15 days of registration.
10.8	TEMPORARY WITHDRAWAL FROM STUDIES
	The Dean may allow temporary withdrawal to a student on any one of the following : <ul style="list-style-type: none"> i. Illness of self to be supported by medical certificate; ii. Death of parent/ Guardian or in the case of married student, the spouse. iii. Temporary withdrawal shall not be allowed for taking up any employment during the course programme. iv. An M.Sc.(Ag.) student who has completed all the requirements except the thesis submission may be allowed temporary withdrawal to take up any assignment provided his/her application has been approved and forwarded by the Supervisor & HOD. v. A Ph.D. student may be allowed temporary withdrawal to take up any assignment only when he/she has completed course work, course seminar, research work as per RPP as well as written and oral comprehensive examination, provided his/her application has been approved and forwarded by the RPC and D.R.C. vi. A student who has been allowed temporary withdrawal will complete his/her degree programme within the prescribed maximum registration period.

	<p>vii. During the period of withdrawal the candidates will not be required to pay any fee. However, fee already paid (temporary withdrawal involving part of a semester) shall not be refunded.</p> <p>viii. An undergraduate student who has been allowed temporary withdrawal shall join in the same semester where he/she was allowed to withdraw.</p> <p>ix. An M.Sc.(Ag.)/Ph.D. student shall have an option to join in the current semester.</p> <p>x. All such students who have been granted temporary withdrawal will join within five (5) days of the start of the semester.</p> <p>xi. An M.Sc.(Ag.) student will submit his/her application through his supervisor and the Head of the Department whereas a Ph.D. student will submit his/her application through the Supervisor RPC and DRC.</p> <p>xii. The temporary withdrawal shall not be granted in the First semester of Admission.</p> <p>xiii. The residential requirement of students allowed temporary withdrawal shall be automatically extended by the duration of the withdrawal. However, such candidates shall be required to complete the degree programme within the maximum period prescribed.</p>
10.9	SCRUTINY
	A student finding some discrepancy in his/her transcript will submit an application within two weeks from the date of declaration of his/her results to the Dean who will have the results scrutinized.
10.10	UNFAIR MEANS
	Students found using unfair means during any examination shall be punished as per the University Ordinances applicable at that time.
10.11	ATTENDANCE REQUIREMENT
	As per University rules
10.12	LEAVE OF A RESEARCH STUDENT
10.12.1	<p>Leave Rules</p> <p>(a) A Ph. D. scholar shall be eligible to avail a leave of 30 days in an academic year. He/she shall not be entitled for any inter-semester breaks, winter and summer vacations. However, he/she is entitled for an additional leave of up to 10 days on medical grounds in an academic year. The aforesaid leave provisions are cumulative. Further, male/female candidates shall be eligible for paternity/maternity leaves as per University rules once during their entire tenure as research scholars.</p> <p>(b) The leave shall be granted by the Head of the Department/Coordinator of the School/Centre on the recommendation of the supervisor/co-supervisor.</p>
10.12.2	LEAVE OF ABSENCE ON RESEARCH ASSIGNMENT
	After the approval of his/her synopsis a Ph.D. student may be allowed leave of absence for 15 days in a semester for carrying out research related work outside Varanasi. This period shall be counted while calculating his/her attendance. The student will submit his/her application to the Head of the Department through her RPC.
10.13	CONDUCT OF VIVA-VOCE (ORAL) EXAMINATION IN THE ABSENCE OF CHAIRMAN OF THE ADVISORY COMMITTEE / RPC.
10.13.1	In the absence of the Chairman the Viva-voce (Oral) examinations of M.Sc. (Ag.) and Ph.D. students shall be conducted under the Chairmanship of Co-supervisor, if any or the Head of the Department with prior permission of the competent authority.
10.13.2	In the absence of a member, the Chairman of the Advisory Committee / RPC will nominate another member(s) on the Advisory Committee / RPC in consultation with the Head of the Department. The name of the member will be recorded as additional name(s).
10.14	TITLE OF THE DEGREES
	The degrees to be awarded after the successful completion of various courses shall have the following titles.
10.14.1	B.Sc. (Ag.) Course: Bachelor of Sciences in Agriculture
10.14.2	Master of Science in Agriculture:

	<ul style="list-style-type: none"> (i) Agricultural Economics (ii) Agronomy (iii) Animal Husbandry and Dairying (iv) Entomology and Agricultural Zoology (v) Extension Education (vi) Genetics and Plant Breeding (vii) Horticulture (viii) Mycology and Plant Pathology (ix) Plant Physiology (x) Soil Science and Agricultural Chemistry
10.14.3	DOCTOR OF PHILOSOPHY DEGREE will be awarded in the same subject as given under clause 10.14.2 and in Agricultural Statistic, Soil & Water Conservation Engineering and Bio Process Engineering.
10.14.4	Specializations within a degree (M.Sc.(Ag.)/Ph.D.) may be indicated within the brackets suffixed after the degree.
10.15	COMMITTEES OF THE INSTITUTE / DEPARTMENT
10.15.1	INSTITUTE ADMISSION COMMITTEE
	The Admission Committee shall comprise the following:
	<ul style="list-style-type: none"> i. Director - Chairman ii. Dean iii. Two Senior Most Teachers of the rank of Professor iv. S.C. Representative v. S.T. Representative vi. Dy. Registrar – Secretary
10.15.2	ADMISSION COMMITTEE OF THE DEPARTMENT
	The Admission Committee shall comprise the following: <ul style="list-style-type: none"> i. Head of the Department – Chairman ii. Two Senior Most Teachers iii. S.C. Representative iv. S.T. Representative v. A permanent teacher to be co-opted on rotation basis to act as Secretary of the Committee.
10.15.3	BOARD OF EXAMINERS OF THE DEPARTMENT
	The Board of Examiners shall comprise the following: <ul style="list-style-type: none"> i. Head of the Department – Chairman ii. Two Senior Most Teachers

Note:

From the date when these Ordinances come into operation all previous ordinances on the subject shall cease to have effect. Provided that this revocation shall not affect the previous Ordinances so revoked or anything done or suffered under any previous Ordinance so revoked or affect any right, privilege, obligation or liability acquired, arrived or incurred under any Ordinance so revoked.

Notwithstanding anything contained in these Ordinances, any question which is not covered by these Ordinances or any difficulty arising out of these Ordinances, shall be dealt with by the Academic Council.

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DETAILS OF EXPERIENTIAL LEARNING COURSES

MODULE –I (CROP PRODUCTION)

AGR(E)-421-Integrated Farming System

5(0+5)

UNIT-I Terminology used in farming systems: Crop system, cropping system, Cropping pattern, Farming system, Specialized farming system (SFS), integrated Farming System (IFS)

UNIT-II Indices used in cropping systems and their application under field conditions: equivalent yield, system productivity, system profitability, land use efficiency, man days, net return, B: C ratio, land equivalent ratio, relative area time equivalent ratio, crowding co-efficient, competitive ratio, aggressiveness, actual yield loss, monetary advantage.

UNIT-III Farming system research: Concept, principles and objectives; steps involved in FSR.

UNIT-IV Integrated farming system: Goals, advantages and components. Integrated farming systems for different agro-climatic zones.

UNIT-V Development of Integrated farming system modules for small and marginal farmers under rainfed and irrigated eco-system.

Management of different components of IFS under actual field conditions: crop dairy, fishery, poultry backyard poultry, mushroom, orchard, value addition, year round production of green fodder, NADEP and vermicompost.

AGR(E) 422 -Water Management (Watershed, Micro-irrigation, Utilization of problematic water)

5(0+5)

UNIT-I Identification, handling, precaution and use of different instruments used in water management.

UNIT-II Soil moisture measurement: Soil moisture content (field method, gravimetric and volumetric method, neutron scattering method, time-domain reflectometry and capacitance sensor method) ; Soil moisture constants- field capacity, permanent wilting point and ultimate wilting point in soil (tensiometer, resistance block, pressure plate apparatus, psychrometer)

UNIT-III Rainfall measurement by rain gauge and problems on calculation of effective rainfall. Measurement of ET by lysimeter, field experimental plots, soil moisture depletion studies, open pan evaporimeter, and climatological (Thornwaite Blaney – Criddle, Pennam, Modified Pennam) methods.

UNIT-IV Scheduling of Irrigation by different methods viz., IW/CPE ratio, soil-cum sand mini plot technique. Problem on calculation of water use efficiency and water requirement in different crops/cropping system. Irrigation management under scarce water situations.

UNIT-V Measurement of irrigation water by direct (velocity area, flow meter, average cross section, trajectory measurement) and constriction flow (weirs, flumes, orifice) methods. Demonstration of surface, drip, sprinkler irrigation system and water saving technologies.

UNIT-VI Sewage water standards and laboratory determination of water quality (viz electrical conductivity, cations and anions, acidity/basicity, sodium absorption ratio) and their management.

UNIT-VII Drainage: Drainage coefficient, drainage requirement, preparation and maintenance of surface and subsurface drainage system. Hydrological unit of India, process of delineation of water shed and water shed management at micro-level.

3. *GPB (E)-421 Seed Production Technology 5(0+5)

(Cross listed with AGR)

UNIT-I: Test for genuineness of variety/hybrid and parental lines of important crops : Characterization of hybrids, varieties and parental lines through DUS testing & molecular markers, varietal identification through electrophoresis; Grow out test (GOT)

Seed testing : Seed sampling, seed heterogeneity, moisture test, physical purity analysis, determination of other species, genetic purity test, germination test, viability test, seed vigour test, seed health test, coated test, tolerance value, real value of seed, calculation of seed requirements of various crops based on test values.

UNIT-I: Seed production & processing : General principles and methods of seed production, maintenance of nucleus and breeder's seed, hybrid seed production techniques.

Seed production techniques of major field crops and vegetables. Layout of seed processing plant, seed blending, conditioning, seed drying, seed cleaning, grading.

Seed treatment, bagging and storage : Seed priming, treatment for breaking dormancy, Bacterial culture treatments, chilling treatment for vernalization effect, seed treatment for control of insect pest and disease, method of bagging, method of seed storage.

UNIT-I: Seed certification and legislation : Method of seed certification, field inspection, minimum certification standards, seed law enforcement, the protection of plant varieties and farmer's right act. Seed bill.

Visit to Seed Processing Units

SSC (E)-421 Biofertilizer

5(0+5)

UNIT I- Prospects of biofertilizers in India agriculture.

UNIT II- Microorganisms used as biofertilizer. Isolation of *Rizobium*, *Azotobacter*, *Azospirillum* and phosphate solubilizers in soils.

UNIT III- Identification, testing and selection of efficient strains.

UNIT IV- Quality of carrier materials. Preparation of carrier and liquid bacterial bio fertilizers formulation.

UNIT V- Testing of biofertilizers quality. Inoculation techniques, preparation of BGA and mycorrhizal cultures.

MODULE –II (CROP PROTECTION APICULTURE & MASROOM CULTUR)

EAZ (E) -421-Apiculture

5(0+5)

UNIT I- Apiculture – Scopes and prospects.

UNIT II- Identification, morphology, life history and structural adaptations of bees. Distinguishing bee castes.

UNIT III- Bee keeping appliances.

UNIT IV- Handling of honey bees – Hive and frame inspection. Apiary management practices – General colony management during different seasons. Recognition of bee pasturage.

UNIT V- Identification and management of bee pests and diseases.

UNIT VI- Honey extraction and processing. Other hive products – bees wax, pollen, bee venom, propolis and royal jelly – methods extraction and uses. Role of bees in cross pollination – their exploitation –

UNIT VII- Case studies with selected crops.

UNIT VIII- Production and marketing of quality, honey and value added honey products.

UNIT IX- Effect of agricultural inputs on bee activity – Symptoms of pesticide poisoning Visit to bee nursery and commercial apiaries.

2. *EAZ(E)-422-Bio-control Agents and Bio-pesticides

5(0+5)

Cross listed with MPP

- UNIT I-** Identification of common natural enemies (parasitoids, predators and pathogens) of crop pests and weeds.
- UNIT II-** Biology- parasitization/predatory potential of common parasitoids and predators.
- UNIT III-** Pathogenicity of virus, bacteria and fungi.
- UNIT IV-** Compatibility of biocontrol with botanicals and chemical pesticides. **UNIT V-** Mass production of predators, parasitoids and pathogens. Experiments to show the effect of Semiochemicals in host selection.
- UNIT VI-** Field release of biocontrol agents in the rice/sugarcane/pigeonpea/chickpea/mustard/tomato. Mass production of prebaceous mits, Visit to National/Commercial biocontrol laboratories.

MPP (E)-421- Mushroom Culture 0+5

- Unit-I** Preparation of culture media for mushrooms, preparation of mushroom culture by tissue culture and by spore print techniques, identification of edible and poisonous mushrooms, microbial contamination during spawn making and their solutions.
- Unit-II** Preventive measures adopted for mushroom spawn laboratory, layout of mushroom farm, mushroom spawn production.
- Unit-III** Formulation of compost and casing materials, preparation of compost by long and short methods, Compost suppliments, cultivation methods of white button mushroom (*Agaricus bisporus*) and oyster mushroom (*Pleurotus* spp.)
- Unit-IV** Cultivation method of milky (*Calocybe indica*), paddy straw (*Volvariella* spp.) and medicinal mushroom (*Ganoderma lucidum*), Preservation and processing of mushrooms.
- Unit-V** Identification and management of diseases of white button and oyster mushroom, insect pests, mites and nematodes of mushrooms, biotic abnormalities of mushrooms and their management. Observation and measurement of growth and yield of mushrooms. Improvement of mushroom strain and preparation of mushroom recipes.

***SSC(E)-422-Soil and Plant Health Clinic 5(0+5)**

Cross listed with (MPP, EAZ & PPH)

- UNIT-I** Collection of soil sample using G.P.S. and its processing. Soil testing for fertilizer recommendation. Soil testing for diagnosis of problems viz., salinity, sodicity, acidity etc. Survey and collection of plant samples related to nutritional disorders and their diagnosis.
- UNIT-II** Technique for collection & storage of plant samples. Ashing of plant samples. Ash analysis for different elements. Wet digestion of plant samples. Analysis of different elements in plant samples by chemical method. Flame photometry & atomic absorption spectrophotometer. Creation of deficiency & toxicity of some elements in crop plants & their tissue analysis.
- UNIT- III** Survey and collection of insect infested and diseased sample from various crops. Diagnosis of different insect pests and diseases. Seed health testing before sowing. Identification of new insect pests and plant pathogens.

MODULE –III HORTICULTURE

HOR(E)-421-Hi-tech Horticulture

5(0+5)

UNIT-I Nursery raising of high value flower and vegetable crops.

Off- season plants/plantlets production of horticultural crops.

Plant production in low cost in polythene bags and in plastic perforated trays.

Familiarization with construction materials of low cost shade nets and polyhouse.

Greenhouse design, structure and technology for production of high quality planting materials.

UNIT-II Use of various media in horticultural crops.

Raising foliage plants in low cost structures.

High density planting and management of horticultural crops.

Micro-irrigation and fertigation in horticultural crops.

Organic farming in horticulture.

UNIT-III Production of Gerbera under protected condition.

Production of cut roses in greenhouse.

UNIT-IV Hi-tech plant protection/IPM strategies in horticultural crops.

Recent developments in post-harvest management.

UNIT-V Standards and grades in horticultural produce and products.

Sanitary and phytosanitary measures for horticultural crops.

Knowledge about logistics and policies for Hi-tech horticulture.

UNIT-VI Visit to the Hi-tech horticulture units.

Visit to the Flower Export Oriented Units.

HOR(E)-422-Commercial Floriculture

5(0+5)

UNIT-I Identification of tools and implements

UNIT-II Nursery raising of flower crops

UNIT-III Bed preparation for rose cultivation

Selection of rose varieties and planting techniques

Care and management of rose plants

Harvesting and handling of rose flowers

UNIT-IV Selection of Gladiolus varieties, corms and corms treatment & planting techniques

Care and management of Gladiolus

Harvesting of Gladiolus spike, grading and post harvest management

Harvesting of corms, cleaning grading and storage

Field preparation for marigold cultivation

UNIT-V Marigold seedling treatment and transplanting

Pinching and weeding of marigold field

Marigold flower harvesting, grading and value addition of marigold

UNIT-VI Production of filler crops

Seed production of important flower crops

Production techniques of annual and perennial chrysanthemum

Value addition and flower arrangements

Production techniques of tuberose

UNIT-VIII Identification of pot plants, cut greens, foliage, succulents, high value foliages and palm, etc.

UNIT-VIII Visit to commercial flower production farm.

HOR (E)-423-Nursery Management of Horticultural Crops 5(0+5)

UNIT-I Method of plant propagation, sexual and asexual.

Layout of Model nursery of fruit crops.

Nursery and layout of annuals and perennials ornamental plants.

UNIT-II Crop calendar and nursery raising in vegetable crops.

Testing of seed viability and germination.

Seed treatment, stratification and scarification.

Use of plant growth regulators.

UNIT-III Raising root stock and propagules (Papaya) through seeds.

Multiplication of plants by cutting, layering, budding and grafting.

Propagation by modified root and stem.

UNIT-IV Propagation media, sterilization and bed preparation.

Plant propagation structure; net house, poly house, cold frame and hot frame.

UNIT-VI Hi-tech nursery and plant propagation through plugged plants.

UNIT-VII Lifting, packing, transport and marketing of nursery plants.

UNIT-VIII Visit to commercial nursery.

UNIT-IX Nursery Acts and Registration.

HOR(E)-424-Commercial Vegetable Production 5(0+5)

- UNIT-I** Different vegetable crops grown in India and preparation of vegetable calendar Identification of implements for vegetable gardening
- UNIT-II** Preparation of nursery bed(raised and flat bed) and seed/ soil treatment Raising of nursery of tomato, brinjal, chilli, onion cabbage and cauliflower
- UNIT-III** Selection of site and layout of the field
Application of manures and fertilizers
Transplanting /sowing of important vegetable crops
Development of irrigation schedule
- UNIT-IV** Application technique of herbicides, insecticides and fungicides
List of improved varieties of vegetable crops
List of important hybrid varieties of vegetables
- UNIT-V** To study the mode of reproduction in vegetable crops
Study the floral biology of vegetable crops
- UNIT-VI** Development of vegetable hybrid seeds
- UNIT-VII** Identification of warm season vegetable crops
- UNIT-VIII** Application techniques of plant growth substances and micronutrients
Determination of maturity indices in vegetable crops
Cost benefit ratio of different vegetable crops
- UNIT-IX** Techniques of seed production of important vegetable crops
Harvesting, cleaning, sorting, grading, and packaging of seeds
Prescribed field/ seed standards for vegetable seed production
- UNIT-X** Visit to commercial vegetable farm

MODULE –IV Basic Science

GPB(E)- 422 Molecular Breeding 5(0+5)

- UNIT-I:** Introduction to molecular plant breeding related laboratory equipments
- UNIT-II:** Demonstration of developed mapping population
- UNIT-III:** DNA isolation protocols
- UNIT-IV:** Handling of PCR
- UNIT-V:** Electrophoresis procedure
- UNIT-VI:** Computer based analysis of gel bands for mapping

***GPB (E)-423 Microbial Technology** **5(0+5)**
(Cross listed with MPP & SSC)

- UNIT-I** Isolation and cultivation of microorganisms (bacteria, fungi and algae)
- UNIT-II** MPN of *Azospirillum* and *Rhizobium*. Isolation of *Azotobacter* and PSM from typical soil.
- UNIT-III** Staining techniques and its application in identification.
Media formulation, microbial culture selection and optimization of fermentation process.
- UNIT-IV** Estimation of growth of bacteria using various methods. Determination of growth rate & generation time.
- UNIT-V** Evaluation of symbiotic nitrogen fixing ability in Rhizobium-legume association.
- UNIT-VI** Isolation of *Pseudomonas fluorescens* its mass production and delivery system.
Estimation of phytohormone production & phosphate solubilization.

GPB(E) 424 Recombinant DNA Technology (GPB) **5(0+5)**

- UNIT-I** Introduction to recombinant DNA technology & handling laboratory tools and equipments
- UNIT-II** Bacterial culture (*Agrobacterium*) procedure
- UNIT-III** DNA isolation, purification and quantification
- UNIT-IV** Agarose gel electrophoresis
- UNIT-V** PCR-machine (Thermocycler) and its application
- UNIT-VI** Blotting techniques

PPH(E)-421-Plant Tissue Culture (GPB, HORT. & PPH.) **5(0+5)**

*Cross listed with GPB & HOR

- UNIT-I** Basic requirements and knowledge of various equipments/accessories. Historical Perspectives.
Media preparation and sterilization techniques.
(a)- Media such as MS, Gamborges. Preparation stock solution.
(b)- Glassware and explants sterilization.
Induction of callus from different parts of germinating seedlings.
Organ cultures *in-vitro*.
Hormonal applications and micropopagation of selected ornamental and medicinal plant using different ex-plants:
(a) - Nodal segments
(b) – Shoot tips.
Abiotic stress tolerance in-vitro: salinity, drought etc.

UNIT-II Initiation of suspension culture, its measurement, selection of mutant cells *in vitro* from culture cells.

Embryogenesis in carrot culture

Micropopagation of turmeric/ginger/potato/banana

Isolation of virus free plant of potato/tomato/tobacco

Protoplast culture and somatic hybridization: isolation of protoplast and fusion of protoplast from two different plant species.

Anther pollen and embryo culture from rice: induction of androgenic callus, haploid production, colchiplodization.

Genetic transformation

Cryopreservation of important plant materials.

UNIT-III Regeneration protocol for:

(a) Ornamental crops: dahlia, chrysanthemum, tuberose, orchids, rose, carnation and gerbera.

(b) Fruit crops: banana, strawberry

(c) Vegetable crops: Asparagus, potato, sweet potato

Ovary and embryo culture for regeneration of interspecific crosses of horticultural crops. Anther culture (Cauliflower, broccoli, chillies, tomato, brinjal) and double haploid regeneration.

Visite to commercial micropopagation unit.

MODULE –V Agri-business Management

AEC (E)-421 Marketing Management

5(0+5)

- Unit-I :** Visit to regulated, cooperative and unregulated markets and preparation and presentation of project report.
- Unit-II:** Visit to organized retail market, corporate market and preparation and presentation of project report.
- Unit-III:** Visit of agro-based industries and documentation of marketing process, collection of marketing information.
- Unit-IV:** Documentation of product processing,
- Unit V:** Types of packaging materials used for packing of different products.
- Unit-VI:** Study of marketing channels.
- Unit-VII:** Marketing research, time series analysis, future trading etc.

AEC (E)-422 Financial Management of Agri-Business

5(0+5)

- Unit – I:** Visit to commercial banks, regional rural banks, NABARD, Cooperatives, NCDC and other financing agencies and preparation and presentation of report.
- Unit – II:** Visit to investment institution i.e. LIC, GIC, mutual funds, commercial bank, non-banking financial companies (NBFC), Agro-industries (Corporation, IDBI, IFCI, ICICI,SFCs, SIDCs) and micro-finance institution and preparation and presentation of report.
- Unit – III:** Preparation and presentation of financial statements-balance sheet, income statement, funds flow statement, cash flow statement.
- Unit – IV:** Financial statement analysis and presentation: ration analysis, time series analysis, common size analysis, du-pont-analysis, breakeven analysis, difficulties associated with financial statement analysis.
- Unit – V:** Analysis and presentation of capital budgeting, payback period, average rate of return, net present value, benefit cost ratio, internal rate of return.

EXT (E)-421

Project Formulation, Evaluation and Monitoring

5(0+5)

- UNIT-I** Fundamentals of Project formulation and management: Procedure

for application, Project Description, Funding Information, Project Management.

UNIT-II Area survey and data collection: Guidelines for Data collection, Socio-economics Survey Formate.

UNIT-III Model project proposal formulation: Preparation of Project, Designing Covering Letter, Preparation of Budget Estimate.

UNIT-IV The logical Framework Approach to Project Planning: Basics of Logical Framework Approach (LFA), Understanding LFA terms, Advantage of LFA.

UNIT-V Collection of project application formats: Information about Implementing Agency, Information about Project. Application formats of various funding agencies.

UNIT-VI Monitoring and evaluation of project: Concept of Monitoring and Evaluation, Procedure of Evaluation.

EXT (E) 422 Information and Communication Management 5(0+5)

UNIT-I Concept and rationale for Information Management in Agriculture in general and Agricultural Extension in particular;

UNIT-II The history of Information Communication Technologies for Development (ICT4D); Issues related to ICT4D; Cyber Extension; Computer Literacy, Information Literacy, Media Literacy, ;

UNIT-III ICT enabled initiatives for Agricultural Development at National and international level; Success stories of ICT use in rural India; Hole in the wall, cybermohalla, wall project, mapping the neighbourhood;

UNIT-IV Market intelligence for farmers; Role of ICT in Entrepreneurship Development in Agriculture; Market survey and financial analysis of projects; Business management; Case studies of ICT application by farmers;

UNIT-V Organisational support for extension functionaries for ICT application in Extension service; User friendly software's for Extension professionals;

UNIT-VI Hands on sessions for learning software packages; Project preparation by students;

UNIT-VII ICT mediated Knowledge management Experiments; Creation of crop specific knowledge models and portals for effective management of information.

MODULE –VI Bio Processing and Value Addition

ENG(E)-421 Processing and Value Addition of Cereals

5(0+5)

UNIT-I: Determination of moisture content using oven method. Determination of moisture content using moisture meter.

UNIT-II: Unit operation for processing of paddy such as cleaning, grading, milling. Rice milling – traditional and modern methods.

UNIT-III: Performance studies of separation methods. Determination of milling quality of paddy influenced by milling parameters.

UNIT-IV: To study different products from wheat.

UNIT-V: To study the storage characteristics of cereals such as rice, wheat. Visit to rice milling plants.

ENG(E)-422 Processing and Value Addition of Pulses and Oilseeds

5(0+5)

UNIT-I: To study the physical properties of pulses and oilseeds. Determination of moisture content using oven method. Determination of moisture content using moisture meter.

UNIT-II: Unit operations such as cleaning, grading, drying, milling of pulses and oilseeds. Performance studies of separation methods. Performance studies on grading equipment.

UNIT-III: Determination of milling quality of pulses influenced by milling parameters. Determination of oil expression/extraction quality of oilseeds influenced by different parameters.

UNIT-IV: To study the storage characteristics of pulses and oilseeds. Visit to Dal mill and Oil mill.

***ENG(E)-423 Processing and Value Addition of Fruits, Vegetables and Dairy Products**

5(0+5)

Cross Listed with HOR & AHD

UNIT-I: To study the physical properties of fruits and vegetables. Study of separation methods. Drying of fruits and vegetables. Performance study of fruits/vegetables washer and green pea sheller.

UNIT-II: Performance study of peeler. Load deformation characteristic of fruits/vegetables. To study the production of fruit juice, RTS and juice concentrate by using RO system.

UNIT-III: To study the production of squash, jelly, jam, marmalades, pickles, cordial, tomato and potato products and bio-safety concerns. Comparative study of packaging materials for fruits and vegetables and their products.

UNIT-IV: To study the storage characteristics of fruits and vegetables-common storage, zero energy cool chamber, cold storage, controlled atmosphere storage, modified atmosphere storage. Visit to fruit/vegetable factory. Visit to cold storage.

UNIT-V: To study processing of milk, production of traditional dairy products and improvement in their packaging. Visit of Dairy Plant.

ENG (E)-424 Processing and Value Addition Aromatic Plants and Spices 5(0+5)
(Cross listed with SSC)

UNIT-I Collection and grading of medicinal and aromatic plants (roots, bark, leaf, flower and seeds). Processing of medicinal plant parts: air drying, over (hot air) drying, lyophilization and grinding. Extraction of active parts: solvent extraction (soxhlet extraction), sonication, blending and super critical fluid extraction.

UNIT-II Formulation and bottling of bioactive constituents of plants. Testing of active ingredients: steroid, terpenoids, flavonoid and alkaloid. Collection and preservation of active parts of aromatic plants. Extraction of essential oils from aromatic plants: expression, distillation and solvent extraction. Bottling of essential oil. Analysis of chemical constituents of essential oils.