

SECOND OPEN CALL DOCUMENT FOR COURSE CONTENT CREATION & REVIEW OF UG E-COURSES

NAHEP Component 2A Project

Dr. Sudeep Marwaha, Dr. Shashi Dahiya, Dr. Anshu Bharadwaj

Investments in ICAR Leadership in Agricultural
Higher Education Component-2, NAHEP

(2020)

Second Call for Revision and Creation of UG e-Learning Courses under NAHEP-2 Subproject - "Investments in ICAR Leadership in Agricultural Higher Education"

Introduction

Education Division undertakes planning, development, coordination and quality assurance of higher agricultural education in the country, and thus, strives for maintaining and upgrading quality and its relevance. E-Learning plays a key role in delivering the quality education in scalable and flexible manner. It is a learning system based on formalized teaching with the help of electronic resources. It is one of the most engaging ways to study today. Since the learning is conducted online, students can study at their own pace and sometimes in their own time. It allows the teachers to reach out to a larger audience of students as compared to the traditional classroom where the number of students is restricted. Thus, a large number of learners have access to learning.

Several UG level e-Courseware contents were developed in seven disciplines (viz. Agricultural Science; Fisheries Science; Dairy Science; Veterinary & Animal Husbandry; Horticulture; Home Science and Agricultural Engineering). These were developed through partnerships and efforts of the components of the ICAR-Agricultural Universities (AUs) System comprising State Agricultural Universities (SAUs), deemed to be universities (DUs), Central Agricultural University (CAU) and Central Universities (CUs) with Agriculture Faculty at SAUs and other organizations under "National agricultural innovation Project".

E-Learning portal under NAHEP, Indian Council of Agricultural Research provides 24x7 services for online access to all the teachers, students and learners in the field of agricultural education. The courses then created under NAIP will be upgraded as per Fifth Dean Committee report and some new UG courses will be created under the light of NAHEP project funded by the World Bank.

Background

The mandate of ICAR/DARE includes promotion and coordination of education in agriculture, agro-forestry, animal husbandry, fisheries, home science and allied sciences in the country. ICAR, through series of efforts over years, brought about uniformity in norms and standards in academics, governance and finance management, quality and relevance of education, and policies on human resource development in the country. ICAR is now embarking upon an ambitious step in further strengthening the National Agricultural Education System in the country through National Agricultural Higher Education Project (NAHEP) with financial assistance of the World Bank by investing on infrastructure, competency and commitment of faculty, and attracting talented students to agriculture.

The Project "**Investments in ICAR Leadership in Agricultural Higher Education**" is a Component-2 NAHEP project funded by the World Bank. It belongs to the main priority area of strengthening of agricultural education system (ICAR and Agricultural Universities) in India. E-Learning activity is one of its major modules. Its major aim is to strengthen the Agricultural Higher Education in India. During Oct-Dec 2019, first open call was conducted for the creation of e-content for PG Courses.

The major objectives covered under First Open Call of the project at ICAR-IASRI are as follows:

- To develop the ICT infrastructure as technical assistance to Agricultural Universities
- To develop digital information systems for agricultural education, data collection, analysis and dissemination.
- To develop and implement next-generation management systems covering information in regard to procurement to contract management and financial management areas

Under the First Open Call, we invited applications from permanent teaching faculty of 45 agricultural universities to create 144 PG courses for establishment of E-Learning/m-learning systems through MOOC/LMS system for participating AUs is a major activity. The main objectives of E-Learning activity are:

- Revision of existing UG e-courses
- Development of e-courses for Under Graduates, Masters and PhD courses
- Deployment of e-courses on MOOC/LMS platform
-

Second E-Learning Call

The Second Open Call is meant for inviting the applications from permanent teaching faculty at Agricultural Universities and ICAR deemed universities/ ICAR institutes with at-least 5 years of experience in teaching/ research, for the upgradation and creation of already existing Undergraduate e-courses. Some of the already existing courses on "**e-krishishiksha**" portal will be upgraded as per Fifth Dean Committee Report. The selected courses are mentioned in Annexure-IVA. For each e-course, one Content Reviser and one Course Reviewer will be selected. The syllabus for the courses is as per the prescribed UG curricula and syllabi of the Education Division, ICAR, New Delhi. In Second Open Call we also invite applications for creating new UG courses. The selected courses are mentioned in Annexure-IVB. For each Course, one Content Creator and one Reviewer will be selected.

The Course Structure and format for upgrading the eLearning content and the Honorarium is given below. Interested faculty can send their essential particulars along with the name of Courses in which they are interested, in the Application Form attached as Annexure-V, or apply online.

Course Structure and Format to be used for Upgrading/Creating E-Course Content

1. Course Name, University/College Name, Department Name

2. Lecture -Wise breakup of the Course. (Around 10-15 Lectures)

3. Lecture Structure:

- Objectives of the Lecture in bullets (At least 2).
- Glossary of terms: 5-10 definitions of the main terms used in each Lecture.
- E-Lecture: E-Learning content of the Lecture containing the Text, Tables and labelled Pictures (The content should be more in bulleted form or small paragraphs rather than big paragraphs).
- Questions/Answers: At least 5-10 Questions (MCQ's, True/False, Fill Ups, Long answer type and short answer type) with their options and correct answers. (all the questionnaires are mandatory). At least 1 Assignment from each Lecture.
- A power point presentation for each Lecture of the course.
- Animations/ Explanatory Video (if any)

4. Format:

1. The e-Learning content should be created in MS-Word, using the font style: Times New Roman.
2. Title of Course and Lectures should be Bold and in 14 pts font size.
3. The text should be written in 12 pts font size.
4. All topics under the Lecture should have a Bold Heading and a Section No. (1, 2, 3...)
5. Sub-sections should be numbered as 1.1, 1.1.1 etc.

Table 1.: Honorarium and Time Duration

	Honorarium	Time Duration
Content Creator/ Reviser	Rs 15000 per Course	1 Month
Course Reviewer	Rs 15000 per Course	1 Month

**List of Courses to be Revised in Second Call
B.Sc (Agriculture)**

S.No	Course
1	Livestock Production and Management
2	Weed Management
3	Statistical Methods
4	Post-harvest Management and Value Addition of Fruits and Vegetables
5	Principles of Seed Technology
6	Principles of Genetics
6	Elementary Mathematics
8	Fundamentals of Biochemistry
9	Renewable Energy
10	Agricultural Microbiology
11	Agricultural Marketing Trade and Prices
12	Agricultural Finance & Cooperation
13	Water Management Including Micro Irrigation
14	Insect Morphology and Systematics

B.Tech (Agricultural Engineering)

S.No	Course
1	Computer programming and Data Structures
2	Watershed Hydrology
3	Human Engineering and Safety
4	Mechanics of Tillage and Traction
5	Food Packaging Technology
6	Strength of Material
7	Engineering Chemistry
8	Electrical Machines and Power Utilization
9	Surveying and Levelling
10	Design of Structures
11	Engineering Mechanics
12	Watershed Planning and Management
13	Soil Mechanics
14	Heat and Mass Transfer
15	Engineering Physics
16	Engineering Mathematics - I
17	Engineering Mathematics - III
18	Applied Electronics and Instrumentation
19	Engineering Mathematics-II
20	Dairy and Food Engineering
21	Agricultural Structures and Environmental Control
22	Irrigation Engineering
23	Drainage Engineering
24	Groundwater, Wells and Pumps
25	Theory of Machines
26	Machine Design
27	Farm Machinery and Equipment
28	Farm Machinery and Equipment-II
29	Tractor Systems and Controls

B.Tech (Dairy Technology)

S.no	Course
1	Engineering Drawing
2	Thermodynamics
3	Dairy Engineering
4	Food Engineering
5	Workshop Practice
6	Heat & Mass Transfer
7	Refrigeration & Air-Conditioning
8	Material Strength & Dairy Machine Design
9	Instrumentation and Process Control
10	Dairy Process Engineering
11	Dairy Plant Design and Layout
12	Fluid Mechanics
13	Starter Cultures and Fermented Milk Products
14	Industrial Statistics
15	Milk Production Management & Dairy Development
16	Marketing Management & International Trade
17	Fundamentals of Dairy Extension
18	Environmental Studies
19	Communication Skills
20	Economic Analysis
21	Financial Management & Cost Accounting
22	Entrepreneurship Dev. & Ind. Consultancy
23	Fundamentals of Microbiology
24	Food and Industrial Microbiology
25	Ice-cream & Frozen Deserts
26	Market Milk

27	Food Technology-I
28	By-Products Technology
29	Food Technology-II
30	Cheese Technology
31	Fat Rich Dairy Products
32	Packaging of Dairy Products
33	Chemical Quality Assurance
34	Food Chemistry
35	Organic Chemistry
36	Physical Chemistry of Milk
37	Chemistry of Milk

B.Sc (Horticulture)

S.No	Course
1	Elementary Statistics and Computer Application
2	Introductory Crop Physiology
3	Growth and Development of Horticultural Crops
4	Medicinal and Aromatic Crops
5	Commercial Floriculture
6	Ornamental Horticulture

7	Principles of Plant Breeding
8	Plantation Crops
9	Tropical and Subtropical Fruits
10	Breeding of Fruit And Plantation Crops
11	Seed Production of Vegetable, Tuber and Spice Crops
12	Fundamentals of Horticulture
13	Weed Management in Horticultural Crops
14	Temperate Fruit
15	Water Management in Horticultural Crops
16	Farm Power and Machinery
17	Fundamentals of Soil Science
18	Introductory Agro-Forestry
19	Introduction to Major Field Crops
20	Organic Farming
21	Soil Fertility and Nutrient Management
22	Fundamentals of Entomology
23	Fundamentals of Plant Pathology
24	Insect Pests of Vegetable, Ornamental and Spice Crops
25	Insect Pests of Fruit, Plantation, Medicinal and Aromatic Crops
26	Diseases of Fruit, Plantation and Medicinal and Aromatic Crops
27	Diseases of Vegetable, Ornamental and Spice Crops
28	Nematode Pests of Horticultural Crops and Their Management
29	Fundamentals of Food Technology
30	Fundamentals of Extension Education
31	Horti-Business Management
32	Spices and Condiments
33	Potato and Tuber Crops
34	Tropical and Subtropical Vegetable Crops
35	Breeding of Vegetable & Tuber and Spice Crops

B.F.Sc (Fisheries)

S.No	Course
1	Freshwater Aquaculture
2	Genetics and Breeding
3	Ornamental Fish Production and Management
4	Principles of Aquaculture
5	Coastal Aquaculture and Mariculture
6	Fish Nutrition and Feed Technology
7	Marine Biology
8	Oceanography
9	Limnology
10	Soil and Water Chemistry
11	Freezing Technology
12	Refrigeration and Equipment Engineering
13	Fishing Craft Technology
14	Aquaculture Engineering
15	Fisheries Economics
16	Fisheries Extension Education
17	Information and Communication Technology
18	Statistical Methods
19	Fish Population Dynamics and Stock Assessment
20	Physiology of Finfish and Shellfish
21	Taxonomy of Finfish
22	Fish Immunology
23	Taxonomy of Shellfish
24	Inland Fisheries

B.V.Sc (Veterinary Sciences)

S.No	Course
1	Animal Genetics and Breeding
2	Animal Nutrition
3	Veterinary Physiology
4	Livestock Production Management
5	Livestock Products Technology
6	Veterinary Anatomy
7	Veterinary and Animal Husbandry Extension Education
8	Veterinary Biochemistry
9	Veterinary Public Health and Epidemiology
10	Veterinary Surgery and Radiology
11	Veterinary Gynaecology and Obstetrics
12	Veterinary Medicine
13	Veterinary Microbiology
14	Veterinary Parasitology
15	Veterinary Pathology
16	Veterinary Pharmacology and Toxicology

B.Sc (Home Science)

S.No	Course
1	Developmental Assessment of Young Children
2	Food Toxicology
3	Food Preservation and Storage
4	Community Nutrition
5	Food Science and Processing
6	Normal and Therapeutic Nutrition
7	Food Standards and Quality Control
8	Housing and Space Management

9	Project Management
10	Computer Aided Interior Design
11	Instructional Video Production
12	Women In Agriculture
13	Public Relations and Social Marketing
14	Fashion Illustrations
15	Fundamentals of Clothing Construction
16	Introduction to Clinical Nutrition ~Clinical Nutrition

Annexure - IVB

List of UG Courses to be created in Second Call B.Sc (Agriculture)

S.No	Courses
1.	Introductory Agro meteorology& Climate Change
2.	Principles of Organic Farming
3.	Farm Management, Production & Resource Economics
4.	Problematic Soils and Their Management
5.	Communication Skills and Personality Development
6.	Environmental Studies and Disaster Management
7.	Introduction to Forestry
8.	Intellectual Property Rights
9.	Commercial Plant Breeding
10.	Food Safety and Standards
11.	Geoinformatics and Nanotechnology and Precision Farming

B.F.Sc (Fisheries Science)

S.No	Courses
1	Fisheries Business Management and Entrepreneurship Development
2	Fish Food Organisms
3	Therapeutics in Aquaculture
4	Aquatic Ecology, Biodiversity and Disaster Management
5	Fish Canning Technology
6	Fish Products and Value Addition
7	Fish By-Products and Waste Utilization
8	Quality Assurance of Fish and Fishery Products
9	Navigation and Seamanship
10	Fisheries Policy and Law
11	Fisheries Co-operatives and Marketing

B.Tech (Agricultural Engineering)

S.No	Courses
1	Building Construction and Cost Estimation
2	Thermodynamics, Refrigeration and Air Conditioning
3	Theory of Machines
4	Web Designing and Internet Applications
5	Artificial Intelligence
6	Environmental Science and Disaster Management
7	Sprinkler and Micro Irrigation Systems
8	Engineering Properties of Agricultural Produce
9	Bio-energy Systems: Design and Applications

10	Remote Sensing and GIS Applications
11	Management of Canal Irrigation System
12	Plastic Applications in Agriculture
13	Precision Farming Techniques for Protected Cultivation
14	Water Quality and Management Measures
15	Mechatronics

B.Sc (Home Science)

S.No	Courses
1	Diffusion and Adoption of Homestead Technologies
2	Textile Science and Fabric Care
3	Techniques of Fabric Construction
4	Ergonomics and Appropriate Technologies
5	Food and Nutrition Policy and Agriculture
6	Marriage and Family Dynamics
7	Elementary Statistics
8	Technical Writing (English)
9	Introduction to rural sociology

B.Tech (Dairy Technology)

S.No	Courses
1	Energy Conservation and Management
2	Quality and Safety Monitoring in Dairy Industry
3	Microbiology of Fluid Milk
4	ICT in Dairy Industry and Introduction to Operations Research
5	Nutraceuticals and Functional Foods
6	Emerging Dairy Processing Technologies

B.Sc (Horticulture)

S.No	Courses
1	Dryland Horticulture
2	Precision Farming and Protected Cultivation
3	Apiculture, Sericulture and Lac Culture
4	Agro-meteorology and Climate Change
5	Entrepreneurship Development & Business Management

B.Sc (Forestry)

S.No	Courses
1	Introduction to Forestry
2	Dendrology
3	Forest Botany
4	Basic Mathematics
5	Geology and Soils
6	Wildlife Biology
7	Recreation & Urban Forestry
8	Principles of Agroforestry
9	Wood Anatomy
10	Climate Science
11	Forest Ecology and Biodiversity
12	Introduction to Agronomy and Horticulture
13	Plantation Forestry
14	Silviculture of Indian Trees
15	Rangeland and Livestock Management

16	Non-Timber Forest Products
17	Seed Technology & Nursery Management
18	Plant Physiology
19	Soil Biology & Fertility
20	Forest Mensuration
21	Forest Extension & Community Forestry
22	Wood Products and Utilization
23	Forest Hydrology and Watershed Management
24	Restoration Ecology
25	Plant Biochemistry
26	Forest Tribology & Anthropology
27	Wood Science and Technology
28	Forest Survey & Engineering
29	Ornithology & Herpetology
30	Logging and Ergonomics
31	Forest Inventory and Yield Prediction
32	Forest Protection
33	Forest Management
34	Tree Improvement
35	Forest Economics and Marketing
36	Forest Laws, Legislation and Policies
37	Plant Cytology and Genetics
38	Entrepreneurship Development & Business Management
39	Forest Biotechnology
40	Certification of Forest Products
41	Agroforestry Systems and Management
42	Wildlife Management

42	Wildlife Management
43	Theory and Practice of Silviculture
44	Geomatics
45	Statistical Methods & Experimental Designs
46	Environmental Studies and Disaster Management
47	Ethnobotany, Medicinal and Aromatic Plants

B.Tech (Biotechnology)

S.No	Courses
1	Basic Botany
2	Basic Zoology
3	Basic Mathematics – I
4	Basic Mathematics – II
5	Economics and Marketing
6	Human Ethics
7	Agricultural Informatics
8	Cell Biology
9	Basic Genetics
10	Introduction to Biotechnology
11	Molecular Biology
12	Recombinant DNA Technology
13	Introductory Bioinformatics
14	Plant Genetic Transformation
15	Electronics and Instrumentation in Biotechnology
16	Classical and Molecular Cytogenetics
17	Immunology
18	Molecular Genetics

19	Nanobiotechnology
20	Animal Biotechnology
21	Molecular Marker Technology
22	Genomics and Proteomics
23	IPR, Biosafety and Bioethics
24	Computational Biology
25	General Biochemistry
26	Enzymology and Enzyme Technologies
27	Biodiversity and its Conservation
28	Microbiology
29	Microbial Genetics
30	Plant Tissue Culture and its Applications
31	Principles and Applications of Plant Genetic Transformation
32	Applications of Genomics and Proteomics
33	Molecular Breeding in Field Crops
34	Molecular Breeding of Horticultural Crops and Forest Trees
35	Epigenetics and Gene Regulation
36	Principles and Procedures of Animal Cell Culture
37	Animal Genomics
38	Embryo Transfer Technologies
39	Transgenic Animal Production
40	Molecular Diagnostics
41	Molecular Virology Production
42	Microbial Biotechnology
43	Bio-prospecting of Molecules and Genes
44	Molecular Ecology and Evolution
45	Fundamentals of Molecular Pharming and Biopharmaceuticals
46	Food Biotechnology
47	Green Biotechnology
48	Programming for Bioinformatics
49	Bioinformatics Tools and Biological Databases

39	Transgenic Animal Production
40	Molecular Diagnostics
41	Molecular Virology Production
42	Microbial Biotechnology
43	Bio-prospecting of Molecules and Genes
44	Molecular Ecology and Evolution
45	Fundamentals of Molecular Pharming and Biopharmaceuticals
46	Food Biotechnology
47	Green Biotechnology
48	Programming for Bioinformatics
49	Bioinformatics Tools and Biological Databases
50	Structural Bioinformatics
51	Pharmacogenomics
52	Metabolomics and System Biology
53	Computational Methods for Data Analysis
54	Plant Physiology
55	Biomathematics
56	Biophysics
57	Basic Statistics
58	Biostatistics
59	Crop Production Technology
60	Production Technologies for Horticultural Crops
61	Basics of Plant Breeding
62	Breeding of Field Crops
63	Fundamentals of Crop Production
64	Anatomy and Physiology of Livestock
65	Introduction to Animal Breeding
66	Livestock Production and Management
67	Livestock Product Technology
68	Animal Health Care