CURRICULUM

OF

AGRICULTURE EXTENSION

B.Sc (Hons)
M.Sc (Hons)

(Revised 2010)
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PREFACE

Curriculum of a subject is said to be the throbbing pulse of a nation. By looking at the curriculum one can judge the state of intellectual development and the state of progress of the nation. The world has turned into a global village; new ideas and information are pouring in like a stream. It is, therefore, imperative to update our curricula regularly by introducing the recent developments in the relevant fields of knowledge.

In exercise of the powers conferred by sub-section (1) of section 3 of the Federal Supervision of Curricula Textbooks and Maintenance of Standards of Education Act 1976, the Federal Government vide notification No. D773/76-JEA (cur.), dated December 4th 1976, appointed the University Grants Commission as the competent authority to look after the curriculum revision work beyond class XII at the bachelor level and onwards to all degrees, certificates and diplomas awarded by degree colleges, universities and other institutions of higher education.

In pursuance of the above decisions and directives, the Higher Education Commission (HEC) is continually performing curriculum revision in collaboration with universities. According to the decision of the special meeting of Vice-Chancellor's Committee, the curriculum of a subject must be reviewed after every 3 years.

A committee of experts comprising of conveners from the National Curriculum Revision of HEC in Agriculture met in 2009 and developed a unified template to standardize degree programs in the country to bring the national curriculum at par with international standards, and to fulfill the needs of the local industries. It also aimed to give a basic, broad based knowledge to the students to ensure the quality of education. The Bachelor (BS) degree shall be of 4 years duration, and will require the completion of 130-140 credit hours. For Agriculture degree programme 77% of the curriculum will consist of discipline specific and supporting Agriculture courses, and 23% will consist of compulsory and general courses.

For the purpose of curriculum revision various committees are constituted at the National level, comprising of senior teachers nominated by universities, degree awarding institutions, R&D organizations, respective accreditation councils and stake holders. The National Curriculum Revision Committee for Agriculture Extension in a meeting held on May 24-26, 2010 at HEC Regional Centre, Karachi in continuation of preliminary meeting held on December 2009 at HEC
Regional Center, Karachi, revised the curriculum in light of the unified template. The revised curriculum is being circulated for implementation in the concerned institutions.

PROF. DR. ALTAF ALI G. SHAIKH
Member Academics

March 2010
INTRODUCTION

The final meeting of National Curriculum Revision Committee (NCRC) was held at HEC Regional Center Karachi from May 24-26, 2010 to review and finalize the revised draft curriculum. The following experts attended the meeting.

Prof. Dr. Tanvir Ali
Convener
Director, Division of Education & Extension,
University of Agriculture, Faisalabad

Dr. M. Umar Mallah
Member
Professor & Chairman
Department of Agricultural Education Extension & Short Courses,
Sindh Agriculture University, Tandojam

Prof. Dr. Nowshad Khan
Member
Chairman
Department of Agricultural Sciences,
Allama Iqbal Open University, Islamabad

Prof. Dr. Muhammad Akram
Member
Professor
Department of Agricultural Extension Education & Communication,
Agricultural University, Peshawar

Dr. Waqar H. Malik
Member
National Agricultural Education Accreditation Council (NAEC),
House No. 103, St.81, E-11/2, Islamabad

Prof. Fazal Karim Rajput
Member
Ex-Convener (NCRC Agri.Extension)
House No. 1386, St No.89, I-10/1, Islamabad.

Dr. Ejaz Ashraf
Member
Assistant Professor
University College of Agriculture,
University of Sargodah, Sargodah
The meeting started with recitation from the Holy Quran by Prof (R) Fazal Karim Rajput. After the recitation, Muhammad Javed Khan, Advisor Academics, HEC, welcomed the participants and highlighted the importance of curriculum development process at national level. Dr. Khan gave a quick rundown of efforts made by HEC to promote Higher Education in Pakistan with special reference to the development of curriculum and its accreditation and uniformity. Dr. Tahir Shah, Deputy Director (Curriculum) HEC, briefed the participants about the outcomes of the Meeting of Deans/Convener of NCRC held at Islamabad on 17.10.2009. The technical proceedings of the meeting began with Prof. Dr. Tanvir Ali as Convener and Dr. Zaheeruddin Mirani as Secretary who were unanimously elected in NCRC preliminary meeting held on December 2009.

The participants reviewed each course keeping in view the comments of their colleagues at their respective universities/colleges. Accordingly, some courses were modified and some new courses were added to the curriculum in Agricultural Extension Education. The participants overwhelmingly emphasized the early registration of the national professional association of Agricultural Extension Education professionals proposed by the NCRC during 2005 and reinforced in NCRC meeting held on December 2009.

The house recommended that Dr. Nowshad Khan, Mr. Fazal Karim, Dr. Tahir Ali Shah, and Mr. Muhammad Ali will pursue the registration
process of the society. The participants hope that paper work for the registration of the Association will be completed by 7th of June, 2010. It was proposed that the office of the Association will initially be housed at AIOU, Islamabad and it will be shifted turn-wise to other universities of the country.

The Committee finalized the draft curriculum for Under-graduate and Post-graduate level for Agricultural Extension Education, assigned chapters among NCRC members to be written and published in textbooks, and suggested some recommendations to HEC. Finally, the meeting was concluded with the vote of thanks by the Chair.

Rationale

In order to spur agriculture growth, Agricultural Extension Education plays an important role. Development of agriculture requires promising technologies and innovations that result in farm productivity. The Research Wing of the Provincial Department of Agriculture, Pakistan Agricultural Research Council, and Agricultural Universities through their post-graduate programs and faculty research are involved in performing this function. The research findings are of no avail unless these are disseminated to the end users/farmers. The Agricultural Extension Wings of the Provincial Department of Agriculture in the country are dealing with the endeavor of educating farmers regarding the adoption of latest agricultural technologies and research recommendations. For this purpose, we require efficient and skilful extension workers who should be competent enough to motivate/convince farmers to fully understand and utilize the latest innovations in agriculture. The curriculum in the discipline of Agricultural Extension Education for B.Sc. (Hons) Agriculture Degree programs has therefore been updated to meet the present day needs of extension workers and farmers. Efforts have been made to make a world-class curriculum so that Pakistani students should be able to compete for the relevant jobs in international market.
## Template for 4-Year B.Sc. (Hons) in Agricultural Disciplines

### 1. Compulsory Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics / Biology (2 courses)</td>
<td>6</td>
<td>(3-0) (2-1)</td>
</tr>
<tr>
<td>Statistics 1 &amp; 2</td>
<td>6</td>
<td>(3-0) (3-0)</td>
</tr>
<tr>
<td>Computers / IT</td>
<td>3</td>
<td>(2-1)</td>
</tr>
<tr>
<td>Pakistan Studies</td>
<td>2</td>
<td>(2-0)</td>
</tr>
<tr>
<td>Islamic Studies</td>
<td>2</td>
<td>(2-0)</td>
</tr>
<tr>
<td>Communications Skills</td>
<td>3</td>
<td>(3-0)</td>
</tr>
<tr>
<td>English</td>
<td>3</td>
<td>(3-0)</td>
</tr>
<tr>
<td>Basic Agriculture</td>
<td>3</td>
<td>(2-1)</td>
</tr>
</tbody>
</table>

**Sub-Total 28**

### 2. Interdisciplinary Foundation Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agronomy</td>
<td>3</td>
<td>(2-1)</td>
</tr>
<tr>
<td>Plant Breeding &amp; Genetics</td>
<td>3</td>
<td>(2-1)</td>
</tr>
<tr>
<td>Entomology</td>
<td>3</td>
<td>(2-1)</td>
</tr>
<tr>
<td>Plant Pathology</td>
<td>3</td>
<td>(2-1)</td>
</tr>
<tr>
<td>Food Technology</td>
<td>3</td>
<td>(2-1)</td>
</tr>
<tr>
<td>Horticulture</td>
<td>3</td>
<td>(2-1)</td>
</tr>
<tr>
<td>Soil Sciences</td>
<td>3</td>
<td>(2-1)</td>
</tr>
<tr>
<td>Agriculture Economics</td>
<td>3</td>
<td>(2-1)</td>
</tr>
</tbody>
</table>

**Sub-Total 24**

### 3. Supporting Courses

(6-8 courses (3 Cr. hr) amongst below)

- Agriculture Extension
- Forestry & Range Management
- Animal Science
- Marketing & Agri Business
- Rural Development
- Human Nutrition
- Agriculture Chemistry
- Agriculture Engineering
- Water Management
- Any other discipline recommended by the university

**Sub-Total 18-24**
Sub-Total during the first four semesters
70-76
Semester 5, 6, 7 & 8 56-60
Project / Internship 04
Grand Total 130-140

- 1 credit of Theory = one contact hour per week for 16-18 weeks and 1 Practical/Lab hour = 3 contact hours per week for 16-18 weeks.
- In case of non availability of department of supporting courses, courses from foundation courses can be opted.

SCHEME OF STUDIES FOR GRADUATE COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AEE 301</td>
<td>Introduction to Agricultural Extension Education</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>AEE 401</td>
<td>Communication Skills in Agricultural Extension</td>
<td>3(2-1)</td>
</tr>
<tr>
<td>AEE 501</td>
<td>Extension Program Development</td>
<td>3(2-1)</td>
</tr>
<tr>
<td>AEE 502</td>
<td>Agricultural Extension Methods</td>
<td>4(3-1)</td>
</tr>
<tr>
<td>AEE 503</td>
<td>History and Philosophy of Agricultural Extension Education</td>
<td>4(4-0)</td>
</tr>
<tr>
<td>AEE 504</td>
<td>Computer Application in Agricultural Extension</td>
<td>3(1-2)</td>
</tr>
<tr>
<td>AEE 505</td>
<td>Rural Development Programs in Pakistan</td>
<td>4(3-1)</td>
</tr>
<tr>
<td>AEE 506</td>
<td>Psychology of Adult Learning</td>
<td>4(4-0)</td>
</tr>
<tr>
<td>AEE 507</td>
<td>Rural Youth in Agricultural Development</td>
<td>3(2-1)</td>
</tr>
<tr>
<td>AEE 508</td>
<td>Human Resource Management</td>
<td>4(3-1)</td>
</tr>
<tr>
<td>AEE 509</td>
<td>Dyadic Communication</td>
<td>3(2-1)</td>
</tr>
<tr>
<td>AEE 510</td>
<td>Introduction to Research Methods</td>
<td>4(3-1)</td>
</tr>
<tr>
<td>AEE 511</td>
<td>Emerging Issues in Agriculture and Technology Transfer</td>
<td>4(3-1)</td>
</tr>
<tr>
<td>AEE 512</td>
<td>Introduction to Program Evaluation</td>
<td>4(3-1)</td>
</tr>
<tr>
<td>AEE 513</td>
<td>Fundamentals of Agricultural Journalism</td>
<td>4(2-2)</td>
</tr>
<tr>
<td>AEE 514</td>
<td>Rural Development Through Agricultural Extension</td>
<td>3(3-0)</td>
</tr>
<tr>
<td>AEE 515</td>
<td>Internship</td>
<td>4(0-4)</td>
</tr>
</tbody>
</table>
DETAILS OF COURSES FOR UNDER-GRADUATE STUDIES IN AGRICULTURAL EXTENSION EDUCATION

AEE 301 INTRODUCTION TO AGRICULTURAL EXTENSION EDUCATION

Course Objectives
At the completion of this course, the students will be able to:
- Define the given concept of Agricultural Extension Education
- Describe principles of effective extension
- Identify the organizational set-up of agricultural extension
- Analyze barriers to communication

Theory

Books Recommended:
Course Objectives

At the completion of this course, the students will be able to:

- Define the given concepts of communication
- Identify the types of communication
- Conduct interviews
- Demonstrate improved communication skills

Theory

Concept, purpose and scope of communication in Agricultural Extension. Factors affecting communication fidelity. Types/forms of communication i.e. written, verbal, and non-verbal. Communication skills: Speaking, listening, writing and reading. Speaking---Face-to-Face communication. Preparing and delivering a speech. Conducting discussions and interviews including probing, counseling, appraisal, focus groups, and job interviews. Conducting extension meetings. Improving facilitation skills. Listening---Reasons for poor listening. Tips for improving listening skills. Writing---Art of good writing. Writing for newspapers and magazines. Writing letters, reports and articles frequently required for the job of an extension worker. Reading---Reasons for poor reading. Tips for developing effective reading skills. Use of audio-visual aids. Presentation skills.

Practical

Micro-teaching---Students will plan and practice extension teaching in small groups. They will also maintain a practical notebook regarding preparation of instructional designs.

Interviewing ---Students will interview farmers and extension workers to identify the problems.

Writing Skills---Students will prepare various entries of registers including stock register, store book, etc. and will prepare different type of reports required for the job of extension worker including maintenance of office records.
Books Recommended


AEE 501 EXTENSION PROGRAM DEVELOPMENT 3(2-1)

Course Objectives
At the completion of this course, the students will be able to:

- Define the given concept of program development
- Describe principles of effective program development
- Define basic concept of program monitoring and evaluation
- Analyze various program development models
- Plan an extension program

Theory
Program development; purpose, concept, scope, significance, assumptions, characteristics, and principles. Program development approaches and models. Steps in program development: Situation analysis, needs assessment, statement of objectives, and plan of work. Planning, implementing, monitoring and evaluating programs.

Practical
The students will conduct situation analysis and needs assessment. They will plan extension programs based on prioritized needs of extension clientele. They are required to submit a written report thereon.

Books Recommended

AEE 502    AGRICULTURAL EXTENSION METHODS    4(3-1)

Course Objectives
At the completion of this course, the students will be able to:
- Develop an instructional plan
- Select an appropriate extension method
- Apply the given extension method under the given situation
- Apply the teaching-learning process

Theory
Teaching as a process of facilitating learning, developing an instructional plan for extension teaching. Classification and critical analysis of extension methods. Planning, conducting and making follow up of various extension methods.

Practical
Each student will develop an instructional plan for a given extension-teaching situation. The student(s) will be involved in micro teaching/field situation concerning agricultural extension work.

Books Recommended

AEE 503    HISTORY AND PHILOSOPHY OF AGRICULTURAL EXTENSION EDUCATION    (4-0)

Course Objectives
At the completion of this course, the students will be able to:
- Explain the philosophical roots of Agricultural Extension Education
- Describe the historical perspective of Agricultural extension in the given era
- Analyze Islamic philosophy of extension education
Theory

Evolution of Agricultural Extension Worldwide. Historical perspective of Agricultural extension education in Pakistan. The past performance of various extension programs, systems and models practiced in Pakistan. The emergence of private sector extension in Pakistan including input manufacturing and supply agencies, commercial banks, NGO’s, private advisory services etc. Philosophy, its definition and branches. Philosophical foundation of agricultural extension education. Islamic bases and foundations of agricultural enterprises. Islamic philosophy of extension education.

Books Recommended


AEE 504 COMPUTER APPLICATION IN AGRICULTURAL EXTENSION 3(1-2)

Course Objectives

At the completion of this course, the students will be able to:
- Use software related to farm management
- Develop computer literacy
- Demonstrate computer skills

Theory

Importance of information and communication technologies in extension education. Developing computer files and data bases. Data communication and networks. Internet basics, E-commerce. MS-Office. MS-Project, Internet Browsers, Use of software for farm management. Browser of website related to agriculture. Use of search engines, email systems, and knowledge portals.
Practical
Students will be given assignments requiring the use of computer application in farm management and agricultural extension education.

Books Recommended

AEE 505 RURAL DEVELOPMENT PROGRAMS 4(3-1)
IN PAKISTAN

Course Objectives
At the completion of this course, the students will be able to:
- Describe philosophy of rural development programs
- Identify the key rural development programs
- Evaluate critically Government plans and policies related to rural development

Theory
Concept, philosophy, importance and objectives of rural development. Main approaches/programs of rural development in Pakistan i.e. V-AID, Basic democracies, rural works program, IRDP, social action program, village cooperatives, supervised credit schemes, participatory rural development projects, community based organizations. Current rural development programs: rural support programs and rural development programs of NGOs. A critical analysis of current government plans and policies for rural development. Emerging trends of rural development in Pakistan.

Practical
Each student will be assigned a project related to any important aspect of rural development. After completing the project, each student will write, submit, and present a comprehensive report on the given problem.
Books Recommended


AEE 506 PSYCHOLOGY OF ADULT LEARNING 4(4-0)

Course Objectives

At the completion of this course, the students will be able to:

- Describe the Psychology and discuss its application in Agricultural Extension
- Differentiate between active and passive learners
- Demonstrate the working knowledge of theories of learning
- Evaluate the learners achievement

Theory


Books Recommended

AEE 507  RURAL YOUTH IN AGRICULTURAL DEVELOPMENT  3(2-1)

Course Objectives
At the completion of this course, the students will be able to:
- Define the meaning and philosophy behind rural youth work
- Describe rural youth clubs/work in global perspective
- Developing guideline for involving youth in Agricultural Extension
- Establish and manage youth clubs for agricultural development

Theory

Practical
The students will be assigned projects involving youth in agricultural development and submit the report.

Books Recommended

AEE 508  HUMAN RESOURCE MANAGEMENT  4(3-1)

Course Objectives
At the completion of this course, the students will be able to:
- Develop the Job design and analyzing skills
- Analyze the management styles
- Resolve group conflict
- Manage human resources
Theory


Practical

The students will be required to analyze their own management style using various techniques and participatory approaches. The students will also be required to develop strategies to improve their management styles.

Books Recommended


AEE 509 DYADIC COMMUNICATION 3(2-1)

Course Objectives

At the completion of this course, the students will be able to:
- Describe the types of Interviews
- Develop questions for interviews
- Conduct interviews

Theory

Dyadic communication: its uses in Agricultural Extension Education. Informal face to face communication. Planning, conducting and interpreting various types of interviews: briefing, probing, selection, performance appraisal and discipline, counseling, persuasive, press conference and broadcast interviews. Principles and techniques of conducting interviews. The interview guide and the interview
schedule. Types of questions to be asked in interviews. Criteria for phrasing questions and question sequences.

**Practical**

Student(s) will plan and conduct interviews in the class in a simulated situation. Interviews will be recorded and discussed in the class.

**Books Recommended**


**AEE 510  INTRODUCTION TO RESEARCH METHODS  4(3-1)**

**Course Objectives**

At the completion of this course, the students will be able to:

- Describe the concepts and types
- Develop research instruments
- Develop plan of work for conducting research
- Apply research skills in real scenario

**Theory**

Concept of research. Types of research: basic, applied, action. Quantitative and Qualitative research. Developing a research synopsis. Research instruments (questionnaire, interview schedule, interview guide etc). Data collection, analysis and writing a report.

**Practical**

Each student will develop a questionnaire/interview schedule/interview guide for data collection. The student(s) will collect data on limited scale, analyze and submit the research report.

**Books Recommended**

AEE 511 AGRICULTURAL TECHNOLOGY TRANSFER  4(3-1)

Course Objectives
At the completion of this course, the students will be able to:

- Discuss the scope and importance of technology transfer
- Evaluate the technology transfer process
- Identify barriers to technology transfer
- Analyze issues in technology transfer

Theory

Practical
Students will be required to demonstrate/present promising technologies in the class.

Books Recommended
AEE 512  INTRODUCTION TO PROGRAM EVALUATION  4(3-1)

Course Objectives
At the completion of this course, the students will be able to:
- Define the basic concepts of evaluation
- Identify the types and forms of evaluation
- Analyze various evaluation techniques
- Develop plan of evaluation

Theory

Practical
The student(s) is required to submit an evaluation plan of any social/development program. The plan will then be presented before the classroom for critical analysis.

Books Recommended

AEE 513  FUNDAMENTALS OF AGRICULTURAL JOURNALISM  4(2-2)

Course Objectives
At the completion of this course, the students will be able to:
- Define the given concepts of Agricultural Journalism
- Develop news, news stories, and articles
- Criticize various news stories and articles
Theory

Practical
The student(s) will prepare and report agricultural information in the form of news, news stories, news articles, and/or documentaries.

Books Recommended

AEE 514 POVERTY ALLEVIATION AND SUSTAINABLE LIVELIHOODS

Course Objectives
At the completion of this course, the students will be able to:
- Describe the basic concepts poverty alleviation and livelihoods
- Analyze the role of Agricultural Extension in Rural development
- Discuss various projects/programs of rural development
- Evaluate the development efforts

Theory

Books Recommended

AEE-515 INTERNSHIP 4(0-4)

The students will be attached singly or in groups with the field staff of the Department of Agriculture (Extension), Nation Building Departments (NBDs), Non-Governmental Organizations (NGOs), etc. In addition, the students will pay study visits to various agricultural research stations and extension projects in the province/country with special reference to the following:

i. Field crop production and protection
ii. Farm machinery/workshops (tractors, threshers, etc.)
iii. Livestock and poultry management
iv. Farm forestry
v. Seed farms etc.
v. Fish farming
vii. Fruit and Vegetable production, preservation, processing (packages industry, cold storage, etc) and protection
viii. Manures/chemical fertilizers
ix. Soil reclamation and conservation (SCARP) projects
x. Water management/Irrigation department
xi. Maintenance of official records.
xii. Agriculture credit, business and marketing
xiii. Cooperatives
xiv. Rural Support Programs/NGOs etc.

Every student will write a comprehensive report based on his/her
field experiences, according to the following guidelines:

i. Introduction
ii. Objectives of apprenticeship training program
iii. Daily activity report
iv. Extension activities undertaken during training
v. Future plans for extension work in the area
vi. Problems faced by field staff (host institutes/department), farmers and internee
vii. Relationship of Agricultural Extension service with other nation building departments, agencies and stakeholders.
viii. Suggestions for improvement of internship program.
ix. Suggestions for the improvement of Agricultural Extension service.

Books Recommended

1. Manuals of Agriculture (Extension Services), published by the USAID Washington, D. C., USA.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>AEE 701</td>
<td>Agricultural Extension Methods</td>
<td>3(2-1)</td>
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<tr>
<td>AEE 702</td>
<td>Program Planning</td>
<td>4(3-1)</td>
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<tr>
<td>AEE 703</td>
<td>Supervised Field Experience</td>
<td>3(0-3)</td>
</tr>
<tr>
<td>AEE 704</td>
<td>Monitoring and Evaluation in Agricultural Extension</td>
<td>4(3-1)</td>
</tr>
<tr>
<td>AEE 705</td>
<td>Communication Strategies in Agricultural Extension</td>
<td>4(3-1)</td>
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<tr>
<td>AEE 706</td>
<td>Advanced Research Methods</td>
<td>4(3-1)</td>
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<tr>
<td>AEE 707</td>
<td>Scientific and Technical Writing</td>
<td>4(3-1)</td>
</tr>
<tr>
<td>AEE 708</td>
<td>Applications of Information and Communication Technologies in Agricultural Extension</td>
<td>4(2-2)</td>
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<tr>
<td>AEE 709</td>
<td>Human Resource Development</td>
<td>3(2-1)</td>
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<tr>
<td>AEE 710</td>
<td>Community Development and Gender Issues</td>
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<td>AEE 711</td>
<td>International Agricultural Extension Systems</td>
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<td>AEE 712</td>
<td>Adult and Continuing Education</td>
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<td>AEE 713</td>
<td>Administration and Supervision in Agricultural Extension</td>
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<td>AEE 714</td>
<td>Special Problem</td>
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<td>AEE 716</td>
<td>Dissertation and Research</td>
<td>10(0-1)</td>
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DETAIL OF COURSES
FOR POST-GRADUATE STUDIES IN
AGRICULTURAL EXTENSION EDUCATION

AEE 701    AGRICULTURAL EXTENSION METHODS  3(2-1)

Course Objectives
At the completion of this course, the students will be able to:
• Identify various extension teaching methods
• Analyze the strengths and weakness of various extension teaching methods
• Practice teaching methods in real field like situation
• Identify ways of involving local institutions in extension teaching

Theory
Extension teaching methods, their merits, demerits, and applicability. Effects of various extension teaching methods at different stages of adoption of farm and home practices. Personal versus impersonal extension teaching methods and their significance. Ways of involving local institutions in extension teaching. Critical analysis of alternative extension methods. Recent advances in agricultural extension methods.

Practical
Students will plan, analyze, and apply given extension teaching method(s) in the simulated situation.

Books Recommended:

AEE 702    PROGRAM PLANNING  4(3-1)

Course Objectives
At the completion of this course, the students will be able to:
• Define the concepts, scope and role of program planning
• Analyze the role of change agents in program planning
• Differentiate between the long-term and short-term program planning
• Describe various program planning models in Extension

Theory
Planning for social change; Planned versus un-planned change; Democratic versus autocratic program planning; Planning Extension Education Programs. Involving grass-roots in the planning process. Role of change agents (Extension workers) in program planning. Identifying the gaps between planning theories and practices. Long-term, short-term, tactical, and strategic planning. Program planning models: review, analysis, and application.

Practical
The students will be given assignments to plan an agricultural extension education program for a typical Pakistani village/farming community and will make presentation.

Books Recommended:

AEE 703 SUPERVISED FIELD EXPERIENCE 3(0-3)

Course Objectives
At the completion of this course, the students will be able to:
• Observe and participate in real-life learning experience
• Develop on-the-job skills
• Develop report writing and presentation skills

Practical
The students will be attached with experienced extension/development workers to learn on-the-job skills and gain experience in practical settings. Each student will observe/participate and report the activities carried out during two weeks period. The
student(s) will be required to make a presentation in the class.

Books Recommended:

2. Swanson, B.E. et.al. 1997 Improving Agricultural Extension. F.A.Q. Rome, Italy

AEE 704 MONITORING AND EVALUATION IN AGRICULTURAL EXTENSION

Course Objectives

At the completion of this course, the students will be able to:

- Define the concepts, scope and role of monitoring and evaluation
- Analyze the importance of evaluation for the future programs
- Develop data collection and analysis procedures for program evaluation

Theory


Practical

The students will be required to review critically monitoring and evaluation reports of development/research projects. They have to identify strengths and weaknesses of the report(s). Each student will select an extension program/project/activity for evaluation. The student(s) will plan and conduct evaluation and submit the report to the concerned teacher.

Books Recommended

publishers, USA.

AEE 705 COMMUNICATION STRATEGIES IN AGRICULTURAL EXTENSION

Course Objectives
At the completion of this course, the students will be able to:
- Identify and define the communication process and models
- Analyze the components of an effective message
- Design and apply various communication methods
- Analyze various barriers to communication

Theory
Defining communication process. Models of communication. Variables in communication process: source variables, receiver variables such as demographic analysis, personality analysis, interpersonal trust, listening ability and feed-back, and verbal message variables. The components of a persuasive message, factors affecting persuasive message, structuring a persuasive message. Non-verbal message variables and difficulties in their understanding. Non-verbal communication, functions of non-verbal communication, non-verbal communication as a global approach. Obstacles to effective communication. Horizontal and vertical communication. The structures of communication process; face to face communication, small group communication, public address communication, mass communication.

Practical
Visits to various Media Centers and holding discussions with media personnel. Participation of students in various communication situations and presenting the results before the class.

Books Recommended

AEE 706 ADVANCED RESEARCH METHODS 4(3-1)

Course Objectives
At the completion of this course, the students will be able to:

- Identify research problem
- Analyze and interpret research data
- Critically analyze various methods of qualitative and quantitative research
- Apply various research designs

Theory

Practical
The students will be engaged to prepare and present their brief research proposals and plan and conduct pilot studies.

Books Recommended
AEE-707  SCIENTIFIC AND TECHNICAL WRITING  4(1-3)

Course Objectives
At the completion of this course, the students will be able to:
- Apply scientific writing skills in their fields
- Identify various formats of research report writing
- Develop report writing and presentation skills
- Present research reports at appropriate forums

Theory
Writing as means of communication in professional and scientific fields. Differences between scientific and general audience writing. Alternative requirements and formats of synopses, theses, technical articles and research papers. Introduction to American Psychological Association (APA) and Council of Biological Editors (CBE) style manuals.

Practical
Every student will be required to write technical articles/reports on given topics and present in the class. Moreover, they will critically evaluate and edit reports prepared by other students and present it.

Books Recommended

AEE 708  APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN AGRICULTURAL EXTENSION  4(2-2)

Course Objectives
At the completion of this course, the students will be able to:
- Compare the role of various extension teaching methods
- Determine role of GIS and remote sensing in extension education
- Use given information technology for extension work
Theory
Overview of technologies used in extension programs (Teaching Aids like multimedia projectors, computers and internet), use of databases for agriculture products, computerized weather forecasting and usage, computerized map reading and interpretation, color coding, spectroscopic study. Introduction to remote sensing & geographical information systems (GIS) for Agricultural Extension Education. Role of remote sensing & GIS for agricultural resource management and rural development. Computerized mass media applications in Agricultural Extension Education: teleconferencing, e-conferencing, knowledge portal, e-office, e-agriculture, e-business etc. Use of mobile communication for agricultural development and business.

Practical
Student will be given hands-on experience in above mentioned technologies

Books Recommended
2. Geographical Information Systems – Principles, Techniques, Applications and Management, Edited by Paul A. Longley, Michael Goodchild, David Maguire and David W. Rhind, Publisher - John Wiley and Sons
3. An Introduction to Geographical Information Systems, By Ian Heywood, Sarah Cornelius and Steve Carver, Publisher - Addison Wesley Longman Limited, New York

AEE 709 HUMAN RESOURCE DEVELOPMENT 3(2-1)

Course Objectives
At the completion of this course, the students will be able to:
- Discuss concept and role of human resource development
- Organize training programs
- Manage training programs
- Evaluate training programs

Theory
Concept of Human Resource Development (HRD). Purpose of
training. Types of training i.e. pre-service, in-service, and follow-up. Determining training needs; Organizing, supervising and managing training programs; Human relations training; identifying requirements. Training of Trainers: selecting, planning, and implementing training programs; Duties and responsibilities of trainers; Evaluating the training programs: performance appraisal, job satisfaction, career planning, conflict management and resolution.

**Practical**

Student will plan and conduct a training program for a given situation.

**Books Recommended**


**AEE 710 COMMUNITY DEVELOPMENT AND GENDER ISSUES**

**Course Objectives**

At the completion of this course, the students will be able to:

- Define the given concepts of community development process
- Determine essential elements of community development
- Discuss socio-cultural constraints to gender mainstreaming
- Describe the role of women in community development

**Theory**

Books Recommended:

AEE-711 INTERNATIONAL AGRICULTURAL EXTENSION SYSTEMS

Course Objectives
At the completion of this course, the students will be able to:
- Compare extension systems in selected countries
- Analyze strengths and weakness of the extension system in the given country
- Describe limitations of agricultural extension services

Theory
Agricultural Extension in Bangladesh; Farmers' Association in Malaysia; Agricultural Development through the participation of small farmers in Afghanistan; Farmers' training and functional literacy in India; Farmers' training programs in Asia with special reference to small farmers. Agricultural extension service in Japan with special reference to training of rural youth; Farmers’ education services in selected Asian countries. Agricultural extension system in developed countries i.e. USA, Canada, UK, China etc.

Practical
The students will compare extension systems in two different countries and present it in the class.

Books Recommended:
AEE 712  ADULT AND CONTINUING EDUCATION  3(3-0)

Course Objectives
At the completion of this course, the students will be able to:
- Narrate the significance of adult education in agriculture
- Describe basic principles of adult education programs
- Select appropriate method(s) of adult education for the given situation
- Demonstrate the use of given adult education method
- Monitor and evaluate adult education programs

Theory
The nature, extent and significance of adult education with special reference to agriculture. Characteristics of adults; Recent trends in adult education; Principles involved in educating adults; Selecting, suitable methods for teaching adults; Nature of adult education programs in agricultural development; Contribution of adult education to agricultural development; Monitoring and evaluation of adult education programs.

Books Recommended:

AEE 713  ADMINISTRATION AND SUPERVISION IN  4(4-0) AGRICULTURAL EXTENSION

Course Objectives
At the completion of this course, the students will be able to:
- Define basic concepts of administration and supervision in extension education
- Practice coordination between national building departments
- Apply basic principles of supervision in real life situation
- Appraisal of various administrative tasks in extension

Theory
Meaning and objectives of extension administration. The organization and administration of extension at different administrative tiers.
Coordinative capacity of the Department of Agriculture (Extension) with the nation building departments, research organizations and related universities. Role of the different administrative heads (Agri. Extension) in planning and coordinating resources and delegation of authority. Meaning and objectives of supervision. Principles of supervision. Staff recruitment, placement, training programs, counseling, job description, ranks, promotion and salary adjustment. Effective team building. Leadership vs management. Leadership theories and styles. Appraisal and improvement of administrative and supervisory activities.

**Books Recommended:**


**AEE 714 SPECIAL PROBLEM 1(0-1)**

**Practical**

A study of problem(s) of special concern assigned to the student in Agricultural Extension

**AEE 715 SEMINAR 1(0-1)**

**Practical**

Students will prepare paper on assigned topic and deliver seminar in given situation
Annexure - A

DETAILS OF COMPULSORY COURSES
COMPULSORY COURSES IN ENGLISH FOR
Undergraduate Level

English I (Functional English) Credit Hrs. 3

Objectives: Enhance language skills and develop critical thinking.

Course Contents
- Basics of Grammar
- Parts of speech and use of articles
- Sentence structure, active and passive voice
- Practice in unified sentence
- Analysis of phrase, clause and sentence structure
- Transitive and intransitive verbs
- Punctuation and spelling

Comprehension
Answers to questions on a given text

Discussion
General topics and every-day conversation (topics for discussion to be at the discretion of the teacher keeping in view the level of students)

Listening
To be improved by showing documentaries/films carefully selected by subject teachers

Translation skills

Urdu to English

Paragraph writing
Topics to be chosen at the discretion of the teacher

Presentation skills
Introduction

Note: Extensive reading is required for vocabulary building
Recommended books

1. **Functional English**
   
a) **Grammar**

b) **Writing**

c) **Reading/Comprehension**

d) **Speaking**

**English II (Communication Skills) Credit Hrs. 3**

**Objectives:** Enable the students to meet their real life communication needs.

**Course Contents**

**Paragraph writing**

Practice in writing a good, unified and coherent paragraph

**Essay writing**

Introduction

**CV and job application**

Translation skills
Urdu to English

40
Study skills
Skimming and scanning, intensive and extensive, and speed reading, summary and précis writing and comprehension

Academic skills
Letter/memo writing, minutes of meetings, use of library and internet

Presentation skills
Personality development (emphasis on content, style and pronunciation)

Note: documentaries to be shown for discussion and review

Recommended books:

Communication Skills

a) Grammar

b) Writing

c) Reading
2. Reading and Study Skills by John Langan
3. Study Skills by Riachard Yorky.
English III (Technical Writing and Presentation Skills) Crh. 3

Objectives: Enhance language skills and develop critical thinking

Course Contents

Presentation skills

Essay writing
Descriptive, narrative, discursive, argumentative

Academic writing
How to write a proposal for research paper/term paper
How to write a research paper/term paper (emphasis on style, content, language, form, clarity, consistency)

Technical Report writing
Progress report writing

Note: Extensive reading is required for vocabulary building

Recommended books:

Technical Writing and Presentation Skills

a) Essay Writing and Academic Writing

b) Presentation Skills

c) Reading
The Mercury Reader. A Custom Publication. Compiled by norther Illinois University. General Editors: Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharton. (A reader which will give students exposure to the best of twentieth century literature, without taxing the taste of engineering students).
Annexure - B

ISLAMIC STUDIES
(Compulsory)

Objectives:
This course is aimed at:
1 To provide Basic information about Islamic Studies
2 To enhance understanding of the students regarding Islamic Civilization
3 To improve Students skill to perform prayers and other worships
4 To enhance the skill of the students for understanding of issues related to faith and religious life.

Detail of Courses
Introduction to Quranic Studies
1) Basic Concepts of Quran
2) History of Quran
3) Uloom-ul -Quran

Study of Selected Text of Holly Quran
1) Verses of Surah Al-Baqra Related to Faith(Verse No-284-286)
2) Verses of Surah Al-Hujrat Related to Adab Al-Nabi (Verse No-1-18)
3) Verses of Surah Al-Munanoon Related to Characteristics of faithful (Verse No-1-11)
4) Verses of Surah al-Furqan Related to Social Ethics (Verse No.63-77)
5) Verses of Surah Al-Inam Related to Ihkam(Verse No-152-154)

Study of Selected Text of Holly Quran
1) Verses of Surah Al-Ihzab Related to Adab al-Nabi (Verse No.6,21,40,56,57,58.)
2) Verses of Surah Al-Hashar (18,19,20) Related to thinking, Day of Judgment
3) Verses of Surah Al-Saf Related to Tafakar,Tadabar (Verse No-1,14)

Seerat of Holy Prophet (S.A.W) I
1) Life of Muhammad Bin Abdullah ( Before Prophet Hood)
2) Life of Holy Prophet (S.A.W) in Makkah
3) Important Lessons Derived from the life of Holy Prophet in Makkah

Seerat of Holy Prophet (S.A.W) II
1) Life of Holy Prophet (S.A.W) in Madina
2) Important Events of Life Holy Prophet in Madina
3) Important Lessons Derived from the life of Holy Prophet in Madina

Introduction To Sunnah
1) Basic Concepts of Hadith
2) History of Hadith
3) Kinds of Hadith
4) Ulom –ul-Hadith
5) Sunnah & Hadith
6) Legal Position of Sunnah

Selected Study from Text of Hadith

Introduction To Islamic Law & Jurisprudence
1) Basic Concepts of Islamic Law & Jurisprudence
2) History & Importance of Islamic Law & Jurisprudence
3) Sources of Islamic Law & Jurisprudence
4) Nature of Differences in Islamic Law
5) Islam and Sectarianism

Islamic Culture & Civilization
1) Basic Concepts of Islamic Culture & Civilization
2) Historical Development of Islamic Culture & Civilization
3) Characteristics of Islamic Culture & Civilization
4) Islamic Culture & Civilization and Contemporary Issues

Islam & Science
1) Basic Concepts of Islam & Science
2) Contributions of Muslims in the Development of Science
3) Quranic & Science

Islamic Economic System
1) Basic Concepts of Islamic Economic System
2) Means of Distribution of wealth in Islamic Economics
3) Islamic Concept of Riba
4) Islamic Ways of Trade & Commerce
Political System of Islam
1) Basic Concepts of Islamic Political System
2) Islamic Concept of Sovereignty
3) Basic Institutions ofGovt. in Islam

Islamic History
1) Period of Khilafat-E-Rashida
2) Period of Ummayyads
3) Period of Abbasids

Social System of Islam
1) Basic Concepts of Social System of Islam
2) Elements of Family
3) Ethical Values of Islam

Reference Books:
1) Hameedullah Muhammad, “Emergence of Islam”, IRI, Islamabad
2) Hameedullah Muhammad, “Muslim Conduct of State”
3) Hameedullah Muhammad, “Introduction to Islam”
4) Mulana Muhammad Yousaf Islahi,”
6) Ahmad Hasan, “Principles of Islamic Jurisprudence” Islamic Research Institute, International Islamic University, Islamabad (1993)
9) Dr. Muhammad Zia-ul-Haq, “Introduction to Al Sharia Al Islamia” Allama Iqbal Open University, Islamabad (2001)
Introduction/Objectives

- Develop vision of historical perspective, government, politics, contemporary Pakistan, ideological background of Pakistan.
- Study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

Course Outline

1. Historical Perspective
   b. Factors leading to Muslim separatism
   c. People and Land
      i. Indus Civilization
      ii. Muslim advent
      iii. Location and geo-physical features.

2. Government and Politics in Pakistan
   Political and constitutional phases:
   a. 1947-58
   b. 1958-71
   c. 1971-77
   d. 1977-88
   e. 1988-99
   f. 1999 onward

3. Contemporary Pakistan
   a. Economic institutions and issues
   b. Society and social structure
   c. Ethnicity
   d. Foreign policy of Pakistan and challenges
   e. Futuristic outlook of Pakistan
Books Recommended

COMPULSORY MATHEMATICS
COURSES FOR B.Sc (Hons) AGRICULTURE

1. MATHEMATICS I (ALGEBRA)

Prerequisite(s): Mathematics at secondary level

Credit Hours: 3 + 0

Specific Objectives of the Course: To prepare the students, not majoring in mathematics, with the essential tools of algebra to apply the concepts and the techniques in their respective disciplines.

Course Outline:

Preliminaries: Real-number system, complex numbers, introduction to sets, set operations, functions, types of functions.

Matrices: Introduction to matrices, types, matrix inverse, determinants, system of linear equations, Cramer’s rule.

Quadratic Equations: Solution of quadratic equations, qualitative analysis of roots of a quadratic equations, equations reducible to quadratic equations, cube roots of unity, relation between roots and coefficients of quadratic equations.

Sequences and Series: Arithmetic progression, geometric progression, harmonic progression.

Binomial Theorem: Introduction to mathematical induction, binomial theorem with rational and irrational indices.

Trigonometry: Fundamentals of trigonometry, trigonometric identities.

Recommended Books:

Dolciani MP, Wooton W, Beckenback EF, Sharron S, Algebra 2 and Trigonometry, 1978, Houghton & Mifflin,

Kaufmann JE, College Algebra and Trigonometry, 1987, PWS-Kent Company, Boston
2. MATHEMATICS II (CALCULUS)

Prerequisite(s): Mathematics I (Algebra)

Credit Hours: 3 + 0

Specific Objectives of the Course: To prepare the students, not majoring in mathematics, with the essential tools of calculus to apply the concepts and the techniques in their respective disciplines.

Course Outline:

Preliminaries: Real-number line, functions and their graphs, solution of equations involving absolute values, inequalities.

Limits and Continuity: Limit of a function, left-hand and right-hand limits, continuity, continuous functions.

Derivatives and their Applications: Differentiable functions, differentiation of polynomial, rational and transcendental functions, derivatives.

Integration and Definite Integrals: Techniques of evaluating indefinite integrals, integration by substitution, integration by parts, change of variables in indefinite integrals.

Recommended Books:
Thomas GB, Finney AR, Calculus (11th edition), 2005, Addison-Wesley, Reading, Ma, USA

3. MATHEMATICS III (GEOMETRY)

Prerequisite(s): Mathematics II (Calculus)

Credit Hours: 3 + 0

Specific Objectives of the Course: To prepare the students, not majoring in mathematics, with the essential tools of geometry to apply the concepts and the techniques in their respective disciplines.
Course Outline:

Geometry in Two Dimensions: Cartesian-coördinate mesh, slope of a line, equation of a line, parallel and perpendicular lines, various forms of equation of a line, intersection of two lines, angle between two lines, distance between two points, distance between a point and a line.

Circle: Equation of a circle, circles determined by various conditions, intersection of lines and circles, locus of a point in various conditions.

Conic Sections: Parabola, ellipse, hyperbola, the general-second-degree equation

Recommended Books

Kaufmann JE, College Algebra and Trigonometry, 1987, PWS-Kent Company, Boston

Note:

1. Two courses will be selected from the following three courses of Mathematics.

2. Universities may make necessary changes in the courses according to the requirement as decided by the Board of Studies.
Annexure - E

Statistics-I

Credit 3 (2-1)

Definition and importance of Statistics in Agriculture, Data Different types of data and variables

Classification and Tabulation of data, Frequency distribution, stem-and-Leaf diagram, Graphical representation of data Histogram, frequency polygon, frequency curve.

Measure of Central tendency, Definition and calculation of Arithmetic mean, Geometric mean, Harmonic mean, Median quantiles and Mode in grouped and ungrouped data.

Measure of Dispersion, Definition and Calculation of Range, quartile deviation, Mean deviation, Standard deviation and variance, coefficient of variation.

Practicals
a. Frequency Distribution
b. Stem-and-Leaf diagram
c. Various types of Graphs
d. Mean, Geometric mean Harmonic Mean,
e. Median, Quartiles Deviation, mean Deviation.
f. Standard Deviation, Variance, Coefficient of variation,
g. Skewness and kensosis

Book Recommended
1. Introduction to Statistical Theory Part- I by Sher Muhammad and Dr. Shahid Kamal (Latest Edition)
2. Statistical Methods and Data Analysis by Dr. Faquir Muhammad
Statistics-II

Credit 3 (2-1)

Sampling Probability and non-Probability Sampling, Simple random sampling stratified random sampling Systematic sampling error, Sampling distribution of mean and difference between two means. Interference Theory: Estimation and testing of hypothesis, Type—I and type-II error, Testing of hypothesis about mean and difference between two means using Z-test and t-test, Paired t-test, Test of association of attributes using X2 (chi-square) Testing hypothesis about variance.

Practicals
a. Sampling random sampling
b. Stratified random sampling.
c. Sampling distribution of mean
d. Testing of hypotheses regarding population mean
e. Testing of hypotheses about the difference between population means
f. Chi-square test
g. Testing of Correlation Coefficient
h. Fitting of simple linear regression
i. One-way ANOVA
j. Two-way ANOVA

Book Recommended
1. Introduction to Statistical Theory Part-II by Sher Muhammad and Dr. Shahid Kamal (Latest Edition)
2. Statistical Methods and Data Analysis by Dr. Faquir Muhammad

Note: Universities may make necessary changes in the courses according to the requirement as decided by the Board of Studies.
Course Name:

Introduction to Information and Communication Technologies

Course Structure: Lectures: 2 Labs: 1 Credit Hours: 3
Pre-requisite: None Semester: 1

Course Description:
This is an introductory course on Information and Communication Technologies. Topics include ICT terminologies, hardware and software components, the internet and world wide web, and ICT based applications.

After completing this course, a student will be able to:

- Understand different terms associated with ICT
- Identify various components of a computer system
- Identify the various categories of software and their usage
- Define the basic terms associated with communications and networking
- Understand different terms associated with the Internet and World Wide Web.
- Use various web tools including Web Browsers, E-mail clients and search utilities.
- Use text processing, spreadsheets and presentation tools
- Understand the enabling/pervasive features of ICT

Course Contents:
- Basic Definitions & Concepts
- Hardware: Computer Systems & Components
- Storage Devices, Number Systems
- Software: Operating Systems, Programming and Application Software
- Introduction to Programming, Databases and Information Systems
- Networks
- Data Communication
- The Internet, Browsers and Search Engines
- The Internet: Email, Collaborative Computing and Social Networking
- The Internet: E-Commerce
: IT Security and other issues
: Project Week
: Review Week

Text Books/Reference Books:
Introduction to Computers by Peter Norton, 6th International Edition (McGraw HILL)
Computers, Communications & information: A user's introduction by Sarah E. Hutchinson, Stacey C. Swayer

Functional Biology-I

Credit Hours 3+0

Biological Methods
Principles of Cellular Life
Chemical Basis
Structure and Function
Principles of Metabolism
Energy Acquisition

Principles of Inheritance
Mitosis and Meiosis
Chromosomes
Observable Inheritance Patterns
DNA Structure and Function
RNA and Proteins
Genes
Genetic Engineering and Biotechnology

Biodiversity
Fundamental Concept of Biodiversity
One or two examples of each of the following from commonly found organism
Prions
Viruses
Bacteria
Protistans
Algae
Fungi
Plants
Crops
Animals
Invertebrates
Vertebrates

Reading

Functional Biology-II

Credit Hours 3+0

Myths and Realities of Evolution
Microevolution
Speciation
Macroevolution

Level of Organization
Plants
Tissues
Nutrition and Transport
Reproduction
Growth and Development

Animals
Tissue, Organ System and Homeostasis
Information Flow and Neuron
Nervous System
Circulation and Immunity
Nutrition and Respiration
Reproduction and Development

Ecology and Behavior
Ecosystems
Biosphere
Social Interactions
Community Interactions
Human Impact on Biosphere
Environment Conservation

Reading

Note: Universities may make necessary changes in the courses according to the requirement as decided by the Board of Studies.
RECOMMENDATIONS

After thorough discussion, the participants of the National Curriculum Revision Committee of Agricultural Extension formulated the following recommendations:

- The Higher Education Commission may provide financial help for conducting a national conference of various stakeholders related to Agricultural Extension as the NCRC realized the importance of Agricultural Extension for boosting the agricultural production in the country.

- Promoting the activities of Pakistan Association for the Advancement of Agricultural Extension Education (PAAAEE).

- Establishing the Media Centers in the Departments of Agricultural Extension in all agricultural universities/institutes. This may also include FM radio station.

- Supporting post graduate students and faculty to visit sister organization in other cities of the country for searching literature and conducting research.