




UNIVERSITY OF SARGODHA  
OFFICE OF THE REGISTRAR  
(ACAD BRANCH)

NOTIFICATION

On the recommendations of Academic Council made in its 21<sup>st</sup> (2/2024) meeting held on 07.06.2024, the Syndicate in its 67<sup>th</sup> (3/2024) meeting held on 12.07.2024 approved the curriculum of BS in Agriculture and Resource Economics for implementation w.e.f. Fall 2024 (Annex-'A').

  
(WAQAR AHMAD)  
Additional Registrar (General)

Dated: 31.01.2025 

No. SU/Acad/25/ 101

Distribution:

- Chairman, Department of Agricultural Economics
- Controller of Examinations
- Director Academics

C.C:

- Dean, Faculty of Agriculture
- Principal College of Agriculture
- Director, QEC
- Additional Registrar (Affiliation & Registration)
- Secretary to the Vice-Chancellor
- PA to Registrar
- Notification File

## **Scheme of Studies for BS Agricultural and Resource Economics (Direct Admission)**

**Introduction:** From Fall 2024-25, Department of Agricultural Economics is planning to start BS Agricultural and Resource Economics degree program with direct admissions after intermediate.


### **Program Educational Objectives (PEOs)**

This graduation Program will be able:

1. To provide students with a strong foundation in the theories and principles of agricultural and resource economics.
2. To equip students with the analytical skills necessary to address complex economic issues related to agricultural and natural resource management.
3. To develop students' ability to apply economic theory and analytical tools to practical problems in agricultural and resource economics.
4. To promote an understanding of the institutional, legal, and political frameworks that shape agricultural and resource management decisions.
5. To prepare students for careers in a variety of fields, including agricultural policy, natural resource management, and international development.

### **Program Learning Outcomes (PLOs)**

1. Demonstrate a solid understanding of the principles of microeconomics, macroeconomics, and agricultural and resource economics.
2. Apply economic theory and analytical tools to real-world issues related to agricultural and resource management.
3. Analyze and evaluate the impact of economic policies and institutions on agricultural and resource management.
4. Use quantitative methods and data analysis techniques to investigate and solve economic problems.
5. Communicate economic concepts and ideas effectively through written reports, oral presentations, and other forms of communication.
6. Work collaboratively with others to develop and implement solutions to economic problems in the agricultural and resource sectors.
7. Demonstrate an understanding of ethical and social responsibility issues related to agricultural and resource economics.

  
**Nadeem Anwar**  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Sargodha,  
SARGODHA

**Eligibility Criteria:** At least 45% marks in HSSC (Part-I / II) (FA, F.Sc., ICS, I.Com, D.Com), DAE (1st & 2nd Year) or Equivalent qualification.

**Number of Seats:** 40 Morning

40 Evening

Other seats for sports, co-curricular, disables, children of UOS employees, etc. as per UOS policy

**Statutes:** All other statutes already approved at undergraduate level by the statutory bodies of the university will also apply for BS Agricultural & Resource Economics

Scheme of studies has been prepared in accordance with the new Undergraduate Policy of HEC, especially in the first four semesters. The bifurcation of different types of courses is as follows:

General Education:	33
Interdisciplinary:	25
Major:	76
Internship/Capstone Project	06
Total	140



---

**Nadeem Anwar**  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Sargodha.  
SARGODHA

**SCHEME OF STUDIES  
FOR THE DEGREE OF**

**BS Agricultural and Resource Economics  
2024**



**Department of Agricultural Economics**

**College of Agriculture  
UNIVERSITY OF SARGODHA**

---

**Nadeem Anwar**  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Sargodha.  
SARGODHA

## CONTENTS

Course Codes for Scheme of Studies BS Agricultural and Resource Economics .....	5
Detailed Course Contents	
Semester I .....	9
Semester II .....	20
Semester III .....	35
Semester IV .....	46
Semester V .....	59
Semester VI .....	65
Semester VII .....	73
Semester VIII .....	81

## Scheme of Studies

### BS Agricultural and Resource Economics

#### Semester-I

Category	Course Code	Course Title	Credit Hours	Pre-Requisite
GE-1	URCG-5118	Functional English	3(3-0)	Nil
GE-2	URCG-5105 URCG-5126	Islamic Studies (compulsory)	2(2-0)	Nil
GE-3	URCG-5123	Applications of Information and Communication Technologies (ICT)	3(2-1)	Nil
IDC-1	ZOOL-6141/ MATH-5128	Introduction to Biology-I (for Pre-Engineering students)/ Mathematics (for Pre-Medical students)	3(3-0)/ 3(3-0)	Nil
Major-1	AGRE-5101	Principles of Agricultural and Resource Economics	3(3-0)	Nil
IDC-2	AGRO-5901	Basic Agriculture	2(1-1)	Nil
IDC-3	SAES-5801	Introduction to Soil Science-I	2(1-1)	Nil
IDC-4	FWRW-5701	Introduction to Forest and Watershed Management	2(1-1)	Nil
<b>Total Credit Hours</b>			20(16-4)	


Semester Total Credit Hours: 20

#### Semester-II

GE-4	URCG-5112	Fables, Wisdom Literature, and Epic	2(2-0)	Nil
GE-5	URCG-5116	Science of Society-I	2(2-0)	Nil
GE-6	URCG-5120	Exploring Quantitative Skills	3(3-0)	Nil
GE-7	URCG-5127	Seerat of the Holy Prophet (SAW)	1(1-0)	Nil
GE-8	URCG-5111	Translation of Holy Quran – I	NC	Nil
GE-9	URCG-5128	Pakistan Studies	2(2-0)	Nil
Major-2	AGRE-5102	Microeconomics I	3(3-0)	Nil
Major-3	AGRE-5103	Statistical Methods in Economics	3(2-1)	Nil
IDC-5	ANSC-5101	Introduction to Animal Husbandry	3(2-1)	Nil
IDC-6	AEXT-5401	Introduction to Agricultural Extension and Rural Development	2(2-0)	Nil
<b>Total Credit Hours</b>			21(19-2)	

Semester Total Credit Hours: 21

~ 5 ~

  
**Wadeem Anwar**  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Sargodha  
SARGODHA

**Semester-III**

Category	Course Code	Course Title	Credit Hours	Pre-Requisite
GE-10	URCG-5119	Expository Writing	3(3-0)	Nil
GE-11	URCG-5121	Tools for Quantitative Reasoning	3(3-0)	Nil
GE-12	URCG-5122	Ideology and Constitution of Pakistan	2(2-0)	Nil
Major-4	AGRE-5104	Microeconomics II	3(3-0)	AGRE-5104
Major-5	AGRE-5105	Logical and Critical Thinking	2(2-0)	Nil
IDC-7	PLBG-5201	Introductory Genetics	2(1-1)	Nil
IDC-8	ENTO-5101	Introductory Entomology	2(1-1)	Nil
IDC-9	PLPT-5301	Introduction to Plant Pathogens	2(1-1)	Nil
IDC-10	HORT-5601	Introductory Horticulture	2(1-1)	Nil
<b>Total Credit Hours</b>			21(17-4)	

Semester Total Credit Hours: 21**Semester-IV**

Category	Course Code	Course Title	Credit Hours	Pre-Requisite
GE-12	URCG-5115	The Science of Global Challenges	3(2-1)	Nil
GE-13	URCG-5124	Entrepreneurship	2(2-0)	Nil
GE-14	URCG-5125	Civic and Community Engagement	2(2-0)	Nil
GE-15	URCG-5111	Translation of Holy Quran-II	NC	Nil
Major-6	AGRE-5106	Macroeconomics I	3(3-0)	Nil
Major-7	AGRE-5107	Mathematics for Economist	3(3-0)	Nil
Major-8	AGRE-5108	Agribusiness Management and Marketing	2(2-0)	Nil
IDC-11	STAT-5126	Statistics for Agricultural Sciences	3(3-0)	Nil
<b>Total Credit Hours</b>			18(17-1)	

Semester Total Credit Hours: 18

adeem Anwar  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Sargodha  
Sargodha

~ 6 ~



**SEMESTER-V**

Category	Course Code	Course Title	Credit Hours	Pre-Requisite
Major-9	AGRE-6101	Macroeconomics II	3(3-0)	AGRE-5107
Major-10	AGRE-6102	Production Economics	3(3-0)	AGRE-5104 AGRE-5105
Major-11	AGRE-6103	Econometrics I	3(2-1)	Nil
Major-12	AGRE-6104	Project Management and Evaluation	3(3-0)	Nil
Major-13	AGRE-6105	Introduction to Environmental Economics	3(3+0)	Nil
Major-14	AGRE-6106	Human Recourse Management	3(3-0)	Nil
<b>Total Credit Hours</b>			18(17-1)	

Semester Total Credit Hours: 18**SEMESTER-VI**

Category	Course Code	Course Title	Credit Hours	Pre-Requisite
Major-15	AGRE-6107	Econometrics II	3(2-1)	AGRE-6103
Major-16	AGRE-6108	Development Economics	3(3-0)	Nil
Major-17	AGRE-6109	Agricultural Policies of Pakistan	3(3-0)	Nil
Major-18	AGRE-6110	Management of Natural Resources	3(3-0)	Nil
Major-19	AGRE-6111	Research Methods for Economist	3(2-1)	Nil
Major-20	AGRE-6112	Economics of Climate Change	3(3-0)	Nil
GE-16	URCG-5111	Translation of Holy Quran III	NC	Nil
<b>Total Credit Hours</b>			18(16-2)	

Semester Total Credit Hours: 18

~ 7 ~

Wadeem Anwar  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Gujrat



**SEMESTER-VII**

Category	Course Code	Course Title	Credit Hours	Pre-Requisite
Major-21	AGRE-6113	Land Use and Urbanization	3(3-0)	Nil
Major-22	AGRE-6114	Agricultural Finance	3(3+0)	Nil
Major-23	AGRE-6115	Data Collection and Analysis	3(0-3)	Nil
Major-24	AGRE-6116	Environment and Sustainable Development	3(3-0)	Nil
Major-25	AGRE-6117	International Economics	3(3-0)	Nil
Major-26	AGRE-6118	Institutional Economics	3(3-0)	Nil
GE-17	URCG-5111	Translation of Holy Quran IV	NC	Nil
<b>Total Credit Hours</b>			18(15-3)	

Semester Total Credit Hours: 18**SEMESTER-VIII**

Category	Course Code	Course Title	Credit Hours	Pre-Requisite
Compulsory	AGRE-6119	Internship	3(0-3)	AGEC-6120
Compulsory	AGRE-6120	Capstone Project	3(0-3)	AGEC-6120
<b>Total Credit Hours</b>			6(0-6)	

Semester Total Credit Hours: 06

**Note:** The scheme of studies of BS Agricultural and Resource Economics has been prepared in accordance with the requirements/s of National Agriculture Education Accreditation Council (NAEAC), Higher Education Commission, and Islamabad.

~ 8 ~

Madeem Anwar  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Sindh, H-22

## SEMESTER-I

URCG-5118

Functional English

3(3-0)

The course aims at providing understanding of a writer's goal of writing (i.e. clear, organized and effective content and to use that understanding and awareness for academic reading and writing. The objectives of the course is to make the students acquire and master the grammatical academic writing skills. The course would enable the students to develop argumentative writing techniques. The students would be able to logically add specific details on the topics such as facts, examples and statistical or numerical values. The course will also provide insight to convey the knowledge and ideas in an objective and persuasive manner. Furthermore, the course will also enhance the student's understanding of ethical considerations in writing academic assignments and topics including citation, plagiarism, formatting and referencing the sources as well as the technical aspects involved in referencing.

### Contents

1. Developing Analytical Skills
2. Transitional devices (word, phrase and expressions)
3. Development of ideas in writing
4. Reading Comprehension
5. Precis Writing
6. Developing argument
7. Sentence structure: Accuracy, variation, appropriateness, and conciseness
8. Appropriate use of active and passive voice
9. Organization and Structure of a Paragraph
10. Organization and structure of Essay
11. Types of Essays

### Recommended Texts

1. Bailey, S. (2011). *Academic writing: A handbook for international students* (3rd ed.). New York: Routledge.
2. Eastwood, J. (2011). *A Basic English grammar*. Oxford: Oxford University Press.
3. Swales, J.M., & Feak, C.B. (2012). *Academic writing for graduate students: Essential tasks and skills* (3rd ed.). Ann Arbor: The University of Michigan Press.
4. Swan, M. (2018). *Practical English usage* (8th ed.). Oxford: Oxford University Press.

### Suggested Readings

1. Biber, D., Johansson, S., Leech, G., Conrad, S., Finegan, E., & Quirk, R. (1999). *Longman grammar of spoken and written English*. Harlow Essex: MIT Press.
2. Cresswell, G. (2004). *Writing for academic success*. London: SAGE.
3. Johnson-Sheehan, R. (2019). *Writing today*. Don Mills: Pearson.
4. Silvia, P.J. (2019). *How to write a lot: A practical guide to productive academic writing*. Washington: American Psychological Association
5. Thomson, A.J., & Martinet, A.V. (1986). *A Practical English Grammar*. Oxford: Oxford University Press

~ 9 ~

Nadeem Anwar  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Sargodha  
SARGODHA

*Introductory/compulsory foundation course*

Islamic Studies engages in the study of Islam as a textual tradition inscribed in the fundamental sources of Islam; Qur'aan and Hadith, history and particular cultural contexts. The area seeks to provide an introduction to and a specialization in Islam through a large variety of expressions (literary, poetic, social, and political) and through a variety of methods (literary criticism, hermeneutics, history, sociology, and anthropology). It offers opportunities to get fully introductory foundational basis of Islam in fields that include Qur'aanic studies, Hadith and Seerah of Prophet Muhammad (PBUH), Islamic philosophy, and Islamic law, culture and theology through the textual study of Qur'aan and Sunnah.

- To make students understand the relevance and pragmatic significance of Islam in their lives.
- To make learners comprehend the true spirit of Islam with reference to modern world.
- To generate a sense of Islamic principles as a code of living that guarantee the effective solutions to the current challenges of being.
- To provide Basic information about Islamic Studies
- To enhance understanding of the students regarding Islamic Civilization
- To improve Students skill to perform prayers and other worships
- To enhance the skill of the students for understanding the issues related to faith and religious life.

*Contents*

1. Introduction to Qur'aanic Studies	تعارف قرآن مجید
1) Basic Concepts of Qur'aan	قرآن مجید کا بنیادی تعارف
2) History of the compilation of Qur'aa	تاریخ جمع و تدوین قرآن مجید
3) Uloom-ul-Qur'aan	علوم القرآن

مطالعہ قرآن (تعارف قرآن مجید، منتخب آیات کا ترجمہ و تفسیر: سورة البقرہ آیات 1-5، 284-286؛ سورة الحجرات آیات 1-18؛ سورة الفرقان آیات 63-77؛ سورة المومنون آیات 1-11؛ سورة الاحزاب آیات 6، 21، 32-33، 40، 56-59؛ سورة الانعام آیات 151-153؛ سورة الصف آیات 1-14؛ الحشر آیات 18-20؛ آل عمران آیات 190-192؛ النحل آیات 12-14؛ لقمن آیت 20، حم السجده آیت 53

2. Introduction to Hadith	تعارف حدیث
1) Legal Status of Hadith	حدیث کی قانونی حیثیت
2) History of the compilation of Hadith	تاریخ جمع و تدوین حدیث
3) Classifications of Hadith	حدیث کی اقسام

متن، حدیث: 1 درج ذیل موضوعات پر احادیث کا مطالعہ  
 1. اعمال کا اجر نیت پر منحصر ہے۔ 2. بہترین انسان قرآن کا طالب علم اور اس کا معلم ہے۔ 3. کتاب و سنت گمراہی سے بچنے کا ذریعہ ہیں۔ 4. ارکان اسلام 5. اسلام، ایمان، احسان اور قیامت کی نشانیاں، 6 بچوں کو نماز کی تلقین 7. دین کا گہرا فہم اللہ کی خاص عنایت ہے 8. حصول علم، تلاوت قرآن اور عمل کی اہمیت و فضیلت، 9. روز محشر میں ہونے والا محاسبہ، 10. حقوق اللہ کے ساتھ ساتھ حقوق العباد کا لحاظ رکھنا بھی لازم ہے 11. حسن خلق کی عظمت اور فحش و بد گوئی کی مذمت 12. دنیا و آخرت کی بھلائی کی ضمانت چار چیزیں، 13. ہلاک کر دینے والی سات چیزیں، 14. بے عمل مبلغ کا عبرت ناک انجام 15. ہر شخص نگران ہے اور ہر شخص مسئول

3. Sirah of the Prophet (PBUH)	سیرت النبی ﷺ
1. Significance of Seerah Studies	مطالعہ سیرت کی ضرورت و اہمیت
2. Prophetic principles of Character building	تعمیر سیرت و شخصیت کا نبوی منہاج

اقامت دین کا نبوی طریق کار، اقامت دین بعدِ خلافت راشدہ، میثاق مدینہ، خطبہ حجۃ الوداع، اخلاقی تعلیمات، تشکیل اجتماعیت اور اسوہ حسنہ، قرآن مجید میں سیرت سرور عالم کا بیان، غزوات نبوی ﷺ کے مقاصد و حکمتیں

~ 10 ~

Wadeem Anwar  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Sargodha.  
SARGODHA



4. Islamic Culture & Civilization

- 1) Basic Concepts of Islamic Civilization
- 2) Historical evaluation of Islamic Civilization
- 3) Salient feature of Islamic Civilization

اسلامی تہذیب و تمدن

اسلامی تہذیب کا مفہوم  
اسلامی تہذیب کا تاریخی ارتقاء  
اسلامی تہذیب کی نمایاں خصوصیات

4) Islamic Civilization and Contemporary Issues

اسلامی تہذیب و تمدن اور معاصر مسائل

اسلامی تہذیب کے عوامل و عناصر ، اسلامی تہذیب کے علمی ، معاشرتی اور سماجی اثرات ، تہذیبوں کے تصادم کے نظریے کا تنقیدی جائزہ، تہذیبی تصادم کے اثرات و نتائج، طبعی ، حیاتیاتی اور معاشرتی علوم میں مسلمانوں کا کردار، نامور مسلمان سائنسدان

*Pre-Requisite: Nil*

*Recommended Books*

- 1) Hameed ullah Muhammad, —Emergence of Islam, IRI, Islamabad
- 2) Hameed ullah Muhammad, —Muslim Conduct of State
- 3) Hameed ullah Muhammad, —Introduction to Islam
- 4) Ahmad Hasan, —Principles of Islamic Jurisprudence, Islamic Research Institute, International Islamic University, Islamabad (1993)
- 5) Dr. Muhammad Zia-ul-Haq,—Introduction to Al Sharia Al Islamia, Allama Iqbal Open University, Islamabad(2001)
- 6) Dr. Muhammad Shahbaz Manj, Teleemat-e- Islam

**Nadeem Anwar**  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Saigodha.  
SAIGODHA



1. Meaning and Scope of Ethics.
2. Relation of Ethics with:
  - (a) Religion
  - (b) Science
  - (c) Law
3. Historical Development of Morality :(a). Instinctive Moral Life.
  - (b). Customary Morality.
  - (c). Reflective Morality.
4. Moral Theories:
  - (a). Hedonism (Mill)
  - (b). Intuitionism (Butler)
  - (c). Kant's Moral Theory.
5. Moral Ethics and Society.
  - (a). Freedom and Responsibility.
  - (b). Tolerance
  - (c). Justice
  - (d). Punishment (Theories of Punishment)
6. Moral Teachings of Major Religions:
  7. a). Judaism
  - b). Christianity
  - c). Islam
8. Professional Ethics:
  - a). Medical Ethics
  - b). Ethics of Students
  - c). Ethics of Teachers
  - d). Business Ethics

**REFERENCEBOOKS:**

1. William Lille. An Introduction to Ethics. London Methuen & Co. latest edition.
2. Titus, H.H .Ethics for Today. New York: American Book, latest edition.
3. Hill, Thomas. Ethics in Theory and Practice. N. Y. Thomas Y. Crowel, latest edition
4. Ameer Ali, S. The Code of Islam. Calcutta: Noor Library Publishers, latest edition
5. Donaldson, D.M. Studies in Muslim Ethics. London: latest edition.
6. Sayeed, S.M.A. (Tr.) Ta'aruf-e-Akhlaqiat. Karachi: BCC&T, Karachi University of





The course introduces students to information and communication technologies and their application in the workplace. Objectives include basic understanding of computer software, hardware, and associated technologies. How computers can be used in the workplace, how communications systems can help boost productivity, and how the Internet technologies can influence the workplace. Students will get basic understanding of computer software, hardware, and associated technologies. They will also learn how computers are used in the workplace, how communications systems can help to boost productivity, and how the Internet technologies can influence the work place.

*Contents*

1. Introduction, Overview of Information Technology.
2. Hardware: Computer Systems & Components, Storage Devices.
3. Software: Operating Systems, Programming and Application Software.
4. Databases and Information Systems Networks.
5. File Processing Versus Database Management Systems.
6. Data Communication and Networks.
7. Physical Transmission Media & Wireless Transmission Media.
8. Applications of smart phone and usage.
9. The Internet, Browsers and Search Engines.
10. Websites and their types.
11. Email Collaborative Computing and Social Networking.
12. E-Commerce.
13. IT Security and other issues.
14. Cyber Laws and Ethics of using Social media.
15. Use of Microsoft Office tools (Word, PowerPoint, Excel) or other similar tools depending on the operating system.
16. Other IT tools/software specific to field of study of the students if any.

Recommended Book

1. Discovering Computers 2022: Digital Technology, Data and Devices by Misty E. Vermaat, Susan L. Se book; 17<sup>th</sup> edition.

Suggested Books

1. Computing Essentials 2021 by Timothy J. O'Leary and Linda I. O'Leary, McGraw Hill Higher Education; 26<sup>th</sup> edition.
2. Computers: Understanding Technology by Fuller, Floyd; Larson, Brian: edition 2018.



This subject aims to yield students with a sense of practical relevance of biology to everyday life. This will make students comprehend life by understanding some of the molecular processes that occur in and around cells, to make students cognizant of biologic phenomenon (nature, body, etc.) on an evolutionary, ecological, behavioral, physiologic, tissue, cellular, and molecular level. In this subject students will examine how life is organized into hierarchical levels; how living organisms use and produce energy; how life grows, develops, and reproduces; how life responds to the environment to maintain internal stability; and how life evolves and adapts to the environment. Moreover, it will also enable them to investigate the biological molecules, homeostasis in vertebrates, and the influence of hormones on coordination and control systems of animal body. Upon completion of this subject students will be having an enhanced knowledge and appreciation of the basics of growth and development plans of animals and can develop cogent and critical arguments based on the course material.

#### Contents

1. Introduction: Nature and scope of biology, Branches of biology, Relationship between biology and psychology
2. Biological molecules: Carbohydrates, Proteins, Fats, Nucleic acids, Water
3. The cell: Structure and function of cell, Cell organelles, Different types of cells
4. Homeostasis: Osmoregulation, Structure and functions of Nephron, Thermoregulation
5. Coordination and control: Structure and physiology of Neuron, Introduction to central and peripheral nervous system, Hormones
6. Basics of growth and development: Embryonic and post embryonic development

#### Recommended Texts

1. Michael, J. and Lenardo. (2013). *Immune Homeostasis: Methods and protocol*. Humana press.
2. Campbell, M. and Christopher J. P. (2016). *Organismal homeostasis*. Momentum press.

#### Suggested Readings

1. Lisa A. U., Michael L. C., Steven A. W., Peter V. M., Jane B. R. and Neil A. C. (2016). *Campbell biology*. 11<sup>th</sup> Pearson
2. Cambell, N. A. Mitchell, I. G. and Reece, J. B. (2009). *Biology: Concepts and connections*. 6<sup>th</sup> edition San Francisco: Addison Wesley, Longman
3. Anna A. S., Richard B. P. (2019). *An Introduction to Conservation Biology* 2nd Edition. Sinauer Associates is an imprint of Oxford University Press

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. Mathematics, as a study of patterns, both practical and abstract, involves analytical thought, logical reasoning, problem solving skills, and precise communication. Because of its power and versatility, mathematics has often been called the "Queen of the Sciences." There is no field of scientific inquiry that does not express itself through the language of mathematics. An undergraduate degree in mathematics provides an excellent foundation for students who are interested in pursuing an advanced degree in mathematics or in a related specialized profession. Mathematics can also provide an excellent foundation for students considering professional degrees in such allied fields such as Law, Business Administration, or Medicine. The kinds of analytical and logical thinking skills that one develops while studying mathematics are precisely the skills that recruiters look for in potential employees. Jobs involving significant mathematical background also consistently rank near the top of the list in annual career surveys.

#### Contents

1. Real Numbers
2. Relations and Functions
3. Inequalities
4. Quadratic Functions and Complex Numbers
5. Linear Equations and Quadratic Equations: Formation of Linear equation
6. Solving Linear equation involving one variable
7. Solution of Quadratic equation by factorization method
8. Solution of quadratic equation by square completion methods
9. Solution of quadratic equation by quadratic formula
10. Application of quadratic equation
11. Sequence and Series
12. Types of Sequences; A. P, A. M., G. P., H. P
13. Trigonometric Functions, Trigonometric Applications
14. Graph of Functions and Modelling
15. Limits and Continuity
16. Derivatives, Integration
17. Probability and Binomial Theorem.

#### Recommended Texts

1. Gantert, A. X. (2009). *Algebra 2 and trigonometry*. New York: AMCOS School Publication INC.
2. Kaufmann, J. E. (1994). *College algebra and trigonometry* (3<sup>th</sup> ed.). Boston: PWS-Kent Pub. Co.

#### Suggested Readings

1. Swokowski, E. W. (1993). *Fundamentals of algebra and trigonometry* (8<sup>th</sup> ed.). Boston: PWS-Kent Pub. Co.
2. Nauman, K. (2019). *Basic mathematics-I: algebra and trigonometry* (2<sup>nd</sup> ed.). Lahore: Al-Hassan Pub.
3. Anton, H. (1999). *Calculus: A new horizon* (6<sup>th</sup> ed.). New York: John Wiley.
4. Stewart, J. (2012). *Calculus* (7<sup>th</sup> ed.). Belmont: Brooks/Cole.



## AGRE-5101 PRINCIPLES OF AGRICULTURAL AND RESOURCE ECONOMICS 3(3-0)

This course provides a comprehensive overview of the economic principles that underpin agriculture and natural resource management. This course explores the production, distribution, and consumption of agricultural goods and resources from both theoretical and practical perspectives. It covers a wide range of topics, including market structures, consumer behavior, production and cost analysis, farm management, environmental economics, and international trade. Students will learn how to analyze and evaluate policies and strategies that affect agriculture and resource management, as well as the economic factors that shape decision-making in the industry.

### *Contents*

1. Introduction to Agricultural and Resource Economics
2. Market structures and competition
3. Consumer behavior and demand analysis
4. Production and cost analysis
5. Farm management and decision-making
6. Environmental and natural resource economics
7. International trade and globalization

### *Recommended Texts*

1. "Agricultural and Food Policy" by Ronald D. Knutson, J.B. Penn, and Barry L. Flinchbaugh
2. "Environmental and Natural Resource Economics" by Tom Tietenberg and Lynne Lewis
3. Parkin, M. (2010). Economics, 10th Edition, Addison Wesley Publishing Company.

### *Suggested Readings*

1. Mankiw, N. Gregory. (2011). *Principles of Economics*, 5<sup>th</sup> Edition. Mason: South-Western Cengage learning Publisher.
2. Penson, J. B., Capps, O., Rossen C. P., & Woodward, R. (2013). *Introduction to Agricultural Economics*, 5<sup>th</sup> Edition. New Jersey: Prentice Hall.
3. Cramer, G., Jensen C. W., & Southgate, D. D. (2001). *Agricultural Economics and Agribusiness*, 8<sup>th</sup> Edition. Wiley Publisher.



The main aim of this course is to provide the basic knowledge and background about Pakistan's Agriculture. Basic Agriculture is a graduate-level course which gives the students a basic knowledge of agriculture/ It will enable the students to understand the basic terminologies of agriculture, its different branches, allied disciplines, salient features of Pakistan's agriculture including climate, land resources etc. as well as the problems of Pakistan agriculture. Basic knowledge about agricultural inputs such as seed, fertilizer, irrigation etc. will be communicated. Crop growth related problems like weeds, insect pests will be elaborated. The students will be able to understand the conventional and international system of land measurement. The knowledge of post-harvest technology is also shared with the students.

#### Contents

##### Theory

1. Agriculture, history, importance, branches and allied sciences.
2. Salient features of Pakistan's agriculture.
3. Climate, land and water resources.
4. Tillage: objectives and types.
5. Seed: types and quality.
6. Crop nutrients, manures and fertilizers, sources and methods of application.
7. Irrigation: systems, types and management.
8. Harvesting, processing, storage and marketing of farm produce.

##### Practical

1. Land measuring units.
2. Demonstration of hand tools and tillage implements.
3. Identification of meteorological instruments.
4. Identification of crop plants, weeds and seeds.
5. Identification of organic and inorganic fertilizers.
6. Calculation of nutrient-cum-fertilizer unit value.
7. Demonstration of various irrigation methods.
8. Field visits.

##### Recommended Texts

1. Bashir, E. and Bantel, R.. (2001), *Soil Science*, Islamabad, National Book Foundation.
2. Brady, N.C. and Weil, R.R. (2013). *Elements of the Nature and Properties of Soils*, 3rd Ed. Upper Saddle River, NJ, USA, Pearson Education.

##### Suggested Readings

1. Hillel, D. (2008). *Soil in the Environment: Crucible of Terrestrial Life*. Burlington, MA, USA, Elsevier Inc.
2. Safdar, M.E., Javaid, M.M., Tanveer, A., Ali, H.H. and Kamran, M. (2019). *Innovation in Agronomic Concepts*. Higher Education Commission, Islamabad.
3. Das, D.K. (2011). *Introductory Soil Science* (3<sup>rd</sup> ed.). New Delhi-110002, India, Kalyani Publ.



This is an introductory course designed to introduce the concept and significance of soil science for agriculture students at undergraduate level. It provides information to the students about soil science and its branches as well as their environmental significance. This course also delivers knowledge to the students about weathering of rocks and minerals as well as their classification. This course gives information to the students about physical properties of soil and their significance in agriculture. This subject also improves the awareness of the students about impact of agricultural and industrial wastes on our environment. In addition, this course also improves the skills of the students how to collect soil and water samples for physio-chemical analysis. Laboratory exercise will be designed to develop student competency for analysis of irrigation water and soil samples. Ability to highlight and support the importance of water and soil quality, analysis for judicious-use of resources.

**Theory**

1. Introduction to Soil and environment: definition of earth, geology and soil science; disciplines of soil science; lithosphere, hydrosphere and biosphere
2. Weathering of rocks and minerals: definition. Agents and classification
3. Parent materials: definition and types
4. Soil formation: definitions, processes and factors
5. Soil profile: definition and description
6. Soil, water and air pollution: sources and types

**Practical**

1. Methods of soil sampling and handling
2. Preparation of saturated soil paste
3. Determination of soil water contents
4. Analysis of irrigation water, report writing and interpretation.
5. Textural analysis of soil

**Recommended Texts**

1. Bashir, E. & R. Bantel. (2001). *Soil Science*. Islamabad, National Book Foundation.
2. Brady, N.C. & R.R. Weil. (2007). *The Nature and Properties of Soils* (14<sup>th</sup> ed.). Upper Saddle River, NJ, USA, Pearson Education.

**Suggested Readings**

1. Brady, N.C. & R.R. Weil. (2009). *Elements of the Nature and Properties of Soils* (3<sup>rd</sup> Ed.). Upper Saddle River, NJ, USA, Pearson Education.
2. Hillel, D. (2008). *Soil in the Environment*: Burlington, MA, USA. Crucible of Terrestrial Life. Elsevier Inc.
3. Das, D.K. (2011). *Introductory Soil Science* (3<sup>rd</sup> ed.). New Delhi-110002, India.



**FWRW-5701 Introduction to Forests and Watershed Management 2(1-1)**

Forests and Watersheds are lifeline of natural system and regulate many global cycles. The understanding of forest resources in relation to watersheds is crucial for agriculture students. The objectives of studying this course are to acquaint the students with basic knowledge of Forestry, principles of watershed management, to impart knowledge about forest resources in Pakistan, and to teach skills helpful in field practices. Watershed management is closely related to forest management as the selection and implementation of different forestry practices are essential component of it. Students will learn the different biological and engineering approaches to control and regulate the water flow and to reduce the sedimentation of the streams and lakes fed by this water.

*Contents*

*Theory*

1. Introduction to forest and watershed management
2. Forest resources of Pakistan and their importance
3. Constraints and problems in natural resource management
4. Forestry practices (Agroforestry, social forestry etc.), Principles of sustainable forest management
5. Principles of Watershed Management
6. Hydrological cycle
7. Problems and potentials of various watersheds.

*Practical*

1. Identification of important forest tree species
2. Visits to various forest types and watershed areas.
3. Watershed measurements (instruments, area, drainage, flow etc.).

*Recommended Texts*

1. Franzel, S.; Scherr, S.J. (2001). *Trees on the Farm*. CAB International.
2. Quraishi, M.A.A. (2002). *Watershed Management in Pakistan*. Department of Forestry. UAF.

*Suggested Readings*

1. Sheikh, M.I. (1999). *Forests and Forestry in Pakistan*. A-One Publishers, Urdu Bazar, Lahore.
2. Quraishi, M.A.A. and Siddiqui, M.T. (2002). *Practical manual of watershed management*. Department of Forestry. UAF.
3. Quraishi, M. A. A. (1999). *Basics of Forestry and Allied Sciences*. Urdu Bazar, Lahore, A-One Publishers.



## SEMESTER-II

URCG-5112

Fables, Wisdom Literature, and Epic

2(2-0)

The course will enable students to explore human experiences, cultivate an appreciation of the past, enrich their capacity to participate in the life of their times, and enable an engagement with other cultures and civilizations, both ancient and modern. But independently of any specific application, the study of these subjects teaches understanding and delight in the highest achievements of humanity. The three components of the course, including fables, wisdom literature and epic, will enable the learners to explore and understand the classic tradition in literature. Development of personal virtue, a deep Sufi ethic and an unwavering concern for the permanent over the fleeting and the ephemeral are some of the key themes explored in the contents that will develop an intimate connection between literature and life.

### *Contents*

#### 1. Fables

The Fables of Bidpai  
The Lion and the Bull  
The Ring-dove  
The Owls and the Crows

Selected poem from Bang-i-Dara

#### 2. Gulistan-e- Sa'di

Ten hikāyāt from John T. Platts, *The Gulistan*

#### 3. Epic

THE SHĀHNĀMA OF FIRDAUSI

### *Recommended Texts*

1. John T. P. (1876). *The Gulistan; or, Rose Garden of Shaikh Muslihu'd- Dīn Sa'dī of Shīrāz*. London: Wm. II. Allen.
2. Chishti, Y.S. (1991). *Sharah-ibāng-idarā*. Lāhaur: Maktaba-ita'mīr-iinsāniyat

### *Suggested Readings*

1. Thackston, W. (2000). *A Millennium of Classical Persian Poetry*. Maryland: IbeX Publishers.
2. Wood, R. (2013). *Kalila and Dimna: Fables of Conflict and Intrigue*. United Kingdom: Medina Publishing, Limited.

~ 20 ~

Muhammad Anwar  
Incharge  
Department of Agriculture Economics  
University College of Agriculture  
University of Agriculture  
Faisalabad

This course will introduce students with the subject matter of social science, its scope, nature and ways of looking at social phenomenon. It will make the participants acquaintance with the foundations of modern society, state, law, knowledge and selfhood. While retaining a focus on Pakistani state and society, students will encounter theoretical concepts and methods from numerous social science disciplines, including sociology, politics, economics anthropology and psychology and make them learn to think theoretically by drawing on examples and case studies from our own social context. Students will be introduced to the works of prominent social theorists from both western and nonwestern contexts. Instruction will include the use of written texts, audio-visual aids and field visits.

**Learning Outcomes:**

The course has following outcomes: It will

- Introduce student with the nature of human social behavior and foundations of human group life
- Analyze the reciprocal relationship between individuals and society.
- Make student aware with the nature of societies existing in modern world
- Make students familiar with the philosophy of knowledge of social sciences
- Introduce students with the works of prominent theories explain human group behavior
- Help students to understand the foundations of society including culture, socialization, politics and economy
- Introduce students with various dimensions of social inequalities with reference to gender, race, ethnicity and religion
- Make them aware about the understanding of various themes pertains to social science in local context
- Help them recognize the difference between objective identification of empirical facts, and subjective formulation of opinionated arguments

**Course Outlines:**

**1. Introduction to Social Sciences**

- Social world, Human Social behavior, Foundations of society
- Evolution of Social sciences
- Philosophy of Science
- Scope and nature of social sciences
- Modernity and social sciences
- Branches of social science: Sociology, Anthropology, Political Science, Economics

**Society and Community, Historical evolution of Society**

- Types of Societies
- For aging society, Horticultural society, Pastoralist society
- Agrarian societies, Industrial society, Postindustrial society

**2. Philosophy of Knowledge in social science and social inquiry**

- Understanding social phenomenon
- Alternative ways of knowing
- Science as a source to explore social reality
- Objectivity, Value-Free research
- Positivism vs Inter pretivism
- Qualitative vs Quantitative



### 3. Culture and Society

- Idea of Culture, Assumptions of Culture
- Types, Components, Civilization and culture
- Individual and culture. Cultural Ethnocentrism, Cultural Relativism
- Outlook of Pakistani culture
- Global Flows of culture, Homogeneity, Heterogeneity

### 4. Social Stratification and Social inequality

- Dimensions of inequality, Social class
- Gender, Race, Religion, Ethnicity, Caste
- Patterns of social stratification in Pakistan
- Class, caste system in agrarian society
- Ascription vs Achievement, Meritocracy
- Global stratification in modern world, Global patterns of inequality

### 5. Personality, Self and Socialization

- Concept of self, Personality
- Nature vs Nurture, Biological vs Social
- Development of Personality
- Socialization as a process, Agents of socialization
- Socialization and self / group identity

### 6. Gender and Power

- Understanding Gender
- Social construction of Patriarchy
- Feminism in Historical context, Gender Debates
- Gender and Development
- Gender issues in Pakistani society, Women Participation in politics, economy and education
- Toward a gender sensitive society, Gender main streaming

### Pakistan: State, Society, Economy and Polity

- Colonialism ,colonial legacy, National identity
- Transformation in Pakistani society: Traditionalism vs Modernism
- Economy, Informality of Economy, Modern economy and Pakistan
- Political Economy, Sociology of Economy

### Recommended Text books and Reading Materials:

1. Giddens, A. (2018). Sociology (11<sup>th</sup>ed.). UK: Polity Press.
2. Henslin, J.M. (2018).Essentials of Sociology: A Down-to-Earth Approach. (18<sup>th</sup>Edition) Pearson Publisher.
3. Macionis, J.J. (2016). Sociology (16<sup>th</sup>ed.). New Jersey: Prentice-Hall.
4. Qadeer, M. (2006) Pakistan –Social and Cultural Transformation in a Muslim Nation.
5. Smelser, N. J. and Swedburg, R. , The Hand book of Economic Sociology, Chapter1 'Introducing Economic Sociology', Princeton University Press, Princeton.
6. SystemsofStratification|BoundlessSociology(nodate).Availableat:<https://courses.lumenlearning.com/boundless-sociology/chapter/systems-of-stratification/>
7. Jalal, A.(ed.)(1995)'The colonial legacy in India and Pakistan', in Democracy and Authoritarianism in South Asia :A Comparative and Historical Perspective. Cambridge: Cambridge University Press (Contemporary South Asia)
8. Zaidi, S.A.(2015)Issues in Pakistan's Economy: A Political Economy Perspective. Oxford

~ 22 ~



**Arif Anwar**  
Incharge  
Department of Agricultural Economics  
University College of Agriculture  
University of Agriculture  
Faisalabad

University Press. Chapter 26

9. Akhtar, A.S.(2017) The Politics of Common Sense: State, Society and Culture in Pakistan. Cambridge: Cambridge University Press.
10. Smelser, N.J.and Swedburg, R., The Hand book of Economic Sociology, Chapter1 'Introducing Economic Sociology', Princeton University Press, Princeton.



Since ancient times, numbers, quantification, statistics and mathematics has played a central role in scientific and technological development. In the 21st century, Quantitative Reasoning (QR) skills are essential for life as they help to better understand socio-economic, political, health, education, and many other issues, an individual now faces in daily life. The skills acquired by taking this course will help the students to apply QR methods in their daily life and professional activities. This course will also change student's attitude about statistics and mathematics. It will not only polish their QR skills, but also enhance their abilities to apply these skills.

#### Contents

1. Introduction to quantitative reasoning
2. Overview of contributions of Mathematicians and Statisticians especially Muslim scholars.
3. Types of standard numbers
4. Proportions, rates, ratio and percentages
5. Odds and odds ratio
6. Scale of measurements
7. Number sequence and series
8. Unit analysis as a problem-solving tool
9. Data handling (small and large)
10. Data errors, absolute and relative and their applications
11. Descriptive statistics
12. Rules of counting :multiplication rule, factorial, permutation and combination
13. Probability and its application in real life
14. A graphical perspective through Venn Diagram
15. Financial indicator analysis, and money management (profit, loss, simple and compound interest)
16. Practical scenarios involving algebraic expressions: linear and quadratic

#### Recommended Texts

1. Akar, G. K., Zembat, İ. Ö., Arslan, S., & Thompson, P. W. (2023). *Quantitative Reasoning in Mathematics and Science Education*. 1<sup>st</sup> Ed., Springer, USA.
2. Peck, R., Olsen, C., & Devore, J.L. (2015). *Introduction to statistics and data analysis*. 5<sup>th</sup> Ed., Brooks Cole, USA.
3. Devlin, K.J. (2012). *Introduction to mathematical thinking*. Palo Alto, CA: Keith Devlin.

#### Suggested Readings

1. Triola, M.F., Goodman, W.M., Law, R., & Labute, G. (2006). *Elementary statistics*. Reading, MA: Pearson/Addison-Wesley.
2. Blitzer, R., & White, J. (2005). *Thinking mathematically*. Pearson Prentice Hall.

## مطالعہ سیرت النبی صلی اللہ علیہ وسلم Seerat of the Holy Prophet

Course Code :

URCG-5127

Title	Description
Semester	
Nature of Course	
No. of C.Hrs.	1(1-0)
Total Teaching weeks	18
Objectives of the Course	<p>۱۔ طلبہ کو مطالعہ سیرت طیبہ کی ضرورت و اہمیت سے آگاہ کرنا</p> <p>۲۔ تعمیر شخصیت میں مطالعہ سیرت طیبہ کے کردار کو واضح کرنا</p> <p>۳۔ بیعت نبوی کے موقع پر اقوام عالم کی عمومی صورت حال سے آگاہ کرنا</p> <p>۴۔ رسول اکرم صلی اللہ علیہ وسلم کی اور مدنی زندگی کا اس طرح مطالعہ کرانا کہ طلبہ ان واقعات سے تاریخ کا استفادہ کر سکیں</p> <p>۵۔ طلبہ کو محمد نبوی کی معاشرت، سیاست، معیشت سے آگاہ کرنا</p>

## Course Description

S.No.	Title	Description
1	حضور صلی اللہ علیہ وسلم کے ابتدائی حالات زندگی	<p>۱۔ حضور صلی اللہ علیہ وسلم کا فطرتی حسب و نسب</p> <p>۲۔ پیدائش اور ابتدائی تربیت</p> <p>۳۔ لڑکپن اور جوانی کے حالات زندگی</p>
2	بیعت نبوی کے وقت و جگہ کے حالات (۱)	<p>۱۔ بیعت نبوی کے وقت اہم تہذیبیں</p> <p>۲۔ عرب، مصر، حبشہ، ہند، یونانی، ساسانی</p>
3	بیعت نبوی	۱۔ کی حد میں رحمت اسلام
4	بیعت نبوی	۱۔ مدنی حد میں رحمت اسلام
5	حصانص النبوی	آپ کا پلو و بیٹا ہیرا من
6	حصانص النبوی	بہشت استاد و معلم
7	حصانص النبوی	بہشت تاجر
8	حصانص النبوی	بہشت سرکار و سیاست
9	حصانص النبوی	ذاتی خاص اور عائلی اثرات

10	مختصر القرآن الکریم	ناموس رسالت
11	اسوہ حسنہ اور عصر حاضر	غیر مسلموں سے تعلقات
12	اسوہ حسنہ اور عصر حاضر	اسوہ حسنہ کی روشنی میں گھریلو زندگی
13	اسوہ حسنہ اور عصر حاضر	مشترقیین اور مطالعہ حیرت
15	اسوہ حسنہ اور عصر حاضر	وطن سے محبت اور حیرت
16	اسوہ حسنہ اور عصر حاضر	مشترقیین کے اعتراضات اور ان کے جوابات

#### تصانیف کتب

نمبر شمار	نام مؤلف	نام کتاب
1	ابن ہشام	السیرة النبویة
2	مولانا قاضی نعمانی سید سلمان گدوی	سیرۃ النبی صلی اللہ علیہ وسلم
3	قاضی محمد سلیمان سلمان مشہور پوری	رحمۃ اللعالمین
4	مولانا سید امجد الحسن علی گدوی	بیمارحت صلی اللہ علیہ وسلم
5	ڈاکٹر حسین مظہر صدیقی	عہد نبوی کا نظام حکومت
6	ڈاکٹر خالد ملوی	الاسان کاٹل

#### حوالہ جاتی کتب

نمبر شمار	نام مؤلف	نام کتاب
1	سید ابوالاعلیٰ مودودی	حیرت سرور عالم صلی اللہ علیہ وسلم
2	مولانا صلی الرحمن سہیل پوری	اربعین الختم
3	سید محمد کرم شاہ آزاد پوری	ضیاء النبی صلی اللہ علیہ وسلم
4	ڈاکٹر اکرم شاہ شاہد اعمری	السیرۃ النبویة المصححة
5	مولانا عبدالرؤف داتا پوری	اربع اسیر

*(Handwritten signature)*

*(Handwritten signature)*

Topic	Details
Semester/Level	1 <sup>st</sup> semester and in some discipline 2 <sup>nd</sup> Semester/ ADP Program 1 <sup>st</sup> Year
Course Code	URCG-5111
Course Title	Translation of the Holy Quran – I
Credit Hours	Non-Credit
Objectives	<ul style="list-style-type: none"> <li>To familiarize the students to keys and fundamentals of recitation of the holy Quran.</li> <li>To develop the skill of the students of recitation the last revelation.</li> <li>Students will learn the basic Arabic grammar in a practical way.</li> <li>To develop an eagerness among the students to explore the last divine Book.</li> </ul>
Course Contents:	<ul style="list-style-type: none"> <li>تیسواں پارہ - ناظرہ مع تجوید</li> <li>بنیادی عربی گرامر</li> <li>اسم اور اسکے متعلقات : اسم فاعل ، مفعول ، تفضیل ، مبالغہ</li> <li>فعل اور اسکی اقسام : ماضی ، مضارع ، امر ، نہی</li> <li>حرف اور اسکی اقسام : حروف علت ، حروف جارہ ، مشبہ بالفعل</li> </ul>
Memorization:	تیسویں پارے کی آخری بیس سورتیں (حفظ مع ترجمہ)



This course is designed to provide students with a comprehensive exploration of Pakistan's identity, spanning geographical, historical and cultural dimensions. It delves into the diverse landscape, ancient civilizations, and rich cultural heritage that define Pakistan. Moreover, it examines the socio-cultural and political transformations in Pakistan over time including democratic transitions and military interventions. The aim of this course is to inculcate in students a nuanced understanding of Pakistan's past, present, and potential future trajectories, enabling them to critically evaluate the complex dynamics shaping the nation's development.

### Course Learning Outcomes

By the end of this course, student will be able to:

1. Have enhanced knowledge of the geographical, historical and political aspects of Pakistan.
2. Understand the society and cultural of Pakistan.
3. Understand and explain the scio-economics developments in Pakistan.
4. Explore contemporary issues and challenges faced by Pakistan and their implications for the future.

### Contents

#### 1. Introduction to Pakistan:

- Geographical location and significance.
- Historical background: Ancient civilizations in the region.
- Factors leading to the creation of Pakistan

#### 2. Political History of Pakistan:

- Formative phase
- Military interventions and democratic transitions.

#### 3. Geography of Pakistan:

- Physiography: Mountains, plains, plateaus, deserts, valleys and coastal areas.
- River system: Indus river and its tributaries;
- Climatic regions of Pakistan.

#### 4. Society and Culture of Pakistan:

- Socio- cultural diversity.
- Language and literature of Pakistan.

#### 5. Economics Development of Pakistan:

- Agriculture and industrial sectors of Pakistan.
- Economic challenges of Pakistan.

#### 6. Contemporary Issues:

- Foreign relations of Pakistan.
- Security challenges: terrorism, extremism, regional conflicts.
- Environmental problems and sustainable development (SDGs).
- Media and social change.

### SUGGESTED READING MATERIALS

1. "Jinnah of Pakistan" by Stanley Wolpert
2. "The sole Spokesman: Jinnah, the Muslim League, and the Demand for Pakistan" by Ayesha Jalal
3. "The struggle for Pakistan" by Ishtiaq Hussain Qureshi
4. "Pakistan, the Formative Phase, 1857-1948" by Khalid B. Sayeed

5. "Pakistan Studies: A Book of Readings" by Sikandar Hayat
6. "Constitutional and Political History of Pakistan" by Hamid Khan
7. "Trek to Pakistan" by Ahmad Saeed and Kh. Mansur Sarwar
8. "Pakistan: A Modern History" by Ian Talbot
9. "Politics in Pakistan: The Nature and Direction of Change" by Khalid B. Sayeed
10. "Physical Geography of Pakistan" by Umar Jahangir
11. "A Geography of Pakistan: Environment, people, and Economy" by Fazle Karim Khan
12. "Pakistan's Foreign Policy: An Historical Analysis" by S.M. Burke
13. "Separatism in East Pakistan" by Rizwan Ullah Kokab
14. "Being Pakistani: Society, Culture and the Arts" by Raza Rumi
15. "Pakistani's Culture Heritage: Socio-Economic and Technological Aspects" edited by Abdul Jabbar Khan
16. "Language and Politics in Pakistan" by Tariq Rahman
17. "Sociology" by Horton and Hunt
18. "Pakistan in the Twentieth Century: A Political History" by Lawrence Ziring
19. "Economic Development of Pakistan" by Ishrat Husain
20. "Issues in Pakistan's Economy" by S. Zaidi

This course discusses the terminology, concepts, contents, methodology and limitations of current microeconomic analysis. The course provides students with a theoretical structure to analyze and understand economics as it relates to individuals and businesses. In addition, it seeks to provide students with an understanding of how political, social and market forces determine and affect the economy. This introductory course explores the principles of production and consumption – and the exchange of goods and services – in a market economy. In particular, it compliments other courses of agricultural economics by highlighting the various market mechanisms that influence managerial decision-making in agricultural business. After completing the course, students will be able to understand economic issues pertaining to households and firms.

### *Contents*

1. Scope of Economics
2. Contents of Consumer's Behavior – Approaches to Utility analysis.
3. Laws of Demand and Supply
4. Various dimensions of Elasticity of Demand and Supply
5. Contents of Production
6. Cost concepts in the short run and long run
7. Market equilibrium analysis.

### *Recommended Texts*

1. Mankiw, N. G. (2018). Principles of Microeconomics (8th ed.). Cengage Learning.
2. Frank, R. H., Bernanke, B. S., & Osberg, L. S. (2019). Principles of Microeconomics (7th ed.). McGraw-Hill Education.
3. Cowen, T., & Tabarrok, A. (2019). Modern Principles of Economics (4th ed.). Worth Publishers.  
Parkin, M. (2010). *Economics*, 10th Edition, Addison Wesley Publishing Company.

### *Suggested Readings*

1. Varian, H. R. (2022). Intermediate Microeconomics: A Modern Approach (10th ed.). W. W. Norton & Company.
2. Mankiw, N. G., & Taylor, M. P. (2022). Microeconomics (5th ed.). Worth Publishers.
3. Nicholson, W., & Snyder, C. M. (2021). Microeconomic Theory: Basic Principles and Extensions (13th ed.). Cengage Learning.



This course helps students develop the understanding that they will need to make informed decisions using data, and to communicate the results effectively. The course is an introduction to the essential concepts, tools and methods of statistics for students in business, economics and similar disciplines, although it may have wider interest. The focus is on concepts, reasoning, interpretation and thinking rather than computation, formula and contents. After completing the course, students will be able to apply the statistical tools and techniques in the field of Agricultural Economics.

#### Contents

1. Concept of Index numbers
2. Types of index numbers
3. Tests for index numbers
4. Introduction to Probability theory
5. Laws of probability
6. Introduction to Baye's Theorem
7. Random Variable and their distributions
8. Uniform probability distribution
9. Normal probability distribution
10. Binomial Probability distribution
11. Hyper geometric probability distribution
12. Poisson distribution
13. Negative binomial distribution
14. Mean and variance of these probability distributions
15. Introduction to time series and graphical presentation of time series data.

#### Recommended Texts

1. Wonnacott, T.H., & Wonnacott. R.J. (1990). *Introductory Statistics*, 5<sup>th</sup> Edition New York: John Wiley Publishers.
2. Floyd, J.E. (2010). *Statistics for economists: a beginning*, University of Toronto.

#### Suggested Readings

1. Aczel, A. D. (1995). *Statistics, Concepts and Applications*, USA: Richard D. Irwan Inc.
2. Newbold, P., Carlson, W., and Thorne, B. (2010). *Statistics for Business & Economics*, 8<sup>th</sup> Edition. Pearson Hall Publisher.

Animal husbandry is the branch of agriculture concerned with animals that are raised for meat, fiber, milk, eggs, or other products. Animal husbandry includes education and experience about the technology of breeding, feeding, producing, managing and marketing animals as well as animal products. This includes all husbandry facets of livestock species (cattle, sheep, goats, poultry, ostriches and horses) and the products derived from them (meat, milk & dairy products, wool, mohair, eggs, skin & leather and feathers) as well as relevant aspects of aquatic (fish, etc.) and wildlife species. It includes day-to-day care, selective breeding and the raising of livestock. The major types of animal husbandry practices include dairy, poultry, sheep, goat farming. This course will help the students to understand the importance of livestock in national economy. They will get a comprehensive knowledge about nutrition, management, breeding and genetic potential of local breeds of livestock. Students will be trained to handle and manage animals for different procedures at livestock farm.

### Contents

#### Theory

1. Importance of livestock in economy of Pakistan
2. Zoological classification of farm animals
3. Livestock management
4. Introduction to breeding and genetics
5. Local breeds of livestock
6. Reproductive cycle in farm animals
7. Common feeds and their classification
8. Basic principles of feeding dry, pregnant and milking animals
9. Classes, breeds and varieties of poultry
10. Broiler and layer management

#### Practical

1. Demonstration and identification of various breeds of livestock
2. Demonstration of male and female reproductive organs
3. Body points of animals
4. Handling and restraining of animals
5. Grooming and cleaning of animals
6. Housing plans
7. Milk quality analyses; identification of
8. Feed samples; formulation of balanced ration for livestock
9. Poultry breeds
10. Visit to livestock shows/farms

#### Recommended Texts


1. Banerjee, G. C. (1998). *A Textbook of Animal Husbandry*. New Delhi, India.: Oxford and IBH Publ, Co.,
2. S. K. Kaushish (2010). *A Textbook of animal husbandry*. Kalyani Publishers

#### Suggested Books

Handwritten signature and stamp of the University of Agriculture, Faisalabad, Pakistan. The stamp includes the text: "Department of Agriculture, Faisalabad, Pakistan" and "University of Agriculture, Faisalabad, Pakistan".

1. Haq, A. & Akhtar M. (2004). *Poultry Farming*. H-9, Islamabad, Pakistan: Higher Education Commission of Pakistan.
2. Khan, B. B., Yaqoob M., Riaz M., Younas M. & Iqbal A. (2004). *Livestock Management Manual*. Department of Livestock Management, University of Agriculture, Faisalabad.

Department of Agriculture, Faisalabad  
University of Agriculture, Faisalabad



## **AEXT-5401 Introduction to Agricultural Extension and Rural Development 2(2-0)**

The main purpose of this course is to give brief introduction of Agricultural Extension education at undergraduate level. The students must know the history and philosophy of agricultural education in the development of present era agricultural system across the world. The following such as concepts of Extension education and rural development, principles of effective extension work, concepts of program planning, research, program evaluation and their importance in agricultural extension and rural development work, Role of communication and ICTs in extension work and development activities in rural areas for the growth of the masses are important to disseminate among undergraduate students so that students will prepare themselves to learn more advance ideas in agricultural education and research. The students will be able to perform better in dissemination of different agricultural technologies.

### *Contents*

1. Agricultural extension; its definition, objectives and importance,
2. Types of education, Brief history/recent trends in agricultural extension,
3. Rural development, its definition/concept, objectives, importance and indicators,
4. Current issues and problems of rural development and extension work in Pakistan. Roles and duties of extension workers at various organizational levels,
5. Extension programs and activities since 1947 to date in Pakistan, role of communication and ICT in Extension and Rural Development work,
6. Principles of effective extension work. Adoption and diffusion of agricultural innovations, Agricultural Technology and its application for Pakistani farmers,

### *Recommended Texts*

1. Ray, G.L. (2006). *Extension Communication and Management*; Kalyani Publishers.
2. Ison, R. & Russell, D. (2004). *Agricultural Extension and Rural Development: Breaking out of Knowledge Transfer Traditions*; Cambridge University Press.

### *Suggested Readings*

1. Bashir, E. (2005). *Extension Methods* (2<sup>nd</sup> ed.). Islamabad, National Book Foundation.
2. Narasaiah, M.L. (2003). *Approaches to Rural Development*. New Delhi (India), Discovery Publishing House.
3. Leeuwis, C. & Van den Ban, A. (2004). *Communication for rural Innovation: Rethinking Agricultural Extension* (3<sup>r</sup> ed.). Wiley-Blackwell.



## SEMESTER-III

URCG-5119

### Expository Writing

3 (3-0)

This course prepares undergraduates to become successful writers and readers of English. The course helps students develop their fundamental language skills with a focus on writing so that they can gain the confidence to communicate in oral and written English outside the classroom. The course is divided into five units and takes a Project-based Learning approach. Unit themestar get the development of 21<sup>st</sup> century skills and focus on self-reflection and active community engagement. The course completion will enable the students to develop communication skills as reflective and self-directed learners. They will be able to intellectually engage with different stages of writing process, and develop analytical and problem-solving skills to address various community-specific challenges.

#### Contents

1. Self-Reflection
  - Introduction to the basics of the writing process
  - Introduction to the steps of essay writing
  - Prewriting activities: Brainstorming, listing, clustering and freewriting
  - Practicing Outlining of the essay
2. Personalized Learning
  - Learning Process, Learning Styles, Goal Setting and Learning Plan
3. Oral Presentation
  - Structure and Significance, Content Selection and Slide Presentation, Peer Review
4. Critical Reading Skills
  - Introducing Authentic Reading (Dawn and non-specialist academic books/texts)
  - Reading Strategies and Practice: Skimming, scanning, SQW3R, Annotating, Detailed reading and note-taking, Standard Test Practice: TOEFL and IELTS, Model Review Reports and Annotated Bibliographies
5. Community Engagement
  - Student-led brainstorming on local versus global issues, Identifying research problems
  - Drafting research questions, Drafting interview/survey questions for community research (in English or L1)
  - Engaging students in Critical reading, Presenting interview/ survey information, Fieldwork
  - Writing Community Engagement Project
6. Letter to the Editor
  - Types of letters, Form at and purpose of letter to the editor, Steps in writing letter-to-editor

#### Recommended Texts

1. Bailey, S. (2011). *Academic writing: A hand book for international students* (3rd ed.). New York: Routledge.
2. Swales, J.M., & Feak, C.B. (2012). *Academic writing for graduate students: Essential tasks and skills* (3<sup>rd</sup> ed.). Ann Arbor: The University of Michigan Press.

#### Suggested Readings

1. Cresswell, G. (2004). *Writing for academic success*. London: SAGE.
  2. Johnson-Sheehan, R. (2019). *Writing today*. Don Mills: Pearson.
- Silvia, P.J. (2019). *How to write a lot: A practical guide to productive academic writing*. Washington: American Psychological Association.

This course is based on quantitative reasoning I course. It will enhance the quantitative reasoning skills learned in quantitative reasoning I course. Students will be introduced to more tools necessary for quantitative reasoning skills to live in the fast paced 21st century. Students will be introduced to importance of statistical and mathematical skills in different professional settings, social and natural sciences. These quantitative reasoning skills will help students to better participate in national and international issues like political and health issues. This course will prepare the students to apply quantitative reasoning tools more efficiently in their professional and daily life activities. This course will help them to better understand the information in form of numeric, graphs, tables, and functions.

### Contents

1. Types of data and its graphical representation (Histogram, Stem and Leaf display, Box Plot, Scatter diagram, Histogram, Bar chart, etc)
2. Solving practical problems using linear and exponential models
3. Population growth models
4. Analytical approach to solve simultaneous equations
5. Inequalities and their application
6. Comparing quantities using analytical tools
7. Logical reasoning and their application in modern age
8. Logical reasoning and decision making
9. Data tendencies via measure of location
10. Variability and Measure of dispersion
11. Measuring relationships via Regression analysis and correlation
12. Statistical inference: sampling techniques, estimation techniques and hypothesis testing for decision and policy making

### Recommended Texts

1. Akar, G.K., Zembat, İ.Ö., Arslan, S., & Thompson, P.W. (2023). *Quantitative Reasoning in Mathematics and Science Education*. 1<sup>st</sup> Ed., Springer, USA.
2. Sharma, A.K. (2005). *Text book of elementary statistics*. Discovery Publishing House.
3. Blitzer, R. (2014). *Precalculus*, 5<sup>th</sup> Ed.. Pearson Education, Limited. New York

### Suggested Readings

1. Gupta, S.C., & Kapoor, V.K. (2020). *Fundamentals of mathematical statistics*. 12<sup>th</sup> Ed, Sultan Chand & Sons.
2. Aufmann, R.N., Lockwood, J., Nation, R.D., & Clegg, D.K. (2007). *Mathematical thinking and quantitative reasoning*. Cengage Learning
3. Blitzer, R., & White, J. (2005). *Thinking mathematically*. Pearson Prentice Hall.

**Course Description:**

This course focuses on ideological background of Pakistan. The course is designed to give a comprehensive insight about the constitutional developments of Pakistan. Starting from the Government of India Act, 1935 till to date, all important events leading to constitutional developments in Pakistan will be the focus of course. Failure of the constitutional machinery and leading constitutional cases on the subject. Moreover, students will study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan. It will also cover the entire Constitution of Pakistan 1973. However, emphasis would be on the fundamental rights, the nature of federalism under the constitution, distribution of powers, the rights and various remedies, the supremacy of parliament and the independence of judiciary

**Outline:**

- **Ideology of Pakistan**
  - Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-e-Azam Muhammad Ali Jinnah.
  - Two Nation Theory and Factors leading to Muslim separatism.
- **Constitutional Developments**
  - Salient Feature of the Government of India Act 1935
  - Salient Feature of Indian Independence Act 1947
  - Objectives Resolution
  - Salient Feature of the 1956 Constitution
  - Developments leading to the abrogation of Constitution of 1956
  - Salient features of the 1962 Constitution
  - Causes of failure of the Constitution of 1962
  - Comparative study of significant features of the Constitution of 1956, 1962 and 1973
- **Fundamental rights**
- **Principles of policy**
- **Federation of Pakistan**
  - President
  - Parliament
  - The Federal Government
- **Provinces**
  - Governors
  - Provincial Assemblies
  - The Provincial Government
- **The Judicature**
  - Supreme Court
  - High Courts
  - Federal Shariat Courts
  - Supreme Judicial Council
  - Administrative Courts and tribunals
- **Islamic Provisions in Constitution**
- **Significant Amendments of Constitution of Pakistan 1973**

**Recommended Books:**

1. Constitutional and Political History of Pakistan by Hamid Khan
2. Mahmood, Shaukat and Shaukat, Nadeem. Constitution of the Islamic Republic of Pakistan, 3rd re edn. Lahore: Legal Research Centre, 1996.
3. Munir, Muhammad. Constitution of the Islamic Republic of Pakistan: Being a Commentary on the Constitution of Pakistan, 1973. Lahore, Law Pub., 1975.
4. Rizvi, Syed Shabbar Raza. Constitutional Law of Pakistan: Text, Case Law and Analytical Commentary. 2nd re edn. Lahore: Vanguard, 2005.
5. The Text of the Constitution of the Islamic Republic of Pakistan, 1973 (as amended).
6. Fundamental Laws of Pakistan by A.K. Brohi

Decision-making by consumers, producers, and governments lies at the heart of economic analyses. The first half of this course in microeconomic contents is devoted to the study of rational decision-making and the modelling of associated market behavior. We then study how individual economic decisions interact in markets with varying degrees of competition, paying substantial attention to the comparative welfare outcomes produced by different market forms. Additional topics include welfare economics and its applications, and market imperfections like oligopoly and externalities. There is substantial emphasis on the use of analytical and mathematical tools. These tools and the subject material underpin much of the current research in microeconomics. The course intends to provide further insight about price and output determination under various market scenarios.

### *Contents*

1. Characteristics and output/price determination under pure competition, monopoly, monopolistic competition and oligopoly
2. profit maximization under different market structures in both short run and long run perspectives.
3. Price discrimination
4. Regulation of monopoly
5. Game Contents
6. Resource Market structure
7. Demand and supply pattern in resource market (wage rent, interest and profit determination)
8. General equilibrium model
9. Welfare Economics, public
10. Goods and externalities
11. Microeconomics of Government.

### *Recommended Texts*

4. Mankiw, N. G. (2018). Principles of Microeconomics (8th ed.). Cengage Learning.
5. Frank, R. H., Bernanke, B. S., & Osberg, L. S. (2019). Principles of Microeconomics (7th ed.). McGraw-Hill Education.
6. Cowen, T., & Tabarrok, A. (2019). Modern Principles of Economics (4th ed.). Worth Publishers. Parkin, M. (2010). Economics, 10th Edition, Addison Wesley Publishing Company.

### *Suggested Readings*

4. Varian, H. R. (2022). Intermediate Microeconomics: A Modern Approach (10th ed.). W. W. Norton & Company.
5. Mankiw, N. G., & Taylor, M. P. (2022). Microeconomics (5th ed.). Worth Publishers.
6. Nicholson, W., & Snyder, C. M. (2021). Microeconomic Theory: Basic Principles and Extensions (13th ed.). Cengage Learning.

This course is designed to help student develop the skills and tools they need to think more clearly, make better decisions, and communicate your ideas more effectively. This course will provide them with a solid foundation in the principles and practices of logical and critical thinking. They will learn how to identify and evaluate arguments, recognize common fallacies and biases, construct well-reasoned arguments and counterarguments, and analyze complex ideas and issues from multiple perspectives. They will also learn how to make sound judgments based on evidence and reasoning, and how to communicate their ideas and arguments clearly and effectively.

### *Contents*

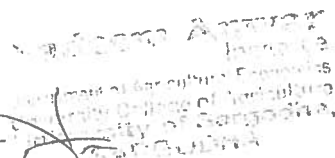
1. Introduction to Logic: An overview of the principles of logic and their application to various fields of study.
2. Critical Thinking: An examination of the methods and techniques used to evaluate arguments, including identifying fallacies, assessing evidence, and distinguishing between valid and invalid reasoning.
3. Reasoning and Argumentation: An exploration of the different types of arguments and how they are constructed, as well as how to analyze and evaluate them.
4. Deductive Reasoning: An examination of the principles of deductive reasoning, including the use of syllogisms, categorical logic, and propositional logic.
5. Inductive Reasoning: An overview of inductive reasoning, including the use of analogies, generalizations, and statistical reasoning.
6. Scientific Reasoning: An examination of the methods used in scientific inquiry, including hypothesis testing, experimental design, and the interpretation of data.
7. Decision Making: An exploration of the principles of decision making, including the use of heuristics, biases, and ethical considerations.
8. Problem Solving: An examination of different strategies for solving problems, including trial and error, algorithmic approaches, and creative thinking.
9. Analytical Thinking: An exploration of the principles of analytical thinking, including the use of data analysis, pattern recognition, and the identification of cause-and-effect relationships.
10. Communication: An examination of effective communication strategies, including the use of clear and concise language, logical organization, and the appropriate use of evidence to support arguments.

### *Recommended Texts*

1. Smith, P. (2019). An introduction to formal logic. Cambridge University Press.
2. Smith, P. (2019). An introduction to formal logic. Cambridge University Press.

### *Suggested Readings*

1. Kelley, D. (1998). The art of reasoning. W. W. Norton & Company.
2. Weston, A. (2018). A rulebook for arguments. Hackett Publishing.
3. Adler, M. J., & Van Doren, C. (2011). How to read a book. Simon & Schuster.



4. Sagan, C. (1996). The demon-haunted world: Science as a candle in the dark. Ballantine Books.

RESEARCH CENTER  
UNIVERSITY OF CALIFORNIA  
LIBRARY  
DANIEL J. BOULDER



To enable students to understand: Basic concepts of genetics, understanding, why the characters of off springs are similar to their parents, what can be the possible reason for the variation that the off springs show to their parents. Mechanism of heredity underlying laws of genetics and their practical manifestation in the form of various monohybrid as well as dihybrid crosses. Understanding the linkage as potential reason for deviation from law of independent assortment. Understanding the concepts of allele and gene both at genotypic as well as phenotypic level. Understanding process and purposes of the cell cycle, meiosis, and mitosis, as well as the outcomes of these processes. Enabling the students to solve various genetics problems, making calculated and accurate predictions about inheritance of genetic traits. Chemical and molecular nature of nucleic acids i.e. RNA and DNA.

### Contents

#### Theory

1. Definition of genetics, concepts of heredity and variation.
2. Mendelian genetics: chromosome theory of heredity.
3. Differences between allelic and non-allelic interactions.
4. Chromosomal aberration.
5. Nucleic acids and classical vs modern concepts of gene.

#### Practical

1. Study of cell divisions and gametogenesis.
2. Calculation of monohybrid and dihybrid ratios.
3. Numerical examples relating to gene interaction, multiple alleles and multiple factor inheritance.
4. Calculation of linkage from test cross and  $F_2$  data.

#### Recommended Texts

1. Singh, B.D. (2004). *Genetics*. New Delhi, India, Kalyani Publishers.
2. Klug, W.S. & Cummings, M. R. (2003). *Concepts of Genetics*. (7<sup>th</sup> ed.), Singapore, Pearson Education.

#### Suggested Readings

1. Singh, P. (2003). *Elements of Genetics*. (2<sup>nd</sup> ed.) Delhi, India, Kalyani Publishers.
2. Stansfield, W.D. ((1988) *Theory and Problems of Genetics*. 4<sup>th</sup>ed. NY, McGraw-Hill Book Co.
3. Khan I.A. Azhar, F.M. Ali, Z. & Khan, A.A. (2008). *Solving Numerical Genetic Problems*. Dept. Plant Breed. Genetic Faisalabad, Uni. Agri.

This course is aimed to make the students familiar with the basic information about the study of insects. The students would be able to know about arthropods and especially insects with their morphological features, identify insects of economic importance and acquire working skills for collecting, mounting, and preserving insects. Course briefs about the basic external and internal morphological and anatomical features along with their basic functioning principles. Students will learn as well about the insect classification and nomenclature. They can easily identify the insect order, family and type and can properly collect, mount and preserve these invertebrates for further studies. Insect body features and their habits help for their identification. This is the basic course that enables the students to further understand the ways and techniques adopted for the control and management of economically important insect pests.

*Contents (Theory)*

- 1 Introduction
- 2 Phylum Arthropoda and its classification
- 3 Metamorphosis and its types
- 4 Briefs of external and internal morphology and physiology with a particular reference to typical insect, 'ak' grasshopper, *Poeciloceris pictus*
- 5 Introduction to classification of class Insecta

*Contents (Practical)*

- 1 Collection and preservation of insects
- 2 Morphology and dissection of a typical insect (digestive, reproductive, excretory, nervous, circulatory and tracheal systems)
- 3 Temporary mounts of different types of appendages of insects

*Recommended Texts*

1. Lohar, M.K. (1998). *Introductory Entomology*, Kashif Publications, Hyderabad, Pakistan.
2. McGavin, G. C. (2001). *Essential entomology: an order-by-order introduction*. USA: Oxford University Press.

*Suggested Readings*

1. Tonapi, G.T. (1994). *Experimental Entomology, an Aid to Lab. and Field Studies*. Dehli: C.B.S. Publishers and Distributors.
- Mani, M.S. (1990). *General Entomology* (4<sup>th</sup> ed.) Dehli: Oxford & IBH Publishing Co. Pvt. Ltd.

Plant pathology is a science that studies plant diseases and attempts to improve the chances for survival of plants when they are faced with unfavorable environmental conditions and parasitic microorganisms that cause disease. As such, plant pathology is challenging, interesting, important, and worth studying in its own right. It is also, however, a science that has a practical and noble goal of protecting the food available for humans and animals. Plant diseases, by their presence, prevent the cultivation and growth of food plants in some areas; or food plants may be cultivated and grown but plant diseases may attack them, destroy parts or all of the plants, and reduce much of their produce, i.e., food, before they can be harvested or consumed. The objective of this course is to acquaint the students with basic concepts and identification of plant pathogens. The course covers all aspects of plant pathogens which include their economic importance, morphology, reproduction and ecology. The course also covers classification of different plant pathogens. In addition to plant pathogens, phanerogamic parasites, viroids and fastidious bacteria will also be covered briefly during this course.

#### Theory

1. Introduction and economic importance.
2. Identification and characteristics of fungi and prokaryotes.
3. Identification and characteristics of viruses, viroids and nematodes.
4. Identification and characteristics of fungus like organisms and phanerogamic parasites

#### Practical

1. Orientation of laboratory equipment
2. Sterilization of glassware
3. Preparation of media and isolation of different plant pathogens
4. Study of characteristics of various plant pathogens through slides
5. Live specimens and their comparative account/study

#### Recommended Texts

1. Agrios, G. N. (2005). *Plant Pathology* (5<sup>th</sup> ed.). Burlington, MA. USA, Elsevier Academic Press.
2. Ahmad, I., & Bhutta, A.R. (2005) *Textbook of introductory Plant Pathology*. Islamabad, NBF Publisher.

#### Suggested Readings

1. Bos, L. (1999). *Plant viruses, unique and intriguing pathogens: a textbook of plant virology*. Netherlands, Backhuys Publishers.
2. Mehrotra, R. S., & Aggarwal, A. (2003). *Plant Pathology* (2<sup>nd</sup> ed.). India, Tata McGraw Hill Education (India) Private Limited.
3. Ravichandra, N. G. (2013). *Fundamentals of plant pathology*. India, PHI Learning Pvt. Ltd.
4. Windham, M. T., Trigiano, R. N., & Windham, A. S. (2003). *Plant pathology: concepts and laboratory exercises*. UK, Taylor and Francis.

This course is aimed to make the students familiar with the basic information about the study of horticultural plants such as fruits, vegetables and ornamental plants. The course covers all aspects of Horticultural crops. The student will learn the division of horticulture and classification of horticultural plants as well as plant parts and their modifications. This course would help understand students regarding, propagation methods, punning, training and laying out of an orchard, vegetable farm. This course will help students to identify the key issues being faced by the growers such as purchasing of plants from nursery, establishing an orchard, pruning, training and wind breaks. Taking this course would broaden their vision regarding the horticulture industry at domestic and international level. Students will be able to identify existing gaps and will be trained to solve those issues.

#### *Contents*

1. Introduction, history, importance and future scope
2. Definition and divisions of horticulture
3. Classification of horticultural crops, Plant parts and their functions.
4. Phases of plant growth.

#### *Practical*

1. Visit of nurseries, commercial gardens and public parks
2. Identification and nomenclature of important fruits, vegetables and ornamental plants
3. Garden tools and their uses, Media and its preparation.
4. Techniques of propagation

#### *Recommended Texts*

- 1 Christopher, E. P. (2012). *Introductory Horticulture*. New Dehli, India, Biotech books
- 2 Carrol, L., J.R. Shry and H.E. Reily. (2011). *Introductory Horticulture* (8th Ed.) Albany, USA, Delmar-Thomson Learning.

#### *Suggested Reading*

- 1 Hartmann, H.T., D.E. Kester, E.T. Davies and R.L. Geneve. (2009). *Plant Propagation—Principles and Practices* (7th Ed.). New Delhi, India, Prentice-Hall India Learning Pvt. Ltd.
- 2 Peter, K.V. (2009). *Basics of Horticulture*. New Dehli, India, New India publishing Agency.
- 3 Reddy, R. and Shanker J.P.A. (2008). *Horticulture*. Commonwealth Publishers.



## SEMESTER-IV

URCG-5115

The Science of Global Challenges

3 (2-1)

**Climate Change** i.e., Global Warming, Natural and Anthropogenic Activities and their impact; **Energy** i.e., Renewable and non-renewable energy resources; **Water Security** i.e., water scarcity and waste water treatment; **Land Degradation** i.e., salinity, water logging, deforestation, land erosion; **Food Security** and roll of Biotechnology in food production; **Global Health Pandemics** i.e., Infectious diseases, vaccine, development of drug discovery for newly explored diseases

### **Practical:**

- 1: Preparation of standard solution and their standardizations
- 2: Soil and Water Analysis

### *Recommended Text:*

Usman, M.(2022). *Science of Global Challenges*. Ilmi Kitab Khana, Lahore

### *Suggested Books*

- 1: Thieman, W.J. & Palladino, M.A. (2014). *Introduction to biotechnology*. Edinburgh Gate UK: Pearson Education Limited.
- 2: Daugherty, E. (2012). *Biotechnology: Science for the New Millennium*, 1<sup>st</sup> Edition, Revised, USA: Paradigm Publication.
- 3: Karaduman, I.C. (Ed.) (2014) *Global Challenges for the world*. Obrocnosc. ZeszytNaukowe. Turkey



Department of Agriculture  
University of Agriculture  
Faisalabad  
~ 46

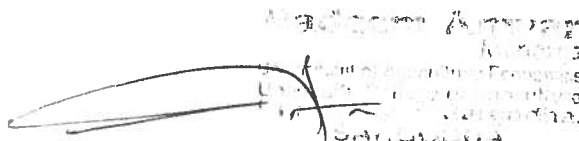
This course addresses the unique entrepreneurial experience of conceiving, evaluating, creating, managing, and potentially selling a business idea. The goal is to provide a solid background with practical application of important concepts applicable to the entrepreneurial environment. Entrepreneurial discussions regarding the key business areas of finance, accounting, marketing and management include the creative aspects of entrepreneurship. The course relies on classroom discussion, participation, the creation of a feasibility plan, and building a business plan to develop a comprehensive strategy for launching and managing a new venture.

### Course Learning Objectives

1. To enhance the 'entrepreneurial intentions' of the students by improving their natural willingness to start a business.
2. To understand the process of entrepreneurship and learn the ways to manage it by working individually in the class and in the form of groups outside the class to conduct field assignments.
3. To educate the students about the practical underpinnings of the entrepreneurship with the aid of practical assignments and idea pitching.

### Contents

1. **Background:** What is an Organization, Organizational Resources, Management Functions, Kinds of Managers, Mintzberg's Managerial Roles.
2. **Forms of Business Ownership:** The Sole proprietorship, Partnership, Joint Stock Company
3. **Entrepreneurship:** The World of the Entrepreneur, what is an entrepreneur? The Benefits of Entrepreneurship, the Potential Drawbacks of Entrepreneurship, Behind the Boom: Feeding the Entrepreneurial Fire.
4. **The Challenges of Entrepreneurship:** The Cultural Diversity in Entrepreneurship, The Power of "Small" Business, Putting Failure into Perspective, The Ten Deadly Mistakes of Entrepreneurship, How to Avoid the Pitfalls, Idea Discussions & Selection of student Projects, Islamic Ethics of Entrepreneurship.
5. **Inside the Entrepreneurial Mind:** From Ideas to Reality: Creativity, Innovation, and Entrepreneurship, Creativity—Essential to Survival, Creative Thinking, Barriers to Creativity, How to Enhance Creativity, The Creative Process, Techniques for Improving the Creative Process, Protecting Your Ideas, Idea Discussions & Selection of student Projects.
6. **Products and technology, identification opportunities**
  7. **Designing a Competitive Business Model and Building a Solid Strategic Plan:** Building a strategic plan, Building a Competitive Advantage, The Strategic Management Process, Formulate strategic options and select the appropriate strategies, Discussion about execution of Students' Project.
  8. **Conducting a Feasibility Analysis and Crafting a Winning Business Plan:** Conducting a Feasibility Analysis, Industry and market feasibility, Porter's five forces model, financial feasibility analysis. Why Develop a Business Plan, The Elements of a Business Plan, What Lenders and Investors Look for in a Business Plan, Making the Business Plan Presentation.
  9. **Building a Powerful Marketing Plan:** Building a Guerrilla Marketing Plan, Pinpointing the Target Market, Determining Customer Needs and Wants through Market Research. Plotting a Guerrilla Marketing Strategy: How to Build a Competitive Edge, Feed Back &



- Suggestions on Student Project, Islamic Ethics for Entrepreneurial Marketing
10. **E-Commerce and the Entrepreneur:** Factors to Consider before Launching into E-Commerce, Ten Myths of E-Commerce, Strategies for E-Success, Designing a Killer Website, Tracking Web Results, Ensuring Web Privacy and Security, Feed Back & Suggestions on Student Project.
  11. **Pricing Strategies:** Three Potent Forces: Image, Competition, and Value, Pricing Strategies and Tactics, Pricing Strategies and Methods for Retailers, The Impact of Crediton Pricing
  12. **Attracting Venture Capitalist:** Projected Financial Statements, Basic Financial Statements, Ratio Analysis, Interpreting Business Ratios, Breakeven Analysis, Feed Back & Suggestions on Student Project,
  13. **Idea Pitching:** Formal presentation, 5-minutes pitch, funding negotiation and launching.

Recommended Texts:

1. Scarborough, N.M. (2011). *Essentials of entrepreneurship and small business management*. Publishing as Prentice Hall, One Lake Street, Upper Saddle River, NewJersey07458..

Suggested Readings:

1. Burstiner, I. (1989). *Small business handbook*. Prentice Hall Press.

**Course Description:**

The Civics and Community Engagement course is designed to provide students with an understanding of the importance of civic participation, culture and cultural diversity, basic foundations of citizenship, group identities and the role of individuals in creating positive change within their communities. The course aims at developing students' knowledge, skills and attitudes necessary for active and responsible citizenship.

**Learning outcomes**

After completing this course, students will be able to

- Understand the concepts of civic engagement, community development, and social responsibility.
- Understand rights and responsibilities of citizenship
- Understand cultural diversity in local and global context
- Analyze the significance of civic participation in promoting social justice, equity, and Democracy.
- Examine the historical and contemporary examples of successful civic and community engagement initiatives.
- Identify and assess community needs, assets, and challenges to develop effective strategies for community improvement.
- Explore the ethical implications and dilemmas associated with civic and community engagement.
- Develop practical skills for effective community organizing, advocacy, and leadership.
- Foster intercultural competence and respect for diversity in community engagement efforts.
- Collaborate with community organizations, stakeholders, and fellow students to design and implement community-based projects.
- Reflect on personal growth and learning through self-assessment and critical analysis of community engagement experiences.

**Course Content:****Introduction to Civics & Community Engagement**

- Overview of the course: Civics & Community Engagement
- Definition and importance of civics
- Key concepts in civics: citizenship, democracy, governance, and the rule of law
- Rights and responsibilities of citizens

**Citizenship and Community Engagement**

- Introduction to Active Citizenship: Overview of the Ideas, Concepts, Philosophy and Skills
- Approaches and Methodology for Active Citizenship

**Identity, Culture, and Social Harmony**

- Concept and Development of Identity, Group identities
- Components of Culture, Cultural pluralism, Multiculturalism, Cultural Ethnocentrism, Cultural relativism, Understanding cultural diversity, Globalization and Culture, Social Harmony,
- Religious Diversity (Understanding and affirmation of similarities & differences)
- Understanding Socio-Political Polarization
- Minorities, Social Inclusion, Affirmative actions

### **Multi-cultural society and inter-cultural dialogue**

- Inter-cultural dialogue (bridging the differences, promoting harmony)
- Promoting intergroup contact/Dialogue
- Significance of diversity and its impact
- Importance and domains of Inter-cultural dialogue

### **Active Citizen: Locally Active, Globally Connected**

- Importance of active citizenship at national and global level
- Understanding community
- Identification of resources (human, natural and others)
- Utilization of resources for development (community participation)
- Strategic planning, for development (community linkages and mobilization)

### **Human rights, constitutionalism and citizens' responsibilities**

- Introduction to Human Rights
- Human rights in constitution of Pakistan
- Public duties and responsibilities
- Constitutional is manddemocratic process

### **Social Institutions, Social Groups, Formal Organizations and Bureaucracy**

- Types of Groups, Group identities, Organizations
- Bureaucracy, Weber's model of Bureaucracy
- Role of political parties, interest groups, and non-governmental organizations

### **Civic Engagement Strategies**

- Grassroots organizing and community mobilization
- Advocacy and lobbying for policy change
- Volunteerism and service-learning opportunities

### **Social issues/ Problems of Pakistan**

- Overview of major social issues of Pakistani society

### **Social Action Project**

#### **Recommended Books:**

1. Kennedy, J.K., & Brunold, A. (2016). Regional context and Citizenship education in Asia and Europe. New York: Routledge, Falmer.
2. Henslin, James M. (2018). Essentials of Sociology: A Down to Earth Approach (13<sup>th</sup> ed.). New York: Pearson Education
3. Macionis, J.J., & Gerber, M.L. (2020). Sociology. New York: Pearson Education

#### **Reference Books:**

1. GlencoeMcGraw-Hill. (n.d.). Civics Today: Citizenship, Economics, and Youth.
2. Magleby, D.B., Light, P.C., & Nemacheck, C.L. (2020). Government by the People (16<sup>th</sup> ed.). Pearson.
3. Sirianni, C., & Friedland, L. (2005). The Civic Renewal Movement: Community-Building and Democracy in the United States. Kettering Foundation Press.
4. Bloemraad, I. (2006). Becoming a Citizen: Incorporating Immigrants and Refugees in the United States and Canada. University of California Press.
5. Kuyek, J. (2007). Community Organizing: Theory and Practice. Fernwood Publishing.
6. DeKieffer, D.E. (2010). The Citizen's Guide to Lobbying Congress. The Capitol.Net.
7. Rybacki, K. C., & Rybacki, D. J. (2021). Advocacy and Opposition: An

Handwritten signature and stamp at the bottom of the page.

- Introduction to Argumentation (8thed.).Routledge.
8. Kretzmann, J. P., & McKnight, J. L. (1993). Building Communities from the Inside Out: A Path towards Finding and Mobilizing a Community's Assets. ACTA Publications.
  9. Patterson, T. E. (2005). Engaging the Public: How Government and the Media Can Reinvigorate American Democracy. Oxford University Press.
- Love, N.S., & Mattern, M. (2005).Doing Democracy: Activist Art and Cultural Politics. SUNY Press.



Topic	Details
Semester/Level	In some discipline 3 <sup>rd</sup> semester and in some discipline 4 <sup>th</sup> Semester/ ADP Program 2 <sup>nd</sup> Year
Course Code	URCG-5111
Course Title	Translation of the Holy Quran – II
Credit Hours	Non-Credit
Objectives	<ul style="list-style-type: none"> <li>▪ Students will come to know about the real nature, significance and relevance of the Islamic beliefs in light of the text of the Holy Quran.</li> <li>▪ Students will seek knowledge of translation and transliteration of the Holy Book Quran.</li> <li>▪ To familiarize the students with the concept of Ibādah (Its significance, scope and relevance) and its types in Islam.</li> <li>▪ Students will learn literal and idiomatic way of translation of the Holy Book.</li> <li>▪ Students will learn about the polytheism and its incompatibility in Islam highlighted by the Holy Quran.</li> <li>▪ To highlight the significance of learning through using all human faculties provided by the almighty Allah and familiarize the students about condemnation of ignorance mentioned in the Quranic text.</li> <li>▪ To develop Awareness among the students about rights and duties of different circles of society in the light of Holy Quran.</li> <li>▪ To introduce the students to Quranic Arabic grammar in practical manner.</li> </ul>




Course Contents:	<p>○ ایمانیات اور عبادات</p> <p>اللہ پر ایمان، فرشتوں پر ایمان، رسولوں پر ایمان، آسمانی کتابوں پر ایمان یوم آخرت پر ایمان، تقدیر پر ایمان نماز، روزہ، زکوٰۃ، حج، جہاد ○ معاشرے کے حقوق</p> <ul style="list-style-type: none"> <li>• خاندان کی تکوین</li> <li>• حق مہر</li> <li>• رضاعت و حمل</li> <li>• اولاد کو قتل کرنے کے ممانعت</li> <li>• شوہر کی نافرمانی</li> <li>• طلاق</li> <li>• بیوہ کی عدت کے احکام</li> <li>• نکاح کا پیغام بھیجنا</li> <li>• عورت کی وراثت (اس کے شوہر کی طرف سے)</li> <li>• والدین کے حقوق</li> <li>• بیویوں اور اولاد کے بیچ عداوت ○ خاندان کے حقوق</li> <li>• مہمان کی عزت</li> <li>• اجازت طلب کرنے کے اصول</li> <li>• مجلس کے آداب</li> <li>• تعاون اور بھائی چارہ</li> <li>• گروہ بندی</li> <li>• محبت</li> <li>• لوگوں کے درمیان صلح</li> <li>• عفو و درگزر، غصہ پر قابو اور معاف کرنا</li> <li>• شعوب و قبائل</li> <li>• لوگوں کے بیچ اختلافات</li> <li>• حمایت و نگہبانی</li> </ul>
Grammar:	□ قرآنی عربی گرامر کے اصول اور ان کے اطلاقات (متن قرآنی پر اطلاق سے
	توضیحات )



Handwritten text or stamp, possibly a library or institutional mark.



The purpose of this course is to provide the students with an introduction to the basic macroeconomic principles; to enable students to appreciate the workings of real (labour and goods) and asset/money markets and the nature of equilibrium in each market; to emphasize the role of macroeconomic policies that affect internal and external deficits, inflation and growth of per capita income. Throughout the course a focus will be on 'critical thinking' to analyze macroeconomic problems. The major areas of focus will be the inputs market, goods market, money/asset market, and economic growth. Business cycles will also be discussed and linked to macroeconomic policy debate issues of 'active' versus 'passive' and 'rules' versus discretion. The equilibrium IS-LM, ADAS model will be covered with some basic applications, providing a smooth transition to Intermediate macroeconomics. The course is pitched at the core principles level so is based on the understanding that students have at least attained some basic macroeconomics knowledge equivalent to that covered in any primary economics course. After completing the course, students are supposed to have fundamental knowledge of economic issues at aggregate level.

### Contents

1. An introduction to Macroeconomics and the economy
2. Microeconomics versus macroeconomics
3. The Roots of macroeconomics
4. Structure of economy and circular flow of income
5. Measuring domestic output and national income
6. Product, expenditure and income approaches
7. Other national income accounts
8. Price indices, Nominal and real GDP
9. Economic growth and instability
10. The business cycle
11. Unemployment and its types
12. Inflation and its types
13. The income consumption and income saving relationships
14. The real interest rate and investment relationship
15. The multiplier, accelerator and super-multiplier effect
16. The aggregate expenditure model.

### Recommended Texts

1. McConnell, C.R., Brue, S.L and Flynn, S.M. (2011). *Economics: Principles, Problems and Policies* 19<sup>th</sup> Edition, New York: McGraw-Hills.

### Suggested Readings

1. Dornbusch, R., Fischer, S. and Startz, R. (2013). *Macroeconomics*, 12<sup>th</sup> Edition, New York: McGraw Hill.
2. Shapiro E. (2003). *Macroeconomic Analysis*, 5<sup>th</sup> Edition. HARCOURT BRACE publisher.
3. Abel, B. Andrew & Ben S. Bernanke. (2005). *Macroeconomics*, 6<sup>th</sup> edition. McGraw Hill Inc.

The course is intended for students without sufficient mathematics who wish to obtain knowledge of mathematical techniques suitable for economic analysis. It assumes very little prerequisite knowledge. The approach is informal and aims to show students how to do and apply the mathematics they require for a successful study of economics. Economic applications are considered, although this course aims to teach the mathematics not the economics. Topics covered include basic algebra, simple calculus and matrix algebra. After completing the course, students will have the basic understanding about the use of Mathematics in Economics.

### *Contents*

1. The nature of mathematical economics
2. Mathematical versus non-mathematical economics and econometrics
3. Economic models and equilibrium analysis
4. Matrix algebra
5. Applications of derivatives
6. Comparative static analysis in economics and economic models
7. Derivatives of implicit functions
8. Optimization Problems, General Constrained Optimization, Dynamic optimization & Integration
9. Convexity and Optimization—Multivariate Optimization
10. Mathematical Programming
11. The concepts of Linear and Non-Linear Programming.

### *Recommended Texts*

1. Chiang, A. C. (2005). *Fundamentals Methods of Mathematical Economics*, 3<sup>rd</sup> Edition., International Edition, McGraw Hill publications.

### *Suggested Readings*

1. Goshaw, M. (2008). *Concepts of calculus with applications*, 1<sup>st</sup> Edition, Singapore: Pearson Publisher.
2. Shannon, J. (1995). *Mathematics for Business Economics and Finance*, Australia: John Willey & Sons.

**AGRC-5108****Agribusiness Management and Marketing 2(2-0)**

This course provides a perspective and understanding of the key components of agricultural business management, with a focus on the management tools used to measure business performance. There will be an emphasis on evaluating farm businesses incorporating financial, marketing, production and human resource management tools, decision making techniques, technology adoption and management of risk. After completing the course, students will have developed some understanding of concepts, principles and issues in business management.

*Contents*

1. Scope of Agribusiness Management
2. Functions of management
3. Forms of business organizations
4. Principles and Techniques of farm planning, operation and management
5. Enterprise budgeting
6. Resource constraints
7. Optimum combinations and alternate business plans.
8. Balance Sheet, income statement and their analysis
9. Benefit Cost Analysis
10. Uncertainty and Risk in Farm Business
11. Risk Management Strategies
12. Supply chain management and Relevant Case studies
13. Role of Government in Agribusiness management.

*Recommended Texts*

1. Downey, W.D. & Erickson, S. P. (2002). *Agribusiness Management*. Singapore: McGraw Hill Education.
2. Castle, E. N., Becker, M. H. & Nelson, A. G. (2002). *Farm Business Management*, New York: Macmillan.

*Suggested Readings*

1. Kinsey, B. H. (2002). *Agri. Business and Rural Enterprise*, London: Croom Helm Ltd.
2. Goldberg, R. A., Wilson, L. M., & Austin, J. E. (1974). *Agribusiness Management for Developing Countries*, Cambridge, MA: Ballinger Publishing Company.
3. Buckett, M. (1981). *An Introduction to Farm Organization and Management*, Elsevier Science & Technology Books.
4. Kay, R., Edwards, W., & Duffy, P. (2007). *Farm Management*, 7<sup>th</sup> Edition. McGraw Hill Education, EU.

**STAT-5126****Statistics for Agricultural Sciences****3(3-0)**

This course is designed for under graduate programs of agriculture sciences. The objective of this course is to impart basic and applied knowledge about statistics for collection, presentation, analysis and interpretations of data related to agriculture issues. After completing this course agriculture students will be able to understand the general concepts of basic statistics, to conduct agriculture surveys, to understand design of experiments, and other statistical tools. These statistical concepts are further will be helpful to complete a research related to agriculture sciences. Moreover over students will also learn some statistical softwares such as Minitab, SPSS and Design Expert to improve their computational and analytical skills. This course will be able to understand and analyze the agricultural problems in field as well as in lab conditions.

**Contents**

1. Definition and importance of Statistics in Agriculture.
2. Data, Different types of data and variables
3. Classification and Tabulation of data.
4. Frequency distribution, Graphical representation of data.
5. Measure of Central tendency and Measure of Dispersion. Calculation of averages, Range, variance, Standard deviation and coefficient of variation.
6. Regression and Correlation Analysis: Simple and Multiple regression, correlation cases.
7. Sampling and its types: Probability and non-Probability Sampling, Simple random sampling, stratified random sampling, Systematic sampling, Sampling and non-sampling error
8. Sampling distribution of mean and difference between two means.
9. Inference 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.
10. Test of association of attributes using  $\chi^2$  (chi-square) Testing hypothesis about variance.
11. ANOVA and its assumptions, One-way ANOVA, Two-way ANOVA.

**Recommended Texts**

1. Muhammad, F. (2000). *Statistical methods and data analysis*. Pakistan: Ilmi Kitab Khana.
2. Rao, G. N. (2007). *Statistics for agricultural sciences* (2<sup>nd</sup> ed.). BS Publication.

**Suggested Readings**

1. Lawal, B. (2014). *Applied statistical methods in agriculture, health and life sciences*. USA: Springer.
2. Sahu, P. K. (2016). *Applied statistics for agriculture, veterinary, fishery, dairy and allied fields*. USA: Springer.
1. Crawshaw, J. & Chambers, J. A. (1994). *Concise course in A. level statistic with world examples*. USA: Springer.



## SEMESTER-V

AGRE-6101

## MACROECONOMICS – II

3(3+0)

The macro-economy of a country is a complex network consisting of millions of interacting pieces such as consumers, firms, banks, and government institutions. This course introduces students to some of the key models economists employ to understand how these pieces interact to generate economic growth, the business cycle, and inflation. The course covers models of aggregate income determination in open economies; theories of aggregate economic behavior with respect to consumption, investment expenditures, and financial transactions; balance of payments and exchange rate analysis; theories of inflation and unemployment; introductory dynamic analysis; and theories of growth and business cycles. The models will be applied to the data and used to analyze the observed growth patterns across the world. Macroeconomics 2 develops the tools, skills and knowledge base, necessary to operate as a practicing macroeconomist. The course leads on from the first year macroeconomics course and provides a smooth transition for those intending to pursue macroeconomics in later years. After completing the course, students will have understandings of major macroeconomic models.

### *Contents*

1. Aggregate demand and Aggregate Supply patterns
2. Changes in AD and AS, equilibrium and dynamics of equilibrium in short run and long run
3. Money and Banking: functions of money, the components of money supply, Money definitions M1, M2, M3
4. Banking system, historical background and functions of different banks, commercial banks, and central bank.
5. The IS-LM Model, equilibrium in the labour market, goods market and money market
6. Factors affecting IS and LM curves
7. General equilibrium in the complete model
8. The phenomenon of Phillips curve
9. The Okun's law
10. Introduction to macroeconomic policies, Monetary and fiscal policies
11. Labour and wage policies
12. International policy
13. International trade, balance of payments and causes of disequilibrium.

### *Recommended Texts*

1. McConnel, C.R., Brue, S.L and Flynn, S.M. (2011). *Economics: Principles, Problems and Policies* 19<sup>th</sup> Edition, New York: McGraw-Hills.

### *Suggested Readings*

1. Dornbusch, R., Fischer, S. and Startz, R. (2013). *Macroeconomics*, 12<sup>th</sup> Edition, New York: McGraw Hill.
2. Shapiro E. (2003). *Macroeconomic Analysis*, 5<sup>th</sup> Edition. HARCOURT BRACE publisher.
3. Abel, B. Andrew & Ben S. Bernanke. (2005). *Macroeconomics*, 6<sup>th</sup> edition. Mcgraw Hill Inc.

After completing the course, students will be able to understand the theoretical core of production economics. The course is focused on economic analysis of production agriculture. The influential role of plant and animal biological growth processes sets this field of study apart from industrial production processes, where much greater levels of control are available to the producer and input and output relationships are measured with more completeness and precision. Course will cover the basic contents and analytical tools required to conduct analysis of optimal management decisions subject to the biological production technology.

### *Contents*

1. Definition and scope of agricultural production economics
2. Assumptions of static and dynamic production economics
3. Production relationships, i.e. factor-product relationships, factor-factor relationship and product-product relationships
4. Economic decision making under various production relationships
5. Costs of production
6. Returns to scale
7. Technological change
8. Resource allocation.

### *Recommended Texts*

1. Debertin, D.L. (2012). *Agricultural Production Economics*, 2<sup>nd</sup> Edition. New York: McMillan Publishing Company.
2. Beatie, B. R. Taylor, C. R., & Myles, W.J. (2009). *The Economics of Production*, New York: Krieger Publishing Company.

### *Suggested Readings*

1. Doll, J.P. & Orazem, F. (1992). *Production Economics: Contents with Applications*, 2<sup>nd</sup> Edition. New York: Krieger Publishing Company.

Econometrics I introduces students the regression methods for analyzing data in economics. This course emphasizes both the theoretical and the practical aspects of statistical analysis, focusing on techniques for estimating econometric models of various kinds and for conducting tests of hypotheses of interest to economists. The goal is to help students develop a solid theoretical background in introductory level econometrics, the ability to implement the techniques and to critique empirical studies in economics. After completing the course, students will be in a position to apply the econometric tools and techniques in the field of Agricultural Economics.

### *Contents*

1. Definition, scope and importance of econometrics
2. Introduction to econometric model
3. Classical Linear Regression model, Difference between population and sample regression model
4. Ordinary least square (OLS) estimation of simple and multiple linear regression
5. Matrix approach to regression and OLS through matrix approach
6. Variance-covariance of regression estimates
7. Computing and interpreting coefficient of determination  $R^2$  and adjusted  $R^2$
8. Inference about regression parameters
9. ANOVA for regression model.
10. Dummy variables
11. Specification bias and tests
12. Concepts of Multicollinearity
13. Heteroscedasticity
14. Autocorrelation

### *Recommended Texts*

1. Gujarati, D.N. (2009). *Essentials of Econometrics*, 4<sup>th</sup> Edition, London: McGraw-Hill.
2. Wooldridge J.M. (2012). *Introductory Econometrics: A Modern Approach*, 5<sup>th</sup> Edition. USA: Cengage Learning Publisher.

### *Suggested Readings*

1. Mirar, T.W. (1990). *Economic Statistics and Econometrics*, New York: McMillan Publishing Co.
2. Ramanathan R. (2001). *Introductory Econometrics with Applications*, 5<sup>th</sup> Edition. South-Western College Publisher.

This course enable students to understand principles and practice of designing, analyzing, appraising agricultural development projects and their relationship with policy analysis and decision making and develop an operational knowledge of selected methods and techniques of project planning, analysis and priority setting. It analyze context, framework, rationale, and methods of monitoring, evaluating and management of development projects. At the end of this course students are able to apply the knowledge to operational and local case studies.

#### *Contents*

1. Development planning (Concepts, costs and benefits); Planning processes (logical framework analysis), planning architecture at federal and provincial level
2. Project management (finances, materials, human resources); Project management life cycle (project identification)
3. Project preparation (PC-II & PC-I), project appraisal (undiscounted measures of project worth), inflation; Nominal and real terms money
4. The time value of money; Risk and discounting; Discounted cash flows; Discounted measures of project worth (Net present worth)
5. Benefit-cost ratio; Internal rate of return; Net benefit investment ratio; Sensitivity analysis
6. Risk management
7. Project approval (approval stages, approving forums, approval types and procedures);
8. Project execution and implementation (PMU), project monitoring (types and methods of monitoring, process monitoring, result-based monitoring); Project evaluation (purpose of evaluation, types of evaluation)
9. Project impact assessment (meaning, purpose and types); Impact assessment methods; Project closure (operational and financial and transfer of assets).

#### *Recommended Text*

1. Anandajayasekeram, P., C.J. Van Rooyen and F. Liebenberg. 2004. Agricultural Project Planning and Analysis: A Sourcebook. 2nd Ed. Flemish Interuniversity Council, Brussels, Belgium.
2. Government of Pakistan. 2017. Manual for Development Projects. Ministry of Planning, Development and Reform, Government of Pakistan, Islamabad, Pakistan.

#### *Suggested Readings*

1. Government of the Punjab. 2015. Punjab Planning Manual, Planning and Development Department, Government of the Punjab, Lahore, Pakistan.
2. Jeffrey, K. P. 2020. Project Management: Achieving Competitive Advantage. 5th Ed./Global Ed. Pearson.
3. Kerzner, H. 2017. Project Management: A Systems Approach to Planning, Scheduling and Controlling. 12th Ed. John Wiley & Sons, NJ, USA.
4. Price, G.J. 1984. Economics Analysis of Agricultural Projects. 2nd Ed. The John Hopkins University Press, Baltimore, USA.



## AGRE-6105 INTRODUCTION TO ENVIRONMENTAL ECONOMICS

3(3+0)

This course is designed to provide students with a comprehensive overview of the field of environmental economics and its relevance to the management of environmental resources. Throughout this course, students will explore various environmental problems and their economic implications, such as climate change, air and water pollution, and biodiversity loss. You will also learn about the role of government and non-governmental organizations in environmental policy-making and the challenges associated with international environmental governance. By the end of this course, you will have a solid understanding of the basic principles of environmental economics and the tools used to analyze environmental policy. You will be able to apply this knowledge to real-world environmental issues and contribute to the development of sustainable solutions.

### *Contents*

1. I. Introduction to Environmental Economics, definition of Environmental Economics, Importance of Environmental Economics, key concepts and tools
2. Economic Concepts for Environmental Economics, basic microeconomic principles, externalities and public goods, market failures
3. Valuation of Environmental Resources, The Value of Ecosystem Services, Contingent Valuation, Hedonic Pricing
4. Market-Based Instruments for Environmental Protection, Tradable Permits, Taxes and Subsidies, Deposit-Refund Systems
5. Cost-Benefit Analysis for Environmental Policy, The Steps of CBA, Discounting and Uncertainty, Sensitivity Analysis
6. Environmental Policy and Regulation, Command-and-Control Approaches, Voluntary Approaches, Coase Theorem
7. International Environmental Policy, The Tragedy of the Commons, Global Environmental Agreements, Trade and the Environment
8. Case Studies in Environmental Economics, Climate Change, Air Pollution, Water Pollution, Biodiversity Loss

### *Recommended Text*

1. Field, B.C. and M.F.E. Ambianal. 2020. Environmental Economics: An Introduction. 8th Ed. McGraw-Hill Education, NY, USA.
2. Harris, J.M. and B. Roach. 2017. Environmental and Natural Resource Economics: A Contemporary Approach. 4thEd. Routledge, London, UK.

### *Suggested Readings*

1. Phaneuf, D.J. and T. Requate. 2016. A Course in Environmental Economics: Theory, Policy, and Practice. Cambridge University Press, Cambridge, UK,
2. Thomas, J. M., and S.J. Callan. 2015. Environmental Economics and Management: Theory, Policy and Application. 6th Ed. Cengage Learning, USA.
3. Tom, T. and L. Lewis. 2018. Environmental and Natural Resource Economics. 11th Ed. Routledge, London, UK.

## AGRE-6106 HUMAN RESOURCE MANAGEMENT

3(3-0)

This course is designed to provide students with a comprehensive understanding of HRM and its role in organizational success. Throughout the course, students will learn about the essential functions of HRM, such as recruitment and selection, compensation and benefits, training and development, and employee relations. They will also explore the legal and ethical aspects of HRM and the various challenges faced by HR managers in a rapidly changing business environment.

By the end of this course students will be able to;

1. Describe the HR management and system at various levels in general and in certain specific industries or organizations.
2. Analyze the issues and strategies required to select and develop manpower resources.
3. Develop relevant skills necessary for application in HR related issues.
4. Integrate the understanding of various HR concepts along with the domain concept in order to take correct business decisions.

### Contents

1. Introduction to Human Resource Management (HRM); Meaning, function, significance and challenges
2. HRM strategy and analysis
3. Recruitment, placement, and talent management
4. Personnel planning and recruiting
5. Employee testing and selection; Interviewing candidates
6. Training and developing employees
7. Performance management system: Definition, importance, objectives, components and methods of performance management system
8. Compensation management
9. Principal compensation issue, job evaluation, pay-structure, individual & group incentives
10. Employee relations.

### Recommended Text

1. Bauer, T., B. Erdogan, D. Caughlin, D. Truxillo. 2019. Fundamentals of Human Resource Management: People, Data, and Analytics. SAGE Publications, Thousand Oaks, California, U.S.
2. Dessler, G., N.D. Cole and N. Chhinzer. 2015. Management of Human Resources: The Essentials. Pearson London, London, UK.

### Suggested Readings

1. Lussier, R.N. and J.R. Hendon. 2017. Human Resource Management: Functions, Applications, and Skill Development. Sage Publications, Thousand Oaks, California, U.S.
2. Dessler, G. 2016. Human Resource Management. Pearson, Florida, U.S.
3. Stone, R.J., A. Cox and M. Gavin. 2020. Human Resource Management. John Wiley & Sons, NJ, Hoboken, U.S.

Econometrics 2 provides the basic tools of applied econometric analysis. The course is based on regression analysis (covered in Econometrics 1), and gives a thorough introduction to the problem of endogeneity with possible treatments, time series regressions, linear panel models, and nonlinear probability and censored outcomes models. Successful completion of the course enables students 1. To understand how econometric methods are used to estimate causal relationships from observational data, 2. Possess a critical understanding of identification and estimation problems in economics and other social sciences, 3. Formulate simple research questions and carry out independent analyses in order to answer those and argue for and against endogeneity of right-hand side variables, 4. Prove consistency and asymptotic bias of estimators, 5. Understand the logic of sampling variance and distribution of estimators, 6. Understand the properties of time-series.

### *Contents*

1. Tests and remedial measures of multicollinearity
2. Tests and remedial measures of Heteroscedasticity and Autocorrelation
3. Model specification issues
4. Limited dependent variables (LPM, Tobit, Logit and Probit Models)
5. Auto regressive and distributed lag models
6. Time series analysis
7. Simultaneous equation models and their estimation approaches
8. Panel Data Analysis

### *Recommended Texts*

1. Gujarati, D.N. (2009). *Essentials of Econometrics*, 4<sup>th</sup> Edition, London: McGraw-Hill.
2. Wooldridge J.M. (2012). *Introductory Econometrics: A Modern Approach*, 5<sup>th</sup> Edition. USA: Cengage Learning Publisher.

### *Suggested Readings*

1. Mirar, T.W. (1990). *Economic Statistics and Econometrics*, New York: McMillan Publishing Co.
2. Ramanathan R. (2001). *Introductory Econometrics with Applications*, 5<sup>th</sup> Edition. South-Western College Publisher.
3. Baltagi, H. B. 2005. *Econometric Analysis of Panel Data*. John Wiley & Sons Ltd.

Poverty and underdevelopment in many countries are among the main contemporary challenges for humanity. This course provides an in-depth discussion of different economic explanations of underdevelopment, and modern strategies for fostering development. It will investigate the role of institutions, institutional change, and markets as they relate to economic development, and discuss related domestic and international economic policy questions. Special emphasis is put on the interplay and synergy between economic contents (attempting to explain underdevelopment) and empirical data (providing both motivating facts and specific test grounds for contents). At the end of this course, students will be able to design innovative ways to assess whether a proposed development intervention is likely to successfully improve the welfare of its target population. After completing the course, students will have the knowledge about the development issues in general and developing countries in particular.

### *Contents*

1. The concepts of economic development and Economic growth
2. Characteristics of developing economies
3. Importance and challenges of the development process
4. Theories of economic growth and development
5. Education, technological change and Economic development
6. Growth, Poverty and Income distribution
7. Economics of population and development
8. Importance of trade for development.
9. Globalization and its implications for development
10. Debt burden of developing countries
11. Governance and developmental experiences in Pakistan
12. NGOs and Development.

### *Recommended Texts*

1. Todaro, M. P., & Smith, S. C. (2008). *Economic Development*, 8<sup>th</sup> Edition. Singapore: Pearson Education Publisher.

### *Suggested Readings*

1. Jhingan, M.C. (2005). *Economics of Development and Planning*, New Delhi: Konark Publishers Pvt. Ltd.
2. Meier, G.M. (2005). *Leading Issues in Economic Development*, New York: Oxford University Press.
3. Zaidi, A.S. (2008). *Issues in Pakistan's Economy*, Karachi: Oxford University Press.

The objective of this course is to provide students with an understanding of the motivations for government policies related to food and agriculture, and the policy instruments that are used to pursue policy. The first part of the course introduces motivations for agricultural policies and describes some tools that can be used to meet policy goals. The second part provides details on specific policies, with emphasis on Pakistani food and agricultural policies and programs, however it is important to note that the primary goal of this course is not to memorize the details of specific government policies. Government policies change every few years, so knowledge of a specific program is useful only for limited period of time. This course is intended to provide students with the tools to understand and analyse both current and future agricultural policies

After completing the course, students will be in a position to understand the economic thought behind agricultural issues & policies in Pakistan's perspective.

#### Contents

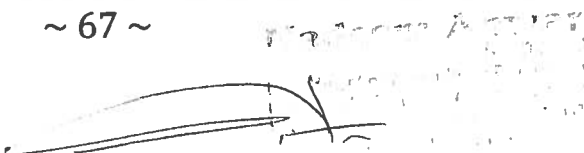
1. Overview of Pakistan's economy and role of Agriculture
2. Major issues and problems in agriculture development of Pakistan
3. Agricultural Policy
4. Policy goals
5. Policy instruments
6. Policy formulation, tradeoffs between goals
7. Land Reforms and land tenure system
8. Agricultural pricing policies, input-Output pricing policies
9. Policy of Agricultural Marketing
10. Agro-based industries
11. Agri-Taxation and subsidies
12. Agri. Credit and finance policies
13. Trade policies for agricultural commodities
14. Farm mechanization
15. Agri. extension, research and educational policies
16. Irrigation policies of Pakistan
17. Institutional reforms
18. Rural development policies
19. Past policies and their evaluation.

#### Recommended Texts

1. Ellise, F. (1992). *Agricultural Policies in Developing Countries*, Cambridge: Cambridge University Press.
2. Eckert, J. B. (1990). *Agricultural Policy Manual: A discussion of Agricultural Policies for Development*, Workshop Manual Series No. 2. Published by the directorate of Agricultural Policy and Chemonics International Consulting Division for EAN/Economic Analysis Network Project.

#### Suggested Readings

1. Naqvi, H.M. & Harold, J. (1998). *National Conference on Agriculture Policies & Farmers in Pakistan May 19-21, 1992*, Proceedings, Academy of Rural Development, Peshawar.
2. Govt. of Pakistan. (1988). *Report of the National Commission on Agriculture*, Ministry of Food and Agriculture.
3. Knutson, R.D., Penn, J.B. & Bocam, W.T. (2002). *Agricultural and Food Policy*, New Jersey, USA: Prentice Hall, Inc.



The course provides the students theoretical knowledge regarding natural resource management and economic concepts associated with its management. This course will help students in preparation of sustainable approaches for the proper utilization of natural resources and pricing regarding economic and optimal use of resources available. The key /outcomes of this course are to introduces the students with basic concept of natural resources and its proper handling and to aware the students about concept of socially optimal resource use and their evaluation.

#### *Contents*

1. Concepts of natural resources
2. Optimal use of renewable and nonrenewable resources
3. Issues related to natural resources (soil, water, forest, fisheries and environment)
4. Resource scarcity, prices, demand and supply of natural resources
5. Market equilibrium
6. Economic efficiency
7. Inter-temporal efficiency
8. Property rights
9. The economics of pollution
10. Natural resource exploitation
11. Economic approaches to conservation of natural resources
12. Benefit cost analysis.

#### *Recommended Texts*

1. Bergstrom, J.C. & Randall, A. (2010). *Resource Economics- An Economic Approach to Natural Resource and Environmental Policy*, New York: Edward Elgar Publishing.
2. Tietenberg, T. & Lewis, L. (2013). *Environmental and natural resource economics*, 9th Edition. Prentice Hall Publisher.

#### *Suggested Readings*

1. Ashfaq, M., Griffith, G., & Hussain, I. (2009). *Economics of Water Resources in Pakistan*, Pakistan: Pak TM Publishers.
2. Common, M., Perman, D. R., Ma, D. Y., Maddison, D. D., & Mcgilvray D. J. (2011). *Natural Resource and Environmental Economics*, 4<sup>th</sup> Edition. Longman Lt: Addison Wesley.



This course is designed to provide students with an understanding of the economic aspects of climate change and the strategies that can be employed to address this challenge. Throughout the course, students will learn about the economic impact of climate change on various sectors, such as agriculture, energy, and infrastructure. They will also explore the economic policy responses to climate change, including carbon pricing, renewable energy subsidies, and emissions trading. This course will equip students with the knowledge and skills required to evaluate the economic costs and benefits of climate change policies and strategies.

*Contents*

1. Climate Change—Concept, nature and indicators
2. Weather and Climate
3. Climate change and variability
4. Climate change—importance, global warming, some observed trends of human vulnerability to climate
5. Forms of Climate changes, global warming, precipitation and evaporation, sea level rise, surface warming, extreme events (also shall be covered impacts thereof).
6. Mitigation limiting the climate change, the need of mitigation, mitigation options and obstacles, mitigation strategies in developing world
7. Adaptation to climate, adaptation concept and strategies, adaptation costs and benefits
8. Climate and developing world, adaptation capacity and increasing the adaptation capacity
9. Climate change and Development
10. Climate Change and agriculture
11. Climate change and food security
12. Climate change and climate policy
13. Impact assessment of climate change
14. Political economy of climate change and future perspective

*Recommended Text*

1. Andrew Dessler, Introduction to Modern Climate Change (2nd edition 2012), Cambridge University Press, New York, USA
2. Andrew Dessler, Edward A. Parson, The Science and Politics of Global Climate Change: A Guide to the Debate (2nd edition 2010), Cambridge University Press, UK.

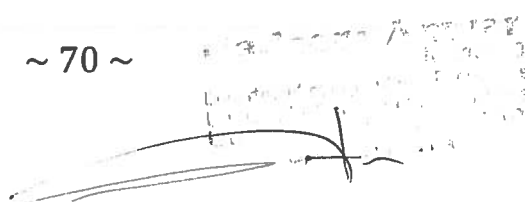
*Suggested Readings*

1. KashavLaalMaharajan and NirajParkash Joshi, Climate Change, agriculture and Rural Livelihood in Developing Countries, Springer, 2013.
2. K. Raja Reddy, H. F. Hodges, Climate Change and Global Crop Productivity CABI publishing, New York, USA.
3. PradeepKurukulasuriya, Shane Rosenthal, Climate Change and Agriculture: A Review of Impacts and Adaptations World Bank 2003.

**URCG-5111**

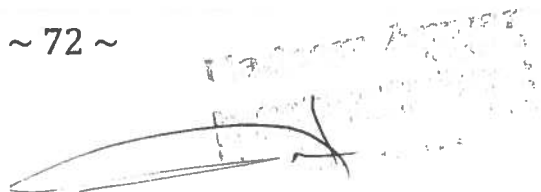
**Translation of the Holy Quran- III Non-Credit**

Topic	Details
Semester/Level	5 <sup>th</sup> semester
Course Code	URCG-5111



Course Title	Translation of the Holy Quran - III
Credit Hours	0(0-0)
Objectives	<ul style="list-style-type: none"> <li>To introduce ethics and highlight its importance, need and relevance for individual and collective life.</li> <li>To illuminate the students with the Quranic norms of Morality i.e. truthfulness, patience, gratitude, modesty, forgiving, hospitality etc.</li> <li>To familiarize the students with immoral values like falsify, arrogance, immodesty, extravagance, backbiting etc.</li> <li>To inculcate ethical and moral values in our youth.</li> <li>To develop a balanced dynamic and wholesome personality.</li> <li>To introduce the students to Quranic Arabic grammar in practical manner.</li> </ul>
Course Contents:	<p>○ اخلاق (تعارف، ضرورت و اہمیت، اقسام، معنویت)</p> <p>اخلاق حسنہ:</p> <ul style="list-style-type: none"> <li>برائی کو نیکی سے مٹانا</li> <li>نیکی کے کاموں میں مسابقت</li> <li>لوگوں کے درمیان صلح</li> <li>عدل و انصاف</li> <li>سچائی</li> <li>ایثار</li> <li>سلیم قلب</li> <li>مہمان نوازی</li> <li>لغویات سے اعراض</li> <li>عاجزی و انکساری</li> <li>نگاہ اور آواز کو پست رکھنا</li> <li>چال میں میانہ روی</li> <li>شرمگاہوں کی حفاظت</li> <li>صبر</li> <li>شکر</li> <li>امور میں میانہ روی</li> </ul> <p>اخلاق سنیہ:</p> <ul style="list-style-type: none"> <li>ظلم اور زیادتی</li> <li>غرور و تکبر</li> <li>نفسانی خواہشات کی پیروی</li> <li>بدگمانی</li> <li>جھوٹ</li> <li>چغلی اور تہمت</li> <li>تمسخر اور شیخی خوری</li> <li>لہو و لعب</li> <li>برے ناموں سے پکارنا</li> <li>احسان جتانا اور تکلیف دینا</li> <li>فضول خرچی اور حد سے بڑھنا</li> <li>حسد اور تنگ دل</li> <li>بے پردگی</li> </ul>
Grammar:	<ul style="list-style-type: none"> <li>قرآنی عربی گرامر کے اصول اور انکے اطلاقات (متن قرآنی پر اطلاق سے توضیحات)</li> </ul>
Details of Chapters and verse Numbers:	<ul style="list-style-type: none"> <li>منتخب آیات مع ترجمہ و تجوید</li> <li>البقرہ (۱۱۲، ۲۳۵، ۸۳، ۱۸۲، ۱۴۲، ۱۵۲، ۱۴۲، ۵۲، ۱۵۳، ۱۴۴، ۲۵۰، ۱۲۵، ۲۲۲، ۲۴، ۴۴، ۱۸۲، ۱۳۸، ۱۸۴، ۱۰۹، ۲۶۳، ۲۶۳، ۲۶۲، ۲۶۲، ۶۴، ۲۳۱، ۱۰، ۲۳، ۱۲۳، ۲۵۸، ۲۴، ۴۱، ۸۳، ۲۲۶، ۱۹۵، ۴۶)</li> </ul>

آل عمران (١٥٣، ١٣، ٢٢، ١٨٥، ١٣٢، ١٣٨، ١٣٣، ١٣٥، ١٤، ٢٠٠، ١٢٥، ١٣٣، ١١٣، ١٠٣، ١٠٣، ١٠٣، ٢٦، ٤٨، ١٢١، ١٣٤، ١٥٩)	■
النساء (١٣٥، ٢٣، ٢٢، ١٠٨، ١٠٤، ١٠٥، ٥٢، ٢٠، ٢٤، ١٤٣، ٣٦، ٢٥، ٢٣، ٣٤، ٥٤)	■
(٢٣)	■
المائدة (٥٨، ٥٤، ٩٣، ١٣، ٦، ٣١، ١٩)	■
النحل (١٢٦، ٩٠، ١٠٥، ١١٣، ٣٠، ١٢٦، ١٢٥)	■
الرعد (٢٥، ٢٠، ٢٣، ٢٢، ٦)	■
الاعراف (٣١، ٦٦، ٥١، ١٣٦، ٣٠، ٣، ٢٠، ١٣٣، ١٩٩، ٩٥، ٨١)	■
القصص (٥٣، ٨٣)	■
فصلت (٣٣)	■
الانعام (٣٢، ٤٠، ٤٠، ١٣٠، ١٥٥، ١٦٠)	■
النمل (٩٠، ٣٦)	■
الحج (٣٠، ٥٨، ٦٠، ٨٨، ٤٤)	■
الحجرات (٩، ١١، ٦، ١١، ٣، ١٢، ١٥، ١٠)	■
الاحزاب (٢٣، ٥٠، ٥٨، ٥٨، ٥٢، ٥٥، ٥٩، ٣٥، ٢٣، ٣٥)	■
الحشر (٩)	■
طه (٤٢)	■
الانعام (١٦٣، ١٣١، ١١٦، ١٥١، ٦٣، ١٢٤)	■
ق (٣٣)	■
الانفال (٢٤، ٣٦، ٦١)	■
الفتح (١٥)	■
يونس (١٠، ١٩، ١٢، ٦٦، ٢٢، ٢٢)	■
الفرقان (٦٣، ٢١، ٦٤، ٦٣)	■
النور (٢٣، ٦، ٣، ٣٠، ٣١، ٣٣، ٣٣، ٦١، ٣١، ٢٢)	■
لقمان (٦، ٣٣، ١٩، ٣٢، ١٨)	■
الاسراء (٣٤، ١١٠، ٥، ٣٤)	■
المزمل (١٨)	■
المدثر (٦، ٣)	■
المدثر (٤٣)	■
فاطر (٣٢)	■
الفتح (٢٩)	■
البيد (١٤)	■
الزمر (٣، ١٠)	■
الحجر (٨٥)	■
النجم (٣١)	■
الرحمن (٦٠)	■
هود (٨، ١٠٢، ٣)	■
الكهف (٢، ٥٦)	■
الشورى (٣٤)	■
غافر (٢٨، ٢٤)	■
الحديد (٢٠، ٢٠)	■
مريم (٥٩)	■
النازعات (٣١)	■
التوبة (٦٥، ٦٣، ٤٤)	■
الهمزة (١)	■



## **SEMESTER-VII**

### **AGRE-6113 LAND USE AND URBANIZATION**

**3(3-0)**

This course is designed to provide students with a comprehensive understanding of the complex relationship between land use patterns, land transactions and urban development. As the world's population continues to grow, urbanization has become an increasingly pressing issue, with cities expanding rapidly and putting pressure on agricultural land and natural resources. This course will examine the historical, social, economic, and environmental factors that shape urban land use patterns, and the policies and planning strategies that are used to manage and regulate them.

Throughout the course, students will explore a range of topics, including urban growth and sprawl, land use regulation, transportation planning, sustainability, and social equity. Students will also learn about the various stakeholders involved in land use decisions, including government agencies, private developers, community groups, and residents.

By the end of the course, students will have gained a thorough understanding of the fundamental principles of land use change – its socioeconomic and environmental impacts and urbanization. They will also be equipped with the knowledge and skills necessary to critically analyze and evaluate urban development policies and practices.

#### *Contents*

1. Urbanization and agriculture: From agricultural rural settlements to urban centers
2. Impact of urbanization on agriculture, food demand and shortage
3. Land use planning for development and protection of infrastructure, economic, social and ecological
4. Urban growth and sustainable development
5. Land division and conversion
6. Environmental and human impacts of urban development
7. Institutional and administrative frameworks governing developing cities
8. Land rent and land use
9. Housing markets and housing policy.

#### *Recommended Text*

1. Kong, X. and S. Hu. 2021. Land Use Transitions under Rapid Urbanization. Mdpi AG, Basel, Switzerland.
2. Maheshwari, B., V.P. Singh and B. Thoradeniya. 2016. Balanced Urban Development: Options and Strategies for Liveable Cities. Springer Nature, London, UK.

#### *Suggested Readings*

1. O'sullivan, A. 2018. Urban economics. 9th Ed. Irwin Chicago, Irwin, USA.
2. Stein, L. 2017. Comparative Urban Land Use Planning: Best Practice. Sydney University Press, Sydney, Australia.
3. McDonald, J.F. and D.P. McMillen. 2010. Urban Economics and Real Estate: Theory and Policy. John Wiley & Sons, Hoboken, NJ, USA.

The course is designed to provide students a general overview of the fundamentals of finance and its application in agriculture and agribusiness. Consequently, it will cover a broad range of finance topics and applications. In addition to a broad overview of finance, it will also cover in some detail several fundamental concepts of finance, including the nature of financial markets, financial instruments and techniques that are critical in financial decision-making. The objectives of the course may be summarized as 1. Introduce students to agricultural finance and highlight the importance of finance in real-world decision-making and the uniqueness of finance related to agriculture. 2. Introduce the fundamental concepts and techniques that are at the heart of financial decision-making. This course will cover various topics including the time value of money, financial statement analysis, capital budgeting and structure, investment decisions, farmland valuations, credit, banking, agricultural lending, risk management and financial markets.

### *Contents*

1. Nature and scope of agricultural finance
2. Sources and types of financial instruments and intermediaries in Pakistan's perspective
3. Credit assessment and decision criteria
4. Agricultural credit markets
5. Agricultural credit policies and their problems
6. Role of central bank and other financial institutions in agricultural financing
7. Classification of loans
8. Insurance in agricultural sector
9. Micro-credit and role of NGO's in agricultural lending and development
10. Nature and scope of financial management
11. Time value of money
12. Capital budgeting
13. Capital and its cost
14. Financial analyses
15. Capital structure
16. Liquidity and lender-borrower relationship and credit evaluation
17. Risk management
18. Financial markets.

### *Recommended Texts*

1. Reddy, S. S., & Ram, P. Raghu. (1996). *Agricultural Finance and Management*, Oxford & IBH publisher Co.

### *Suggested Readings*

1. Barry, P. J., Ellinger, P. N., Hopkin, J.A., & Baker, C. B. (2000). *Financial Management in Agriculture*, 6<sup>th</sup> Edition. Prentice Hall.
2. Downey, W.D. & Enieson, S.P. (2002). *Agribusiness Management*, Singapore: McGraw Hill.

This course is designed to provide students with the skills and knowledge needed to analyze and interpret data in a statistical and economic context. Data analysis is a critical skill in economics and many other fields. In today's data-driven world, the ability to collect, analyze, and interpret data is essential for making informed decisions and solving complex problems. This course will provide students with a comprehensive understanding of the principles and techniques of statistical and economic data analysis. Throughout the course, students will learn about a range of topics, including probability theory, hypothesis testing, regression analysis, time series analysis, and panel data analysis. Students will also learn about the software tools and programming languages commonly used in data analysis, such as R and Python. In addition to learning the technical skills of data analysis, students will also develop critical thinking and problem-solving skills by applying these methods to real-world economic problems. They will learn how to identify and formulate research questions, design experiments and surveys, collect and clean data, and analyze and interpret the results. By the end of the course, students will have gained a deep understanding of the principles and techniques of statistical and economic data analysis. They will be equipped with the knowledge and skills needed to analyze and interpret economic data, and to communicate their findings effectively to a variety of audiences. This course is an essential foundation for any student interested in pursuing a career in economics or related fields that require data analysis skills.

#### *Contents*

1. Identifying different types of data (categorical quantitative, discrete, continuous, bivariate, multivariate, time series, panel data, pool data, cross sectional data)
2. Data visualization and presentation
3. Data cleaning
4. Detecting outlier
5. Detecting inferential observations
6. Regression model through R & Python
7. Building regression model with quantitative and categorical data
8. Introduction to time series analysis
9. Introduction to panel data analysis
10. Introduction to cross sectional data analysis
11. Nonparametric methods
12. Statistical software and programming languages (such as SPSS, STATA, EViews, R and Python)

#### *Recommended Text*

1. Alijandali, A. and M. Tatahi. 2018. Economic and Financial Modelling with EViews: A Guide for Students and Professionals (Statistics and Econometrics for Finance). Springer, Berlin Germany.
2. Brown, T.A. 2015. Confirmatory Factor Analysis for Applied Research. 2nd Ed. The Guilford Press, NY, USA.

#### *Suggested Readings*

1. Consoli, S., D. R. Recupero, and M. Saisana. 2021. Data Science for Economics and Finance: Methodologies and Applications. Springer, Cham, Switzerland.
2. McCormick, K., J. Salcedo, J. Verlen, J. Peck and A. Wheeler. 2017. SPSS Statistics for Data Analysis and Visualization 1st Ed. Willey, Hoboken, New Jersey, USA.
3. Stata Corp. 2017. Stata Survey Data Reference Manual: 15th Ed. Statacorp Ltd. California, USA.

## AGRE-6116 ENVIRONMENT AND SUSTAINABLE DEVELOPMENT 3(3-0)

This course is designed to provide students with a comprehensive understanding of the complex relationship between human societies, the natural environment, and sustainable development. As we face unprecedented challenges such as climate change, loss of biodiversity, and environmental degradation, it has become increasingly important to develop strategies for achieving sustainable development. This course will explore the various social, economic, and environmental factors that contribute to sustainable development, as well as the policies and practices that can help to achieve it.

### *Contents*

1. Introduction to environmental science and sustainability
2. The history and evolution of sustainable development
3. Ecological systems and biodiversity
4. Climate change and global environmental challenges
5. Environmental ethics and values
6. Environmental policy and governance
7. Natural resource management and conservation
8. Sustainable energy and transportation systems
9. Sustainable urban planning and design
10. Sustainable business practices
11. Social equity and environmental justice
12. Community engagement and participation
13. International perspectives on sustainability and development

### *Recommended Text*

1. Berck, P. and G. Helfand. 2018. *Economics of the Environment*. Pearson Education, London, UK.
2. Bergstorm, J.C. and A. Randall. 2016. *Resource Economics- An Economic Approach to Natural Resources and Environmental Policy*. 4th Ed. Edward Elger Publishing, Massachusetts, USA.

### *Suggested Readings*

1. Callan, E.J. 2015. *Environmental Economics and Management: Theory, Policy, and Applications*. 6th Ed. Cengage Learning, Mason, USA.
2. Field, B.C. and M.K. Field. 2017. *Environmental Economics: An introduction*. 7th Ed. McGraw Hill, NY, USA.
3. Iqar A. K. 2018 (ed). *Developing Sustainable Agriculture in Pakistan*. 1st Ed. Taylor and Francis Inc. Boca Raton, Florida, USA.
4. Thampapillai, D. 2002. *Environmental Economics: Concepts, Methods, and Policies*. Oxford University Press, Melbourne, Australia.
5. Titenberg, T. and L. Lewis. 2018. *Environmental and Natural Resource Economics*. 11th Ed. Pearson Education, New Jersey, USA.
6. Verma, M. K. 2021. *Environment and Sustainable Development: Perspectives and Issues*. Taylor & Francis Limited, Oxfordshire, United Kingdom.

This course provides a critical overview of theoretical, empirical and policy issues relating to international economics. The first part of the course provides an introduction to the main theories of international trade, including standard neoclassical free trade approaches and recent theories addressing imperfect competition, economies of scale, national competitiveness issues, and managed trade. It also discusses topics in international trade such as the effects of trade on income distribution and poverty, the debate about import substitution and trade protection, and alternative approaches to trade policy. It also covers topics in international macroeconomics and finance, including inter alia, the balance of payments, exchange rate policy, globalization and international capital flows, financial crises and regionalism. After qualifying the course, the students will be able to understand the theories and dimensions of international economics.

### *Contents*

1. Concept of International economics and trade
2. Market integration and challenges
3. Trade Theories
4. Free trade versus protectionism
5. Tariff and non-tariff trade barriers
6. Approaches to the measurement of protection
7. Distortion and comparative advantage
8. The effects of exchange rates on the agricultural and food sectors
9. Commodity and price instability and terms of trade
10. International commodity agreements
11. Balance of payment in Pakistan's perspective
12. International migration and remittances.

### *Recommended Texts*

1. Salvatore, D. (2007). *International economics*, 9<sup>th</sup> Edition. Wiley Publisher.
2. Krugman, P.R. & Obstfeld, M. (1998). *International Economy: Contents and Policy*, New York: Addison-Wesley Longman, Inc.

### *Suggested Readings*

1. Appleyard, R.D., Field, A. J. & Cobb, S., *International Economics*, 7<sup>th</sup> Edition, Irwin: McGraw-Hill Publisher, (2009).
2. Appleyard, R.D. (2006). *International Economics, Trade, Contents and Policy*, 3<sup>rd</sup> Edition. Illinois: Richard D. Irwin Inc.

This course provides a comprehensive understanding of how institutions shape the economic behavior of individuals, businesses, and governments and explores the interplay between formal and informal institutions and their impact on economic performance, development, and growth. Through this course, students will develop analytical skills to critically evaluate the effectiveness of institutions and their impact on economic outcomes. They will examine how institutions vary across countries and cultures, and how institutional changes can affect economic development and political stability.

### *Contents*

1. Introduction to Institutional Economics: definition, history, and key concepts
2. Formal institutions: property rights, contracts, and the rule of law
3. Informal institutions: norms, culture, and social capital
4. Institutional change: path dependence, critical junctures, and policy reforms
5. Institutional analysis: transaction costs, principal-agent problems, and collective action
6. Institutions and economic performance: efficiency, productivity, and innovation
7. Institutions and economic development: growth, poverty reduction, and inequality
8. Institutions and politics: democracy, governance, and corruption
9. Comparative institutional analysis: cross-country variation and the role of culture
10. Institutional design: optimal institutional arrangements and policy recommendations

### *Recommended Text*

1. North, D. C. (1990). *Institutions, institutional change, and economic performance*. Cambridge University Press.
2. Williamson, O. E. (2000). The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature*, 38(3), 595-613.

### *Suggested Readings*

1. Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.
2. Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Publishers.
3. Rodrik, D. (2007). *One economics, many recipes: Globalization, institutions, and economic growth*. Princeton University Press.
4. Greif, A. (2006). *Institutions and the path to the modern economy: Lessons from medieval trade*. Cambridge University Press.



- التوبه (٢٣، ٢٣، ٢٣، ٢٣، ٦٠، ٢٣)
- الاعراف (١٤٢، ١٨٥، ٥٤، ٥٨، ١٦٣، ١٦٣، ١٦٠، ١٦٠، ٣٠)
- (١٣٣، ١٤٦، ١٦٦)
- الرعد (٣، ١٤)
- الطور (٣٣)
- الانعام (٥٩، ٦٣، ١٣١، ١٣٦، ٣٨)
- الانفال (٢٨، ٣٦، ٣١)
- الكهف (٥١، ١٠٩، ٣٤، ٣٢، ٣٥، ١٤، ٣٥)
- الجاثية (٥)
- فاطر (٢٤، ١٢، ١٣)
- العنكبوت (٢٠، ٦٣، ٣١)
- الروم (٥٠)
- الاسراء (٤٠، ٩٩)
- الرعد (٢)
- السبا (١٠، ٣، ٢٢)
- يونس (٨٨، ١٠١، ٢٣، ٢٣، ٥، ٢٢)
- يوسف (٩٣، ١٣)
- الفرقان (٦٢، ٥٣)
- لقمان (٢٩، ١٦)
- طه (١١٣، ٥٣)
- النحل (٤٥، ١١، ٦١، ٣٩، ٤٩، ٦٨، ٦٨، ١١٥، ٨، ٨)
- النمل (٦٣، ٦٣، ٨٨، ٦٠، ٨٢، ١٦، ١٤، ١٨)
- السجده (٢٤)
- الحديد (٦)
- هود (٣٣، ٦)
- يسين (٣٤، ٣١)
- الروم (٣٩، ٣٩، ٥٠، ١٩، ٢٣، ٣٦)
- فصلت (٣٩، ٣٩)
- الحج (٦١، ٦٥، ٢٢، ٤٣)
- الحجر (١٩، ٢٢)
- الانبياء (٣١، ٣٠، ٣٤)
- الزاريات (٣٤)
- الزلزله (١)
- القصص (٤٦، ٤٩، ٨٠، ٨١، ٨٢)
- النور (٣٤، ٢٢، ٢٢، ٣٠، ٣٥، ٣٣)
- الجمع (١١، ٦٢، ١٠، ١١، ٥)
- القمر (٤)
- الواقعه (٦٩)
- الفاطر (٢٠، ١٣)
- الملك (١٩)
- الصف (١٠)
- الجن (١٣)
- الشورى (٢٨)
- الزخرف (١١)
- الفيل (١)



## SEMESTER-VIII

**AGRE-6119**

### **INTERNSHIP AND EXTERNAL EVALUATION**

**3(0+3)**

This course is designed to provide students with hands-on experience in applying the principles and concepts of agricultural and resource economics in real-world settings. Agriculture and resource economics is a diverse field that deals with the economic behavior of individuals, firms, and governments in relation to agriculture, natural resources, and the environment. This internship course aims to provide students with the opportunity to apply their academic knowledge and skills in real-world settings, gain practical experience, and develop professional skills that will be useful in their future careers.

During the internship, students will work in a professional setting, such as a government agency, non-governmental organization, or private firm, where they will be able to apply the theories and concepts learned in class to real-world problems. The internship may involve conducting research, collecting and analyzing data, assisting with policy development, or working on other relevant projects. Throughout the internship, students will be supervised by a faculty member and a mentor from the host organization, who will provide guidance and feedback on their work. In addition, students will be required to complete regular assignments and prepare a final report summarizing their experiences and the knowledge gained during the internship.

By the end of the course, students will have gained practical experience in applying the principles and concepts of agricultural and resource economics, developed professional skills and connections, and gained a deeper understanding of the field and its applications in the real world. This course is an excellent opportunity for students to gain valuable experience and enhance their career prospects in the field of agricultural and resource economics.

In addition, the students will pay study visits to various agricultural research stations and economics projects in the province/country with special reference to the following:

1. Field crop production and protection
2. Livestock and poultry management
3. Fruits and vegetable production, preservation, processing
4. Manures/chemical fertilizers
5. Water management/irrigation department
6. Agriculture credit, business and marketing cooperatives
7. Rural Support Programs/NGO's etc.
8. Institutes of Economic Research and Rural Development

Every student will write a comprehensive report based on his/her field experiences, according to the following guidelines and present individually in the class

1. Introduction.
2. Objectives of apprenticeship training program.
3. Daily activity report.
4. Activities undertaken during training.
5. Future plans for work in different areas of Agricultural Economics.
6. Problems faced by field staff (host institutes/department), farmers and internee.
7. Relationship of Agricultural Economics with other nation building departments, agencies and stakeholders.
8. Suggestions for improvement of internship program
9. Suggestions for the improvement of Agricultural Economics and Marketing.

*Recommended Texts*

1. FAO (2010). *Manuals of Agriculture*. Washington, D.C., USA, Published by the USAID.

*Suggested Readings*

1. Mickhel, B. (2000). *Integrating Quantitative and Qualitative Research in Development Project*. Washington, D.C., USA Published by USAID.
2. Keith, H.; Jhon, P. & Jhon, S. (2002). *The Management of Student to Research Project*. (3<sup>rd</sup> Edition). USA, Published by the Grower publishing Burlington.



In the world universities degree programs particularly in undergraduate programs, the capstone project (CP) has become pivotal. It may be of different forms but its core objective does not change. The CP makes the student able to work independently in group research with the purpose of devising a state-of-the-art solution for any existing global problem. Though CP project is sometimes challenging but in long run it becomes rewarding for the students of the universities. The CP is generally considered as the final project or the assignment, but it plays a vigorous role developing students research abilities to compete in the world in research and technology and it hones students research skills and knowledge. The CP course also paves the way for students to get contacted with industry partners and provides solutions to the world, in this way, a strong networking develops between students and industry and even between universities and industries.

#### *Contents*

1. What is Capstone Project?
2. Significance of Capstone Project
3. Misconceptions
4. Role of Supervisor, Coordinator, and Capstone Team.
5. How to choose Supervisor?
6. Evaluation Criteria
7. Get others know your work
8. Capstone proposal development including abstract, project success criteria, supervisor selection, and Dos and Donts.
9. Capstone proposal (Research) including abstract, background, research methodology, project scope. Functional specifications/requirements including project code, internal advisor, external advisor if any, project manager, project team, and submission date. While, non-functional requirements are performance requirements, safety requirements, security requirements, user documentation.
10. Literature review-elaboration of problem. Appendices, references.

#### *Recommended Texts*

1. Hauhart, R. C., & Grahe, J. E. (2015). Designing and teaching undergraduate capstone courses. John Wiley & Sons.
2. Bemker, M., & Schreiner, B. (Eds.). (2016). The DNP degree & capstone project: A practical guide. DEStech Publications, Inc.

#### *Suggested Readings*

1. Forestell, J. (2018). Capstone Project (Doctoral dissertation, Hamline University).
2. Ghafoor, A. (2016). *Manual for synopsis and thesis preparation*. Faisalabad, University of Agriculture Press.
3. Clear, T. (2009). Thinking Issues: the three p's of capstone project performance. ACM SIGCSE Bulletin, 41(2), 69-70.
4. Relevant latest literature on target issues.

#### Reviews, research articles

2. Illustrated Manuals, Compendiums
3. Pocket books