

COURSE CONTENTS FOR SEMESTER-II

GEN-3201

Expository Writing

Credit Hours: 3(3-1)

Course Objectives: The course is developed with the aim to enable the students to meet their real life communication needs by

- Helping them learn and understand basic concepts of communication process
- Practically implementing theoretical aspects in the real life situations

Course Contents:

What is Communication?

- Process of communication, effective steps of communication, basic communication skills

Paragraph Writing;

- Practice in writing a good, unified and coherent paragraphs
- Paragraph writing leading towards the writing of five to seven paragraphs long essay
- Stages of writing (brain storming, researching, drafting and editing)
- Methods of writing (cause and effect, problem solutions, comparison and contrast)

Essay Writing;

- Basic structure of essay, topic sentence, supporting sentence, concluding sentence, thesis statement
- Unity and Coherence, Introduction and Conclusion

CV and Job Application;

- Preparing a Curriculum Vitae
- Writing a formal job application

Translation Skills;

- Urdu to English

(Practice at advanced level)

Study Skills;

- Skimming and scanning, intensive, extensive and speed reading
- Summary and precis writing
- Comprehension (at advanced level)
- (sQ3R and Sq4r methods)

Academic Writing;

- Letter/ Memo writing, Minutes of Meeting, use of Dictionary, Library and Internet

Presentation Skills;

- Personality development (emphasis on content, style and pronunciation)
- Preparation stage, audience analysis, handling and asking questions, managing time, handling non-verbal means, feedback

Academic Writing;

- How to write a research proposal for research paper/term paper?
- How to write a research paper/ term paper?
- (Emphasis on style, content, language, form, clarity , consistency)

Report Writing;

- Technical Report writing
- Progress report writing

- Preparation and planning

E-mail writing;

- Creating e-mail account
- Writing and sending e-mails

Preparing for Interview and Research proposal/ research paper defense

Note: Documentaries to be shown for discussion and review

Recommended Books:

Communication Skills

a) Grammar

1. Practical English Grammar by A. J. Thomson and A. V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.

b) Writing

1. Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Françoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 019 435405 7 Pages 45-53 (note taking).
2. Writing. Upper-Intermediate by Rob Nolasco. Oxford Supplementary Skills. Fourth Impression 1992. ISBN 0 19 435406 5 (particularly good for writing memos, introduction to presentations, descriptive and argumentative writing).

c) Reading

1. Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 453403 0.
2. Reading and Study Skills by John Langan
3. Study Skills by Richard York.

d) Speaking

4. Ellen, K. 2002. Maximize Your Presentation Skills: How to Speak, Look and Act on Your Way to the Top
5. Hargie, O. (ed.) Hand book of Communications Skills
6. Mandel, S. 2000. Effective Presentation Skills: A Practical Guide Better Speaking
7. Mark, P. 1996. Presenting in English. Language Teaching Publications

GEN-3202

Arabic

Credit Hours: 2(2-0)

Objectives of the Course	<p>۱۔ طلباء کو عربی زبان کی علوم اسلامیہ میں اہمیت سے آگاہ کرنا ۲۔ طلباء کو علم صرف اور نحو کے بنیادی قواعد سے آگاہ کرنا تاکہ اسلامی علوم سے کما حقہ استفادہ کیا جا سکے ۳۔ طلباء کو علم صرف کے بنیادی اصولوں سے آگاہ کرنا ۴۔ قرآن مجید سے قواعد عربیہ کی عملی مشق کروانا۔</p>
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Week	Lecture No.	قواعد	عملی مشق
Week 1	Lecture 1	• اسم کی پہچان	• تَعَوُّذ اور سورۃ الفاتحة)

	Lecture 2	• هُوَ، هُمْ، ضمائر منفصلة	• سورة الفاتحة (5-7)، تكبير، ثناء، تسبيحات	
Week 2	Lecture 3	• ل، مِنْ، عَنْ، مَعَ حروف جار	• تشهد، درود، دعا	
	Lecture 4	• فعل ماضى: فَعَلَ	• سورة الإخلاص	
Week 3	Lecture 5	• فعل مضارع: يَفْعَلُ	• سورة الفلق	
	Lecture 6	• فعل امر، فاعل، مفعول، فعل	• سورة النَّاس	Quiz # 01
Week 4	Lecture 7	• نَصَرَ، عَدَى	• سورة النصر	Assignment# 01
	Lecture 8	• ضَرَبَ، ظَلَمَ، سَمِعَ، عَلِمَ	• سورة الكافرون	
Week 5	Lecture 9	• كمزور أفعال: وَهَبَ، وَعَدَى	• سورة البقرة: 1-5	
	Lecture 10	• كمزور أفعال: قَالَ، زَادَ	• سورة البقرة: 6-10	
		•	•	
		• Mid Term		
Week 6	Lecture 11	• بمزه والى أفعال: أَمَرَ	• سورة البقرة: 11-13	
	Lecture 12	• يكسان حروف والى أفعال: ظَنَّ، ظَلَّ	• سورة البقرة: 14-18	
Week 7	Lecture 13	• فعل مجهول: نُصِرَ، جُعِلَ	• سورة البقرة: 19-20	
	Lecture 14	• فعل مجهول: أُعِدَّ، أَمَرَ	• سورة البقرة: 21-22	
		•	•	
Week 8	Lecture 15	• مزيد في: حَاسَبَ	• سورة البقرة: 23-25	
	Lecture 16	• مزيد في: أَسْلَمَ، اِخْتَلَفَ	• سورة البقرة: 26-29	
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Week 9	Lecture 17	• مزيد في: اِسْتَعْفَرَ	• سورة البقرة: 30	Quiz # 02

	Lecture 18	• مزيد في: نَدَبَر، نَدَارَس، إِنْقَلَبَ	• سورة البقرة: 31-35	
		•	•	
Week 10	Lecture 19	• مزيد في: وَلى	• سورة البقرة: 36-37	Assignment# 02
	Lecture 20	• مزيد في: نَادَى، أَقَامَ	• سورة البقرة: 38-42	
		•	•	
Week 11	Lecture 21	• مزيد في: اتَّقَى، سَنَقَمَ	• سورة البقرة: 43-46	
	Lecture 22	• مؤنث ضمائر	• سورة البقرة: 47-50	
Week 12	Lecture 23	• مؤنث فعل كا ثبيل	• سورة البقرة: 51-53	
	Lecture 24	• مؤنث فعل كا ثبيل، تثنيه (دو) ثبيل	• سورة البقرة: 54-57	
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Week 13	Lecture 25	• فعل مجهول (مزيد في) عَلَّمَ، أَنْزَلَ	• سورة البقرة: 58-59	
	Lecture 26	• فعل: كَرَّمَ، أَوْرَ فَعْل مضارع	• سورة البقرة: 60-61	
		•	•	
Week 14	Lecture 27	• لَمْ أَوْرَ مَضَارِعَ مَزِيدَ فِي أَفْعَالِ	• سورة البقرة: 62	
	Lecture 28	• لَنْ أَوْرَ فَعْلَ مَضَارِعَ، اسْمِ مَكَانِ	• سورة البقرة: 63-66	
		•	•	
Week 15	Lecture 29	• اسم مكان	•	
	Lecture 30	• جمع تكسير، جملة اسميه	• سورة البقرة: 67-70	
		•	•	
Week 16	Lecturer 31	• جملة فعليہ	• سورة البقرة: 71-73	

	Lecturer 32	• مضاف، مضاف اليه، موصوف، صفت	• سورة البقرة: 74	
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Week 17		Terminal Examination		

نصابى كتب

نمبر شمار	نام مصنف	نام كتاب
1	عبدالستار خان	عربى كا معلم (چارون حصر)
2	معين الله ندوى	تمرين صرف
3	محمد مصطفى ندوى	تمرين النحو
4	مولانا عبدالماجد ندوى	معلم الانشاء
5	مولانا مختار احمد	مختار النحو

حواله جاتى كتب

نمبر شمار	نام مصنف	نام كتاب
1	على جارم	النحو الواضح
2	نعيم الرحمن	اساس عربى
3	رشيد الشريطوى	مبادئ العربية فى الصرف و النحو
4	عبدالرحمن امرتسرى	كتاب النحو
5	محمد مصطفى ندوى	تمرين النحو
6	عبدالرحمن طاہر	قواعد القرآن
7	جامعة الملك السعود، رياض	اللغة العربية لغير الناطقين بها
8	ڈاکٹر ابراهيم سورتى	قرانى عربىک

OR

GEN-3202

Kashmir Studies

Credit Hours: 2(2-0)

Objectives: To impart the knowledge about the multicultural historical legacy, religious and cultural heritage.

Course Contents:

Unit I: Geographic and Administrative Profile of divided State of Jammu & Kashmir

- Geographic and Administrative Profile of Azad Jammu & Kashmir and Gilgit Baltistan.
- Geographic and Administrative Profile of Indian Occupied Jammu and Kashmir.
- Geographic and Administrative Profile of Indian Occupied Jammu and Kashmir,
- Current Political Status of divided regions of disputed state of Jammu and Kashmir,

Unit II: Sources of Kashmir History:

- Famous ancient and Medieval historians
- Famous books on ancient and Medieval history of Kashmir Ancient

Unit III: Ruling Dynasties in Kashmir

- Earlier inhabitants and Introduction to ancient ruling dynasties up to 1320 (selective Famous Ancient Rulers)
- Introduction to ancient Religions of Kashmir,
- Rise and fall of Buddhism in Kashmir
- Causes for decline of Hindu Rule in Kashmir

Unit IV: Muslim Rule in Kashmir

- a. Advent of Islam in Kashmir
- b. First Muslim Rule in Kashmir (1320-23)

Unit V: Shah Miri Dynasty

- a) Rise of Muslims in Kashmir
- b) Shahmir and his successors
- c) Zainul-ul-Abidin
 - I. Successors of Zainulabidin
 - II. Rule and development of Kashmir

Unit VI: Development of Art and Culture during Shahmiri dynasty

- a- Development of Art and Culture during Shahmiri dynasty
- b- Development of Industries
- c- Causes for the decline of Shahmiri dynasty

Unit VII: Role of Sufi Saints for spread of Islam in Kashmir

- a. Role of Shah Hamdan for spread of Islam in Kashmir
- b. Role of Shah other Saints for spread of Islam in Kashmir
- c. Development of Islamic Culture in Kashmir and role of Sufi Saints

Unit VIII: Chak Rule in Kashmir

- a- Causes for decline of Chak Rule in Kashmir and Mughals' occupation of Kashmir
- b- Ruling Era of Mughals and governing methods
- c- Condition of Kashmir during Mughal Era
- d- Causes for decline of Mughal Rule in Kashmir

Unit IX : Kashmir under Afghans

- a) Ruling Era of Afghans and governing methods
- b) Condition of Kashmir during Mughal Era
- c) Causes for decline of Afghan Rule in Kashmir

Unit X: Occupation of Kashmir by Sikhs

- a. Ruling Era of Sikhs and governing methods
- b. Condition of Kashmiris during Sikh Rule
- c. Rise of Dogras' Treaty of Lahore and Treaty of Amritsar

Unit XI: Kashmir under Dogra rule in Kashmir

- a. Successors of Gulab Singh in Kashmir
- b. Condition of Kashmiris during Dogra Rule, Muslim Subjects of Kashmir and Dogra rulers and Resistance movements in Kashmir during Dogra Rule

Unit XII: Jammu and Kashmir in after 1947

- a. Indian occupation
- b. Kashmir issue: genesis
- c. Kashmir issue in the United Nations
- d. Human rights violations in Indian Occupied Kashmir

Unit XIII: Economic Resources of Jammu and Kashmir Cultural Heritages of Kashmir**Unit XIV: Languages Spoken in Kashmir****Recommended Books:**

1. Kalhana Pandit.(1991),Rajatarangint, Mirpur Verinag Publishers AJ& K
2. GMD Sufi (1962), Kashir, Lahore: University of Punjab

3. Somnath Dhar. Jammu & Kashmir. India: National Book Trust, 2013.
4. Ram Chandra Kak. Ancient Monuments in Kashmir. London: 1993.
5. Dr. S.C. Ray Early History and Cultural of Kashmir. New Dehli: 1969.
6. Dr. A.N. Rania. Geography & Jammu & Kashmir. New Dehli 1972.
7. Walter Lawrence. The Valley of Kashmir. London 1895.
8. G.M Rabani. Kashmir Social and Cultural History: Srinagar Gulshan Books 2007.
9. Muhammad Yusuf Saraf, Kashmiris Fight for Freedom.

OR

GEN-3202

Introduction to History

Credit Hours: 2(2-0)

Course Objectives:

The purpose of this course is:

- To make students aware of the nature of historical knowledge and research.
- To introduce to the students, the basic concepts and controversies related to historical understanding.

Course Content:

Unit I: What is History?

Literal, terminological and conceptual meaning of history

History as Fact

History as Process

History as Narrative

Unit II: Memory, Record and History

Unit III: Nature of History:

Being and Becoming;

Continuity and Change; Evolution, Progress and Development Macrocosm & Microcosm:

Time, Space, Causation, Facts and opinion/ objectivity & Subjectivity

Unit IV: Utility, Benefits & importance of History:

History as a corrective/cohesive force;

History as a repetitive force

Continuity of History from Past to Future

Lessons from Past

Historical determinism, etc.

History as Mother of All Sciences/Knowledge

Unit V: Epistemological nature of History:

Relationship of History with other forms of knowledge:

Natural Sciences

Social Sciences

Literature and Arts

Unit VI: Forms and Classification of History

Suggested Readings:

1. Burke, Varieties of Cultural History, Cornell University Press, 1977
2. Carlo, Ginzburg. Clues. Myths, and the Historical Method, John Hopkins: University Press, 1992
3. Carr, E. H., What is History? Harmondsworth: Penguin, 1961

4. Cohn, Bernard. An Anthropologist among Historians and Other Essay, Oxford University Press, 1988
5. Collingwood, R. G. The Idea of History. Oxford: Oxford University Press, 1978.
6. Daniels, Studying History: How and Why, New Jersey, 1981.
7. Gertrude Himmelfarb. The New History and the Old, Cambridge: Harvard University Press, 1987
8. Govranski. History Meaning and Methods, USA, 1969
9. Hegel. Elements of the Philosophy of Right. Cambridge University Press, 1991
10. Qadir, Khurram, Tarikh Nigari Nazriyat-o-Irtiqqa, Lahore: Palgrave, 1994.
11. Qureshi, Muhammad Aslam. A Study of Historiography. Lahore: Pakistan Book Centre, Latest Edition.
12. Steedman. Caroline, Dust: The Archive and Cultural History, Manchester University Press, 2002
13. Stern Fritz, Varieties of History: from Voltaire to the Present, Vintage, 2nd Edition 1975
14. Tahir Kamran, The Idea of History Through Ages, Lahore: Progressive Publisher, 1993
15. Lemon, M. C., Philosophy of History, London: Routledge, 2003
16. Marwick, Arthur, The New Nature of History, London, 1989, pp.31-35.
17. Roberts, Geoffrey, ed., History and Narrative Reader, London: Routledge, 2001.
18. Shafique, Muhammad, British Historiography of South Asia: Aspects of Early Imperial Patterns and Perceptions, Islamabad, NIHCR, Quaid-i-Azam University, 2016

GEN- 3203 APPLICATION OF INFORMATION AND Credit Hrs: 3(2-1)
COMMUNICATION TECHNOLOGY

Objective

1. Explain the fundamental concepts, components, and scope of Information and Communication Technologies (ICT).
2. Identify uses of various ICT platforms and tools for different purposes.

Course Contents:

1. Introduction to Information and Communication Technologies:

- Components of Information and Communication Technologies (basics of hardware, software, ICT platforms, networks, local and cloud data storage etc.).
- Scope of Information and Communication Technologies (use of ICT in education, business, governance, healthcare, digital media and entertainment, etc.).
- Emerging technologies and future trends.

2. Basic ICT Productivity Tools:

- Effective use of popular search engines (e.g., **Google**, Bing, etc.) to explore World Wide Web.
- Formal communication tools and etiquettes (Gmail, Microsoft Outlook, etc.).

- Microsoft Office Suites (Word, Excel, PowerPoint).
- Google Workspace (Google Docs, Sheets, Slides).
- Dropbox (Cloud storage and file sharing), Google Drive (Cloud storage with Google Docs integration) and Microsoft OneDrive (Cloud storage with Microsoft Office integration).
- Evernote (Note-taking and organization applications) and OneNote (Microsoft's digital notebook for capturing and organizing ideas). Video conferencing (Google Meet, Microsoft Teams, Zoom, etc.).
- Social media applications (LinkedIn, Facebook, Instagram, etc.).

3. ICT in Education:

- Working with learning management systems (Moodle, Canvas, Google Classrooms, etc.).
- Sources of online education courses (Coursera, edX, Udemy, Khan Academy, etc.).
- Interactive multimedia and virtual classrooms.

4. ICT in Health and Well-being:

- Health and fitness tracking devices and applications (Google Fit, Samsung Health, Apple Health, Xiaomi Mi Band, Runkeeper, etc.).
- Telemedicine and online health consultations (OLADOC, Sehat Kahani, Marham, etc.).

5. ICT in Personal Finance and Shopping:

- Online banking and financial management tools (JazzCash, Easypaisa, Zong PayMax, I LINK and MNET, Keenu Wallet, etc.).
- E-commerce platforms (Daraz.pk, Telemart, Shophive, etc.).

6. Digital Citizenship and Online Etiquette:

- Digital identity and online reputation.
- Netiquette and respectful online communication.
- Cyberbullying and online harassment.

7. Ethical Considerations in Use of ICT Platforms and Tools:

- Intellectual property and copyright issues.
- Ensuring originality in content creation by avoiding plagiarism and unauthorized use of information sources.
- Content accuracy and integrity (ensuring that the content shared through ICT platforms is free from misinformation, fake news, and manipulation).

Practical Requirement

As part of the overall learning requirements, the course will include:

1. Guided tutorials and exercises to ensure that students are proficient in commonly used software applications such as word processing software (e.g., Microsoft Word), presentation software (e.g., Microsoft PowerPoint), spreadsheet software (e.g., Microsoft Excel) among such other tools. Students may be assigned practical tasks that require them to create documents, presentations, and spreadsheets etc.
2. Assigning of tasks that involve creating, managing, and organizing files and folders on both local and cloud storage systems. Students will practice file naming conventions, creating directories, and using cloud storage solutions (e.g., Google Drive, OneDrive).
3. The use of online learning management systems (LMS) where students can access course materials, submit assignments, participate in discussion forums, and take quizzes or tests. This will provide students with the practical experience with online platforms commonly used in education and the workplace.

Reading Materials

1. "Discovering Computers" by Vermaat, Shaffer, and Freund.
2. "GO! with Microsoft Office" Series by Gaskin, Vargas, and McLellan.
3. "Exploring Microsoft Office" Series by Grauer and Poatsy.
4. "Computing Essentials" by Morley and Parker.
5. "Technology in Action" by Evans, Martin, and Poatsy.

BOT-3204 Plant systematics, Anatomy and Development Credit Hours: 3(2-1)

Aims and Objectives

To understand:

1. Various systems of classification, identification and nomenclature of higher plants.
2. Structures and functions of tissues and organs at embryonic level.

Course Contents:

a. Plant systematics

1. Introduction to Plant Systematics: aims, objectives and importance.
2. Classification: brief history of various systems of classification (artificial, natural and phylogenetic and current).

3. Brief introduction to nomenclature, importance of Latin names and binomial system with an introduction to International Code of Botanical Nomenclature (ICBN). Principles of ICBN.

4. Morphology: a detailed account of various, morphological characters' root, stem, leaf, inflorescence, flower, placentation and fruit types.

5. Diagnostic characters, economic importance of following families:

Ranunculaceae, Brassicaceae (Cruciferae), Fabaceae (Leguminosae), Rosaceae, Euphorbiaceae, Cucurbitaceae, Solanaceae, Lamiaceae (Labiatae), Apiaceae (Umbelliferae), Asteraceae (Compositae), Liliaceae and Poaceae (Gramineae)

b. Anatomy

Concept, structure and function of various tissues like: Parenchyma, Collenchyma, Sclerenchyma, Epidermis (including stomata and trichomes), Xylem, Phloem, Meristem: types, stem and root apices, Vascular cambium, Structure and development of root, stem and leaf. Primary and secondary growth of dicot stem, periderm, Characteristics of wood: diffuse porous and ring –porous, sap and heart wood, soft and hard wood, annual rings.

c. Development / Embryology

Early development of plant body: Capsella bursa-pastoris, Structure and development of Anther Microsporogenesis Microgametophyte, Structure of Ovule Megasporogenesis Megagametophyte, Endosperm formation, Parthenocarpy, Polyembryony

Practical

Anatomy

1. Study of stomata, epidermis,
2. Tissues of primary body of plant
3. Study of xylem 3-dimensional plane of wood.
4. T.S of angiosperm stem and leaf.

Taxonomy

1. Identification of families given in syllabus with the help of keys.
2. Technical description of common flowering plants belonging to families mentioned in theory syllabus.
3. Field trips shall be undertaken to study and collect local plants.
4. Students shall submit 40 fully identified herbarium specimens.

Recommended Books:

1. Mauseth, J.D. 1998. An Introduction to Plant Biology: Multimedia Enhanced. Jones and Bartlett Pub. UK
2. Moore, R.C., W.D. Clarke and Vodopich, D.S. 1998. Botany. McGraw Hill Company, U.S.A.
3. Raven, P.H., Evert, R.E. and Eichhorn, S.E. 1999. Biology of Plants. W.H. Freeman and Company Worth Publishers.
4. Stuessy, T.F. 1990. Plant Taxonomy. Columbia University Press, USA.
5. Lawrence, G.H.M. 1951 Taxonomy of Vascular Plants. MacMillan & Co. New York.
6. Panday, B.P. 2004. A textbook of Botany (Angiosperms). S. Chand and Co. New Delhi.
7. Raymond E, S. E. Eichhorn. 2005. Esau's Plant Anatomy. Meristems cells and tissues of the plant body, 3rd ed. John Wiley & Sons. Inc.
8. Fahn, A. 1990. Plant Anatomy. Pergamon Press, Oxford.
9. Esau, K. 1960. Anatomy of Seed Plants. John Wiley, New York.
10. Maheshwari, P.1971. Embryology of Angiosperms, McGraw Hill.New York.
11. Eames A.J. and L.H Mac Daniels. 2002. An Introduction to Plant Anatomy. Tata-Mac Graw-Hill Publishing Company, Limited New Delhi.
12. Pullaiah, T. 2007. Taxonomy of Angiosperms. 3rd Edition Regency Publications, New Delhi.
13. Naik, V.N. 2005 Taxonomy of Angiosperms. 20th Reprint. Tata-Mac Graw-Hill Publishing Company, Limited New Delhi.

ZOO-3205

Animal Diversity-I

Credit Hours: 3(2-1)

Course Objectives:

1. To provide the knowledge of evolutionary/ phylogenetic relationship (from simple to the complex organisms).
2. To impart the basic taxonomic characteristics and classification of all the invertebrate phyla.
3. To provide understanding of body organization, Feeding and Digestive system; Other Organ System;
4. To provide the description of mode of Reproduction and Development
5. To provide the information of their economic and ecological importance

Course Learning Outcomes:

This course will be based on following outcomes:

1. Acquire the basic concepts of invertebrates with explanation of evolutionary origin and diversification.
2. Understand invertebrate organismal concepts in laboratory and field.
3. Demonstrate major evolutionary innovations for invertebrates with functional importance.
4. Understand how reproduction and development occurred and able to breed animal in the laboratory/field
5. Analyze economic and ecological importance of invertebrates.

Course Contents:

Note: The minimum details of the titles in the content must be of the principal book Zoology by Miller and Harley. This must be kept in view in teaching and assessments.

Introduction

- a. Classification of Organisms:
- b. Evolutionary Relationships and Tree Diagrams: Patterns of organization.
Animal-like Protists: The Protozoa
- c. Evolutionary perspective; Life within a single plasma Membrane;
- d. Symbiotic Life-styles.
- e. Protozoon Taxonomy; (up to Phyla, subphyla and super Classes, wherever applicable).
- f. Pseudopodia and Amoeboid Locomotion; Cilia and other pellicular structure;
- g. Nutrition; Genetic Control and Reproduction; Symbiotic ciliates;
- h. Further Phylogenetic Consideration.

Multicellular and Tissue Levels of Organization

- i. Evolutionary Perspective:
- j. Origins of Multicellularity; Animal Origins.

Phylum Porifera

- a. Characteristics and classification. Cell Types, Body Wall, and Skeletons;
- b. Water Current and Body Forms;
- c. Maintenance Functions, Reproduction.

Phylum Cnidaria (Coelenterate)

- a. Characteristics and classification. The body Wall and Nematocysts:
Alteration of Generations;

- b. Maintenance Functions; Reproduction and
- c. Classification up to Class.

Phylum Ctenophore;

- a. Characteristics, body organization

The Triploblastic and with Acoelomate Body Plan Phylum Platyhelminthes

- a. Evolutionary Perspective; Classification up to class;
- b. The Free-Living Flatworms and the Tapeworms, adaptive modification for parasitic life style

Phylum Numerate; Characteristics, body organization

Phylum Gastrotrich; Characteristics, body organization

2. Pseudocoelomate Body Plan

Phylum Aschelminths

- a. Evolutionary perspective; General Characteristics; Classification up to order with External Features;
- b. Feeding and Digestive system; Other Organ System; Reproduction and Development including Phylum Rotifera, Phylum Nematoda and Phylum Kinorhyncha.
- c. Some Important Nematode Parasites of Humans;

3. Phylum Mollusca

- a. Evolutionary perspective; Relationship to other animals; Origin of the Coelom;
- b. Molluscan Characteristics, Classification up to class. The Characteristics of Shell and Associated Structures,
- c. Feeding, Digestion, Gas Exchange, Locomotion,
- d. Reproduction and Development, Other maintenance Functions and Diversity in Gastropods, Bivalves and Cephalopods:

4. Phylum Annelida

- a. The Metameric Body Form; Evolutionary perspective; Relationship to other animals,
- b. Metamerism and Tag-matization, Classification up to Class. External Structure and Locomotion,
- c. Feeding and the Digestive system, Gas Exchange and Circulation,
- d. Nervous and Sensory Functions, Excretion,
- e. Regeneration, Reproduction and Development, in Polychaeta, Oligochaeta and Hirudinea, Further Phylogenetic Consideration.

5. Phylum Arthropoda:

- a. Evolutionary Perspective: Classification and Relationship to other Animals;
- b. Metamerism and Tagmatization;
- c. The Exoskeleton; Metamorphosis;
- d. Classification up to Class; Further Phylogenetic Consideration. The Hexapods and Myriapods:
 - a. Evolutionary Perspective: Classification up to class. External Structure and Locomotion,
 - b. Nutrition and the Digestive system, Gas Exchange, Circulation and Temperature Regulation,
 - c. Nervous and Sensory Functions, Excretion, Chemical Regulation,
 - d. Reproduction and Development in Hexapoda,
 - e. Insects Behavior, Insect and Human;

6. Phylum Echinoderms

- a. Evolutionary Perspective: Relationship to other Animals; Echinoderm Characteristics; Classification up to class.
- b. Maintenance Functions, Regeneration,
- c. Reproduction, and Development in Asterozoa, Ophiurozoa, Echinozoa, Holothurozoa and Crinozoa;

Some Lesser-Known Invertebrates;

- a. The Lophophorates, Entoprocts, Cycliophores, and Chaetognaths.

Practical:

Note: Classification of each member of each phylum upto order with adaptations in relation to habitat of the specimen. Preserved Specimen and or colored projection slide and or CD ROM projection of computer must be used.

1. Study of Euglena, Amoeba, Entamoeba, Plasmodium, Trypanosome, Paramecium as representative of animal like Protists.
2. Study of prepared slides of sponges, spicules of sponges, and their various body forms. Study of representatives of classes of Phylum Porifera.
3. Study of principal representatives of classes of Phylum Coelenterate.
4. Study of principal representatives of classes of Phylum Platyhelminthes.
5. Study of representatives of phylum Rotifer, Phylum Nematode.
6. Study of principal representatives of classes of Phylum Mollusca.
7. Study of principal representatives of classes of Phylum Annelida.

8. Study of principal representatives of classes of groups of Phylum Arthropoda
9. Study of representatives of classes of phylum Echinodermata.
10. Preparation of permanent mount of Leucosolenia, Obelia, Hydra, Proglottid of Tapeworm, Parapodia of Nereis and Daphnia. Drawing and labeling.
11. Preparation of permanent slide of mouthpart of insects (after dissection). Drawing and labeling.
12. How to make grade-wise series for preparation of temporary and permanent slides.

Recommended Principal Reference Book:

1. Miller, A.S. and Harley, J.B. ; 1999 , 2002., 2007, 2009, 2012 & 2016 Zoology, 4th , 5th, 6th, 7th, 8th , 9th& 10th Edition (International), Singapore : McGraw Hill.

Additional Readings:

1. Schierwater, B., &DeSalle, R. (2021). Invertebrate zoology: a tree of life approach. CRC Press.
2. Hickman, C.P., Roberts, L.C/, AND Larson, A., 2018. INTEGRATED PRINCIPLES OF ZOOLOGY, 15th Edition (International), Singapore: McGRAW-Hill.
3. Mandal, F. B. (2017). Biology of Non-chordates. PHI Learning Pvt. Ltd..
4. Pechenik, J.A., 2015. BIOLOGY OF INVERTEBRATES, 7th Edition, (International), Singapore: McGraw-Hill.
5. Hickman, C.P., Roberts, L.C/, AND Larson, A., 2007. INTEGRATED PRINCIPLES OF ZOOLOGY, 12th& 13th Edition (International). Singapore: McGraw-Hill.
6. Sandhu, G. S. (2005). Textbook of invertebrate zoology (Vol. 1). Campus Books International.
7. Campbell, N.A., 2002; BIOLOGY 6th Edition, Menlo Park, California; Benjamin Cummings Publishing Company, Inc.
8. Kent, G. C. and Miller, S., 2001. COMPARATIVE ANATOMY OF VERTEBRATES New York: McGraw-Hill. BOOKS FOR PRACTICAL
9. Verma, P. S. (2010). A Manual of Practical Zoology: Invertebrates. S. Chand Publishing.
10. Miller, S.A., 2002. GENERAL ZOOLOGY LABORATORY MANUAL. 5th Edition (International), Singapore : McGraw-Hill.
11. Hickman, C.P. and Kats, H.L., 2000. Laboratory Studies in integrated principal of zoology. Singapore : McGraw-Hill.

CHM-3206

Inorganic Chemistry

Credit Hours: 4(3-1)

Course Objectives: Students will not only be able to understand and acquire knowledge about basic concept of inorganic chemistry but this course will also help in developing their knowledge about the modern periodic table and basic theories of chemical bonding. This course will provide a rigorous description of chemical equilibrium phenomena and its application during chemical reactions or analysis. They will be able to understand the acid base concepts and relative strength of acids and bases. They can understand the abnormal behavior of the p-block elements, general properties and important uses of these elements and their compounds. Students will also be able to know about basic laboratory ethics and necessary precautionary measures required to carry out chemical reactions in laboratory and will be able to prepare some important compounds in the laboratory. They will also be able to analyze different radical present in the salts.

Course Contents:

1. **Periodicity:** Modern periodic table, similarities and differences among first row elements, their diagonal and vertical relationship with other elements, group trends and periodic properties in s, p, d and f block elements i.e., atomic radii, ionic radii, ionization potentials, electron affinities, electronegativities and redox potential.

2. **Theories of Chemical Bonding:** Nature and types of chemical bonding. Concept of valence bond theory (VBT) and molecular orbital theory (MOT), Valence shell electron pair repulsion (VSEPR) theory. Directed valence bond theory (hybridization) and their applications to homo and hetero diatomic inorganic molecules. Metallic bonds.

3. **Acid-Base Concept:** Theories of acids and bases, applications of soft and hard acid-base (SHAB) concept. pH, pKa, pKb and their significance. Relative strength of acids and bases based on pka values. Leveling effect. Buffers, indicators and theory of indicators.

4. **Essentials of Chemical Analysis:** Law of mass action and its applications, precipitation and solubility product, common ion effect and its application, co-precipitation, fractional precipitation.

5. Chemistry of p-Block Elements

(a) Boron and Aluminum: General characteristics, group anomalies, structure, bonding and properties of boron and aluminium hydrides.

(b) Carbon and Silicon: General characteristics, comparison of carbon and silicon, allotropic forms of carbon. Structure and industrial applications of carbides, silicates and silicones.

(c) Nitrogen and Phosphorus: General characteristics, group anomalies. Role of oxides of nitrogen in the environment, preparation of nitric acid and ortho phosphoric acid.

(d) Oxygen and Sulphur: General characteristics, group anomalies, role of oxides of sulphur in air pollution. Preparation of sulphuric acid. Preparation of hypo and its use in photography.

(e) Halogens: General characteristics, anomalous behaviour of fluorine, industrial preparation and uses of fluorine. Structure and properties of Interhalogens and pseudohalogens.

(f) Noble Gases: Discovery of noble gases, structure and properties of xenon fluorides, Industrial uses of noble gases and their compounds.

6. Chemistry of d-Block Elements:

Electronic configuration and general characteristics of d-block elements. Industrial applications of transition metals. Werner's concept and nomenclature of coordination compounds.

Inorganic Chemistry Practical

1. Laboratory Ethics and Safety Measures: Awareness about the toxic nature of chemicals and their handling, cleaning of glassware, safe laboratory operations

2. Qualitative Analysis: Analysis of four ions (two cations and two anions) from mixture of salts.

3. Quantitative Analysis

1. Determine the %age purity of NaCl (rock salt) by Mohr's method.

2. Determination of number of water molecules (x) in $\text{CuSO}_4 \cdot x\text{H}_2\text{O}$ iodometrically.

3. Determination of amount/dm³ of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ with $\text{K}_2\text{Cr}_2\text{O}_7$ by both internal and external indicators.

4. Determination of %age of iron in Ferric alum $(\text{NH}_4)_2\text{SO}_4 \cdot \text{Fe}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$ using $\text{K}_2\text{Cr}_2\text{O}_7$ by both internal and external indicators.

5. Standardization of EDTA solution by Magnesium Sulfate/Zinc Sulfate solution by complexometry.

6. Find out the amount of Ca^{2+} in the given sample of marble (lime stone) by complexometry.

COURSE CONTENTS FOR SEMESTER-IV

GEN-4401

Introduction to Psychology

Credit Hrs: 2(2-0)

Objective

To describe psychology with major areas in the field, and identification of the parameters of this discipline.

Course Contents:

Unit I: Introduction to Psychology

- Nature and Application of Psychology with special reference to Pakistan.
- Historical Background and Schools of Psychology (A Brief Survey)

Unit II: Methods of Psychology

- Observation
- Case History Method Experimental Method
- Survey Method d. Interviewing Techniques

Unit III. Biological Basis of Behavior

- Neuron: Structure and Functions
- Central Nervous System and Peripheral Nervous System
- Endocrine Glands

Unit IV: Sensation, Perception and Attention

a. Sensation

- Characteristics and Major Functions of Different Sensations
- Vision: Structure and functions of the Eye.
- Audition: Structure and functions of the Ear.

b. Perception

- Nature of Perception
- Factors of Perception: Subjective, Objective and Social
- Kinds of Perception:
- Spatial Perception (Perception of Depth and Distance)
- Temporal Perception; Auditory Perception.

c. Attention

- Factors, Subjective and Objective
- Span of Attention
- Fluctuation of Attention
- Distraction of Attention (Causes and Control)

Unit V: Motives a. Definition and Nature b. Classification

- Primary(Biogenic) Motives

Hunger, Thirst, Defecation and Urination, Fatigue, Sleep, Pain, Temperature, Regulation, Maternal Behavior, Sex

- Secondary (Sociogenic) Motive

Play and Manipulation, Exploration and Curiosity, Affiliation, Achievement and Power, Competition, Cooperation, Social Approval and Self Actualization.

Unit VI. Emotions

- Definition and Nature
- Physiological changes during Emotions (Neural, Cardial, Visceral, Glandular), Galvanic Skin Response; Pupillometrics
- Theories of Emotion
- James Lange Theory; Cannon-Bard Theory
- Schechter –Singer Theory

Unit VII: Learning

- Definition of Learning
- Types of Learning: Classical and Operant Conditioning Methods of Learning: Trial and Error; Learning by Insight; Observational Learning

Unit VIII: Memory

- Definition and Nature
- Memory Processes: Retention, Recall and Recognition
- Forgetting: Nature and Causes

Unit IX: Thinking

- Definition and Nature
- Tools of Thinking: Imagery; Language; Concepts
- Kinds of Thinking d. Problem Solving; Decision Making; Reasoning

Unit X. Individual differences

- Definition concepts of Intelligence, personality, aptitude, achievement

RECOMMENDED BOOKS

1. Atkinson R. C., & Smith E. E. (2000). Introduction to psychology(13thed.). Harcourt Brace College Publishers.
2. Fernald,L.D.,&Fernald,P.S.(2005). Introduction to psychology. USA: WMCBrownPublishers. 3. Glassman, W. E. (2000). Approaches to psychology. Open University Press. Hayes, N. (2000). Foundation of psychology (3rd ed.). Thomson Learning. Lahey, B. B. (2004). Psychology: An introduction (8th ed.). McGraw-HillCompanies, Inc.
4. Leahey, T. H. (2003). A history of psychology: Main currents in psychological thought. New Jersey: Prentice-Hall International, Inc. (7th ed.)
5. Myers, D. G. (1992).Psychology. (3rd ed.). New York: WadsworthPublishers.
6. Ormord, J. E. (1995). Educational psychology: Developing learners. Prentice- Hall, Inc.

OR

GEN-4401

Introduction to Sociology

Credit Hrs: 2(2-0)

Objective: The course is designed to introduce the students with sociological concepts and the discipline. The focus of the course shall be on significant concepts like social systems and structures, socio-economic changes and social processes. The course will provide due foundation for further studies in the field of sociology.

Course Outline

Unit I: Introduction

- a. Definition, Scope, and Subject Matter
- b. Sociology as a Science
- c. Historical back ground of Sociology

Unit II: Basic Concepts

- b. Group, Community, Society
- c. Associations
 - i. Non-Voluntary
 - ii. Voluntary
- d. Organization
 - i. Informal
 - ii. Formal
- e. Social Interaction
 - i. Levels of Social Interaction
 - ii. Process of Social Interaction
 1. Cooperation
 2. Competition
 3. Conflict
 4. Accommodation
 5. Acculturation and diffusion
 6. Assimilation
 7. Amalgamation

Unit III: Social Groups

- a. Definition & Functions
- b. Types of social groups
 - i. In and out groups
 - ii. Primary and Secondary group
 - iii. Reference groups
 - iv. Informal and Formal groups
 - v. Pressure groups

Unit IV: Culture

- a. Definition, aspects and characteristics of Culture
 - i. Material and non-material culture

- ii. Ideal and real culture
 - b. Elements of culture
 - i. Beliefs
 - ii. Values
 - iii. Norms and social sanctions
 - c. Organizations of culture
 - i. Traits
 - ii. Complexes
 - iii. Patterns
 - iv. Ethos
 - v. Theme
 - d. Other related concepts
 - i. Cultural Relativism
 - ii. Sub Cultures
 - iii. Ethnocentrism and Xenocentrism
 - iv. Cultural lag

Unit V: Socialization & Personality

- a) Personality, Factors in Personality Formation
- b) Socialization, Agencies of Socialization
- c) Role & Status

Unit VI: Deviance and Social Control

- a) Deviance and its types
- b) Social control and its need
- c) Forms of Social control
- d) Methods & Agencies of Social control

Unit VII: Collective Behavior

- a) Collective behavior, its types
- b) Crowd behavior
- c) Public opinion
- d) Propaganda
- e) Social movements
- f) Leadership

Recommended Books:

1. Anderson, Margaret and Howard F. Taylor. 2001. *Sociology the Essentials*. Australia: Wadsworth.
2. Brown, Ken 2004. *Sociology*. UK: Polity Press
3. Giddens, Anthony 2002. *Introduction to Sociology*. UK: Polity Press.
4. Macionis, John J. 2006. 10th Edition *Sociology* New Jersey: Prentice-Hall
5. Tischler, Henry L. 2002. *Introduction to Sociology* 7th ed. New York: The Harcourt Press.
6. Frank N Magill. 2003. *International Encyclopedia of Sociology*. U.S.A: Fitzroy Dearborn Publishers
7. Macionis, John J. 2005. *Sociology* 10th ed. South Asia: Pearson Education
8. Kerbo, Harold R. 1989. *Sociology: Social Structure and Social Conflict*. New York: Macmillan Publishing Company.

9. Koenig Samuel. 1957. *Sociology: An Introduction to the Science of Society*. New York: Barnes and Nobel..
10. Lee, Alfred Mclung and Lee, Elizabeth Briant 1961. *Marriage and The family*. New York: Barnes and Noble, Inc.
11. Leslie, Gerald et al. 1973. *Order and Change: Introductory Sociology* Toronto: Oxford University Press.
12. Lenski, Gevbard and Lenski, Jeam. 1982. *Human Societies*. 4th edition New York: McGraw-Hill Book Company.
13. James M. Henslin. 2004. *Sociology: A Down to Earth Approach*. Toronto: Allen and Bacon.

OR

GEN-4401

Introduction to Management

Credit Hrs: 2(2-0)

Objectives:

- To introduce the concept of principles of management, functions of management: Planning, Organizing, leading and controlling, Practical Learning for the 21st century.
- To address the most pertinent issues likely to be encountered in Organizational life and future by professionals especially in Pakistan.

Week #	Lecture #	TOPICS TO BE COVERED
1.	1.	Foundation of management. Definition Scope and Functions of Management
	2.	Different Levels Roles and Skills of Management, Management & Organization.
2.	3.	Management theories and perspectives, Evolution of Management Theories.
	4.	Scientific Management, Administrative Management, Bureaucratic Management.
3.	5.	Behavioral theories, Hawthorne Studies, System Approach, Contingency Approach.
	6.	Current Trends & Issues of Management; workforce diversity, globalization.
4.	7.	Organizational culture & environment: Different Views and Sources of Culture.
	8.	External & Internal Environmental Factors, Task & Mega Environment.

5.	9.	Corporate social responsibility, Views on CSR, value based management
	10.	Ethics in management, factors affecting ethics and improving ethical behaviors.
6.	11.	Decision making: Decision making process of eight steps and its Conditions.
	12.	Decision Making Errors and Biases, Types of Problems & Respective Decisions.
7.	13.	Foundation of planning: Conceptual View of Planning and its Purpose & importance.
	14.	Challenges & Types of planning, Developing Organizational Goals, Types of Goals.
		MID TERM EXAMS
8.	15.	Strategic management: Strategic Management Process & Formulation of Strategies.
	16.	Organizational & Environmental Analysis: SWOT & PEST analysis.
9.	17.	Types of Organizational Strategies: Corporate and business Strategies
	18.	Types of Organizational Strategies: Functional strategies, Strategic Flexibility.
10.	19.	Organizing; Foundation of Organizational Structure & design. Contingency Factors.
	20.	Types of Organizational Structure, Departmentalization & Chain of Command.
11.	21.	Span of Control & Formulization, Centralization & Decentralization, Work division.
	22.	Traditional & Contemporary Designs, Mechanistic & Organic Organizations.
12.	23.	Leadership & management: Who are Leaders? What is Leadership?
	24.	Early Leadership Theories: Trait & behavioral theories, Models of Leadership
13.	25.	Different Leadership Styles, Contingency Theories of Leadership. Today challenges.

	26.	Foundation of Control: Importance of Control, Control Process of different steps.
14.	27.	Elements, Approaches & Types of Controlling, Organizational Performance
	28.	Measures to Control Organizational Performance. Control Strategies for deviations.

Reference Material:

- Courtland L Bovee, John V Thill, Marian Burk Wood, George P. Thill, Management, international Edition.
- Emerald Case studies for Management practice.
- Activity of “Six Thinking Hat” By Edward DeBono.
- Analytical discussions on “Seven Habits of highly Effective People” by Stephen R. Covey 1989.

OR

GEN-4401

Introduction to Education

Credit Hrs: 2(2-0)

Objective: To provide students with a foundational understanding of the field of education, including its history, philosophy, social context, and practical applications, ultimately helping them explore the teaching profession and develop a personal philosophy of teaching and learning.

Course Contents:

Unit 1 Ideological Foundation of Education

Introduction to Education

Concepts and Aims of Education

Modes and Scope of Education

Islamic Foundations

Islamic concept of Peace

Other religions and Islam

Ideology and teachers

Unit 2 Philosophical Foundations of Education

Philosophy and Education

Main Philosophical Thoughts

Idealism

Realism

Pragmatism

Re-constructionism

Unit 3 Psychological Foundations of Education

Learning and Maturation

Individual Differences

Self-Concept

Academic Aptitude

Instructional Strategies and Psychology

Unit 4 Socio-Economic Foundations of Education

Concept of Society and Culture

Social Conditions and Education

Economic Conditions and Education

Politics and Education

Unit 5 Historical Foundations of Education in Pakistan

Pre-Pakistan Period (712 A.D. to onward)

Period from 1947-1958

Period from 1959-1971

Period from 1972-1979

Period from 1980 -1991

Period from 1992 – to date

Unit 6 Aims of Education

Aims, Goals and Objectives

Taxonomies of Objectives

Aims and Objectives of Education in Pakistan

Unit 7 Problems and Issues in Education in Pakistan

Universalization of Primary Education

Literacy

Medium of Instruction

Diversification of Education

Environmental Education

Gender and Education

Islamization of Education

Special Education

Health Education / Drug Education

HIV / Aids, STIs, Hepatitis

Recommended Books

Canestrari, A. (2009). *Foundations of Education*. New York: Sage Publications Eugene, F.P.

(2005). *Critical issues in education: Anthology of reading*. New York: Sage Publications.

Goldblatt, P.F., & Smith, D. (2005). *Cases for teacher development*. New York: Sage Publications.

Holt, L.C. (2005). *Instructional patterns: Strategies for maximizing students learning*.

Murphy, D. (2005). *Foundations/Introduction to Teaching*. USA: Allyn & Bacon, Inc. New York: Sage Publications.

Semel, S. F. (2010). *Foundations of education: The essential texts*. USA: Routledge.

OR

GEN-4401

Introduction to Anthropology

Credit Hrs:2(2-0)

Objective: To provide a broad overview of the discipline, encompassing its core concepts, subfields (like archaeology, biological anthropology, cultural anthropology, and linguistics), and methodologies, while also fostering an understanding of human diversity and the human experience across time and cultures.

Course Contents:

1. Introduction

- a. Definition of Anthropology
- b. Fields of anthropology
- c. Anthropological research methods
- d. Anthropology and other social sciences
- e. Significance of anthropology

2. Culture

- a. Definition, properties and taxonomy
- b. Evolution and growth of culture
- c. Evolution of man: religious and modern perspectives
- d. Evolution of culture

3. Language and culture

- a) Communication
- b) Structural linguistics
- c) Historical linguistics
- d) Sociolinguistics
- e) Relationship between language and culture
- f) Sapir Whorf Hypothesis

4. Economic system

- a. Economic anthropology
- b. Adaptive Strategies
 - Foraging
 - Pastoralists
 - Horticulture
 - Agriculture
 - Industrial
- c. Distribution and Exchange
 - Market exchange
 - Redistribution
 - Reciprocity (types)
 - Barter
- d. Kula Ring
- e. Pot latching

5. Marriage and family

- a. Marriage its types and functions
- b. Forms and functions of family
- c. Residence patterns
- d. Kinship and descent
- e. Descent groups; Rules and types of descent

6. Political organization

- a. Types of political organization
- b. Centralized and Un centralized political systems
- c. Membership, settlement patterns, decision making in Band Tribes and Chiefdom
- d. Leadership/Resolution of conflict in Band Tribes and Chiefdom

7. Religion and magic

- a. Definition, Basic Concepts
- b. Animism and Animatism
- c. Religious practitioners (Shamans)
- d. Rituals and its examples
 - Rites of Passage
- e. Witchcraft, Magic and sorcery
- g. Functions of religion

8. Culture change

- a. Mechanism of cultural change
- b. Repressive change
 - Acculturation and Ethnocide
 - Genocide
- c. Cultural change in the modern world
- d. Problems of cultural change in Pakistani society

9. The arts

- a. Visual Arts
- b. Verbal Art
 - Myth
 - Legend
 - Tale

Books recommended

1. Adamson, Hoebel and Everett L. Frost. (1979). Cultural and Social Anthropology, New Delhi: McGraw Hill Publishing Co.
2. Bernard, H. Russell (1994). Research Methods in Anthropology; Qualitative and Quantitative Approaches. London: Sage Publications
3. Bodley, Jhon H. (1994). Cultural Anthropology. California: Mayfield Publishing Co.
4. Clammer, John R. (1983). Modern Anthropological Theory, New Delhi, Cosmo
5. Ember, Carol R. and Ember, Melvin (1990). Anthropology. (6th ed. Englewood Cliffs: Prentice Hall Inc.
6. Harris, Marvin (1987). Cultural Anthropology, New York: Harper and Row.
7. Harris, Morven (1985). Culture, People, Nature; An Introduction to General Anthropology. London: Harper and Row.

CIVICS AND COMMUNITY ENGAGEMENT

UGE Policy V 1.1 : General Education Course

Credits: 02
Pre-Requisite: Nil
Offering: Undergraduate Degrees (including Associate Degrees)
Placement: 1 - 4 Semesters
Type: General Education
Fields: All

DESCRIPTION
<p>This course is designed to provide students with fundamental knowledge about civics, citizenship, and community engagement. In this course, the students will learn about the essentials of civil society, government, civic responsibilities, inclusivity, and effective ways to participate in shaping the society which will help them apply theoretical knowledge to the real-world situations to make a positive impact on their communities.</p>
COURSE LEARNING OUTCOMES
<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate fundamental understanding of civics, government, citizenship and civil society. 2. Understand the concept of community and recognize the significance of community engagement for individuals and groups. 3. Recognize the importance of diversity and inclusivity for societal harmony and peaceful co-existence.
SYLLABUS
<ol style="list-style-type: none"> 1. Civics and Citizenship: <ul style="list-style-type: none"> • Concepts of civics, citizenship, and civic engagement. • Foundations of modern society and citizenship. • Types of citizenship: active, participatory, digital, etc. 2. State, Government and Civil Society: <ul style="list-style-type: none"> • Structure and functions of government in Pakistan. • The relationship between democracy and civil society. • Right to vote and importance of political participation and representation. 3. Rights and Responsibilities: <ul style="list-style-type: none"> • Overview of fundamental rights and liberties of citizens under Constitution of Pakistan 1973. • Civic responsibilities and duties. • Ethical considerations in civic engagement (accountability, non-violence, peaceful dialogue, civility, etc.) 4. Community Engagement: <ul style="list-style-type: none"> • Concept, nature and characteristics of community. • Community development and social cohesion. • Approaches to effective community engagement. • Case studies of successful community driven initiatives. 5. Advocacy and Activism: <ul style="list-style-type: none"> • Public discourse and public opinion. • Role of advocacy in addressing social issues. • Social action movements. 6. Digital Citizenship and Technology: <ul style="list-style-type: none"> • The use of digital platforms for civic engagement. • Cyber ethics and responsible use of social media.

- Digital divides and disparities (access, usage, socioeconomic, geographic, etc.) and their impacts on citizenship.
- 7. Diversity, Inclusion and Social Justice:**
- Understanding diversity in society (ethnic, cultural, economic, political etc.).
 - Youth, women and minorities' engagement in social development.
 - Addressing social inequalities and injustices in Pakistan.
 - Promoting inclusive citizenship and equal rights for societal harmony and peaceful co-existence.

SUGGESTED INSTRUCTIONAL / READING MATERIALS

1. "Civics Today: Citizenship, Economics, & You" by McGraw-Hill Education.
2. "Citizenship in Diverse Societies" by Will Kymlicka and Wayne Norman.
3. "Engaging Youth in Civic Life" by James Youniss and Peter Levine.
4. "Digital Citizenship in Action: Empowering Students to Engage in Online Communities" by Kristen Mattson.
5. "Globalization and Citizenship: In the Pursuit of a Cosmopolitan Education" by Graham Pike and David Selby.
6. "Community Engagement: Principles, Strategies, and Practices" by Becky J. Feldpausch and Susan M. Omilian.
7. "Creating Social Change: A Blueprint for a Better World" by Matthew Clarke and Marie-Monique Steckel.

GEN-4403

Ideology and Constitution of Pakistan

Credit Hrs: 2(2-0)

GICP-101: IDEOLOGY AND CONSTITUTION OF PAKISTAN

General Education Course

Credits:	02
Pre-Requisite:	Nil
Offering:	Undergraduate Degrees (including Associate Degrees)
Placement:	1 – 4 Semesters
Type:	General Education
Fields:	All

DESCRIPTION

This course is designed to provide students with a fundamental exploration of the ideology and the constitution of Pakistan. The course focuses on the underlying principles, beliefs, and aspirations that have been instrumental in shaping the creation and development of Pakistan as a sovereign state. Moreover, the course will enable students to understand the core provisions of the Constitution of the Islamic Republic of Pakistan concerning the fundamental rights and responsibilities of Pakistan citizens to enable them function in a socially responsible manner.

COURSE LEARNING OUTCOMES

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

1. Demonstrate enhanced knowledge of the basis of the ideology of Pakistan with special reference to the contributions of the founding father of Pakistan.
2. Demonstrate fundamental knowledge about the Constitution of Pakistan 1973 and its evolution with special reference to state structure.
3. Explain about the guiding principles on rights and responsibilities of Pakistan citizens as enshrined in the Constitution of Pakistan 1973.

SYLLABUS

- 1. Introduction to the Ideology of Pakistan:**
 - Definition and significance of ideology.
 - Historical contest of the creation of Pakistan (with emphasis on socio-political religious and cultural dynamics of British India between 1857 till 1947).
 - Contributions of founding fathers of Pakistan of Pakistan in the freedom movement including but not limited to Allama Muhammad Iqbal, Muhammad Ali Jinnah., etc.
 - Contributions of women and students in the freedom movement for separate homeland for Muslims of British India.
- 2. Two-Nation Theory:**
 - Evolution of the Two-Nation Theory (Urdu-Hindi controversy, Partition of Bengal, Simla Deputation 1906, Allama Iqbal's Presidential Address 1930, Congress Ministries 1937 Lahore Resolution 1940).
- 3. Introduction to the Constitution of Pakistan:**
 - Definition and importance of a constitution.
 - Ideological factors that shaped the Constitution(s) of Pakistan (Objectives Resolution 1949).
- 4. Constitution and State Structure:**

- Structure of Government (executive, legislature, and judiciary).
 - Distribution of powers between federal and provincial governments.
 - 18th Amendment and its impact on federalism.
- 5. Fundamental Right, Principles of Policy and Responsibilities:**
- Overview of fundamental rights guaranteed to citizens by the Constitution of Pakistan 1973 (Articles 8-28).
 - Overview of Principles of Policy (Articles 29-40).
 - Responsibilities of the Pakistan citizens (Article 5).
- 6. Constitutional Amendments:**
- Procedures for amending the Constitution.
 - Notable Constitutional amendments and their implications

SUGGESTED INSTRUCTIONAL / READING MATERIAL

1. "The Idea of Pakistan" by Stephen P. Cohen.
2. "Ideology of Pakistan" by Javed Iqbal.
3. "The Struggle for Pakistan" by I.H. Qureshi.
4. "Pakistan the Formative Phase" by Khalid Bin Sayeed.
5. "Pakistan: Political Roots and Development" by Safdar Mahmood.
6. "Ideology of Pakistan" by Sharif-ul-Mujahid.
7. "The Struggle for Pakistan: A Muslim Homeland and Global Politics" by Ayesha Jala.
8. "Jinnah, Pakistan and Islamic Identity: The Search for Saladin" by Akbar S. Ahmed.
9. "The Making of Pakistan: A Study in Nationalism" by K.K. Aziz.
10. "Pakistan: A New History" by Lan Talbot.
11. "Pakistan in the Twentieth Century: A Political History" by Lawrence Ziring.
12. "The Constitution of Pakistan 1973". Original.
13. "Constitutional and Political Development of Pakistan" by Hamid Khan.
14. "The Parliament of Pakistan" by Mahboob Hussain.
15. "Constitutional Development in Pakistan" by G.W. Choudhury.
16. "Constitution-Making in Pakistan: The Dynamics of Political Order" by G.W. Choudhury.

Botany

BOT-4404

Cell Biology, Genetics & Evolution

Credit Hrs: 3(2-1)

Objectives

To understand

1. Structure and functions of cell.
2. Nature of genetic material and hereditary process.
3. Familiarization with evolutionary processes.

Course Contents

a) Cell biology

1. Structures and Functions of Biomolecules
Carbohydrates, Lipids, Proteins, Nucleic Acids
2. Cell: Physico-chemical nature of plasma membrane and cytoplasm.
3. Ultrastructure of plant cell with a brief description and functions of the following organelles
Cell wall, Endoplasmic reticulum, Plastids, Mitochondria, Ribosomes, Dictyosomes, Vacuole, Microbodies (Glyoxysomes and Peroxisomes)

4. Nucleus: Nuclear membrane, nucleolus, ultrastructure and morphology of chromosomes, karyotype analysis
5. Reproduction in somatic and embryogenic cell, mitosis and meiosis, cell cycle
6. Chromosomal aberrations; Changes in the number of chromosomes. Aneuploidy and euploidy. Changes in the structure of chromosomes, deficiency, duplication, inversion and translocation.

b) Genetics

1. Introduction, scope and brief history of genetics. Mendelian inheritance; Laws of segregation and independent assortment, back cross, test cross, dominance and incomplete dominance.
2. Sex linked inheritance, sex linkage in *Drosophila* and man (colour blindness), XO, XY, WZ mechanisms, sex limited and sex-linked characters, sex determination.
3. Linkage and crossing over: definition, linkage groups, construction of linkage maps, detection of linkage.
4. Molecular genetics; DNA replication. Nature of gene, genetic code, transcription, translation, protein synthesis, regulation of gene expression (e.g., *lac* operon).
5. Transmission of genetic material in Bacteria: Conjugation and gene recombination in *E. coli*, transduction and transformation.
6. Principles of genetic engineering / biotechnology; Basic genetic engineering techniques.
7. Application of genetics in plant improvement: Induction of genetic variability (gene mutation, recombination), physical and chemical mutagens, selection, hybridization and plant breeding techniques. Development and release of new varieties.
8. Introduction to germplasm conservation

c) Evolution

The nature of evolutionary forces, adaptive radiation, differential reproductive potential, first plant cell, origin of organized structures, early aquatic and terrestrial ecosystem, first vascular plant.

Practical

Study of cell structure using compound microscope and elucidation of ultrastructure from electron microphotographs

1. Measurement of cell size.
2. Study of mitosis and meiosis by smear/squash method and from prepared slides.
3. Study of chromosome morphology and variation in chromosome numbers.
4. Extraction and estimation of carbohydrate, protein, RNA and DNA from plant sources

Genetics

1. Genetical problems related to the transmission and distribution of genetic material.
2. Identification of DNA in plant material. Carmine/orcein staining.
3. Study of salivary gland chromosomes of *Drosophila*.

Recommended Books:

1. Hoelzel, A. R. 2001. Conservation Genetics. Kluwer Academic Publishers.
2. Dyonsager, V.R. (1986). Cytology and Genetics. Tata and McGraw Hill Publication Co. Ltd, New Delhi.

3. Lodish, H. 2001. Molecular Cell Biology. W. H. Freeman and Co.
4. Sinha, U. and Sinha, S. (1988). Cytogenesis Plant Breeding and Evolution, Vini Educational Books, New Delhi.
5. Strickberger, M.V. (1988), Genetics, MacMillan Press Ltd., London.
6. Carroll, S.B., Grenier, J.K. and Welnerbee, S.d. 2001. From DNA to Diversity - Molecular Genetics and the Evolution of Animal Design. Blackwell Science.
7. Lewin, R, 1997. Principles of Human Evolution. Blackwell Science.
8. Strickberger, M. W. 2000 Evolution. Jones & Bartlet Publishers Canada
9. Ingrouille M. J. & B. Eddie. 2006. Plant Diversity and Evolution. Cambridge University Press.

Chemistry

CHM-4406

Organic Chemistry

Credit Hrs: 4(3-1)

Objective: To equip students with a foundational understanding of the structure, properties, reactions, and synthesis of carbon-containing compounds, including their importance in biological systems and various applications.

Course Contents:

1. Basic Concepts in Organic Chemistry Hybridization of orbitals of carbon atoms in alkanes, alkenes, alkynes and arenes. Hybridization of orbitals of nitrogen, oxygen and sulphur atoms in various functional groups. Localized and delocalized chemical bonding. Conjugation and hyper conjugation. Resonance, rules of resonance, resonance energy, resonance hybrid, factor effecting the resonance; inductive effect, Applications of inductive effect and resonance on various properties of organic compounds; Steric effect and its applications, Hydrogen bonding and its effect on various properties of organic compounds, Tautomerism.
2. Nomenclature of Organic Compounds: Nomenclature of alkanes, alkenes, alkynes, cycloalkanes, bicycloalkanes, spiroalkanes, monofunctional and polyfunctional derivatives of open chain and cyclic compounds, polysubstituted benzenes, polycyclic hydrocarbons such as naphthalene, anthracene, phenanthrene and their derivatives and heterocyclic compounds.
3. Aromatic Hydrocarbons: Structure of benzene, Resonance energy of benzene, Aromaticity, Criteria for aromaticity, Evidences of aromaticity, Natural sources of aromatic hydrocarbons; Preparation of aromatic hydrocarbons by different methods. Reactions of aromatic hydrocarbons: electrophilic aromatic substitution reactions i.e. nitration, halogenation, Friedal-Crafts reaction and its limitations, sulfonation; Orientation and reactivity of substituted benzenes; Nucleophilic aromatic substitution reactions; reaction such as addition, hydrogenation, Birch reduction, and oxidation reactions of side chain. Polycyclic aromatic hydrocarbons like naphthalene,

anthracene and phenanthrene, their resonance structures and relative stabilities. Synthesis of naphthalene, Electrophilic substitution reactions of naphthalene, Oxidation and reduction reactions, Brief description of orientation and reactivity of naphthalenes.

4. Isomerism Conformational Isomerism: conformational analysis of ethane, n-butane, cyclohexane, mono- and di-substituted cyclohexanes. Optical isomerism: optical activity, chirality and optical activity; enantiomers, diastereomers; racemates and their resolution; D, L and R, S conventions; Optical isomerism in cyclohexanes, biphenyls and allenes. Geometrical isomerism: cis and trans isomers; E-Z convention; determination of configuration of the isomers; inter-conversion of geometrical isomers; geometrical isomerism in cyclic compounds.

5. Alkyl halides: Preparation of alkyl halides from alcohols, carboxylic acids; Chemical reactions: Aliphatic nucleophilic substitution reactions, SN1 and SN2 mechanism, effects of the nature of substrates, attacking nucleophile, leaving group and the nature of solvent. Elimination reactions, E1 and E2 mechanisms, orientation of elimination (Hoffmann and Saytzeff rules). Grignard Reagents; synthesis, structure, and reactions with active hydrogen compounds carbonyl compounds such as aldehydes, ketones, esters, acid halides and CO₂; reaction with nitriles, ethylene oxides, sulphur and oxygen.

6. Chemistry of Phenols and Ethers Phenols: Physical properties; Synthesis of phenols, reactions of phenols such as acylation, Friedel-Crafts reaction, Nitration, Sulphonation, Carbonation, Formylation and Diazo coupling. Ethers: Physical properties, Preparation of ether from alcohols, alkyl halides and alkenes; Reactions of ether, brief introduction of crown ethers and polyethers.

7. Chemistry of Carbonyl Compounds: Preparation of aldehydes and ketones, by pyrolysis of calcium salts of acids, acylation of alkenes and arenes, reduction of acid halides and nitriles. Physical properties of aldehydes and ketones; Structure and reactivity of carbonyl group; Comparison of the reactivity of aldehydes and ketones; Nucleophilic addition of water, alcohols, ammonia and its derivatives, hydrogen cyanide, bisulfite, reduction and oxidation reactions; Aldol condensation and related reactions, Cannizzaro's reaction, Wittig reaction, oxidation reactions, chemical tests of aldehydes and ketones.

8. Chemistry of Carboxylic Acids and their Derivatives: Physical properties of carboxylic acids; Effects of different parameters on the acid strengths of aliphatic and aromatic carboxylic acids. Chemical properties like salt formation nucleophilic acyl substitution, reduction of carboxylic acids, decarbonylation, Hunsdiecker reaction, Kochi reaction, substitution at α -carbon. Preparations,

properties and reactions of acids chlorides, acids anhydrides, amides, cyanides and esters; Maolnic and acetoacetic esters synthesis.

9. Heterocyclic Compounds: Methods of preparation of pyrrol and pyridine, their aromatic character and comparison with benzene. Important reactions of pyrrol and pyridine.

Recommended Books:

1. M. Yousan, A Textbook of Organic Chemistry, Ilmi kitab Khana, Urdu Bazar, Lahore. 2. Khairat M. Ibe Rasa, M.A. Rehman and Abdul Rehman, Organic Chemistry, Caravvan Book House, Lahore.

Reference Books:

1. Younas, M., Text Book of Chemistry, Ilmi Kutab Khana, Lahore.
2. Rehman, A., Text Book of organic Chemistry, Karwan Book House, Lahore.
3. Bhatti, H. N. and Rahman, R. 2013. Text Book of Organic Chemistry. Caravan Book House Pakistan.
4. Bahl, A., and B. S. Bhat. "A Text Book of Organic Chemistry, 17th Edn, S."Chand and Company, New Delhi ISBN: 81-219.
5. March, J., Advance Organic chemistry, John Wiley & Sons, New York.
6. I. L. Finar, "Organic chemistry" , Vol. I, Pearson Education, L.P.E.
7. I. L. Finar, , "Organic chemistry" , Vol. II, 5th Edition, L.P.E.
8. Jerry March, "Advanced Organic chemistry, Reaction, Mechanism and Structure" , 5th Edition, Wiley Inter Science.
9. Morison and Boyd, "Organic chemistry" , 6th Edition, Prentice Hall.
10. Seyhan N. Ege, "Organic chemistry Structure and Reactivity", 3rd Edition, The University of Michijan, A.I.T.D.S. Publishers & Distributors (Redg).

Organic Chemistry Practical

1. Compound Analysis: Identification of organic compounds containing only one functional group with special emphasis on compounds containing following functional groups. -COOH, -OH, C=O, -NH₂ and -CONH₂
2. Preparation of organic compounds: Preparation and techniques of purification of tribromophenol, nitrobenzene, aspirin, ethyl benzoate and benzoic acid from toluene, butyl chloride, acetanilide.

3. Basic Experimental techniques used in organic chemistry: Simple distillation, Solvent extraction, Sublimation, Re-Crystallization.
4. Estimation (Volumetric): Determination of molecular weight of carboxylic acid. Estimation of amide group and glucose.

Recommended Book:

Muhammad Abid Khawaja, Practical Chemistry Note Book, Organic Chemistry, Ilmi Kitab Khana, Urdu Bazar, Lahore.

Zoology

ZOO-4405 Animal Form and Function-I (INVERTEBRATES) Credit Hrs: 4(3-1)

Objective:

1. To teach about animals' diversity adapted in different strategies' for performance of their similar functions through modifications in body parts in past and present times.

Course Contents

1. Protection, Support, and Movement:

- a. Protection: the integumentary system of invertebrates and vertebrates;
- b. movement and support: the skeletal system of invertebrates and vertebrates;
- c. movement: non-muscular movement; an introduction to animal muscles; the muscular system of invertebrates and vertebrates.

2. Communication I: Nerves:

- a. Neurons: structure and function; neuron communication: introductory accounts of resting membrane potential, action potential (nerve impulse) and transmission of the action potential between cells; invertebrate and vertebrate nervous systems: the spinal cord, spinal nerves, the brain, cranial nerves and the autonomic nervous system.

3. Communication II:

- a. Senses: Sensory reception: baroreceptors, chemoreceptors, georeceptors, hygroreceptors, phonoreceptors, photoreceptors, proprioceptors, tactile receptors, and thermoreceptors of invertebrates;
- b. lateral-line system and electrical sensing, lateral-line system and mechanoreception, hearing and equilibrium in air, hearing and equilibrium in water, skin sensors of damaging stimuli, skin sensors of heat and cold, skin sensors of mechanical stimuli, sonar, smell, taste and vision in vertebrates.

4. Communication III:

- a. The Endocrine System and Chemical Messengers: hormones chemistry; and their feedback systems; mechanisms of hormone action;
- b. hormones of porifera, cnidarians, platyhelminthes, nemertean, nematodes, molluscs, annelids, arthropods, and echinoderms invertebrates; an overview of the vertebrate

endocrine system; endocrine systems of vertebrates, endocrine systems of birds and mammals.

5.Circulation, Immunity, and Gas Exchange:

- a. Internal transport and circulatory systems in invertebrates:
- b. characteristics of invertebrate coelomic fluid, hemolymph, and blood cells; transport systems in vertebrates; characteristics of vertebrate blood, blood cells and vessels;
- c. heart and circulatory systems of bony fishes, amphibians, reptiles, birds and mammals; the human heart: blood pressure and the lymphatic system; immunity: nonspecific defenses, the immune response; gas exchange: respiratory surfaces; invertebrate and vertebrate respiratory systems: cutaneous exchange, gills, lungs, and lung ventilation; human respiratory system: gas transport.

Recommended Books

1. Hickman, C.P., Roberts, L.S. and Larson, A. Integrated Principles Of Zoology, 11th Edition (International), 2004. Singapore: McGraw Hill.
2. Miller, S.A. and Harley, J.B. Zoology, 5th Edition (International), 2002. Singapore: McGraw Hill.
3. Pechenik, J.A. Biology Of Invertebrates, 4th Edition (International), 2000. Singapore: McGraw Hill.
4. Kent, G.C. and Miller, S. Comparative Anatomy Of Vertebrates. 2001. New York: McGraw Hill.
5. Campbell, N.A. Biology, 6th Edition. 2002. Menlo Park, California: Benjamin/Cummings Publishing Company, Inc.

Practicals

1. Study of insect chitin, fish scale, amphibian skin, reptilian scales, feathers and mammalian skin.
2. Study and notes of skeleton of *Labeo*, *Rana tigrina*, *Varanus*, fowl and rabbit.
Note: Exercises of notes on the adaptations of skeletons to their function must be done.
3. Earthworm or leech; cockroach, freshwater mussel, *Channa* or *Catla catla* or *Labeo* or any other local fish, frog, pigeon and rat or mouse and rabbits are representative animals for study in dissections.
4. Study of models or preserved brains of representative animals and notes on adaptations.
5. Study of nervous system of earthworm and a fish.
6. Study of endocrine system in an insect and a rabbit.
7. Study of different types of blood cells in blood smear of rabbit.
8. Study of heart, principal arteries and veins in a representative vertebrate (dissection of representative fish/mammals).

9. Study of respiratory system in cockroach or locust and a vertebrate representative (Model).

Recommended Books

1. Pechenik, J.A. 2013. Biology of Invertebrates, 4th Ed. (International), Singapore: McGraw-Hill.
2. E. S Russell, 2010. Form and Function: A contribution to the history of Animal Morphology (Classic reprint)
3. Hickman, C.P., Roberts, L.S., Larson, A. 2014. Integrated Principles of Zoology, 11th Ed. (International), Singapore: McGraw-Hill.
4. Miller, S.A. and Harley, J.B. 2002. Zoology, 5th Ed. (International), Singapore: McGraw-Hill.
5. Campbell, N.A. 2002. Biology, 6th Ed. Menlo Park, California: Benjamin/Cummings Publishing
6. Kent, G.C., Miller, S. 2001. Comparative Anatomy of Vertebrates. New York: McGraw-Hill.
7. Prof. Dr. M. Khalid Baloch. T.book of Zoology, Animal form & function (A comparative prespective)