

COURSE WISE BREAKUP

First Year First Semester

THEORY

COURSE CODE	TITLE	CREDIT HOURS	MARKS
ENG-101	ENGLISH-I (FUNCTIONAL)	03	100
GEN-101	GENERAL-I	03	100
GEN-101	GENERAL-II	03	100
MATH-101	MATHEMATICS-I	03	100
BIO-101	FUNCTIONAL BIOLOGY-I	03	100
CHEM-151	INORGANIC CHEMISTRY	03	100

PRACTICALS

COURSE CODE	TITLE	CREDIT HOURS	MARKS
CHEM-151	INORGANIC CHEMISTRY	01	25

- **Total Credits of the Semester = 16 (theory 15 & practicles 01 credits)**
- **Maximum Marks = 525 (theory 500 & practicles 25 marks)**

1st Year; 1st Semester

Title of the Course: **ENGLISH-I (FUNCTIONAL)**

Code: **ENG-101**

Credit Hours: **03**

Marks: **100**

Objectives: Enhance language skills and develop critical thinking.

Course Contents:

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

Comprehension: Answers to questions on a given text

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

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

Translation Skills, Urdu to English

Paragraph Writing: Topics to be chosen at the discretion of the teacher

Presentation Wkills: Introduction, Extensive reading is required for vocabulary building

RECOMMENDED BOOKS:

1. Functional English

a) Grammar:

1. Practical English Grammar by A.J. Thomson and A.V., Martinet. Exercises 1. Third edition. Oxford University, Press. 1997. ISBN 0194313492.
2. Practical English Grammar by A.J. Thomson and A.V., Martinet. Exercises 2. Third edition. Oxford University, Press. 1997. ISBN 0194313506

b) Writing

1. Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford, Supplementary Skills. Fourth Impression 1993. ISBN 019 435405 7 Pages 20-27 and 35-41.

c) Reading/Comprehension

1. Reading. Upper Intermediate. Brain Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression, 1992. ISBN 0 19 453402 2.

1st Year; 1st Semester

Title of the Course: GENERAL-I

Code: GEN-101

Credit Hours: 03

Marks: 100

Social Issues of Pakistan:

Social problems: concept and approaches. Nature and scope of Pakistani social problems. Corruption, child labour, terrorism, gender bias, population growth, poverty and diseases, non-access to quality health, violation of human rights, honour killing, malnutrition, problems of working women, beggary, unemployment, drug abuse, dowry system, non-vaccination of children in rural areas, problems in rural girls education, non-empowerment of women in decision making. Causes and remedies.

1st Year; 1st Semester

Title of the Course: GENERAL-II

Code: GEN-101

Credit Hours: 03

Marks: 100

History of Science:

Concept of science, scientist and natural philosopher.

1. Early cultures: Empirical investigations of the natural world by Ancient Egypt, Ancient Mesopotamia and Ancient Greek philosophers (Aristotle, Plato etc). Science in the Roman world, India and China.
2. Science in the Middle Ages: Application of scientific methods for investigations. Science in the Islamic World (Ibn al-Haytham, Abu Rayhan al-Biruni, al-Razi, Muhammad ibn Musa al-Khwarizmi, Avicenna, al-Farabi, Nasir al-Din al-Tusi) and science in the Medieval Europe (Roger Bacon etc).
3. Modern science: 18th century onwards (scientific revolution), the birth of specific disciplines.

1st Year; 1st Semester

Title of the Course: **MATHEMATICS-I**

Code: **MATH-101**

Credit Hours: **03**

Marks: **100**

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

Course Contents:

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

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

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

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

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

Trigonometry: Fundamentals of trigonometry, trigonometric identities.

RECOMMENDED BOOKS:

1. Dolciani MP, Wooton W, Beckenback EF, Sharron S, Algebra 2 and Trigonometry, 1978, Houghton & Mifflin,
2. Boston (suggested text) Kaufmann JE, College Algebra and Trigonometry, 1987, PWSKent Company, Boston
3. Swokowski EW, Fundamentals of Algebra and Trigonometry (6th edition), 1986, PWS-Kent Company, Boston

1st Year; 1st Semester

Title of the Course: **FUNCTIONAL BIOLOGY-I** **Code: BIO-101 Credit**

Hours: 03

Marks: 100

Course Contents:

Principles of Cellular Life: Chemical Basis Structure and Function, Principles of Metabolism, Energy Acquisition

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

Biodiversity: Fundamental Concept of Biodiversity,

One or two examples of each of the following from commonly found organism

Prions, Viruses, Bacteria, Protistans, Algae, Fungi, Plants, Crops, Animals, Invertebrates, Vertebrates

RECOMMENDED BOOKS:

1. Roberts, M.M., Reiss and G. Monger. 2000. Advanced Biology, Nelson.
2. Starr, C, and R, Taggart, 2001. Biology: The Unity and Diversity, of Life Brooks and Cole.
3. Campbell, N.A., J.B, Reece, L.G. Mitchell, M.R, Taylor. 2001, Biology: Concepts and Connections. Prentice-Hall.

1st Year; 1st Semester

Title of the Course: INORGANIC CHEMISTRY

Code: CHEM-151

Credit Hours: 03

Marks: 100

Objectives:

1. The Development of periodic law and properties of elements in a systematic way.
2. The principal of chemical bonding
3. Chemistry of acid and bases
4. Chemistry of p-block Elements

Course Contents:

The Periodic Law and Periodicity

Development of Periodic Table; Classification of elements based on *s*, *p*, *d* and *f* orbitals; group trends and periodic properties in *s*, *p*, *d* and *f* block elements, i.e., atomic radii, ionic radii, ionization potential, electron affinities, electronegativities and redox potential.

Principles of Chemical Bonding

Types of chemical bonding; ionic bonding; the localized bond; approach: VB theory, hybridization and resonance; the delocalized approach to bonding: molecular orbital theory as applied to diatomic and polyatomic molecules, three center bonds, bonding theory of metals and intermetallic compounds; conductors, insulators and semiconductors; bonding in electron deficient compounds; hydrogen bonding.

Acids and Bases

Concepts of acids and bases including SHAB concept, relative strength of acids and bases, significance of pH, pK_a, pK_b and buffer solutions. Theory of Indicators; solubility; solubility product; common ion effect and their industrial applications.

Chemistry of p-block Elements

Chemistry and structure of *p*-block elements; main emphasis on the chemistry and structure of noble gases and their compounds; chemistry and structure of interhalogens; pseudohalogens and polyhalides. Prediction of shapes of molecules using VSEPR model and hybridization.

1st Year; 1st Semester

Title of the Practical: INORGANIC CHEMISTRY

Code: CHEM-151

Credit Hours: 01

Marks: 25

Course Contents

Laboratory Ethics and Safety Measures

Awareness about the toxic nature of chemicals and their handling, cleaning of glassware, safe laboratory operations

Qualitative Analysis

Analysis of four ions (two anions and two cations) from mixture of salts

Quantitative Analysis

Laboratory work illustrating topics covered in the lecture of Inorganic Chemistry.

RECOMMENDED BOOKS:

1. Huheey, J. E., Keiter, E. A. and Keiter, R. L., "Inorganic Chemistry: Principles of Structure and Reactivity", 4th Ed., Harper and Row, New York, 2001
2. Cotton, F. A., Wilkinson, G. and Gaus, P. L., "Basic Inorganic Chemistry", 3rd Ed., Wiley, New York, 1995.
3. Clyde Day, M. & Selbin, J., "Theoretical Inorganic Chemistry", 2nd Ed., Van Nustrand Reinhold, 1969.
4. Lee, J.D., "Concise Inorganic Chemistry", Chapman and Hall, 5th Edition, 1996.
5. Shriver, D. F., Atkins, P. W. and Langford, C. H., "Inorganic Chemistry", Oxford University Press, 2nd Edition, 1994.
6. Bassette, J., Denney, G. H. and Mendham, J., "Vogel's Textbook of Quantitative Inorganic Analysis Including Elementary Instrumental Analysis" English Language Book Society, 4th Edition, 1981.
7. Vogel, A. I., "A Textbook of Micro and Semi-micro Qualitative Inorganic Analysis" Longman Green & Co. 1995.