Pokhara University

Faculty of Science and Technology

Entrance Examination Curriculum

Master of Science in Construction Management

Total marks: 150 Qualifying marks: 75 (Paying)/53(Scholarship)

Time: 3 hrs

Entrance curriculum mainly covers common topics of all streams covering Engineering Economics, Project Engineering, Construction Management and Engineering Professional Practice.

Section	Course	Weightage (%)
A	Engineering Economics	30
B	Project Engineering	30
C	Construction Management	30
D	Engineering Professional Practice	10
	Total	**100**

Section A: Engineering Economics:

Interest and Time Value of Money, Payback Period, Net Present Value, Internal Rate of Return, External Rate of Return, Benefit Cost Analysis, Financial and Economic Analysis, Breakeven Analysis, Sensitivity Analysis, Law of Demand and Supply.

Section B: Project Engineering:

Definition and Characteristics of Project, Project Cycle, Types of Project, Feasibility Analysis, Project Proposal, Bar Chart, CPM, PERT, Resource Levelling, Project Monitoring and Control, Earned Value Analysis, Time Cost Trade off Analysis, Capital Budgeting Techniques, Capital Structure Planning.

Section C: Construction Management:

Construction Management Framework, Material Management, Construction Equipment, Job Layout, Method of Contract, Types of Contract, Request for Proposal, Expression of Interest, Bidding Document, Tender Notice, Bid Evaluation, Conditions of Contract, Contract Document, Running Bill, Project Completion Report, Personnel Management, Project Maintenance, Health and Safety at site.

Section D: Engineering Professional Practice:

Ethics and Profession, Code of Conduct, Professional Associations, Nepal Engineering Council Act, Liability and Negligence, Professional Liability Insurance, Detailed duties of Engineers, Types of Business Organizations, Labor Law, Intellectual Property right.

Pokhara University
Faculty of Science and Technology
Central Entrance Examination Curriculum
Master of Science in Bioinformatics (M.Sc. Bioinformatics)

Total marks: 150 Qualifying marks: 75 (Paying) / 53 (Scholarship)
Time: 3 hrs

Entrance curriculum mainly covers the fundamental topics of Cell and Molecular Biology, Computer Science, and Mathematics and Statistics as follows.

Section	Course	Weightage (%)
A	Cell and Molecular Biology	50
B	Computer Science	30
C	Mathematics and Statistics	20
Total		100

Section A: Cell and Molecular Biology

1. Structure of the cell, Prokaryotic and eukaryotic cells, Membrane structure and function, Transport across cell membranes, Cell organelles and functions, Chromatin and chromosomes, and Cell division.
2. Properties and functions of carbohydrates, lipids, amino acids, proteins, enzymes, and vitamins. Carbohydrate metabolism and Electron transport system, and Photosynthesis.
3. Nucleic acids, Structure and functions of DNA and RNA, DNA replication, Gene, Genome, Central dogma, Gene transcription, Genetic code, Gene translation, Fundamentals of genetic engineering, Gene cloning vectors, Genetically modified organisms, Gene editing, Gene therapy, Mendel's law of inheritance, Chromosome aberrations, Genetic mutation, and Single Nucleotide Polymorphism, Polymerase chain reaction, Quantitative real time PCR, Gel electrophoresis, DNA fingerprinting.
4. Fundamentals of bioinformatics, Basic principles of genome sequencing, Gene and protein sequence, Human Genome Project, and Genome databases.

Section B: Computer Science

1. **Number System**: Binary systems and hexadecimal, Measurement of the size of computer memories, Example uses of binary and hexadecimal system
2. **Communication and internet technologies:** Introduction, Data transmission, Internet technologies, HTML, Hyperlinks, WWW, Web 2.0, Networks: WAN, LAN.
3. **Basic Logic gates and logic circuits:** Introduction, Logic gates, Truth tables, The function of the six logic gates, Simple Logic circuits, Universal Gates.
4. **Operating systems and computer architecture:** Operating systems, interrupts, CPU, computer memory hierarchy, input and output devices, file format.

5. **High- and low-level languages:** Programming languages types, translators, interpreters, compiling a program, running a program.
6. **Security and ethics:** What is computer security? Introductory concepts (Encryption, firewalls, proxy servers, biometric security) Data security needs and data integrity, cookies, loss of data and data corruption, security protocols, computer ethics, free software, freeware and shareware.
7. **Problem-solving and design:** Flow chart basics, computer program fundamentals, very simple concept of Algorithm design and pseudocode, conditional statements, loop structures, programming concepts (Declaration and use of variables and constants, basic data types) simple data structures, arrays.
8. **Databases:** Introduction, databases uses, structure of a database, role of databases in organizations.
9. **Computer Applications:** Artificial Intelligence and Big Data applications, applications of computer science in biological and medical systems, current trends of artificial intelligence and recent developments.

Section C: Mathematics and Statistics

1. Logarithms, Progressions, Partial Fractions, Binomial Expansion, Equations, System of Linear Equations, Inequalities, Systems of Linear Inequalities and their Graphs, Polynomial Equations, Basics of two-dimensional and three-dimensional coordinate geometry, Permutation and Combination, Set theory, Real Number System, Relation, Functions and Graphs, Limits and continuity, Derivatives, Anti-derivatives, Matrices and Determinants, Complex Numbers

2. Presentation of data, Descriptive statistics, basic probability concepts, Conditional probability, Random variables, Binomial distribution, Poisson distribution, Normal distribution, Terminology used in sampling, Sampling distributions of mean and proportion, Confidence interval, Sample size considerations, Terminology used in testing of hypothesis, Hypothesis testing: z-test, t-test and chi-square test, Correlation and Regression, Coefficient of determination.