

**Gandaki University**  
**Gandaki Province, Pokhara, Nepal**

**Title: Syllabus**

**Subject: IT**

**Faculty: Faculty of Engineering/ICT**

**Post: Assoc. Professor/Reader-ICT**

Section A: Academic knowledge (subject-oriented)

I. Background of IT

1. Background and future of IT
2. Knowledge about advanced computer architecture
3. Technical communication
4. Advanced problem-solving techniques

II. System design and development

1. Object Oriented Design and Modeling through UML
2. Knowledge of programming language (Front end and Backend level)
3. Machine learning
4. Database Management System
5. Management Information System (MIS)

III. Network and Communication

1. Telecommunication system
2. Network Theory
3. Control system

IV. Data management and analysis

1. Data analytics
2. Big data
3. Cloud computing
4. Mobile computing
5. Data mining and warehousing
6. Software engineering
7. Signal System & Processing

V. Basic electrical and electronics

1. Electrical system
2. Digital logic
3. Instrumentation
4. Control system

VI. Organization and management

1. Project organization and management
2. Research methodology
3. Social and professional issues in IT
4. Business planning and management

5. Entrepreneurship
- VIII. Machine learning
  1. Machine learning; Artificial Intelligence and its implications (both technical issues and ethical complexities)
  2. Cloud computing and open-access data based mining/management/research
- VII. Mathematics
  1. Probability and statistics
  2. Discrete structure
  3. Numerical method
  4. Operation research
  5. Managerial economics
- VIII. Security
  1. Information security
  2. Cryptography
  3. Security protocols

## Section B: Specific and advance knowledge testing

### I. Specific knowledge testing

#### MIS (Management information system)

1. Advanced problem-solving techniques
2. Object Oriented Design and Modeling through UML
3. Software design
  - a. Front end and back end programming (New generation programming, such as machine learning)
  - b. SDLC (Risk analysis)
4. Testing (Different levels of testing of the system)

### II. Advanced knowledge testing

1. Software engineering
2. Validation and verification
  - a. SRS (Software requirement specification) document
3. Data analysis (Data mining)
4. Analysis of system
  - a. Feasibility study of the system
    - i. Technical analysis
    - ii. Economical analysis
  - b. Statistical analysis of the system
    - i. Variance analysis
    - ii. Data mining
5. E-governance
6. Telecommunication and security

### Section C: Contemporary development of IT science

- I. Current status of IT
  1. Development and uses of IT in Nepal
  2. Discovery and disciplines of IT in natural and social aspects
  3. Existing telecommunication policy
  4. Existing policy of IT
  
- II. Shaping future of IT
  1. Adapting new technological advancement (Accepting emerging IT)
  2. Computer-aided design (CAD)
  3. Solving existing problems of IT development
  4. Use of mathematics to explore the use and management of IT
  5. International level of IT policy

### Section D: Research methods and advances including knowledge of statistical analysis and tools

- I. Methods of research
  1. Research design
  2. Sampling
  3. Variables
  4. Hypothesis testing
  5. Primary and secondary data
  6. Qualitative and quantitative methods
  7. Methods of research
    - a. Experiment method
    - b. Scientific method
    - c. Case study
  
- II. Advanced knowledge and tools of statistical analysis
  1. Data interpretation methods
  2. Measures of central tendency
  3. Sample size estimation
  4. Parametric and non-parametric tests
  5. Data presentation tools

### Section E: Knowledge application and system perspective

1. Conceptual framework for Knowledge management
2. Emerging IT
3. Innovations in IT
4. Relationship between knowledge management and IT innovation
5. Knowledge-based theory (Information processing approach)
6. R&D (Research and development) & knowledge application
7. Knowledge and Information System (KIS)

### Section F: Data structure & Algorithm

1. Concept of data structure like Stack, Queue, Tree

## 2. Concept of operations like search, sort, traversal