Course Title: Management Information Systems   **Credit: 3**

Course No: CSIT.416.3   **Number of period per week: 3+3**

Nature of the Course: Theory + Case Study   **Total hours: 45+45**

Year: Fourth   Semester: Seventh

Level: B.Sc. CSIT

1. Course Introduction

This course introduces information systems that are used for organizational decision making & problem solving. It discusses the significant managerial aspects of treating information as an organizational resource and its increasing impact on today's organization. Besides this, it will include topic of ethical, social and political issues of IS, securing information systems, enhancing decision making, and project management.

2. Objectives

By the end of this course, it is expected the student will be able to

- ↓ Highlight information systems and their effectiveness in organization success
- ↓ Understand types of MIS applications in organisations
- ↓ To provide concepts of new ethical issues, security threats, information system development process
- ↓ Analyze the business issues, processes, and techniques associated with organizational information systems;
- ↓ Select and design MIS systems appropriate to meet management requirements.
- ↓ Critically evaluate MIS contributions to the strategic management of organisations
- ↓ Identify project management tools, techniques and risks

3. Specific Objectives and Contents

Specific Objectives	Contents
◦ Differentiate between data, information, information systems, and information technology ◦ Understand trends in MIS and Challenges & opportunities due to globalization ◦ Discuss how MIS can transform businesses	**Unit I: Information Systems in Global Business (6)** 1.1. Role of Information Systems in Business, How Information Systems are Transforming Business 1.2. New in MIS, Globalization Challenges and Opportunities, Emerging Digital Firm. 1.3. Data vs Information, Information System, Information technology, Dimensions of IS, Contemporary approaches to IS 1.4. MIS Hands-on Project: Sales Trend Analysis by using Database or Excel
◦ Understand role of information	**Unit II: Business and Information Systems (9)** 2.1. Business Processes, Use of Information Technology to

systems to enhance business process ・ Explore information systems used in different organizational levels & functional areas ・ Conceptualize role of enterprise applications and collaboration systems in business firms	Enhance Business Process 2.2. Systems for Different Management Groups: Transaction Processing Systems, Management Information Systems, Decision Support Systems, Executive Support Systems 2.3. Systems for Different Functional Areas: Finance and Accounting Systems, Sales and Marketing Systems, HR Systems, Manufacturing and Production Systems 2.4. Systems for Linking Enterprise: Enterprise Systems, Supply Chain Management Systems, Customer Relationship Systems, Knowledge Management Systems 2.5. MIS Hands-on Project: Analyzing Opportunities by using Excel, Business Case
・ Understand Organization and Impact of IS in Organizations ・ Discuss competitive advantages of using information systems. ・ Explain Business value chain and impact of internets in competitive advantages	**Unit III: Information Systems & Organizational Strategy(6)** 3.1. Definition of Organization, Features of Organization, Impact of IS on Organization and Business Firms 3.2. Information Systems and Competitive Advantages, Porters Competitive Force Model, Using Information System to Deal with Competitive Forces, Impact of Internet on Competitive Advantages. 3.3. Business Value Chain Model, The Value Web, Synergies, Core Competencies and Network Based Strategies, 3.4. Business Case
・ Relate ethical issues with society and politics ・ Understand nee types of ethical issues raised due to growth of information systems & internet ・ Describe & exemplify moral dimensions of information age ・ Identify some ethical dilemmas created due to information systems	**Unit IV: Ethical & Social Issues Related to IS (6)** 4.1. Understanding Social and Ethical Issues: Ethics, Relationship between Ethical, Social and Political Issues, Moral Dimensions of Information Age, Technology trends that raises Ethical Issues 4.2. Ethics in Information Society: Responsibility, Accountability & Liability, Ethical Analysis, Some Real World Ethical Dilemmas 4.3. MIS Hands-on Project: Analyzing Privacy and other Ethical Issues by Analyzing Data, Business Case
・ Describe the reasons behind vulnerabilities of information systems ・ Understand business value of security & control ・ Identify & explain different tools used for protecting organizational information	**Unit V: Securing Information Systems (6)** 5.1. Why Systems are Vulnerable, Internet Vulnerabilities, Wireless Security Challenges, Malicious Software, Hackers and Computer Crime, Software Vulnerabilities 5.2. Business value of Security and Control, Legal and Regulatory Requirements for Electronic Record Management, Electronic Evidence and Computer Forensic. 5.3. Information System Control, Risk assessment, Security Policy, Disaster Recovery and Business Continuity Planning, Role of Auditing 5.4. Access Control, Firewalls, Intrusion Detection Systems, Antivirus Software, Securing wireless Networks, Encryption and PKI, Ensuring System Availability

	5.5. MIS Hands-on Project: Analysing Security Vulnerabilities by using Spreadsheets and Web Tools, Business Case
ᵛ Understand different types of decisions and decision making process ᵛ Demonstrate the role of DSS, MIS and ESS is Decision making ᵛ Discuss importance of GDSS and ESS in firms	**Unit VI: Enhancing Decision Making (6)** 6.1. Decision Making and Information Systems: Business Value of Improved Decision Making, Types of Decisions, Decision Making Process, Managers and Decision Making 6.2. Systems for Decision Support: Management Information Systems, Decision Support Systems, Executive Support Systems, Web Based Customer Decision Support Systems, Group Decision Support Systems 6.3. ESS and Balanced Scoreboard Framework, Role of ESS in the Firm, Business value of ESS 6.4. MIS Hands-on Project: Improving Decision Making by using Pivot Tables and Analyzing Sales Data, Business Case
ᵛ Understand value of project management and its objectives ᵛ Identify different factors to be considered and analyzed in selecting projects ᵛ Demonstrate and analyze value of in formations systems for business ᵛ Explain different project management risks and their management	**Unit VII: Managing Projects (6)** 7.1. Importance of Project management: Runway Projects, System Failures, Project Management Objectives 7.2. Selecting projects: Management Structure for IS Projects, Linking Projects to Business Plan, Critical Success Factors, Portfolio Analysis, Scoring Models 7.3. Establishing Business Value of IS: IS Cost and Benefits, Real Options Pricing Models, Limitations of Financial Models 7.4. Managing project Risks: Dimensions Project Risks, Change Management and Concept of Implementation, Controlling Risk Factors, Project Management Tools 7.5. Business case

Evaluation System

Undergraduate Programs							
External Evaluation	**Marks**	**Internal Evaluation**	**Weight age**	**Marks**	**Practical**	**Weight age**	**Mark**
End semester examination		Assignments	20%		Practical Report copy	25%	
(Details are given in the separate table at the end)	60	Quizzes	10%	20	Viva	25%	20
		Attendance	20%		Practical Exam	50%	
		Internal	50%				

		Exams					
Total External	60	Total Internal	100%	20		100%	20
Full Marks 60+20+20 = 100							

External evaluation

1. **End semester examination:**
   It is a written examination at the end of the semester. The questions will be asked covering all the units of the course. The question model, full marks, time and others will be as per the following grid.

2. **External Practical Evaluation:**
   After completing the end semester theoretical examination, practical examination will be held. External examiner will conduct the practical examination according to the above mentioned evaluation. There will be an internal examiner to assist the external examiner. Three hours time will be given for the practical examination. In this examination Students must demonstrate the knowledge of the subject matter.

Full Marks: 100, Pass Marks: 45, Time: 3 Hrs

Nature of question	Total questions to be asked	Total questions to be answered	Total marks	Weightage
Group A: multiple choice*	20	20	20×1 = 20	60%
Group B: Short answer type questions	7	6	6×8 = 48	60%
Group C: Long answer type questions	3	2	2×16 =32	60%
			100	100%

Each student must secure at least 50% marks in internal evaluation in order to appear in the end semester examination. Failed student will not be eligible to appear in the end semester examinations.

Internal evaluation

Assignment: Each student must submit the assignment individually. The stipulated time for submission of the assignment will be seriously taken.

Quizzes: Unannounced and announced quizzes/tests will be taken by the respective subject teachers. Such quizzes/tests will be conducted twice per semester. The students will be evaluated accordingly.

Attendance in class: Students should regularly attend and participate in class discussion. Eighty percent class attendance is mandatory for the students to enable them to appear in the end semester examination. Below 80% attendance in the class will signify NOT QUALIFIED (NQ) to attend the end semester examination.

Presentation: Students will be divided into groups and each group will be provided with a topic for presentation. It will be evaluated individually as well as group-wise. Individual students have to make presentations on the given topics.

Mid-term examination: It is a written examination and the questions will be asked covering all the topics in the session of the course.

Discussion and participation: Students will be evaluated on the basis of their active participation in the classroom discussions.

Instructional Techniques: All topics are discussed with emphasis on real-world application. List of instructional techniques is as follows:
- Lecture and Discussion
- Group work and Individual work
- Assignments
- Presentation by Students
- Quizzes
- Guest Lecture

Students are advised to attend all the classes and complete all the assignments within the specified time period. If a student does not attend the class(es), it is his/her sole responsibility to cover the topic(s) taught during that period. If a student fails to attend a formal exam/quiz/test, there won't be any provision for re-exam. Unless and until the student clears one semester he/she will not be allowed to study in the following semesters.

Field Visit/Case Study
First, each student will join a group. The student or student group (at most 4 students) needs to finish a written case study report (2000 – 3000 words) on the effectiveness and limitations of some existing information system. The Field Visit/Case study report must reflect your understanding on basic concepts taught in the course and capability of using them to analyze practical cases. The case study should be outlined tentatively as follows:

a) Abstract
b) Introduction and purpose of Information System
c) Categorization of the IS
d) Infrastructures required for the IS
   ☞ Hardware Infrastructure
   ☞ Software Infrastructure
   ☞ Network Infrastructure
e) Data Sources and Data Analysis required for the IS
f) Effectiveness of the IS and its Assistance to Management
g) Conclusion, Limitations of the IS and Recommendations for Enhancements

Prescribed Text

- *Laudon, K. C. & Laudon, J. P.,* Management Information Systems, 12th Edition Pearson, 2013
- *James A. O'Brien, George Marakas*, Management Information Systems, 7th Edition McGraw-Hill Companies, 2006
- *R. Kelly Rainer, Efraim Turban, Richard E. Potter*, Introduction to Information Systems: Supporting and Transforming Business, Wiley, 1st Edition, 2006

Course Title: Neural Network   **Credit: 3**
Course : CSIT.416.4   **Number of period per week: 3+3**
Nature of the Course: Theory + Lab   **Total hours: 45+45**
Year: Fourth, Semester: Seventh
Level: B. Sc. CSIT

1. Course Introduction

This course introduces the fundamental concepts of neural networks and essentials of artificial neural networks with single layer and Multilayer Networks. The course covers the basics and applications of neural networks, including design of neural network, learning processes, perceptron model, radial basis function and neuro-fuzzy systems.

2. Objectives

The main objective of the course is to introduce concepts of artificial neural networks. The general objectives are to:
- introduce the neural networks as means for computational learning
- present the basic neural network architectures
- give design methodologies for artificial neural networks
- introduce learning theories used in neural networks
- demonstrate neural network applications on real-world tasks.
- explore use of fuzzy system in neural networks

3. Specific Objectives and Contents

Specific Objectives	Contents
• Understand Biological Neural Network • Understand analogy between biological neural network and artificial network • Explore real world applications of neural networks	**Unit I: Introduction (6 Hrs)** 1.1. Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological Neuron Model, Artificial Neuron Models, Artificial Network Networks (ANN) 1.2. History of neural network research, characteristics of neural networks, Applications of ANN
• Understand mathematical foundations of neural network • Explore different neuron models • Understand different neural network architectures	**Unit II: Basics of Artificial Neural Networks (8 Hrs)** 2.1. Artificial Neuron Model and its Mathematical model 2.2. Activation Function, Types of Neuron Activation Function: Linear, Threshold, Sigmoid, Tangent 2.3. Models of neuron Mc Culloch –Pitts model, Perceptron, Adaline model, Madaline Model

	2.4. ANN Architectures: Single-layer, Multilayer Feed Forward, Recurrent 2.5. Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic)
• Understand the learning strategies • Explore different learning approaches	**Unit III: Learning Process (7 Hrs)** 3.1.Learning, Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application 3.2.Error-Correction Learning, Memory-Based Learning, Hebbian Learning, Competitive Learning, Boltzman Learning
• Understand perceptron model • Explore theories and algorithms for perceptron networks • Determine applications of perceptrons	**Unit IV: Single Layer Perceptrons (8 Hrs)** 4.1.Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks 4.2.Least Mean Square Algorithm 4.3.Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications
• Understand feed forward and feedback networks • Construct multilayer neural networks • Explore the Hopfield network • Understand and analyze delta rule and back propagation algorithm with its use	**Unit V: Single and Multilayer Feed forward Neural Networks (8 Hrs)** 5.1.Basic Concepts of single layered networks, Hopfield Networks 5.2.Multilayer Feed Forward Networks, Feedback Networks, 5.3.Discrete Hopfield Network 5.4.Gradient Descent, Delta Rule 5.5.Derivation of Back-propagation (BP) Training, Summary of Back-propagation Algorithm, Selection of tuning parameters in Back-propagation
• Understand Radial function networks • Understand regularization theory • Construct Radial Basis Function Networks	**Unit VI: Radial Basis Function Networks (5 Hrs)** 6.1. Pattern separability and Interpolation 6.2. Regularization Theory 6.3. Regularization and Radial Basis Function (RBF) Networks 6.4. RBF network design and training 6.5. Approximation properties of RBF
• Understand basics of fuzzy systems and fuzzy neural Networks	**Unit VII: Fuzzy Neural Networks (3 Hrs)** 7.1. Neuro-fuzzy systems 7.2. Background of fuzzy sets and logic, Design of fuzzy systems 7.3. Design of fuzzy neural networks, applications of neuro-fuzzy systems