Course detail of
BIM (Bachelor of Information Management) 8th Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr. hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 229: IT Entrepreneurship and Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>IT 230: Economics of Information and Communication</td>
<td>3</td>
</tr>
<tr>
<td>Two Elective Courses</td>
<td>6</td>
</tr>
<tr>
<td>IT 350: Internship</td>
<td>3</td>
</tr>
</tbody>
</table>

2017
IT 229: IT Entrepreneurship and Supply Chain Management

Credits: 3
Lecture Hours: 48

Course Objectives
This module aims to impart entrepreneurial skill in student to effectively run business and efficiently manage the supply chain. Students are required to undertake project work in this module.

Course Description

Course Details

Unit 1: Overview of Entrepreneurship
Entrepreneurship
Definition of Entrepreneur
The entrepreneurial decision process
Role of entrepreneurship In economic development
Intrapreneurship
Ethics and social responsibility of Entrepreneurship

Unit 2: Business Plan for a new venture-introduction
Defining the Business plan
Scope and value of the Business plan
Writing the Business plan
The Marketing plan
   Marketing research for a new venture
   Characteristics of a Marketing plan
   Steps in preparing a marketing plan

Unit 3: Overview of Supply Chain Management
Definition of Supply Chain Management
Functions and Objective of a Supply Chain
Decision phases of Supply Chain
Process View of a Supply Chain - Cycle View and Pull/Push View
The importance of a supply chain flows
Pitfalls and opportunities in a Supply Chain
   Case Studies presentations
   Dell Computer: Direct Marketing
Unit 4: Co-ordination in a Supply Chain

Lack of Supply Chain co-ordination and the Bullwhip effect
Effect of lack of co-ordination on performance
Obstacles to co-ordination in a Supply chain
Managerial Levers to achieve coordination.
Role of IT in coordination, forecasting and Replenishment

Unit 5: Supply Chain performance: Achieving Strategic fit and scope

Competitive and Supply Chain Strategies Achieving Strategic fit
   Understanding the customer
   Understanding the supply chain
   Achieving strategic fit
   Obstacles in achieving strategic fit

Unit 6: Supply chain Drivers and Matrices

Drivers of supply Chain performance
Frame work for structuring Drivers.
Role of each cross functional drivers in competitive strategy and supply chain strategy with components
   Facility
   Inventory
   Information
   Transportation
   Sourcing
   Pricing

Presentations
   Role of MIS,ERP,ESS,EIS, AI ,DSS in cross functional drivers performance.

Unit 7: Designing the supply chain Network

Role of distribution in supply chain
Factors influencing distribution network design
Design Option for a distribution Network
E-business and the Distribution Network.
Role of network design in supply chain.
Factors influencing Network Design Decisions
Frame work for Network design Decision
Network optimization Models
   The capacitated plant location model
   Gravity Location model

Unit 8: IT in a Supply Chain
   The role of IT in a Supply Chain and its network design
   Supply chain IT Framework
   Supply chain Macro process and IT
   Future of IT in supply chain
   Risk Management in IT
   Supply chain IT in Practice

Unit 9: Planning demand and supply in supply chain
   Characteristic and role of forecasting
   Role of IT in forecasting
   Role of aggregate planning with problems in supply chain
   Role of IT in aggregate Planning
   Inventory Planning with known and uncertain demand

Unit 10: Supply Chain Globalization
   Rational and key strategies
   Requirements and Challenges
   Supply Chain Globalization
   Potential hidden costs
   Total Cost Strategy

Unit 11: Entrepreneurial Supply Chain
   Introduction
   Strategies

Tutorial

References
   Entrepreneurship (Fifth Edition) By Robert D. Hisrich and Michael P. Peters
   Management information system (Managing the digital firm) by Kenneth C. Laudon and Jane P. Laudon (Ninth edition)
   Management Information system by James O’ Brien (sixth edition)
IT 230: Economics of Information and Communications

Credits: 3
Lecture Hours: 48

Course Objective
This module aims to examine information as an economic commodity and a public good especially in relation to pricing, provision and regulation.

Course Description

Course Details

Unit 1: Managerial Economics Basic
1.1 Defining moments of economics: from Industrial revolution to Information revolution
1.2 Technological change in a global economy
1.3 Market failure, Externalities and Public goods

Unit 2: Markets for Information Goods
1.4 Foundations of the Information economy
1.5 Introduction to Information economy
   1.5.1 Definition of information good
   1.5.2 The cost of producing information
   1.5.3 Managing intellectual property
   1.5.4 Economic and public good
   1.5.5 The economics of attention
1.6 Technology
   1.6.1 Systems competition
   1.6.2 Lock-in and switching costs
   1.6.3 Positive feedback, network externalities, and standards
1.7 Policy

Unit 3: The Role of Information in an Economy
1.8 Transaction costs and Information costs
1.9 The economy of search
1.10 Information problems
   1.10.1 The moral hazard problem
   1.10.2 The Adverse-Selection Problem
1.11 Speculation and Risk Bearing
The Futures Market

Unit 4: Strategies for Pricing Information

1.13 Pricing Information Goods
   1.13.1 Cost of producing information
   1.13.2 Costs and competition
   1.13.3 Product Personalization
   1.13.4 Product pricing
   1.13.5 Personalized pricing
   1.13.6 Versioning
   1.13.7 Group pricing - Price sensitivity, Network effects, Lock-in, Sharing

1.14 Versioning Information
   1.14.1 Types of versioning
   1.14.2 Value-subtracted versions
   1.14.3 Avoiding pitfalls in versioning
   1.14.4 On-line and off-line versions
   1.14.5 Goldilocks pricing
   1.14.6 Customizing the browser
   1.14.7 Bundling
   1.14.8 Promotional pricing

Unit 5: Rights Management

1.15 Production and distribution costs
1.16 Lower distribution costs
1.17 Lower reproduction costs
1.18 Trusted systems
1.19 Historical examples - Growing the market
1.20 Choosing terms and conditions

Unit 6: Market Strategies: Switching costs and Lock-in

1.21 Recognizing Lock-In
   1.21.1 Examples of lock-in
   1.21.2 Valuing an installed base of customers
   1.21.3 Classification of lock-in
   1.21.4 Suppliers and partners face lock-in, too
   1.21.5 The lock-in cycle

1.22 Managing Lock-In
   1.22.1 Lock-in strategy for buyers
   1.22.2 Lock-in strategy for sellers
   1.22.3 Investing in an installed base
   1.22.4 Encouraging customer entrenchment
   1.22.5 Leveraging your installed base

Unit 7: Networks and Positive Feedback

1.23 Positive feedback
1.24 Demand-side economies of scale
Unit 8: Strategies for Information Industries

1.32 Cooperation and Compatibility
   1.32.1 How standards change the game
   1.32.2 Winners and Loser from standards
   1.32.3 Tactics in formal standard-setting
   1.32.4 Managing open standards
      1.32.4.1 Case Study- Linux Adoption in the Public Sector: An Economic Analysis

1.33 Waging a Standards War
   1.33.1 Classification of standards wars
   1.33.2 Information-age standards wars
   1.33.3 Key assets in network markets
   1.33.4 Two basic tactics in standards wars
   1.33.5 Capstone case: Microsoft vs. Netscape,

Unit 9: Antitrust and Information Policy

1.34 Policy overview
1.35 Price differentiation
1.36 Competition policy
1.37 Telecommunications regulation and policy in brief (Nepalese context)

Unit 10: Thriving in a new economy

1.38 The components of Digital Economics
1.39 Twelve theme of the new economy
1.40 The ten technology shift
1.41 The Internet Economy and its Indicators
1.42 E-commerce and Digital Economy

Unit 11: Information and communication Technologies in the Hollywood's global Primacy

- Drivers of Hollywood’s competitive Advantage
- The economic drivers of Hollywood’s global
  - Competitive advantage
  - Factor conditions
  - Relating and supporting industries
  - Strategy, structure and rivalry
  - Demand conditions
  - The potential threats to Hollywood’s global primacy in an evolving landscape
Unit 12: The effects of continual disruption: technological resources supporting resilience in regions of conflict

- Technologies to aid resilient behavior
- Research setting
- Technologies resources supporting resilience

Information systems in crisis
- Introduction
- Exploring key information resources
- Fundamental components of an information environment

References


An Introduction to the Economics of Information 2nd Edition Oxford –Ines Macho-Stadler and J. David Tiz Castrillo
IT 305: Object Oriented Database Management System
(Elective)

Credits: 3
Lecture Hours: 48

Course Objective
This module aims to provide the students the knowledge of Object Oriented Database Management System.

Course Description
Introduction, Object Oriented DBMS, Semantic Database Models & Systems, Object Oriented Database Systems, OODBMS Architecture – An Introduction, Introducing object oriented programming, Objects in the Database, Large Objects

Course Details

Unit 1: Introduction
- A major Change: The relational Data Model
- Object Roles in Databases
- Sample uses of Object-oriented Databases
- Benefits of Object Orientation

Unit 2: Object Orientated DBMS
- The Object-oriented Data Model
  - Object-Oriented Data Relationships
  - Object Identifiers
  - One-to-Many relationships
  - Many-to-Many relationships
  - The IS-A relationship
  - The Extends relationship
  - The Whole-Part relationship
  Relationship Integrity
  ER Diagramming Models for Object-Oriented Relationships
  - Booch Notation
  - Unified Modeling Language
  Integrating Objects into a Relational Database
- The Extended Relational Model Approach
- The Semantic Database Approach
- The Proposed Object Database Standard
  - Basic OODBMS Terminology
  - Understanding Types
  - External specifiers
  - Implementations
  - Primitive Types
  - Inheritance
  - Interfaces and Inheritance
  - Classes and Extensions
  Objects
  - Collection Objects
  - Structured Objects
  - Creating and Destroying Objects
  Representing Logical Relationships

Unit 3: Semantic Database Models & Systems
- The Entity relationship Model
- Relational Model – Tasmania (RMT)
## Unit 4: Object Oriented Database Systems
- Performance Issues in OODBMS
- Application Selection for OODBMS
- The Object Oriented Database Paradigm Manifesto
- The Mandatory Features
- The Optional Features

## Unit 5: OODBMS Architecture – An Introduction
- An overview

## Unit 6: Introducing object oriented programming
- Data and Procedural Abstraction
- Object Type Overview
- Creating Object Types
  - Object type specification: attributes, methods
  - Declaring and initializing objects
  - SELF parameter
  - MAP and ORDER Methods
  - Object type inheritance

## Unit 7: Objects in the Database
- Introduction to objects in the database
- Object Tables: creating Object tables, Inheritance and attribute chaining
- Object views
  - Creating Basic Object views
  - Accessing Column Objects
  - DEREF
  - IS DANDLING
  - TREAT
  - VALUE
  - SYS_TYPEID
  - UTL_REF

## Unit 8: Large Objects
- Introduction to Large Objects
- Features Comparison
- Types of LOBS, LOB Locators
- Internal LOBs: BLOB, CLOB, NCLOB
- External LOBS: BFILE, VARRAY

### Text Books
- Scott Urman, Ron Hardman, Micheal McLaughlin, Oracle Database 10g PL/SQL Programming, Tata McGraw Hill

### References:
- Feuerstein S., Pribyl B., Oracle PL/SQL Programming, O'Reilly
- McLaughlin M., (2008), Oracle Database 11g PL/SQL Programming, Oracle Press
Course Objectives
The module aims to provide an overview of the roles, responsibilities and management methods of the software project manager. The course intended to teach students how to develop approaches and styles of management for software projects.

Course Description
Software Project Basics, Tools and Techniques, Estimation, Project Schedules, Reviews, Software requirements, Design and Programming, Software Testing, Using Project management effectively, Management and leadership, Managing an outsourced Project, Process Improvement

Course Details
Unit 1: Software Project Basics
Introduction
Types of Software Projects
Classification of software projects: Based on software development life cycle, approach driven, maintenance, web application, agile development
Approaches to software project management
Alignment of software engineering methodology with project management methodology
The Ad Hoc Methods-based Approach
The process-Driven Approach
Comparison between Ad Hoc Approach with the process-driven approach
Software Project Acquisition
Writing proposal, negotiating, contract acceptance

Unit 2: Tools and Techniques
Software project planning
Understanding the why is project needed and needs of project
Project management plan: resources, skill sets, computer systems
Risk assessment and management plan
Create the project plan

Unit 3: Estimation
Elements of successful estimate
Wideband Delphi Estimation
Other Estimation Techniques
Evaluation Estimation Problems

Unit 4: Project Schedules
Building the project schedule
The Work breakdown structure
Graphic representation of a schedule
Managing multiple projects
Schedule to manage commitments
Evaluation scheduling problems
Unit 5: Reviews
  Inspections
  Deskchecks
  Walkthroughs
  Code reviews
  Pair Programming
  Inspect to manage commitments

Unit 6: Software requirements
  Requirement elicitations
  Use Cases
  Software requirement specification
  Change control

Unit 7: Design and Programming
  Review the design
  Version control with subversion
  Refactoring
  Unit Testing
  Use automation

Unit 8: Software Testing
  Test plans and cases
  Test execution

Unit 9: Using Project management effectively
  Understanding change, making change successful

Unit 10 Management and leadership
  Take responsibility
  Doing everything out in open
  Manage the organization
  Manage the team

Unit 11: Managing an outsourced Project
  Prevent major sources of project failure
  Management issues in outsourced projects
  Collaborate with the Vendor

Unit 12: Process Improvement
  Software process improvement
  Moving forward

References
Meida
Murali K. Chemuturi, Thomas M. CagelyJr, “Mastering software project management” ,J. Ross
Publishing
Course Objective
The objective of the course is to make learner understand foundation principles and techniques of data mining and data warehousing. Students will be able to select and use various data mining language and tools very useful for adding business value of an organization.

Course Description
Introduction, Data Preprocessing- Data Integration and Transformation, Classification, Association Analysis, Cluster Analysis, Information Privacy and Data Mining, Advanced Applications, Search engines, Data Warehouses, Capacity Planning.

Course Details
Unit 1: Introduction
1.1. Data Mining Origin
1.2. Data Mining & Data Warehousing basics

Unit 2: Data Preprocessing
2.1. Data Types and Attributes
2.2. Data Pre-processing
2.3. OLAP
2.4 Characteristics of OLAP Systems
2.5 Multidimensional View and Data cube
2.6 Data Cube Implementation
2.7 Data Cube Operations
2.8 Guidelines for OLAP Implementation

Unit 3: Classification
3.1. Basics and Algorithms
3.2. Decision Tree Classifier
3.3. Rule Based Classifier
3.4. Nearest Neighbor Classifier
3.5. Bayesian Classifier
3.6. Artificial Neural Network Classifier
3.7. Issues : Overfitting, Validation, Model Comparison

Unit 4: Association Analysis
4.1. Basics and Algorithms
4.2. Frequent Itemset Pattern & Apriori Principle
4.3. FP-Growth, FP-Tree
4.4. Handling Categorical Attributes
Unit 5: Cluster Analysis
5.1 Basics and Algorithms
5.2 K-means Clustering
5.3 Hierarchical Clustering
5.4 DBSCAN Clustering

Unit 6: Information Privacy and Data Mining
6.1 Basic principles to Protect Information Privacy
6.2 Uses and Misuses of Data Mining
6.3 Primary Aims of data Mining
6.4 Pitfalls of Data Mining

Unit 7: Advanced Applications
7.1 Web-mining: Web content mining, web usage mining
7.2 Time-series data mining

Unit 8: Search Engines
8.1 Characteristics of search engine
8.2 Search Engine functionality
8.3 Ranking of Web pages

Unit 9: Data Warehousing
9.1 Operational Data sources
9.2 ETL (Extract, Transform, Load)
9.3 Data Warehouse Processes, Managers and their functions
9.4 Data Warehouses and Data Warehouses Design
9.5 Guidelines for Data Warehouse Implementation

Unit 10 Capacity Planning
10.1 Calculating storage requirement, CPU requirements

Practical:
Students should practice enough on real-world data intensive problems

References:
- Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Introduction to Data Mining, 2005, Addison-Wesley.
- Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, 2nd Edition, 2006, Morgan Kaufmann.
- G.K. Gupta, Introduction to Data Mining with Case Studies, Prentice Hall of India
- IBM, An Introduction to Building the Data Warehouse, Prentice Hall of India
- IBM, Introduction to Business Intelligence and Data Warehousing, Prentice Hall of India
- Adriaans Pieter, D. Zantige, "Data Mining", Pearson Education Asia Pub. Ltd, 2002
Course Objectives
This module aims to revisit and reinforce the knowledge in the networking system with special emphasis to Internet protocols, and client server based architecture. Laboratory work is essential in this course.

Course Description

Course Details

**Unit 1: Introduction to Client / Server**
Introduction to Client / Server.
- 2-tier Architecture
- 3-tier Architecture
Benefits and Characteristics of Client / Server Architecture.
Client / Server Models
- Distributed Presentation
- Remote Presentation
- Distributed Logic
- Remote Data
- Distributed Data.
- Fat vs. Thin

**Unit 2: Client / Server Components**
Network Operating Systems for Client / Server.
- Examples of NOS (Explanation not required)
- Common Services of NOS.

**Unit 3: Networking and Communication**
Seven Layers Function of OSI Model
- Cables(Structure, Application)
- Guided(Twisted, Coaxial,Optical)
- Unguided (Microwaves, Radiowaves, Bluetooth, Wimax)
Concepts of Logical and Physical Topologies.
Effect of Bandwidth on Client/Server.
Unit 4: Transport Layer Protocols

Introduction to UDP (User Datagram Protocol)
  Operation of UDP
  Characteristics of UDP
  Application of UDP
Introduction to TCP (Transmission Control Protocol)
  Operation of TCP
  Characteristics of TCP
  TCP three-way handshake process
  Application of TCP
Relationship between TCP & IP
  Standard TCP / IP services
  Port numbers and socket address

Unit 5: Understanding Middleware

The Database Connectivity Challenge
  Data Source Differences, Approaches to Database Connectivity
Basic view of Middleware
  General Characteristics
Introduction to Groupware
The main types of Middleware,
  DCE (Distributed Computing Environment)
    Components
    Application
  MOM (Message Oriented Middleware)
    Working Mechanism
    Application
  Transaction processing Monitors
    Working Mechanism (ACID)
    Application
  ODBC (Open Database Connectivity) & JDBC (Java Database Connectivity)
    Components
    Features and Application.

Unit 6: Client Server Database

1.1 Database System Architectures
1.2 Classic Client/Server Architecture
1.3 Setting ODBC/JDBC for connecting database in MSSQL Server, Oracle
1.4 Developing Three-Tier Client/Server Architecture
1.5 Open Database Connectivity

Unit 7: Socket Programming in Java

1.6 Creating Client and Server Sockets (UDP and TCP sockets)
1.7 Reading from and writing to a Socket
1.8 Writing the Server Side of a Socket
Unit 8: Performance Tuning and Optimization

Client Performance
  Hardware and Software.

Server Performance
  Hardware and Software.

Database Performance
  Index design
  Query design
  Database design

Network Performance
  Data rate
  Bandwidth
  Throughput
  Congestion

Unit 9: Securing a Client/Server System

The Challenges of Client / Server Security

Security for the Clients and Servers
  Physical security
  Software security
  Network security

Unit 10: Distributed System Architecture

Remote Procedure Call (RPC)
Object Management Architecture (OMA)
Distributed Resource Architecture
  Distributed data Architecture
  Distributed Server Architecture
  Distributed Computing Architecture

Project Work: Instructor should assign project work to each group of student demonstrating distributed client server architecture overview using the following tools:
  Back End : My SQL 1 or oracle
  Front End : VB.Net or Java

References
  ➢ Alex Berson, Client / Sever Architecture
  ➢ Neil Jonkins et al, "Client/Server Unleashed"
  ➢ Jeffrey D. Schank, Client-Server Applications and Architecture
Course Objectives
This module aims to provide the concepts of Operating Systems and Implementation of Systems Utilities for Inter-process communication in a multiprocessor environment.

Course Description
Overview, Process Management, Scheduling, Basic Synchronization principles, Memory Management, File Management, Protection and Security, Device Management

Detailed Course

Unit 1: Overview
1.1 Introduction
1.2 System Structures
1.3 The abstract Model of computing
1.4 Resources: files
1.5 Processes: Creating Processes (using C functions: FORK, JOIN, and QUIT, )
1.6 Threads: C threads

Unit 2: Process Management
2.1 The system view of processes and resources
2.2 Initializing the Operating System
2.3 Process address spaces
   2.3.1 Creating the address space
   2.3.2 Loading the program
   2.3.3 Maintaining consistency in the address space
2.4 The process abstraction
   2.4.1 Process descriptors
   2.4.2 Process state diagram
2.5 The resource abstraction
2.6 Process hierarchy
   2.6.1 Refining the process manager
   2.6.2 Specializing resource allocation strategies

Unit 3: Scheduling
3.1 Scheduling Mechanisms
   3.1.1 The process scheduler organization
   3.1.2 Saving the process context
   3.1.3 Voluntary CPU Sharing
   3.1.4 Involuntary CPU Sharing
   3.1.5 Performance
3.3 Strategy Selection
   3.1.1 Partitioning a process into small processes

3.4 Nonpreemptive Strategies
   3.1.1 First come first served
   3.1.2 Shortest Job next
   3.1.3 Priority Scheduling
   3.1.4 Deadline scheduling

3.5 Preemptive strategies
   3.1.1 Round robin
   3.1.2 Multiple-level queues
   3.1.3 Monitors

Unit 4: Basic Synchronization principles

4.1 Interacting processes
   4.1.1 Critical Sections
   4.1.2 Deadlock

4.2 Coordinating processes
   Semaphores
   4.2.1 Principles of operation
   Practical considerations

Unit 5: Memory Management

5.1 The Basics
   5.1.1 Requirements on the primary memory
   5.1.2 Mapping the address space to primary memory
   5.1.3 Dynamic memory for data structures

5.2 Memory Allocation
   5.2.1 Fixed-partition memory strategies
   5.2.2 Variable-partition memory strategies
   5.2.3 Contemporary Allocation Strategies

5.3 Dynamic Address Resolution
   5.3.1 Runtime bound Checking

5.4 Memory Manager Strategies
   5.4.1 Swapping
   5.4.2 Virtual Memory
   5.4.3 Shared-memory Multiprocessors

Unit 6: File Management

6.1 File System
   6.1.1 File Concept
   6.1.2 Access Methods
   6.1.3 Directory Structure
   6.1.4 File System Mounting
   6.1.5 File Sharing
   6.1.6 Protection
6.2 Implementing File Systems
   6.2.1 File System Structure
   6.2.2 File System Implementation
   6.2.3 Directory Implementation
   6.2.4 Allocation Methods
   6.2.5 Free Space Management

6.3 Secondary Storage Structure
   6.3.1 Disk Structure
   6.3.2 Disk Scheduling
   6.3.3 Disk Management
   6.3.4 Swap Space Management

6.4 I/O Systems
   6.4.1 I/O Hardware
   6.4.2 Application I/O Interface

**Unit 7: Protection and Security**

7.1 Fundamentals
   7.1.1 Policy and Mechanism
   7.1.2 Implementing Policy and mechanism
   7.1.3 Authentication Mechanisms
   7.1.4 Authorization Mechanisms
   7.1.5 Encryption

**Unit 8: Device Management**

8.1 Device Management approaches
   8.1.1 I/O System Organization
   8.1.2 Direct I/O with Polling
   8.1.3 Interrupt-Driven I/O
   8.1.4 Memory-Mapped I/O
   8.1.5 Direct memory access

8.2 Device Drivers
   8.2.1 The device driver interface
   8.2.2 CPU-device interactions
   8.2.3 I/O optimization

8.3 Some Device Management Scenarios
   8.3.1 Serial Communications
   8.3.2 Sequentially accessed storage devices
   8.3.3 Randomly accessed devices
Laboratory:
- Students should implement operating system functionality in their project.

Text Book:

References:
- Andrew S. Tanenbaum, Modern Operating System, PHI
- Andrew S. Tanenbaum, Operating Systems Design and Implementation, Prentice Hall
- James L. Peterson & Abraham Silberschatz, Operating System concepts, Addison Wesley
- Thomas W. Doeppner, Operating Systems in Depth, John Wiley & Sons