

Institute of Information & Communication Technologies
Edwin College UK



Bachelor of Science in Information Systems
(BS in IS)

Syllabus & Course Contents

General Education Courses (13 Courses; 39 Cr. Hrs.)

HU-2121-3 Pakistan Studies /Religious Studies

Credit Hours: 3

Pre Requisite: None

Follow-up: None

Syllabus:

Islamic Studies:

Fundamentals of Islam. (Aqaid, Ibadat, Islamic Dawah etc.); Ethical values of Islam; Serah of the Holy Prophet (PBUH); Islamic Civilization and its affects on humanity. Study of other prominent world religions and ethical systems in comparison with Islamic viewpoint. Multicultural societies.

Pakistan Studies:

Historical background of Pakistan: Muslim society in Indo-Pakistan, the movement led by the societies, The downfall of Islamic society, The establishment of British Raj- Causes and consequences. Political evolution of Muslims in the twentieth century: Sir Syed Ahmed Khan; Muslim League; Nehru; Allama Iqbal: Independence Movement; Lahore Resolution; Pakistan culture and society, Constitutional and Administrative issues, Pakistan and its geo-political dimension, Pakistan and International Affairs, Pakistan and the challenges ahead.

Text Books:

1. Dr. Sarwar, M. *Pakistan Studies*
2. Ikram-UI-Haq R. *Pakistan Studies*
3. Prof. Chawla. *Islamic Studies*

BUSN-2111-3 Introduction to Business

Credit Hours: 3

Prerequisite: None

Follow Up: ACC-2111-3

Syllabus:

Introduction to Business; Organizational structure: organizational hierarchy, chain of command, centralization & decentralization; Forms of business organizations: sole proprietorship, partnership, corporations; Different types of businesses: Merchandising,

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Manufacturing, Service, Banking; Functions of Business Concerns: Marketing, Wholesaling, Retailing, Export, Finance: sources of finance, business finance; Accounts: Cash & bank, Sales, Purchase, Inventory, Payroll; Costing: Material costing, Job order costing; Taxation, Excise tax, Sales tax, Income tax; Audit: Internal audit, External audit; Production: Product manufacturing, Specialization and Division of Labor, Quality control; Research & Development: Idea generation of product, Product development, Product Testing, Product Modification; Information Systems; Human Resources: Recruitment, Training, Promotion, Job specifications;

Text Book(s)

- A. Daniels, John D, International Business, 10th edition
- B. Khalid Mahmood Cheema, Introduction Business.

Additional Resources:

- A. Robbins, P. Stephen, Principles of Management: 12 Edition

ENG-2221-3 English Comprehension and Composition**Credit Hours: 3****Pre Requisite:** None**Follow-up:** ENG-2241-3**Syllabus:**

Specific Grammatik issues: Construction of Sentences, Tenses, Preposition, Articles, Comprehension Paragraph, Influence of medium on Communication: Listening, Speaking, Reading, Writing, Nonverbal communication, Components of Communication: The Seven C's of Communication; Global and Ethnic Communication Variables; Intercultural communication Models, Recognizing Cultural Differences, Factors Effecting Communication Within / Outside an Organization; Degrees of Interest and Attitude, Occasion and Location, Influences on personal ethics ;Legal Issues; Ethics and Organizational Responsibilities, Communication and Ethical Issues, ;Examining the Variety of Techniques of Application of Language in Communication; Short Formal Reports, Implication of Exploding Technology in Communication; Technology in Contemporary Business Communication, How Technology is Changing Communication, Individual and Group Communication, The Awareness of the Risks and Complications In Making Information Public; Managing the News Media, Macro Overview of Oral Communication Skills; Kinds and Ways of Delivering/Presentations, Sign of Discomfort, Speaking Fear, Faults in Listening, Various Layouts of Business Setups; Letters, Memos.

Text Books:

- A. Bovee, L. C & Thill, J. V. *Business Communication Today*, 5th Edition, 1995.
- B. Murphy, H. A & Hildebrandt, H. W. *Effective Business Communication*, 7th Edition, McGraw-Hill, 1992.

Additional Resources:

1. Lesikar, Raymond V. & Flatley, Marie E. *Basic Business Communication*, 9th Edition, McGraw-Hill, 2002.

HU-2111-3 Introduction to Philosophy**Credit Hours: 3**

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Pre Requisite: None

Follow-up: None

Syllabus:

Introduction of philosophy; Critical and Analytical thinking; Epistemology; Truth and Theories of Truth; Rationalism and Empiricism; Philosophy of religion: Confusions of different beliefs in different religions; Reason and Revelation. Ethics; Definition, importance and Computer Ethics. Philosophy of computer science and Information technology; Philosophical aspects of Computer Science and information technology, Cognitive Science. Artificial Intelligence and philosophy of mind; Cyber Philosophy; Impact of computing on society and organization structure. General philosophical views: Globalization and its importance, Importance of Revolution in human' life. Freedom and Responsibilities: Importance of Human' Existence. Art and culture: Creative culture, Aesthetic experience, Culture and society.

Text Books:

- A. John, H. *An Introduction to Philosophical Analysis*, 4th edition, Prentice Hall, 1996.

Additional Resources:

- A. John, H. *Philosophy of religion*, 4th edition, Prentice Hall, 1989.

ENG-2241-3 Business Communication and Technical Writing

Credit Hours: 3

Pre Requisite: ENG-2221-3

Follow-up: None

Syllabus:

Introduction to Communication Skills: 7 C's of Communication, Concepts and Problems of Communication, Components of Communication. Process of Preparing Effective Business Messages: Memo Writing, Forms of Written Communication; Good News and Neutral Messages, Bad News Messages, Business Letters. Proposals and Business Plans: Writing Proposals and Technical Reports. Short Reports, Long Formal Reports, Review of Technical Language. Writing Technical Research Reports: Special Topics in Business Communication, Documentation and Research Citation. Business Documentation Language, Style and Professional Appearance of the Long Formal Report Management Information Systems: Foundation Concepts; Information Systems and Technologies. Business Research Methods; Primary and Secondary Research; Direct and Indirect Research Methods. Strategies for improving Oral Presentations; Steps for improving Speaking and Listening skills in a Formal Presentation; Strategies for an effective Audience Analysis. Non-verbal Communication; Strategies for an effective Nonverbal Delivery in a Presentation. Effective Communication Instruments; Choice of Visual Aids and Graphics. The Job Application Process: Self-Assessment and CV Formatting; Cover Letter for Resumes. Successful Preparation for the Job Interviews. Effective Follow-up Messages after the Interview. Mock Interviews for individual personality enhancement Business Communication and the Ethical Context. Business Communication and the Global Context. Research Documentation and its Oral Presentation.

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Text Books:

1. Murphy, H.A & Hildebrandt H.W. *Effective Business Communication*, 6th Edition, McGraw-Hill, 1997.
2. Lesikar, Raymond V. & Flately, Marie E. *Basic Business Communication*, 9th Edition, McGraw-Hill, 2002.
3. Bovee, L.C & Till, J.V. *Business Communication Today*, 7th Edition, Pearson Education, 2003.

Additional Resources:

1. Prof. Sh. Aatur Rehman. *Effective Business Communication and Report Writing* 2002.
2. Fowler, H.W. *Dictionary of Modern English Usage*. Oxford University Press, 1995.
3. www.technical-writing-course.com/type-of-technical-report.html
4. www.technical-writing-course.com/technical-writing-links.html
5. www.college.hmco.com/english/riordan/tech_report/8e/students/samples/
6. www.college.hmco.com/english/riordan/tech_report/8e/students
7. www.lorien.ncl.ac.uk/ming/Dept/Tips/writing/writeindex.htm
8. www.io.com/~tcm/busi1304/planners/report_hunting.html
9. www.montana.edu/places/gps/lres357/techreport.html
10. www.lib.ipfw.edu/1205.0.htm
11. www.kent.k12.wa.us/KSD/KR/WRITE/TECH/tech_report.htm

ACC-2111-3 Accounting Information System**Credit Hours:** 3**Prerequisite:** BUSN-2111-3**Follow Up:** MNGT-3211-3**Syllabus:**

Introduction to Accounting Information Systems: Overview of Accounting, Accounting Information Systems, Financial Accounting Information System; Overview of Financial Statements: Purpose and Uses Of Financial Statements, Balance Sheet, Income Statement, Statement of Cash Flows, Statement of Retained Earnings; The Accounting Equation; The Accounting Cycle: Double Entry Accounting, The Journal, General Ledger, Special Ledgers; Net Income: Revenues & Expenses, Rules for Revenue and Expenses; The Trial Balance; Adjustments; Rectification of Errors; Preparing Financial Statements: Income Statement, Balance Sheet, Closing & Opening of New Books, The Work Sheet; Spread Sheet; Operating Cycle Of A Company; Inventory & Cost of Goods Sold; Evaluation of Assets: Depreciation Methods, Amortization, Depletion; Cash Flow Statements: Preparing Cash Flow Statement; Accounts Receivable Management; Accounts Payable Management; Accounting for Web Businesses; Development of Accounting Information System Modules: General Ledger, Inventory Management, Fixed Asset Management, Accounts Receivable Management, and Accounts Payable Management.

Text Book(s)

- A. Financial & Management Accounting "The Basis For Business Decisions", By Williams, Haka, Bettner, Meigs, McGraw Hill 12th Edition.
- B. Accounting Information Systems By Gelinas, Ulric J 5th Edition

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Additional Resources:

- A. Building Accounting Systems using Access 2002 by James T. Perry and Gary P. Schneider

MNGT-3211-3 Financial Management**Credit Hours:** 3**Prerequisite:** ACC-2111-3**Follow Up:** MNGT-3711-3, MNGT-3811-3**Syllabus:**

Introduction to Financial Management; Understanding Financial Statements, Taxes, and Cash Flows; Evaluating a Firm's Financial Performance; Ratio analysis; Financial Forecasting, Planning, and Budgeting; The Time Value of Money; Risk and Rates of Return; Valuation and Characteristics of Bond; Stock Valuation; Capital-Budgeting Techniques; Capital Budgeting and Estimating Cash Flows; Risk and Managerial Options in Capital Budgeting; Cost of Capital; Managing for Shareholder Value; Raising Capital in the Financial Markets; Analysis and Impact of Leverage; Planning the Firm's Financial Mix; Dividend Policy and Internal Financing; Working-capital Management and Short-term Financing; Cash and Marketable Securities Management; Accounts Receivable and Inventory Management; INTERMEDIATE AND LONG-TERM FINANCING; Risk Management; International Business Finance; Corporate Restructuring: Combinations and Divestitures; Term Loans and Leases.

Text Book(s)

- A. Arthur J. Keown, John W. Martin, William D. Petty, David F. Scott, Financial Management: Principles and Applications, 9/E
- B. Principles of financial Management by Timothy J Gallegger 8th Edition /Latest
- C. Managerial Finance by Gitman

Additional Resources:

1. Douglas Emery, John Finnerty, John Stowe Principles of Financial Management: 1/e.

BUSN-3111-3 Electronic Business**Credit Hours:** 3**Prerequisite:** BUSN-2111-3**Follow Up:** IS-4532-3**Syllabus:**

Introduction and overview of E-Business; E-Business Framework; E-Business History, Advantages & Limitations; Driving Forces Behind E-Business; E-Business Models; Click n Mortar, Brick n Mortar, E-Stores and E-Malls B2B, B2C, C2B C2C etc; Steps required for building E-Business; E-Business Idea Generation; Finding Market Opportunity; Preparing E-Business Plan; Electronic Marketing: E-Marketing Basics, Building Customer Experience, Designing Customer Interface, Understanding Customer Relationships, Product Development, Pricing, Communication, Distribution Channel, Building Online Communities, E-Marketing Matrix, Marketing Information System;

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Payments Methods in E-Business; E-Business Security; Ethics and Legal Issues; E-Finance: Introduction; Banking & E-Business; Enterprise Resource Planning; Mobile Business;

Text Book(s)

- A. E-Business by Samson, Danny ISBN: 0-074-71169-5
- B. Strategic Management of e-Business by Chen, Stephen ISBN: 9812-53-136-x
- C. Management Information Systems, managing information technology in the E-Business Enterprise Sixth Edition by James A. O' Brien ISBN: 0072823119

Additional Resources:

1. Electronic Commerce by Jeffery Rayport

MNGT-3311-3 Human Resource Management

Credit Hours: 3

Pre Requisite: BUSN-2111-3

Follow-up: IS-4582-3

Syllabus

Overview of Human Resources Management; Perspectives on Human Resources Management; The Contemporary Legal Environment; The Labor Market and the Changing Workforce; Human Resources Planning and Staffing; Performance Evaluation and Management; Compensation and Reward Systems; Human Resources Development; Labor Relations in Contemporary Work Environments; Rights; Responsibilities; Values; and Ethics; Organization Culture and Change; Work Environment Stressors; Support; Safety; and Health; Employee Attitudes; Organizational Exit; Performance and Effectiveness.

Text Books:

1. Gerald R. Ferris, M. Ronald Buckley, Donald B. Fedor, Human Resources Management: Perspectives, Context, Functions, and Outcome, Prentice Hall, ISBN: 0130608548. 2001.
2. Mathis and Jackson, Human Resource Management, , 10th ed., Thomson/South-Western, 2003.
3. Abey, C., Salaman, G., & Story, J, Human Resource Management: A Strategic Introduction. Oxford: Blackwell, 1998.

Additional Resources:

1. Mike Losey (Editor), Dave Ulrich (Editor), Sue Meisinger (Editor), The Future of Human Resource Management: 64 Thought Leaders Explore the Critical HR Issues of Today and Tomorrow, Wiley, 2005.
2. Raymond Andrew Noe, John R. Hollenbeck, Barry Gerhart, Patrick M. Wright, Human Resource Management : Gaining a Competitive Advantage with OLC card, McGraw-Hill/Irwin; 5 edition, 2005.

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

3. Lawrence S. Kleiman, Human Resource Management: A Managerial Tool for Competitive Advantage, Atomic Dog Publishing, 2004.
4. Noe, R. A., Hollenbeck, J. R., Gerhart, B. & Write, P. M., Readings in Human Resource Management, (2nd ed.). Homewood, IL: Richard D. Irwin, Inc.1997.

GE-4521-3 Research Methodologies

Credit Hours: 3

Pre Requisite: NONE

Follow-up: NONE

Definition of research, Application of research, Characteristics of research, Types of Research, Paradigms of research, literature review, Problem formulation, identifying variables, constructing hypothesis, research design, selecting a study design, data collection instruments, selecting a method for data collection, establishing the validity and reliability of a research instrument, sampling, writing research proposal, ethical issues in data collection, data collection, processing data, displaying data, writing research report.

Text Book(s):

- A. Ranjit Kumar, Research Methodology: A Step-by-Step Guide for Beginners, SAGE Publications; 2nd edition, 2005.
- B. Ivan Valiela, Doing Science: Design, Analysis, and Communication of Scientific Research, Oxford University Press, 2000.

Additional Resource(s):

- A. Geoffrey R. Marczyk, David DeMatteo, David Festinger, Essentials of Research Design and Methodology (Essentials of Behavioral Science), John Wiley & Sons, 2005.

E-Customer Relationship Management

Credit Hours: 3

Prerequisite: MNGT-3211-3, BUSN-3111-3

Follow Up: IS-4581-3

Syllabus:

CRM An Overview; Philosophies of CRM, Types of CRM: Analytical CRM, Operational CRM, Components of CRM, Marketing Automation, Sales Force Automation; Customer Support. Market-Intelligent Enterprise (MIE), Mass Customization; Building & Implementing Strategy; Creating Loyalty in Customer Strategy; Customer Dependency; Customer Acquisition & CRM; Financial Perspective; CRM Through New Product Development; Channel Management; Embracing e-Channel; e-Channel Management; Consumer-Centric Organization; The infrastructure strategy; Tools for CRM; Database Marketing; Data mining; Implementing CRM; Catalytic Measures to improve CRM; Learning and Knowledge Management Programs in the Age of CRM; The need for Performance Alignment.

Text Book(s)

- A. CRM at the speed of light by Paul Greenberg 3rd Edition ISBN: 0072231734

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

- B. Sales Force Management 7th edition by Mark W. Johnston & Greg W. Marshall
- C. Stanley A. Brown (2000), "Customer Relationship Management: A Strategic Imperative in the World of E-Business", John Wiley & Sons, ISBN: 0471644099.

Additional Resources:

1. Ronald S. Swift (2000), "Accelerating Customer Relationships: Using CRM and Relationship Technologies", Prentice Hall, ISBN: 0130889849.
2. Gary Heil, Tom Parker, Deborah C. Stephens (1999), "One Size Fits One: Building Relationships One Customer and One Employee at a Time", 2nd/ed., Wiely, ISBN: 0-471-33167-8

E-Supply Network Management**Credit Hours:** 3**Prerequisite:** MNGT-3211-3, BUSN-3111-3**Follow Up:** IS-4581-3**Syllabus:**

The E-Supply Network Management (E-SNM); The Advent of E-SNM; Architecting the Supply Network for Competitive Advantage; Impact of E-Commerce on E-SNM; Learning to Compete as Value Network; Driving Real Value from E-Procurement and Strategic Sourcing; Challenges of B2C and B2B E-Commerce; E-Design and E-Manufacturing Challenge; Synchronizing Supply Networks through E-Marketplaces; New Information Technology Architecture for Supply Networks; New Ways to Deliver E-Working and Continuous Innovation; Looking over the Cyber Horizon; Rise of E-SNM; E-SNM Principles; E-SNM Evolution of E-SNM; Defining E-SNM; Characteristics of E-SNM; Summary and Transition; Technology in E-SNM; Intelligent E-Supply Network Decision Support; Modeling the Dynamics of Supply Networks.

Text Book(s)

- A. Sunil Chopra, Peter Meindl (2004) "Supply Chain Management: Strategy, Planning, and Operations", 2nd/e Pearson Education India, ISBN: 8178085763

Additional Resources:

1. Andrew Berger and John Gattorna (2001), "Supply Chain Cyber mastery Building High Performance Supply Chains of the Future", Gower Pub Co., ISBN: 1574443240.
2. David Frederick Ross (2002), "Introduction to E-Supply Chain Management Engaging Technology to Build Market-Winning Business Partnerships", Saint Lucie Press, ISBN: 1574443240.
3. Charles C. Poirier, Michael J. Bauer (2000), "E-Supply Chain: Using the Internet to Revolutionize Your Business", Berrett-Koehler Pub; ISBN: 1576751171.

ACC-2211-3 Financial Accounting**Credit Hours:** 3**Pre Requisite:****Follow-up:** None**Syllabus**

Introduction to the basic measurement and reporting concepts underlying the accounting system for communicating financial information to users external to the organization and to internal managers. Topics include information processing, preparation of financial statements, the role of ethics in accounting decisions, analysis of financial data, and valuation and reporting issues for assets, liabilities, stockholders' equity, revenues, and

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expenses, exploration of financial accounting software. Projects require team activities and written reports.

Text Books:

- A. Clyde P. Stickney, Roman L. Weil, Financial Accounting : Introduction to Concepts, Methods and Uses, South-Western College Pub; 11 edition, 2005.

Additional Resources:

- B. Carl S. Warren, James M. Reeve, Philip E. Fess, Financial and Managerial Accounting (Financial & Managerial Accounting), South-Western College Pub; 8 edition, 2004.
- C. Paul D. Kimmel, Jerry J. Weygandt, Donald E. Kieso, Financial Accounting : Tools for Business Decision Making, Wiley; 3 edition, 2003.
- D. Rick Antle, Stanley J. Garstka, Financial Accounting (with Questions, Exercises, Problems, Case Problems, Cases and Thomson Analytics Access), South-Western College Pub; 2 edition, 2003.

MNGT-2111-3 Principles of Management

Credit Hours: 3

Pre Requisite: None

Follow-up: None

Syllabus:

Nature of Management, The Evolution of Management Thought, Managerial Environments, Decision Making and Problem Solving, Organizational Planning, Creating Organizational Structure, Organizational Design and Structure, Managing Change, Staffing and Human Resources Management, Understanding Teams, Motivating and Rewarding Employees, Leadership and Management, Communication and Interpersonal Skills, Control, Total Quality Management, Management in a Global Environment, current trends and practices

Text Books:

- A. Benowitz E. A. *Principles of Management* Wiley Publications, 2001.

Additional Resources:

- A. Gilb T. *Principles of Software Engineering Management* Addison-Wesley Professional 1996.

HU-2111-3 Cyber Psychology

Credit Hours: 3

Pre Requisite: NONE

Follow-up: NONE

Syllabus:

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Cyber psychology: History and Introduction to Cyber psychology, Cyberspace, Areas of cyber psychology, Dual processor theory, behavior control. Cognitive Psychology: Memory, Learning, Perception, Extra ordinary perception, Forgetting, Emotions, Remembering, Thinking, Tools of thinking, Intelligence, Creative thinking. Experimental psychology: Psychophysiology: Sensations, Sensitivity, Threshold, PSE, JND, Weber's law, Physiological Psychology: Psychological basis of human behavior, CNS, Heredity Endocrinology, Five senses. Health psychology: Mental health, Frustration, Defense mechanism, Anxiety, Phobias, Conflicts their types and resolving strategies, Work place design, Physiological disorders caused by ubiquitous computing and their prevention. Social psychology: Ceberculture, Aggression, Attitudes, Attitudes change and their formational factors. Prejudice and propaganda, Crowed behavior. Criminal psychology: Criminal behavior. Types of computer crimes, Cyber ethics, Psychological bases of criminal behavior. Psychology of art and aesthetics: Color psychology, Emotional effects of color, Color blindness. Individual psychology: individual differences, Trait differences, Theories of individual differences. Naive psychology: Mental models, Components of mental models. Organizational behavior: Motives and work motives, Job satisfaction, Leadership, Stress management, Decision making, Problem solving, Risk and time management. Engineering psychology: Ergonomics, Usernomics, H0edonomics, Usability and its principles. Psychological principles of web design, Cross cultural web design, Principles of web design, User centered web and interface design.

Text Books:

- A. Jhon Suler ,The psychology of cyberspace, 1st edition, November, 2004.

Additional Resources:

- A. Angel,J & Parker, I. *Cyber psychology*, Routledge, 1999.
 B. Riva ,G. *Towards Cyber psychology*, 1st edition, IOS Press, 2001.
 C. Mary, Ann Liebert. *Cyber psychology And Behaviour*,7th edition, ISO Press, 2003.

IS-3711-3 Professional Issues in Information Systems

Credit Hours: 3

Pre Requisite:

Follow-up: None

Syllabus

Organizations and their Structures: Limited companies, private and public; partnerships; sole traders. Special features of limited companies; responsibilities of directors; Company Finance: The need for capital; investment and working capital; sources of funds; equity capital and loan capital. Cash flow and its importance. Costing: fixed costs and variable costs; overheads; opportunity costs; depreciation. Problems of cost allocation. Budgeting. Assessment of capital investment. Discounted cash flow analysis, with particular reference investment in software tolls and new product development. Financial accounts: balance sheets, profit and loss accounts, cash flow statements. The treatment of software in company accounts. Ownership of rights in software as goodwill; Intellectual Property The nature of intellectual property. The law relating to different types of intellectual property (confidential information, copyright, trade marks, patents) and the relevance of each type to the software industry; Health and Safety: The Health and Safety at Work Acts and other relevant statutory provisions. Human factors. Financial considerations. Regulatory issues as they affect software systems: standards, certification and licensing, professional codes of practice, legal regulation. Liability: negligence and product liability; the Consumer Protection

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Acts; negligence. Is software a product?. Professional codes of conduct and codes of practice.

Text Books:

- A. M.F. Bott, J.A. Coleman, J. Eaton, and D. Rowland, Professional Issues in Software Engineering 3rd Ed.. Taylor and Francis, London 2001. ISBN 0748409513
- B. ACM Code of Ethics,
<http://pages.cpsc.ucalgary.ca/~kremer/courses/451/Ethics.html#ACMCode>
- C. IEEE Code of Ethics,
<http://pages.cpsc.ucalgary.ca/~kremer/courses/451/Ethics.html#IEEEEthics>

Mathematics Core Courses

Quantitative Techniques for Business

Credit Hours: 3

Pre Requisite: NONE

Follow-up: MATH-2411-3

Syllabus:

Overview of Elementary Mathematics; Data Source; Data Presentation Techniques: Data Sources; Graphical representation of classified data; Descriptive Statistics and Measures of Dispersion; Sampling Techniques; Index Numbers; Correlation; Regression Analysis ; Time Series; Probability; Decision Theory; Statistical Estimation; Statistical Estimation and Statistical Inference; Financial Mathematics

Text Books:

- A. A Lind, Marchal and Mason. "Statistical Techniques in *Business & Economics*", Mcgraw-Hill International Editions, Eleventh Edition 2003 , ISBN:0072471042
- B. Peers S. and Philips P. "*CIMA: Quantitative Techniques For Business*" Viva Low Priced Edition, 2000, ISBN:81-7649-266-3

Additional Resources:

1. Earl K.Bowen, Martin K. Starr " Basics for Business & Economics " ,McGraw Hill International Editions ,1999,ISBN.0-07-006725-2

MATH-2411-3 Discrete Mathematics

Credit Hours: 3

Pre Requisite: MATH-2431-3

Follow-up: MATH-3411-3

Syllabus:

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Classical Logic: Fundamental Concepts, Logical Equivalence, Propositional Logic, Predicate Logic. Fuzzy Logic: Fundamental Concepts, Fuzzy Controller. Sets: Sets and Operations, Computer Representation of Sets, Fuzzy Sets and Operations on Fuzzy Sets, Functions, The growth of Functions, Integers and Algorithms, Rules of Inference, Mathematical Induction, Recursion and Recursive Algorithms, Recurrence Relations, Counting Principles, Permutations and Combinations, Binomial Theorem, Principle of Inclusion-Exclusion. Relations: Types of Relations, Representation of Relation in zero-one matrix and Digraph. Graphs: Terminology, Representation, Isomorphism, Connectivity, Euler and Hamilton Paths and Circuits, Shortest Path Problems, Planar Graphs, Graph Coloring. Trees: Properties of Trees, Tree Traversal, Trees and Sorting, Spanning Trees, Minimal Spanning Trees.

Text Book:

1. Kenneth H Rosen. *Discrete Mathematics and Its Applications*, 5th Edition, McGraw-Hill.

Additional Resources:

2. Susana S. Epp. *Discrete Mathematics with Applications*, 2nd Edition, PWS Publication Company, 2000.

MATH-3411-3 Operations Research**Credit Hours:** 3**Pre Requisite:** MATH-2411-3**Follow-up:** None**Syllabus:**

Introduction of OR, Linear Programming: Graphical Method and Simplex Model, Duality, Transportation Model, Network Model, Integer Linear Programming, Inventory Model, Games Theory, Queuing Systems, Simulation Modeling.

Text Book:

- A. Hamdy A. Taha, *Operations Research*, 7th Edition, Prentice Hall, 2002.
ISBN 0-13-281172-3

Additional Resources:

1. Hillier, Lieberman, *Introduction to Operations Research*, 7th Edition, McGraw-Hill, 2002.

Computer Science Core Courses**CS-2111-4 Object Oriented Programming****Credit Hours:** 3**Pre Requisite:** None**Follow-up:** CS-2112-4**Syllabus:**

Introduction and History of Programming Languages; Basics of a Typical Java Environment; Developing Java Applications: Algorithms, Pseudocode, Operators and Primitive Data Types, Strings, Control Structures; Methods; Method Overloading;

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Recursion; Arrays; Searching; Sorting; Object-Based Programming (OBP): Abstract Data Type, Class, Abstract Class and Interface, Data Abstraction and Information Hiding, Software Reusability using OBP, Composition, Aggregation; Object-Oriented Programming; Software Engineering with Inheritance; Method Overriding, Polymorphism; Type Casting; Autoboxing/ Unboxing; Dynamic Method Binding; Introduction to GUI Components and Programming.

Text Books:

A. Horton, I. *Beginning Java 2*, 5th edition, Wrox, 2004.

Additional Resources:

1. Schildt, H. *Java 2: The Complete Reference*, 5th edition, McGraw-Hill Osborne Media, 2002.

CS-2112-4 Advanced Object Oriented Programming

Credit Hours: 3

Pre Requisite: CS-2111-4

Follow-up: CS-3132-3

Syllabus:

Advance GUI Components and Programming; Exception Handling: Exceptions and Inheritance; Concurrent Programming and Multithreading; Priorities; Scheduling, and Synchronization; Daemon Threads; Runnable Interface; Thread Groups; Files and Streams: Data Hierarchy, Files and Streams, Database Connectivity; Network Programming: Client/Server Interaction with Connections Oriented and Connectionless Communication; Distributed Programming using Remote Method Invocation; Generics and Collections Framework.

Text Books:

A. Horton, I. *Beginning Java 2*, 5th edition, Wrox, 2004.

Additional Resources:

1. Schildt, H. *Java 2: The Complete Reference*, 5th edition, McGraw-Hill Osborne Media, 2002.

CE-2211-4 Digital Logic and Computer Architecture

Credit Hours: 3

Pre Requisite: NONE

Follow-up: CN-2311-3

Syllabus:

Digital Fundamentals; Number System and Logic Gates; Boolean Algebra and Logic Simplification; Minterms and Maxterms; Sum of Product terms; Product of Sum terms; Conversion Between Canonical Forms; Standard Forms of Algebraic Functions; The Karnaugh Map; Combinational Logic; Universal Gates; Adders; IC Implementation; Digital Devices; Parity Generation and Checking, Flip Flops and Related Devices; Counters Design and Application; Registers; Word-Time Generation; Memory and Storage Design and Application; Register Transfer Language: Register Transfer, Bus and Memory Transfers, ALU Designing, Micro operations, Logic micro operations, Shift

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micro operations, Arithmetic Logic Shift Unit; Instruction set Designing: Instruction codes, Computer Registers; Control Unit Designing (Hard Wired): instructions, Timing and control Instruction Cycle, Memory-reference instructions, Input-output and interrupt Cycle, Design of Basic computer, Control Logic Gates, Accumulator; Control Unit Designing: Control Memory, Address sequencing, Micro Program Example, Micro program Sequencer; Processor's Organization: Accumulator/General Register/Stack Organization; Instruction Formats: zero/One/two/three address instructions, Addressing Modes; Instruction Types: Data Transfer, Control Transfer, Arithmetic and Logic Instruction Design Philosophies, RISC and CISC. Parallel System classification: SISD, SIMD, MISD, MIMD; Pipelining: Data/Instruction pipelining, pipelining Hazards and their solutions, Vector Processors; I/O Organization: Devices and interfaces, isolated versus memory-mapped I/O, Asynchronous Data Transfer, Strobe and Handshaking, Asynchronous communication interfaces, Buffer Designing; Modes of Transfer: Programmed I/O, Interrupt-initiated I/O, Direct Memory Access; Priority Interrupt: Serial Daisy Chain and Parallel Priority Interrupt, I/O Processor and Serial Communication; Memory Organization: Memory Hierarchy, Memory address space, Auxiliary Memory, Associative Memory, Matching Logic, Read and Write mechanism, Cache Memory and its mapping techniques, Virtual Memory; Multiprocessor Systems: Multiprocessor (shared memory) and multi-computer (distributed) systems, Processor's interconnection structure forms. Inter-processor communication and synchronization.

Text Books:

- A. Floyd, T. L *Digital Fundamentals*, 9th Edition, Prentice Hall, 2005.
- B. M.Morris, Mano. *Computer System Architecture*, 3rd Edition, Prentice Hall International.

Additional Resources:

1. Tocci, R. J. Widmer, N. S. Moss, G. L. *Digital Systems: Principles and Applications*, 9th edition, Prentice Hall, 2003.
2. Shiva S. G *Computer Design and Architecture*, Marcel Dekker, 2000.
3. William Stallings, *Computer Organization and Architecture*, 6th Edition, Prentice Hall International.
4. Rafiquzzaman & Chandra, *Modern Computer Architecture*, Galgotia Publications Pvt. Ltd.

SE-2611-3 Principles of Software Engineering**Credit Hours:** 3**Pre Requisite:** NONE**Follow-up:** SE-3621-3**Syllabus:**

Definition, Motivation and Scope of Software Engineering; Software Process; Software Process Models; Software Project Management: Essential Concepts, 4Ps (People, Product, Process, Project); Software Measurement Essentials: Project, Process, Product, Software Quality Metrics, Software Cost Estimation Techniques; Project Scheduling Techniques; Requirements Engineering: Definition, Requirements Elicitation, Requirement Traceability, Requirements Analysis and Specification; Software Designing: Elementary Concepts, Data Design, Software Architecture, Functional

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Independence, Interface Design, Component-level Design; Coding Standards; Software Testing: Fundamentals, Verification & Validation, Testing Plan, Testing Techniques; Test Case Design; Software Testing Strategies; Debugging Practices; Advance Concepts and Prevailing Practices.

Text Books:

- A. Pressman, Roger S. *Software Engineering: A practitioner's approach*, 6th edition, McGraw-Hill, 2005.

Additional Resources:

1. Sommerville, I. *Software Engineering*, 7th edition, Addison Wesley, 2004.
2. <http://www.commerce-database.com/software-engineering.htm>
3. <http://www.mhhe.com>

CS-3132-3 Data Structures for information system

Credit Hours: 3

Pre Requisite: CS-2112-4

Follow-up: CE-3261-3

Syllabus:

Algorithm Specification and Performance Measurement, Abstract Data Type, Data Representation Methods, Implementations and Applications: Linear Lists, Arrays & Matrices, Stacks, Queues, Priority Queues, Binary trees, Search Trees, Selection Trees, Hashtable and Dictionary. Graphs and its Algorithms

Text Books:

- A. Sahni, S. *Data Structures, Algorithms and Applications in Java*, 2nd edition, Mcgraw-Hill College, 2001.

Additional Resources:

1. Goodrich, M. T., Tamassia, R. *Data Structures and Algorithms in Java*, Wiley; 3rd edition, 2003.

CN-2311-3 Data Communications and Computer Networks

Credit Hours: 3

Pre Requisite: CE-2211-4

Follow-up: CN-2323-3

Syllabus:

Data Communications: Fundamental Concepts, Standards, Data Transmission, Transmission Media, Encoding and Modulation Techniques, Multiplexing, Interfacing, Error Detection, Flow and Error Control; Computer Networks: Local Area Networks, Wide Area Networks, Switched Networks, Network Topologies, LAN Technologies, Network Devices, Network Security; Protocols and Standards: OSI Reference Model, TCP/IP Protocol Suite Overview, IP Addressing and Subnetting.

Text Books:

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

- A. Stallings, W. *Data and Computer Communications*, 7th Edition, Prentice Hall, 2004.
- B. Forouzan, B. A. *Data Communications and Networking*, 3rd Edition, McGraw-Hill, 2003.

Additional Resources:

1. Tanenbaum, A. S. *Computer Networks*, 4th Edition, Prentice Hall, 2003.
2. Comer, D. *Computer Networks and Internets*, 3rd Edition, Prentice Hall, 2003.

SE-3621-3 Object Oriented Analysis & Design**Credit Hours:** 3**Pre Requisite:** SE-2611-3**Follow-up:** NONE**Syllabus:**

Basic Concepts of Object Oriented Paradigm; Introduction to Object Oriented Analysis & Design; Unified Process, Evolution of Unified Process; Introduction to Unified Modeling Language(UML): History, Diagrams, Architecture, Basic Framework, Stereotypes, Profiles; Inception Phase; Requirement Traceability Matrix; Use Case: Modeling, Documentation, Use Case Types, Semantics, Supplementary Specifications; Inception Phase Artifacts; Overview of UML Visual Modeling Tools(VMT); UML Diagram Modeling VMT; Elaboration Phase: Interaction Diagrams, Domain Model, Use Case Operational Contracts; Introduction of Design Patterns; Testing in Object Oriented Environment; Testing Tools; Design Implementation Aspects; Current Trends and Practices.

Text Books:

- A. Larman, C. *Software Engineering using UML*, 2nd Edition, Prentice Hall PTR, 2001.
- B. Bruegge, B. Dutoit, A. H. *Object-Oriented Software Engineering Using UML, Patterns, & JAVA*, 2nd Edition, Pearson Education, 2004.

Additional Resources:

1. O'Docherty, M. *Object-Oriented Analysis and Design: Understanding System Development with UML 2.0*, John Wiley & Sons, 2005.
2. <http://www.commerce-database.com/software-engineering.htm>
3. <http://www.mhhe.com>

CE-3261-3 Operating Systems**Credit Hours:** 3**Pre Requisite:** CS-3132-3**Follow-up:** CS-3871-3**Syllabus:**

Operating Systems and Utility Programs, Windows XP Environment, Using Windows Control Panel, File Systems Hierarchy Standards, The Directory Tree Structure, Basic Commands, Permissions, Managing File Links, Administration of User Accounts and Groups, Managing Users with Command Line Tools, System Startup & Shutdown,

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Process Management, RPM Management, Backup, Recovery Routines, Linux GUI Environment (KDE & GNOME).

Text Books:

- A. *MCSE Windows XP Professional Study Guide*- SYBEX.
- B. *MCSE Windows 2003 Server Study Guide*- SYBEX.
- C. *Practical Guide to Red Hat Linux 9.0*.

CN-2323-3 Internet Architecture and Protocols**Credit Hours:** 3**Pre Requisite:** CN-2311-3**Follow-up:** CS-3882-3**Syllabus:**

Internet Architecture: Basics, History, Internet Service Providers, Internet Backbones; Internet Technologies: Dial up, Frame Relay, ATM, ISDN, Mobile IP, VPN, DSL, Cable Modem, SONET; TCP/IP Protocol Suite: IPv4, IPv6, ARP, ICMP, TCP, UDP, SMTP, FTP; Routing Protocols: Routing Basics, RIP, IGRP, OSPF, and BGP; Access Control Lists: Introduction, Types of ACL, Implementation of ACL; Multimedia: Concepts, Real Time Interactive Applications, Protocols.

Text Books:

- C. Forouzan, B. A. *TCP/IP Protocol Suite*, 2nd Edition, McGraw-Hill, 2003.
- D. Todd Lammle. *CCNA Cisco Certified Network Associate*, 4th Edition, BPB Publications.

Additional Resources:

1. Kurose, J. F. and Ross, K.W. *Computer Networking A Top-Down Approach Featuring the Internet*, 3rd Edition, Addison Wesley , 2005.
2. Tanenbaum, A. S. *Computer Networks*, 4th Edition, Prentice Hall, 2003.

CS-3871-3 Artificial Intelligence**Credit Hours:** 3**Pre Requisite:** CE-3261-3**Follow-up:** None**Syllabus:**

Introduction to AI; Application of artificial intelligence; Propositional logic, Predicate logic, Inferences Rules, Unification; Lists, Operators, Arithmetic, Representation of Lists, Some Operations on lists, Operator Notation, Arithmetic Controls and Loops, Implementing If-Else structure in Prolog, Implementing Iterative Structures in Prolog, Input and Output, Communication with files, Manipulating characters, Constructing and Decomposing atoms Reading programs, User Interface Design Connectives, Summary, Graph as state representation data structure, Graph, Tree, State Space, Searching in State Space for solution Goal Driven Search, Depth First Search, Breadth First Search, Depth First with iterative deepening, Complexity issues, Data Driven Search, Heuristics, Best First Search, Characteristic for Good Heuristics, Admissibility, Monotonic, Infirmness, A* search, Mini Max Search, And-Or Graph, Alpha-Beta Search, Complexity

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

issues Summary, Introduction, Impairments in Knowledge Representation Knowledge Representation Schemas, Scripts, Semantic Networks ,Frames, Frames and OOPs, Conceptual Graphs Issues, Expert system, Expert system Architecture, Inference engine, Knowledge Base, Expert System Shell, Application Of Expert Systems, Introduction, Biological Model of Neuron, Artificial Model of Neuron, Interconnectivity of Neuron, Types of Neural Networks, Perceptron, Multi-layer Perceptron, Back-Propagation Network, Hopfield Network, Kohonen Feature Map, Bayesian Network , Learning of Neural Networks, Forward Propagation, Backward Propagation, Self-Organization, Application of Neural Networks, Summary, Introduction, Biological Background, Elements of Genetic Algorithms, Genetic Cycle, Penalty Functions, Integer Variable Constraints, Real Variable Constraints, Traveling Sales Person Problem, Application of Genetic Algorithms Case Study, Summary, Introduction, Communication and Language, Understanding Sub-Modalities, Presuppositions, Levels of Language Processing, Grammars, Stages of Natural Language Analysis, Morphology, Derivational Morphology, Inflectional Morphology, Segmentation Problem, Grammar & Syntactic Analysis, Context Free Grammar, Definite Clause Grammar, Application Of NLP, Issues of NLP, Summary, Introduction to Computer Vision

Text Books:

- A. George F. L. Stubblefield W. A. *Artificial Intelligence: Structures and Strategies for Complex Problem Solving* 1st edition, 2005.
- B. Bender, E. A. *Mathematical Methods in Artificial Intelligence* 1st edition Wiley-IEEE Computer Society Pr; 1996.
- C. Russal *Artificial Intelligence A Modern Approach* 2nd edition Prentice Hall 2002

CS-3882-3 Interactive Information System Design

Credit Hours: 3

Pre Requisite: CN-2323-3

Follow-up: IS-4531-3

Syllabus:

Introduction to HCI: Goals, Motivations; Accommodation of Human Diversity: Theories, Principles, Models and Guidelines; Recognition of Diversity; Guidelines for Dialog Design; Prevention of Errors; Guidelines for Data Display; Guidelines for Data Entry; Prototyping and Acceptance Testing; Adaptive Agents and User Models; Semantic Organization; Item Presentation Sequence; Response Time and Display Rate; Menu Traversal; Menu Screen Design; Selection Mechanisms; Graphical User-Interface Menu Features; Embedded Menus; Form Fill-in; Functionality to Support Users' Tasks; Command-Organization Strategies; Naming and Abbreviations; Command Menus; Natural Language Interfaces; Direct Manipulation: Visual Thinking and Icons; Direct-Manipulation Programming; Remote Direct-Manipulation; Interaction Devices; Response Time and Display Rate Issues; System Messages, Screen Design, and Color; Hypertext and Hypermedia; Iterative Design; Testing, and Evaluation; User-Interface Development Environments; Social and Individual Impact of User Interfaces; Multimedia; Ethics; Ergonomics; Usability Engineering; Human Memory; Cognitive Psychology; Ubiquitous Computing; Virtual Reality; Groupware Applications;

Text Books:

- A. Shneiderman, C. P. *Designing the User Interface*, 4th edition, Addison Wesley, 2004.

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

B. Finlay, J. Abowd, G. D. Beale, R. *Human Computer Interaction*, 4th Edition

Additional Resources:

1. Booth P. *Introduction to Human-Computer Interaction*, Psychology Press, 1989.

Information Systems Core (9Courses; 27 Cr. Hrs and 6 Cr. Hrs. Projects)

Introduction to Information Technology

Credit Hours: 3

Pre Requisite: NONE

Follow-up: NONE

Syllabus:

Introduction to Computers: Elementary Components, Categories, Input/Output Devices, Central Processing Unit, Memory, Buses, Expansion Slots, Motherboards, Ports, Interfacing Cards, Modems. Software: Open Source, Shareware, Proprietary; Software Categories; System Software, Firmware, Application Software; Operating System; Stand Alone, Distributed, Functions, Utility Programs. Storage: Floppy, Zip, Hard Disks, CDs and DVDs, Tape, PC Cards, Miniature Mobile Storage Media; USB Flash Drives, Smart Cards. Internet: History, WWW; Web Page, Browser, URL, Web Site. FTP, IM, Email Communication and Networks: Communications; Uses, Devices, Software, Channel, Networks; LAN, MAN, WAN. Data and Information: Data, Information, Knowledge, Data Storage Hierarchy, Database Management System, Relational, Object Oriented, Multidimensional Database, Database Administration. Information System Development: System Development Cycle, Phases in the System Development Cycle; Planning, Analysis, Design ,Implementation ,Support Phase. Enterprise Computing: Information System in the Enterprise, Enterprise-Wide Technologies; Portals, EDI, Data Warehouse, Extranet, Web Services, Enterprise Hardware; RAID, Storage, Network Attached Storage, Backup Procedures. Ethics: Computer Security Risks, Computer Viruses, Unauthorized Access Information, Hardware and Soft Ware Theft, Information Privacy ,Property Rights ,Codes of Conduct Health Concerns of Computer Use . Computer Careers and Certification: Careers in the Computer Industry, Certification Problem Solving and Critical Thinking: What is problem, what is solution, Problem solving process Critical thinking activities Theory of automata: Languages, Recursive Definition, Regular Expressions, Finite Automata. Programming Languages and Program Development: Low-level Languages, Procedural and Non-procedural Languages Visual basic: Basics, Data Types and Declarations, Operators, Control Structures, Subprograms.

Text Books:

- A. Shelly Cashman, *Discovering Computers* 2005, Course Technology, 1st edition, ISBN: 0-619-25525-0
- B. Daniel I.A.Cohen, *Introduction to Computer Theory*, Wiley; 2 edition, ISBN: 0471137723
- C. Byron S Gottfried, *Visual Basic Schaum's Outlines*, McGraw-Hill; 1 edition, ISBN 0-07-120379-6, McGraw-Hill

Additional Resources:

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

1. Sarah E Hutchinson and Stacey C.Sawyer, Computers Communications information, Mcgraw-Hill College, 7th edition, ISBN: 0072508280
2. K.D.Joshi John, Applied Discrete Structures, Wiley & Sons Inc 2nd edition, ISBN: 0470213337
3. Greg Perry, Sams teach your self visual basic in 24 Hours, Sams, Bk&CD Rom edition, ISBN:0672315335

IS-2511-3 Database Systems

Credit Hours: 3

Pre Requisite: IT-2011-3

Follow-up: IS-3511-3

Syllabus:

Database Concepts: File Systems and Databases: Introduction of the Database and Database Systems, Database Models, Introduction to Relational Algebra, Introduction to RDBMS: Fundamentals of Relational Database: Entities, Attributes, Tables and their Characteristics, Keys; Integrity Rules Revisited, Relational Database Operators, The Data Dictionary and the System Catalog. Design and Implementation Concepts: Database Design: The System Development Life Cycle (SDLC), The Database Life Cycle (DBLC), Database Design Strategies, Basic Modeling Concepts, Entity Relationship (E-R) Modeling, The Enhanced Entity Relationship (E-ERD) Diagram, Transformation of ERD and E-ERD, Normalization of Database Relations: Normal Forms, Normalization and Demormalization, Structured Query Language (SQL): Introduction to SQL, Data Definition Language (DDL), Data Manipulation Language (DML), Data Control Language(DCL), Triggers, Stored procedures, Open Database Connectivity, Advanced Database Concepts: Transaction Management and Concurrency Control: Introduction of Object-Oriented Data Model, Client/ Server Systems: Client/ server computing, Client/ Server Architecture, Database Objects

Text Books:

- D. Peter Rob & Carlos Coronel. *Database Systems: Design, Implementation, Management*, 5th Edition, Course Technology, 2002.

Additional Resources:

1. *Introduction to PL\SQL*, Oracle Press
2. C.J. DATES. *Database Management Systems*, 8th Edition, 2001.
3. M. TAIMER. *Distributed Database Management Systems*, 2nd Edition
4. Fred R. McFadden, Jeffrey Hoffer, *Modern Database Management*, Design, Implementation, Management, 5th Edition.

IS-3511-3 Distributed Database System

Credit Hour: 3

Pre Requisite: IS-2511-3

Follow Up: IS-3541-3

Syllabus:

Introduction of Distributed Database: Distributed Data Processing, Introduction to Transparencies, Promises, Complications and Problem Areas of DDBMS; Distributed DBMS Architecture: DBMS Standardization; Architectural Models for DDBMS; DDBMS

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Architecture; Directory Issues; Distributed Database Design: DDBMS Design and Implementations Strategies: Fragmentation, Allocation, Replication, Semantic Data Control: View Management; Data Security; Semantic Integrity Control; Query Processing: Objectives and Problem, Complexity of Relational Algebras Operations, Layers Of Query Processor; Query Decomposition and Data Localization: Query Decomposition; Localization of Distributed Data; Optimization of Distributed Queries: Query Optimization; Centralized Query Optimization; Join Ordering In Fragment queries; Distributed Query Optimization Algorithms; Transaction Management: Definition of Transaction; Properties of Transaction; Types of Transactions; Architecture Revisited; Distributed Concurrency Control: Serializability Theory; Taxonomy of Concurrency Control Mechanisms; Locking-Based Concurrency Control Algorithms; Timestamp-Based Concurrency Control Algorithms; Optimistic Concurrency Control Algorithms; Deadlock Management; Relaxed Concurrency Control; Distributed DBMS Reliability: Reliability Concepts and Measures; Failures and Faults Tolerance In Distributed Systems; Failures In DDBMS; Local Reliability Protocols; Distributed Reliability Protocols.

Text Books:

A. M. Tamer Ozsu and Patrick Valduriez “*Principles of Distributed Database Systems*”, 2nd Ed., Prentice hall, 2002. ISBN 0-13-b597907-b

Geographical Information System (GIS)

Credit Hours: 3

Pre Requisite: IS-2511-3

Follow-up: IS-4532-3

Syllabus:

Introduction to GIS; History of GIS; Architecture of GIS; Coordinate Systems; Geographic Information; Maps; Scales and Projections; Topology; Formats for GIS Data; Exchanging Data; Analog-to-Digital Maps; Extracting and Reading Map Data; Digitizing and Scanning; Field and Image Data; Data Entry; Editing and Validation; Spatial Data Modeling; Attribute Data Management; Data Input and Editing; Data Analysis; Analytical Modeling in GIS; Output from New Maps to Enhanced Decisions Basic Database Management; Searches by Attribute; Searches by Geography; Query Interface; Describing Attributes; Statistical Analysis; Spatial Description; Spatial Analysis; Searching for Spatial Relationships; GIS and Spatial Analysis; Making Maps with GIS; Evolution of GIS Software; GIS and Operating Systems; GIS Software Capabilities; GIS Software and Data Structures; Development of Computer Methods for Spatial Data; Data Quality Issues; Future Data; Future Hardware; Future Software; Some Future Issues and Problems.

Text Book(s):

1. Keith C. Clarke. *Getting Started with Geographic Information Systems*, 3rd Edition.

Additional Resources:

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

2. Tor Bernhardsen, Geographic Information Systems : An Introduction, Wiley; 3 edition, 2002.
3. Michael N. DeMers, Fundamentals of Geographic Information Systems, John Wiley & Sons; 3 edition, 2002.

IS-3541-3 Database Administration

Credit Hours: 3

Pre Requisite: IS-3511-3

Follow-up: IS-4563-3

Syllabus:

Introduction: Installation; of a Tool Components: Database Server (any Tool preferably Oracle), Instance; Physical Structure; SGA; Shared Pool; Library Cache; Data Dictionary Cache; Large Pool; Process; and Data dictionary: Creation Prerequisites; Creating Database; Starting Instance; Dynamic Performance Views; Data Dictionary Examples. Files in database Server: Parameter File; Alert Log File; Background Trace File; User Trace File: Control File; Using Redo Log Files; Adding Redo Log Groups and Members. Managing Table spaces: System and Non-System; Physical and Logical Structure: Types of Segments; Extents Allocation; Database Block. Managing Undo Data: Undo Segment; Read Consistency; Managing Tables, Users, and Indexes. Maintaining Data Integrity: Types of Constraints; Managing Constraints. Managing Privileges: System Privileges; Object Privileges. Managing Roles: Assign and Revoke Roles and Roles Management. Network overview, Types of Networks Server Side Configuration: The Listener Process; Usage and Configuration of Database Shared Server: Server Configuration. Backup and Recovery overview: Categories of Failure; Defining Backup and Recovery Strategy; Configuration and management of Archive log mode User Managed Backups: User Managed backups and Issues, Import and Export Utilities, Data Loading Methods; Tuning Overview, Tuning Tools: Tuning Phases; Tuning Goals; Different Tolls in Tuning Pack. Using Dynamic Performance Views; Sizing SGA for Java Pool Memory; Contention for Latches, Tuning Rollback Segments: Purpose of Latches; Waiting for a Latch; Reducing Contention; Rollback Segment Concepts; Using Less Rollback. Lock Contention, Tuning Shared Servers: Types of Locks; Dead Locks; Tuning Shared Servers.

Text Book(s):

- C. Oracle 9i DBA Fundamentals I (Student Guide, Volume I and II).
- D. Oracle 9i DBA Fundamentals II (Student Guide, Volume I and II).
- E. Performance Tuning (Student Guide, Volume I and II).

Additional Resources:

1. URL: <http://otn.oracle.com>

IS-4532-3 Web based Information System

Credit Hours: 3

Pre Requisite: IS-3522-3

Follow-up: IS-4531-3

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Syllabus:

Overview of web programming, Client side scripting, Introduction to Dynamic web pages, Dynamic web pages using JSP and servlets, Server side scripting, Dynamic web pages for information system, 2-tier and 3-tier Architecture, Role of XML in web based information system.

Text Books:

- A. Lerve Relaowsky, *Java Server Pages*, 2003, Adison Wesly
- B. Elliot Rusty Hardd, *XML in Nut Shet*, 3rd edition
- C. Andra Steelman, Murach's Java Servlets and JSP
- D. Iver Horton *Beginning Java 5*

Strategic Planning for Information Systems

Credit Hours: 3

Pre Requisite: CS-3882-3

Follow-up: IS-4571-3

Syllabus:

Introduction: Purpose of information Systems Strategic Planning, Improvements of the Organization; The Planning Process: Planning Components, Process, Contents; Phase 1 of Planning Process (Conceptual Business Level): Understanding the Business Direction, Document High-Level Business Direction, Executive Management Interviews, Summarize and Present the Business Direction, Environmental and External Requirements, Operating Vision, Phase 2 of the Planning Process (Detailed Business Analysis): Understanding and Communicating the Current information system Situation; Phase 3 of the Planning Process (Conceptual IS Plan and vision): Information system Environment, Organizational Structure, Industry Trends, Competitor Profiles; Determining the High-Level Direction of Information systems : Mission, Vision, Strategic Objectives, Strategies, Information system and Business Goals, Computing and Information Architecture, Policies and Responsibilities, Annual Objectives, Information Systems Service Architecture; Determining the Gap Between your Current Situation Phase 4 of the Planning Process (Option Analysis and Action Plan): Business Operating Vision, Environmental Requirements, Information Needs, Business Requirements, Technical Computing Architecture and Service Architecture Assessments; Option Identification: Information Gathering, Request for Quote, RFQ Response Review, Option Analysis, ROI Analysis, Selling the Recommendation: Management Overview, Plan Document, Executive Committee Presentation; Vendor Review and Implementation Team: Project Plan, Project kick-Off Meeting, Vendor Review, Vendor Selection, Risk Management;

Text Book(s):

- A. Anita Cassidy, *A Practical Guide to Information System Strategic Planning*, AUERBACH; 2 edition, 2005.

Additional Resources:

1. John Ward & Joe Peppard, *Strategic Planning for Information Systems*, John Wiley & Sons; 3 edition, 2002.

IS-4531-3 Information Systems Control and Audit

Credit Hours: 3

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Pre Requisite: CS-3882-3

Follow-up: IS-4571-3

Syllabus:

Overview of Information Systems Auditing; IT Audits; Reengineering Operations; Temporal Aspects of IT Audit Process; IT Audit and Requirements Planning; Selecting and Managing Audit Process; Advantage and Impact of IT Audit; Concurrent Auditing Techniques; Evaluating System Effectiveness; Evaluating System Efficiency; Managing the Information Systems Audit Function; Audience Analysis; Top Management Controls; Systems Development Management Controls; Programming Management Controls; Data Resource Management Controls; Security Management Controls; Operations Management Controls; Quality Assurance Management Controls; Boundary Controls; Input/Output Controls; Communication Controls; Processing Controls. Database Controls; Objectives Convergence; Market Demand Drives Technological Innovation; Data Management Trends; Strategic Business Audit Objectives; Corporate Culture; Personnel; Organization Chart; Planning Issues; Corporate Effectiveness; Management Effectiveness; Facilities; Financial Information; Market Factors; Products and Services; Market Analysis; Market Differentiation Factors; Customer; Purchase Factors; Customer Satisfaction; Competition; Business Development and promotion; Production Issues; Purchasing Issues; Sales Forecasts and Analysis; Auditor's Recommendations; AICPA WebTrust and SysTrust Programs; Digital Analysis as an Auditing Tool; Fraud and Collusion Handling Tools; Extensible Business Report Language (XBRL).

Text Book(s):

A. Ron Weber, *Information Systems Control and Audit*, ISBN: 0139478701

Additional Resources:

IS-4563-3 Data Warehouse and Data Mining

Credit Hour: 3

Pre Requisite: IS-3541-3

Follow Up: IS-4581-3

Syllabus:

Introduction to Data Warehouse: History, Evolution, Comparison, Components, Trends, Requirements, Planning, and Management of Data Warehouse; Infrastructure of Dimensional Modeling; Data Transformation Processes; Design Schemas; Online Analytical Processing; Implementation and Maintenance; Deployment; Monitoring; Reporting; tools and applications; Patterns and Models; Statistics and Artificial Intelligence; Fundamentals Data Mining: Algorithms, Models and Strategies; Current Trends and Practices.

Text Books:

A. Paulraj Phonniah "*Data warehousing Fundamentals*"

B. Jiawei Han, Micheline Kamber "*Data Mining Concepts and Techniques*"

Additional Resources:

1. Ralph Kimball "*The Data Warehousing Life Cycle Toolkit*"
2. Inmon "*Building Data Warehouse*"
3. Ralph Kimball "*The Data Warehousing Toolkit by Ralph*" Case study book.

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

4. Richard J. Roiger, Michael W. Geatz “*Data Mining A Tutorial- Based Primer*”
5. Kimball “*Why Decision Support Fails and How to Fix It*”
6. Graefe “*Query Evaluation Techniques for Large Databases*”
7. Inmon, W “*The Data Warehouse and Data Mining*”

IS-4524-3 Information Systems Electives (6 Courses; 18 Cr. Hrs.)

Multimedia Information system

Credit Hours: 3

Pre Requisite: IS-2511-3, IS-3522-3

Follow-up: None

Syllabus:

Introduction of multimedia information system, Multimedia Data Types and Formats, Multimedia Database Design Issues, Text Document Indexing and Retrieval, Indexing and Retrieval of Audio, Image Indexing and Retrieval, Video Indexing and Retrieval, Integrated Multimedia Indexing and Retrieval, Techniques and Data Structures for Efficient Multimedia Similarity Search, System Support for Distributed Multimedia Databases, Measurement of Multimedia Information Retrieval Effectiveness, Products, Applications and new Development.

Text Book(s):

- A. Guojun Lu, “*Multimedia Database Management System*”

Additional Resources:

1. Timothy k. Shih, *Distributed Multimedia Databases: Techniques and Applications*

IS-4571-3 Information System Project Management

Credit Hours: 3

Pre Requisite: IS-4531-3

Follow-up: IS-4582-3

Syllabus:

Introduction to Project Management, The Project Management and Information: Understanding Organization, Project Phases and Project Life Cycle. Project Integration Management: Project Plan Development, Project Plan Execution, And Integrated Change Control. Project Scope Management: Planning and the Scope Statement, Scope Definition and the Work Breakdown structure, Scope Verification and Scope Change Control. Project Time Management: Importance of Project Schedules, Activity Control, Schedule Development, and Controlling Changes to the Project Schedule. Project Cost Management: Basic Principles of Cost Management, Resource Planning, Cost Budgeting, Cost Control, Project Quality Management, Project Human Resource Management: Keys to Managing People, Organizational Planning, Project Staff Acquisition, Team Development. Project Communication Management, Project Risk Management: Risk Management Planning, Risk Identification, Quantitative Risk Analysis, And Qualitative Risk Analysis. Current and Prevailing Practices.

Text Books:

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

- B. Schwalbe, K. *Information Technology Project Management*, 4th edition, Course Technology, 2005.

Additional Resources:

12. Phillips, J. *IT Project Management: On Track from Start to Finish*, 2nd Edition, McGraw-Hill Osborne Media, 2004.

IS-4581-3 Business Intelligence

Credit Hours: 3

Pre Requisite: IS-4563-3

Follow-up: IS-4592-3

Syllabus:

Business Intelligence Foundations: Understanding Business Intelligence: Describing Business Intelligence, Defining the BI Cycle, Enabling Business Intelligence. Bridging Analysis Gap: Multidimensional Analysis, Operational Systems, Business Intelligence Systems; Defining BI Technologies: The High-Level View, Reporting and Analysis, Data Warehouse; Business Intelligence Case Studies: Improving Operational Efficiency—Audi AG: Company Background, Business Requirements, The Solution, Solution Benefits, Future Plans. Maximizing Profitability—The Frank Russell Company: Company Background, Business Requirements, The Picasso Solution, The Einstein Solution: Building on Success; Impacting the Bottom Line—CompUSA Inc.: Company Background, Business Requirements, The Solution, Solution Benefits, Project Challenges, Lessons Learned, Future Plans; Keeping Customers Loyal—Disco S.A.: Company Background, Business Requirements, The Solution, Solution Benefits, Project Challenges; Managing Seasonal Variability—Cascade Designs: Company Background, Business Requirements, The Solution, Solution Benefits, Project Challenges, Lessons Learned, Future Plans; A Business Intelligence Roadmap: Identifying BI Opportunities: Doing Your Homework, Sharing and Collecting Ideas, Evaluating Alternatives. Implementing a BI Solution: An Implementation Strategy, The Fundamental Decisions.

Text Book(s):

1. Elizabeth Vitt, Michael Luckevich, Stacia Misner *“Business Intelligence”*
2. David Loshin, *Business Intelligence: The Savvy Manager's Guide*, Morgan Kaufmann, 2003.

Additional Resources:

3. Larissa T. Moss, Shaku Atre, *Business Intelligence Roadmap: The Complete Project Lifecycle for Decision-Support Applications*, Addison-Wesley Professional, 2003.

IS-4582-3 Knowledge Management Systems

Credit Hours: 3

Pre Requisite: IS-4571-3

Follow-up: NONE

Acknowledgement: We are thankful to all those individuals who have contributed their intellectual inputs towards this project.

Syllabus:

Introduction: Motivation, Goals, Procedure, Methods and Overview. Concepts and Theories: Foundation of Knowledge Management Systems: Knowledge management, Knowledge, Knowledge management systems. Strategy: Strategy and knowledge management, Goals and strategies, Success factors and barriers. Organization: Structural organization, Process organization, Organizational culture, other interventions, modeling. Contents and Systems: Technological roots, Contents, Centralized architecture, Distributed architecture, Classification. Economics: Expenses and funding, Benefits of knowledge management initiatives, Information systems success, Success of knowledge management systems. State of Practice: Related Empirical Studies: Surveys, Case studies. Research Design: Goals and research model, Methods, procedure and sample, Hypotheses, Respondents and response rate. Strategy and Environment: Organizational and business environment, Strategy. Organization: Organizational design, Organizational culture. Contents and Systems: Platforms and systems, Contents, Functions. Economics: Funding, Benefits. Conclusion and Outlook: Scenarios: Knowledge management starter, Centralized "market and hierarchy", Decentralized "network and community", Personal "idea and individual", Knowledge Management Tools and Systems

Text Books:

- B. Maier Ronald *Knowledge Management Systems: Information and Communication Technologies for Knowledge Management* 2nd edition, SPRINGER Publications 2004.

Additional Resources:

1. <http://www.kmresource.com/>
2. <http://www.kmworld.com/>

IS-4592-3 Information Systems Security

Credit Hours: 3

Pre Requisite: IS-4581-3

Follow-up: NONE

Syllabus:

Accountability and Access Control, Attacks and Monitoring, ISO Model, Network Security, and Protocols, Communications Security and countermeasures, Security management concepts and Principles, Asset Value, Policies and Roles, Data and Application Security Issues, Malicious Code and Application Attacks, Cryptography and private key algorithms, PKI and cryptographic Application, Principles of computer design, Principles of Security Models, Administrative Management, Auditing and Monitoring, Business continuity Planning, Law and Investigations, Incidents and Ethics, Physicals Security Requirements.

Text Book(s)

- A. Ed Tittel, Certified Information Systems Security

Additional resources

1. Gerald L.Kovacich, The Information Systems Security Officers Guide

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