

# **MBA in BIOINFORMATICS**

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# **MBA in BIOINFORMATICS**

## **SEM I**

### **DYPP1.1 Marketing Management.**

#### **1. Objectives.**

- To help students understand the basic concepts of marketing management.
- To help students understand various marketing tools/models for solving marketing problems.
- To help students comprehend various situations and marketing terminologies.

#### **2. Scope.**

- Introduction to Marketing Concepts, its relevance in India.
- Marketing Mix, Marketing Structures and Systems.
- Environmental scanning and Market opportunity analysis.
- Buyer behavior – Household and Institution / Organizational.
- Market segment and segmental analysis.
- Market estimation – Market potential, Demand Forecasting & Sales Forecasting.
- Marketing Informations Systems.
- Marketing Research.
- Market Planning.
- Product Mix Decision – Product identification, Product Life Cycle, Branding and Packaging.
- New Product development and management.
- Pricing Policies, Structures and Methods.
- Concepts of Regulated Prices in selected industries.
- Promotion decision – Communication process, Promotion mix, Promotion strategies with reference to consumer and industrial products.
- Advertising and personal selling.
- Distribution management – Importance of distribution in a developing country.
- Role of middle man, identification selection and managing dealers – distribution channels – channel management - physical distribution.
- Performance and controls – Marketing Audit.

#### **3. Prescribed Text.**

- Phillip Kotler, 2003. Marketing Management. 11<sup>th</sup> Edition, New Delhi : Pearson Education.

#### **4. References.**

- V.S.Ramaswamy and S. Namakumari, 2002. Marketing Management : Planning implementation and Control, 3<sup>rd</sup> Edition. New Delhi : Macmillan India Ltd.
- 
- Rajan Saxena, 2003. Marketing Management, 2<sup>nd</sup> Edition, New Delhi : Tata McGraw Hill.

#### **5. Internet References.**

[www.mmaglobal.com](http://www.mmaglobal.com)  
[www.marketingpower.com](http://www.marketingpower.com)

### **DDYP1.2 PRINCIPLES OF MANAGEMENT.**

#### **1. Objectives.**

To help students understand managerial concepts and practices.

#### **2. Scope.**

- Evolution, objectives, importance and advantages of management
- Role and functions of a manager and activities of management
- All functional aspects of Management
- Management practices and their applications in the Indian Context
- Concepts of profession and professionalisation of management
- Role of values and ethics in management.

#### **3. Prescribed Text:**

- Principles of Management, Koontz
- Principles of Management, Davar
- Management a competency Building Approach, Heil
- Reigel, Jackson, Slocum

### **DDYP1.3 BUSINESS STATISTICS.**

#### **1. Objectives.**

- To emphasize the need for statistics and decision models in solving business problems.
- To impart learning about concepts involved in statistics and decision models.

- To familiarize the students with sampling and sampling theories.
- Need for statistics in solving business and research problems.

## **2. Scope.**

- Basic Statistical Concepts.
- Summarization of Data : Frequency Distribution : Measures of Central Tendency.
- Measure of Dispersion ; Relative Dispersion – Skewness, Kurtosis.
- Elementary Probability theory ; Relative frequency approach; Axiomatic Approach; Subjective Probability; Marginal and Conditional Probability; Independence / Dependence of Events.
- Elementary Statistical Distribution; Binomial, Poisson, Normal, Estimation; Point and Interval, Sampling, Distribution, Mean and Proportion.
- Testing of Hypothesis.
- Simple Correlation and Regression; Spearman's Rank Correlation.
- Types of Sampling – Simple and Random, Stratified sampling and Cluster sampling.
- Time series – Components of time series, Estimation of trends and seasonal components.

## **3. Prescribed Text.**

- Business Statistics, S.P. Gupta.

## **DDYP1.4 ORGANIZATIONAL BEHAVIOUR**

### **1. Objectives.**

- To introduce students to framework that are useful for diagnosing problems involving human behavior.
- To increase students understanding of psychological and sociological phenomenon that regularly occur in organizations.
- To help them learn how to exercise leadership to solve problems-from managing the motivation and performance of individuals and teams to leading at the executive level.
- To understand the dynamics of human organizations and organization structure.
- To understand the concepts at and individual as well as the group level.

### **2. Scope.**

- Introduction to Organizational Behaviour : Origin, Nature and Scope of organizational behaviour and its relevance to organizational effectiveness and contemporary issues.
- Personality : Meaning and Determinants of personality; process of personality formation; personality types; assessment of personality traits for increasing self awareness.
- Perception, Attitude and Value : Perceptual processes, effect of perception on individual decision making, attitude and behaviour. Sources of value, effect of values on attitudes and behaviors. Effects of perception, attitudes and values on work performance.
- Motivation Concepts : Motives, Theories of motivation and their application for behavioral change.
- Group Behavior and Group Dynamics : Work groups, formal and informal groups and stages of group development : Concepts of group dynamics, group conflicts and group decision making. Team effectiveness : high performing teams, team roles, cross functional and self directing teams.
- Organizational Design : Structure, size, technology, environment; organizational roles: concept of roles; role dynamics; role conflicts and stress. Organizational conflicts.
- Leadership : Concepts and skills of leadership; leadership and managerial roles, leadership styles and effectiveness; contemporary issues in leadership, power and politics, sources and uses of power; politics at work place; tactics and strategies.
- Organizational development; organizational change and culture, environment, organizational culture and climate; contemporary issues relating to business situations. Process of change and organizational development.

### **3. Prescribed Text.**

- Understanding Organizational Behavior – Uday Parekh
- Organizational Behavior – Stephen Robbins.
- Organizational Behavior – Fred Luthans.
- Organizational Behavior – L.M.Prasad, Sultanchand.

### **4. References.**

- Organizational Behaviour, Fred Luthans.
- Organizational Behaviour, Stephen Robbins.
- Organizational Behaviour, Ashwathappa.
- Organizational Behaviour, L.M.Prasad.

## **DDYP1.5 FINANCIAL ACCOUNTING.**

### **1. Objectives:**

- To familiarize the students with basic Accounting concepts and Conventions.
- To make the students understand Financial Statements.
- To familiarize with the intricacies of accounting, planning and Management and to make them aware about the tools for decision making.

## **2. Scope :**

- Financial Accounting – Scope and Importance
- GAAP, Conventions and Concepts
- Balance Sheet and Related Concepts
- Profit and Loss Account and Related Concepts
- Accounting Mechanism: Basic Records – Understanding of Transactions and related documents – Process leading to preparation of Trial Balance and Financial Investments
- Revenue Recognition and Measurement – Revenue Vs Capital (Receipts and Expenditure)
- Accounting Methods – Cash, Accrual, Hybrid
- Inventory Accounting – Perpetual and Periodic System Accounting and Physical flow Valuation
- Fixed Assets and Depreciation Accounting
- Understanding of the following items:
  - Net worth
  - Reserves
  - Provisions
  - Intangible Assets
  - Fictitious Assets
- Revaluation of fixed assets and its impact on financial statements
- Overview of External and Internal Audit
- Inflation Accounting
- Corporate Financial Reporting in India
- Mandatory Accounting standards

## **3. Prescribed Text :**

- Management Accounting, M.Y.Khan & P.K.Jain.

## **4. References :**

- Financial Accounting Text and Cases, Deardon & Bhattacharya
- Financial Accounting for managers, T.P.Ghosh.
- Financial Accounting, R. Narayanswamy.

## **DDYP1.6 BUSINESS LAW**

### **1. Objectives.**

- To make the students familiar with the concept of law & various laws relating to business.

### **2. Scope.**

- Indian Contract Act.
- Special Contracts.
- Negotiable Instruments Act.
- Partnership Act.
- Introduction to Company Law.

### **3. Prescribed Text.**

- Law of Contract – Avtar Singh
- Company Law – Avtar Singh
- Special Contracts – Avtar Singh
- Negotiable Instruments Act – Avtar Singh
- Business Law – K.R.Bulchandani
- Partnership Act – Avtar Singh.

### **4 References.**

- Company Law – Ramaiah
- Special Contracts – N.D.Kapur.

## **DDYP1.7 MANAGERIAL ECONOMICS**

### **1. Objectives.**

- To impart knowledge and understanding to students on managerial economics and their application to business decision making.

### **2. Scope.**

- Introduction: Meaning and relevance of Managerial Economics-
- Relationship to Economic Theory-Relationship to the decision sciences.
- The management revolution-Role and Responsibilities of a Managerial
- Economist- The Firm, objectives and constraints.

- Demand Analysis: Demand Theory, Demand determinants, Using elasticities in managerial decision making. Demand Estimation and Demand Forecasting
- Production and Cost Analysis: Cobb Douglas Production Function
- ISOquant approach, Scale line, Factor substitutability – Cost concepts for business decisions - Cost-output relationship in the short-run and the long run Learning and Costs
- Market Structure and The Theory of Prices: Concept of Perfect
- Competition Price and output decisions under monopoly, oligopoly and monopolistic competition - Pricing practices.
- Case study on demand forecasting/elasticity/pricing practices.

### 3. Prescribed Text.

- Managerial Economics – Joel Dean
- Managerial Economics, Concepts and Cases – Mote, Paul & Gupta.
- Fundamentals of Managerial Economics – James Pappas & Mark Hershey.
- Economics – Samuelson.
- Managerial Economics – R.L.Varshney & Maheswari.

### 4. References.

- Managerial Economics, Joel Dean.
- Managerial Economics – Concepts and Cases, Mote, Paul & Gupta.
- Economics, Samuelson.
- Keat, Paul.G & Young, Phillip K.Y. 3rd Edition, Managerial Economics; Economic tools for today's decision makers.
- Schiller, The Micro Economy Today.
- Salvatore Dominic, 3rd Edition, Managerial Economics in a Global Economy.

### 5. Internet References.

[www.economist.com](http://www.economist.com)

[www.epw.org.in](http://www.epw.org.in)

## **DDYPB 1.8 INTRODUCTION TO LIFE SCIENCES AND BIOTECHNOLOGY. & INTRODUCTION TO BIOINFORMATICS**

### **1. Objectives :**

- To familiarize the students with the basic concepts of life sciences and Biotechnology.
- To Familiarize the students with the basic concepts of Bioinformatics.

## **2. Scope :**

### **INTRODUCTION TO LIFE SCIENCES AND BIOTECHNOLOGY:**

(50MARKS)

- Cell Biology, Genetics, Microbiology.
- Levels of organisms and size of organisms.
- Cell theory, Pro karyotic and Eu karyotic cells.
- Organals; structure and functions.
- Cell membrane, Cell cycle.
- Mytosis and Meiosia
- Karyotyping, Phage genetics, growth of microorganisms, anti-biotics,.
- Application of microbes in various industries.
- Principles of bioenergetics.
- Enzyme kinetics, metabolism and regulation.
- Integrated overview on biotechnology.
- Traditional v/s. Modern Biotechnology.
- DNA, RNA and Protien structure and Functions.
- Gene expressions.
- Enzyme Technology.
- Application of Biotechnology in Industry.

### **INTRODUCTION TO BIOINFORMATICS (50MARKS)**

- What is Bioinformatics.
- Scope of information technology in Biology
- Management Information System
- Impact of technology migration
- Databank, data capture, data analysis.
- Pair wise alignment, multiple alignment, BLAST, FAST algorithm for analysis sequence comparison, accessing databank.
- Protein structure databank and application.

## **3. Prescribed Text :**

- Biological Sciences, D.J.Taylor, NPO Green and G.W.Stout.
- General Microbiology, H.G.Schlegel.
- Biotechnology, John E. Smith
- An Introduction to Bioinformation Algorithms, Jones.
- Bioinformatics and Molecular Evolution, Higgs.

## **4. References :**

- Biotechnology-Demystifying the Concepts, D.Bourgaize.
- Biotechnology, A. Borem.

## **DDYP1.9 INFORMATION TECHNOLOGY FOR MANAGEMENT.**

### **1. Objectives :**

- To familiarize the students with the concepts of Information Technology and their relevance to Management.

### **2. Scope :**

- Historical Perspective of Computer and Information Technology.
- How a computer works, hardware and software components and their characteristics from a user/ buyer perspective
- Basics of networking-need for components of networks, LAN, WAN, MAN, various options for networking for a business – Dial Up, Leased Lines, DSL Lines, VSAT. Various medium options for Networking for communication – terrestrial, satellite, copper, fiber optic etc
- Basics of Internet - how internet works – Familiarity with various components of the internet Browser, Web Server, DNS Server, Search Engine – Applications of Internet – Websites, Blogs, email, FTP, Voice over Internet
- Impact of IT on business and society
- Role of IT – Overview of concepts such as ERP, SCM, CRM, Data Warehousing and Business Intelligence, e-commerce, e-Business, Knowledge management etc

### **3. Reference Text**

- e-Business : Roadmap for Success : Ravi Kalakota and Marcia Robinson
- The Seven Steps to Nirvana: Strategic Insights into e-Business Transformation: Mohanbir Sawhnay
- Competitive Strategy by Michael Porter
- Knowledge Management by Ganesh Natarajan and Sandhya Shekhar
- Business @ The Speed of Thought by Bill Gates
- TechVenture: New Rules on Value and Profit from Silicon Valley by Mohanbir Sahwnay
- Alex Leon & Mathews Leon: Introduction to computers (Vikas)
- Rajaraman: Introduction to Information Technology (Prentice Hal India)
- Sanders, D. H.: Computers in Business: An Introduction (McGraw Hill)
- Articles from HBR, Journal of Marketing

## **DDYP1.10 FOREIGN LANGUAGE:**

## 1. Objectives :

- To impart the basics of the French language.
- To teach basic conversation in French language.

## 2. Scope

- Theory  
Basic nouns  
Things around us.  
Items of daily use.
- Numbers  
0-100.  
Ordinal numbers.
- Colours  
use them in complex sentences  
change them according to the nouns.
- Different materials  
eg. silk, coton.....
- Grammer  
Definite & indefinite articles.  
prepositions.  
singular-plural.  
adjectives.  
masculine-feminine.  
negation & inversion of verbs.
- Verbs  
Basic verbes like etre, avoir.....
- Conversation skills

understand simple sentences used in class.

formal & informal greetings.

understand & translate simple passages.

answer basic & complex "wh" type questions.

# MBA in BIOINFORMATICS

## SEM II

## **DDYP2.1      MARKETING STRATEGY AND APPLICATIONS.**

### **1. Objectives**

- Appreciate the value of marketing concepts when they are used as guides for understanding management problems and developing comprehensive marketing programs
- Develop a disciplined analytical skill amongst the participant for marketing situations
- Make connections between marketing and other functional areas of business
- Appreciate how the elements of successful marketing programs fit together.
- To familiarize participants with the concept of marketing strategy, its link to corporate strategy and environmental influences on marketing strategy. Also to provide some exposure to marketing strategy in different types of industries; how to plan proactive marketing

### **2. Scope**

- Corporate Planning, Business Planning & Strategies Marketing Planning including BCG, GE & Ansoff Models.
- Marketing Strategy Development
- New Product Development Process
- Pricing Strategy
- Distribution Strategy
- Introduction to Integrated Marketing Communication
- Advertising & Media Planning
- Introduction to sales management and Selling Process
- Product Life Cycle Strategy
- Marketing Audit and Control
- Concept of strategy: The environment, corporate vision and mission; setting goals and objectives, planning and strategy, from corporate strategy to marketing strategy. The 4 “A” s of Day’s Marketing Strategy model
- Approaches to strategy: Porter’s 5 forces model, generic strategies; Hamel and Prahalad and the concept of “Strategic Intent”; Consumer oriented, competition oriented and resource based strategies
- Competitive strategies: Porter’s concept of value chain analysis; market leader/challenges/follower strategies
- Competitive strategies: Industry life-cycle stage and company’s marketing strategy; strategic mapping
- Competitive strategies: Branding as a marketing strategy: when and how industrial products v/s consumer products; Positioning the Company and the Brand; Brand Extensions

- Marketing Strategy and Marketing-mix: Customer-value creation intensive integrative and diversification growth strategies
- Structural approaches to marketing strategy: PIMS Model, Malcolm Baldrige Model, McKinney's 7-S Model
- Financial considerations in evolving marketing strategy.

### 3. Prescribed text

- Philip Kotler(2003). Marketing Management: Eleventh Edition, New Delhi: Pearson Education

### 4. References

- V. S. Ramaswamy and S Namakumari (2002). Marketing Management: Planning Implementation and Control (3rd Edition). New Delhi: Macmillan India Ltd.
- Rajan Saxena (2003) . Marketing Management, Second Edition. New Delhi : Tata McGrawhill
- Harish Bijoor (2001). Marketing Trends: Smart Insights Into the world of Indian Business New Delhi: Vikas Publishing House Pvt. Ltd.
- Porter, M.; Competitive Strategy
- Porter, M; Competitive Advantage
- Hamel, G & C. K. Prahalad: Competing for the Future
- Aaker,D.; Managing Brand Equity
- Kapferer, J.; Strategic Brand Management Day, G. S.; Market Driven Strategy

## **DDYP2.2 COST ACCOUNTING & MANAGEMENT ACCOUNTING.**

### 1. Objectives

- To familiarize with the intricacies of cost accounting, planning and management and to make aware about the tools for decision-making.
- This paper complements the inputs provided in financial accounting. It is a detailed foray into aspects not covered very deeply in the financial accounting systems. In this era of intense global competition, cost control has become an imperative part of strategic management.

### 2. Scope

### 3. Cost Accounting:

Specialised areas of accounting:

Financial, Cost and Managerial Accounting – Aims and objectives of Cost and Managerial Accounts as a part of Management Information System.

Cost Classification:

The Elements of Cost – Direct Material; Direct Labour; Direct Expenses; Overhead; Cost Behaviour; other methods of classification to suit the requirements of management.

Accounting of Costs:

Materials:

Purchasing procedures; Organisation of stores, Stores Records – Methods of valuing material issue – Inventory control procedures.

Labour:

Engagement, Time Keeping and Time booking – Methods of remuneration – Factors influencing the wage settlements – Treatment of different items included in the compensation package for labour – Preparation of wage sheet and payment of wages – Accounting for labour.

Overheads Expenses:

Classification into Production, Administration and Selling and Distribution – Distribution of overheads – Apportionment, recovery of overheads. Methods of calculating depreciation; Obsolescence; Interest on Capital. Treatment of overheads in valuation of work-in-progress and finished goods inventory.

Cost Book Keeping:

Cost Ledgers and Control records for recording transactions – Link between financial and cost books – Reconciliation of cost and financial accounts – Integrated accounts.

Costing Methods

Basic grouping job/process costing methods

Job order cost systems

Contract costs.

Process costing:

Cost flows in job

Process costing methods

Treatment for joint and by products in process costing

Cost Accounting for services

Management Accounting.

Past and Present of Management Accounting

Cost-Volume-Profit Analysis

Linear-Programming Models for Planning

Cost Estimation and Regression Analysis

Topics in Regression Analysis

Cost Analysis for Pricing Decisions

Assigning Service Department Costs

Joint Costs

Sales, Profitability, and Productivity Variances

Measuring Quality

New Technology for Manufacturing Operations: JIT and CIM

Justifying Investments in New Technology

Decentralization

Profit Centers and Transfer Pricing  
Investment Centers: Return on Investment  
Executive Contracts and Bonus Plans  
Formal Models in Budgeting and Incentive Contracts.

### 3. Prescribed text

- 'Cost Accounting: A Managerial Emphasis' (CAME) 11<sup>th</sup> edition, by Charles T Horngren, George Foster and Srikant M Datar. Prentice Hall of India Pvt. Ltd. New Delhi.
- Management Accounting for profit control, Keller & Ferrar.

### 4. References

- 'Management & Cost Accounting' by Colin Drury. Chapman & Hall Publication
- 'Students' Guide to Cost Accounting' by Ravi M Kishore. Taxmann publication
- 'Cost Management: A Strategic Emphasis' by Edward J Blocher, Kung H Chen and Thomas W Lin. Irwin McGraw Hill publication
- 'Accounting for Decision Making and Control' by Jerold L Zimmerman. Irwin McGraw Hill publication
- 'Management Accounting' by M Y Khan and P K Jain. Tata McGraw Hill publication Magazines & Journals :
- 'Management Accounting: Text & Cases' by Robert N. Anthony & James S. Recce.
- 'Management Accountant' published by the Institute of Cost & Works Accountants of India, Calcutta.
- 'Chartered Accountant' published by the Institute of Chartered Accountants of India, New Delhi
- 'The Journal of Accounting' published by the Indian Accounting Association, New Delhi
- 'Accounting World' published by the Institute of Chartered Financial Analysts of India, Hyderabad.

### 6. Internet References

- The Institute of Chartered Accountants of India, [www.icaai.org](http://www.icaai.org)
- The Institute of Cost and Works Accountants of India, [www.icwai.org](http://www.icwai.org)
- The detailed information of Indian companies, industry and economy, [www.indiainfoline.com](http://www.indiainfoline.com)
- The news of economy and business, [www.economictimes.com](http://www.economictimes.com)
- The Business Magazine for business and economy news, [www.business-today.com](http://www.business-today.com)
- The International Accounting Standards Board, UK, <http://www.iasc.org.uk>

- The American Institute of Certified Public Accountants, <http://www.aicpa.org/index.htm>
- The Chartered Institute of Management Accountants, [www.cima.org.uk](http://www.cima.org.uk)

## **DDYP2.3 BUSINESS MATHEMATICS AND OPERATIONS RESEARCH.**

### **1. Objectives**

- The concepts involved in Quantitative Methods in Operations Management
- Need for Quantitative Methods in Operations Management in solving business problems
- Scope and limitation of use

### **2. Scope.**

#### **BUSINESS MATHEMATICS.**

- Introduction to probability.
- Probability Distributions.
- Decision Analysis.
- Utility and Decision Making.
- Forecasting.
- Introduction to Linear Programming.
- Project Scheduling : PERT & CPM.
- Markov Processes.
- Multi-Criteria Decision Problems.

#### **OPERATIONS RESEARCH**

- Introduction to OR: Concepts, genesis, application potential to diverse problems
- in business & Industry, Scope and Limitations.
- Assignment Problem (AP): Concepts, formulation of model, Hungarian method of solution – Maximisation / minimization – Balanced / Unbalanced – prohibited assignments – problems.
- Transportation Problem (TP): Concepts, formulation of model – Solution Procedures for IFS and Optimality Check – Balanced / Unbalanced – Maximization/Minimization – case of degeneracy – prohibited routing problems – Post-optimal sensitivity analysis.
- Linear Programming (LP): Concepts, Formulation of models, diverse problems – Graphical explanation of solution – Maximisation/minimization – Simplex Algorithm- Use of slack/surplus/artificial variables – Big M method/Two phase method –

Interpretation of the Optimal tableau – (Unique, optimum, multiple optimum, Unboundedness, Infeasibility & Redundancy problems) Integer Linear Programming.

- Linear Programming (LP): Duality principle – Primal/dual inter-relationship- Post-optimal sensitivity analysis for changes in b-vector, c-vector, addition/deletion of variables/constraints – Dual simplex method-problems. Limitations of LP vis-à-vis Non-linear programming problems. Brief introduction to Non-LP models and associated problems.
- Network Analysis: Minimal spanning tree problem- shortest route problem- Maximal flow in capacitated network-Concepts and solution algorithm as applied to problems – Project Planning & control by use of CPM/PERT concepts – definitions of project, jobs, events – Arrow diagrams – Time analysis and derivation of the critical path-concepts of floats (total, free, interfering, independent) – Crashing of a CPM network-Probability assessment in PERT network.
- Queuing (Waiting-line) models: Concepts- Types of queuing systems (use of 6 character code) – Queues in series and parallel – problems based on the results of following models (M/M/1) single channel queue with poisson arrival rate, and negative exponent service time, with and without limitations of queue size. (M/G/1) single channel with poisson arrival rate, and general service time, PF-Formulae.
- Inventory Models: Types of inventory situations; Fixed quantity/fixed review period – Costs involved – Deterministic probability models – Economic – order-quantity (EOQ) and EBQ for finite production rate – Sensitivity analysis of EOQ-EOQ under price break-Determination of safety stock and reorder levels-Static inventory model – (Insurance spares)
- Digital simulation: Concepts – areas of application – random digits and methods of generating probability distributions-Application to problems in queuing, inventory, new product, profitability, maintenance etc.
- Replacement and Maintenance Models: Replacement of items subject to deterioration and items subject to random total failure – Group V/s. Individual replacement policies.
- Game Theory: Concept 2-person, n-person games-Zero-sum and Non-zero sum games- Solution Procedures to 2-person zero sum games-Saddle-point, Mixed Strategy, Sub-games method for  $m \times 2$  or  $2 \times n$  games-Graphical methods-Equivalence of game theory and Linear Programming models – Solution of  $3 \times 3$  games by LP simplex including duality application for maximizing / minimizing player's strategy.

### 3. Prescribed text

- Operations Research by Taha
- Operations Research by J K Sharma
- Problems in Operations Research by Hira Gupta
- Quantitative techniques in management by N D Vohra

### 4. References

- Operations Research Techniques for Management by B. Banerjee
- Operations Research by Ravindran Phillips & Solberg
- Introduction to Operations Research by Hillier & Lieberman

## **DDYP2.4 HUMAN RESOURCE MANAGEMENT.**

### **1. Objectives**

To provide the future manager with inputs with a view to:

- Enhancing the appreciation of the Human Resources function as a potential career option.
- Understanding the interface of the Human Resources function with Operations, Marketing, and Finance functions.

### **2. Scope**

- Human Resource Management – Its scope, relationship with other
- social sciences – Approaches to Human Resource Management /
- Interdisciplinary approach.
- Organisation of Personnel Functions – Personnel Department, its
- organization, Policies, responsibilities and place in the organization.
- Manpower Planning, Job Analysis, Job Description, Scientific
- Recruitment and Selection Methods.
- Motivating Employees – Motivational Strategies, Incentive Schemes,
- Job-enrichment, Empowerment
- Job-Satisfaction, Morale, Personnel Turnover
- Performance Appraisal Systems – MBO Approach, Performance
- Counselling, Career Planning
- Training & Development – Identification of Training Needs, Training
- Methods, Management Development Programmes.
- Organisational Development – Organisation Structure – Reengineering,
- Multi-skilling, BPR.
- Management of Organisational Change.
- HRD Strategies for long term planning & growth
- Productivity and Human Resources Management

### **3. Prescribed text**

- Decenzo and Robbins “Human Resource Management,” John Wiley and Sons Inc. Sixth Edition
- Aswathappa, K., “Human Resource and Personnel Management-Text and Cases” Tata McGraw Hill, 2003. Third Edition
- C.B. Mammoria, Human Resource Management.

### **4. References**

- Bohlander G.; Snell, S.; Sherman A. “Managing Human Resources” Thomson South Western, 2001. 12<sup>th</sup> Edition
- Gary Dessler Human Resource Management 2004, Prentice Hall, New Delhi, 9<sup>th</sup> ed.

## **5. Internet References**

- [www.shrm.org/hr/links](http://www.shrm.org/hr/links)
- [www.human-resources.org](http://www.human-resources.org)
- [www.hrvillage.com](http://www.hrvillage.com)

## **DDYP2.5 FINANCIAL MANAGEMENT.**

### **1. Objectives**

- To understand financial statements
- To interpret and analyze the financial summaries
- To inculcate a finance sense among students

### **2. Scope**

- Financial Objectives – Financial Planning and Control – Analysis of Profit and Loss A/c – Balance Sheets.
- Financial Ratio Analysis – a tool in planning and control – Inter Firm Comparisons
- Fund Flow Analysis – Analysis of statement of Long Term sources and uses of Funds – Working Capital Based Fund Flow statement – Cash Flow Statements
- Sources of Term Finance – Term Loans – Fixed Deposits – Debentures- Bonds- Role of Financial Institutions- Equity capital as a source of Finance-Govt. regulations of Issue of Securities in India – Internal generation as a source of Finance.
- Cost of Capital – Weighed average and Marginal Concept – Application in capital Budgeting decisions.
- Direct or Corporate Taxation and its implication on Financing
- Capital Expenditure decisions-Projects appraisal – Non Financial Factors influencing capital budgeting decisions-Payback period method. ROI approach – Discounted cash flow techniques and its applications.
- Working capital management – Assessing working capital requirements – Financing working capital requirements – RBI guidelines influencing Working Capital Finance – Management of Receivables and inventories.
- Dividend Policy – Guidelines for issue of Bonus Shares

### **3. Prescribed text**

- White, Sondhi & Fried, Analysis & Uses of Financial Statements, Wiley
- Helfert Erich, Techniques of Financial Analysis, Jaico

#### **4. References**

- Van Horne James C., Financial Management & Policy, Prentice Hall India

#### **5. Internet References**

- [www.crisilonline.com](http://www.crisilonline.com)

## **DDYP2.6 LEGAL ASPECTS OF BUSINESS**

### **1. Objectives :**

- To familiarise the students with basic concepts of law
- To provide adequate knowledge of recent developments in Law

### **2. Scope :**

- Company Law. – In Detail  
Sales of Goods Act – Contracts of Sale, Conditions & Warranties.  
Consumer Protection Law – Basic Definitions & Restrictive Trade Practices.  
Overview of Related Law – CPC, Constitution and Criminal Law.
- Competition Act – Overview.
- WTO and related agreements.
- Intellectual Property Laws and TRIPS.
- Foreign Exchange Management Act.

### **3. Prescribed Text :**

- Company Law - Avatar Singh, Eastern Books, Lucknow, 2004
- Competitor Law – D.P. Mittal
- W.T.O - WTO organisation, Deep & Deep Publication, New Delhi, 1998
- Intellectual Property Laws – Narayan P., Eastern Law, Calcutta, 1990

### **4. Reference :**

- SEBI manual
- SEBI guidelines and listing of companies : Studies in financial services in India, V.S. Avadhani
- Corporate taxation Vol. I, H.P. Raina, 6<sup>th</sup> edition

- Corporate taxation Vol. II, H.P. Raina, 6<sup>th</sup> edition
- Textbook of company law, Mahesh Tandon, 6<sup>th</sup> edition
- Commentary on companies bill, 1993, K. Srinivasan, B.P. Bhargava
- Intellectual property rights and copyright, S.P. Satarkar
- Intellectual property manual, Avinash Shivade
- Innovation and competition policy, Allan Guttermann
- Agriculture, Trade and the WTO : Creating a trading environment for development, Merlinda Ingco
- GATT 1994, the WTO and India, Shyamal Banerjee
- WTO analytical index Vol I : Guide to WTO law and practice, World Trade Organisation
- WTO analytical index Vol II : Guide to WTO law and practice, World Trade Organisation
- Foreign exchange management act with rules and regulations under FEMA, Taxmann
- The law and practice of arbitration and conciliation : The arbitration and conciliation act, 1996, O.P. Malhotra
- Trips, PCT and global patent procurement, Markus Nollf
- Corporate hijack of biodiversity : How WTO-TRIPS rules promote corporate hijack of peoples biodiversity and knowledge, Vandana Radha Holla Afsar H, Shiva Bhar Jafri

## 5 . Internet References :

- [www.laweye.de](http://www.laweye.de)
- [www.ibd.com](http://www.ibd.com)
- [www.august1.com](http://www.august1.com)
- [www.alllaw.com](http://www.alllaw.com)
- [www.justice.com](http://www.justice.com)
- [www.law.cornell.edu](http://www.law.cornell.edu)
- [www.ilsa.org](http://www.ilsa.org)
- [www.hg.org](http://www.hg.org)

## DDYPBI2.7 Computational Biology I

### 1. Scope :

- Biological background for sequence analysis
- Distance and similarity: Evolutionary basis for sequence alignment- Concepts of homology and analogy
- Combinatorial problems in biology
- DNA and Protein sequence analysis packages – GCG, EMBOSS
- Pairwise sequence alignment – local alignment
- Global alignment

- Dot plots
- Needleman-Wunsch algorithm
- Smith waterman algorithm
- Scoring schemes & substitution matrix
- PAM and BLOSUM
- Dynamic and Heuristics programming methods .
- Multiple sequence alignment (ClustalW)
- BLAST, FASTA, Entrez and SRS
- Internet resources, tools (NCBI, Medline, primer design) and biological
- Database searching

## **2. Prescribed Text :**

- Sequence and Genome Analysis by David W. Mount - Cold Spring Harbor Laboratory ;2004
- Fundamental Concepts of Bioinformatics by Dan E. Krane, Michael L. Raymer;Benjamin Cummings Released: 12 September, 2002
- Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, Third Edition;by Andreas D. Baxevanis, B. F. Francis Ouellette Wiley-Interscience;Released: 15 October, 2004

## **DDYP2.8 PRODUCTION MANAGEMENT.**

### **1. Objectives.**

- To understand the concepts of Production and its applications in industrial situations.
- To familiarize the students with various concepts of Production Planning and Management.

### **2. Scope.**

- The Production Function – nature and scope, interface with other
- functional areas like Marketing, Finance, Personnel, Materials.
- Types of Production Systems – Job, Batch and Flow Systems,
- Assembly Lines, Process Plants, Intermittant and Continuous Production
- Elementary knowledge of Manufacturing Processes – Assembling, Fabrication, Forming and Heat Treatment, Welding; Machining and similar processes.
- Plant Layouts- Objectives, Symptoms, of poor layouts, types of layouts – functional, line and static product layouts, group layouts, factors influencing layouts, techniques of optimizing layouts.
- Materials Handling – Objectives, principles and methods of efficient handling, introduction to material handling equipment.
- Problems of Location – Types of locational decisions and factors affecting location, location of manufacturing and service units, location of distribution and retail units, location of procurement centres
- Inventory Management – types of inventory management systems, detailed mathematical treatment of P, Q and MRP Systems, Selective inventory control – techniques like ABC analysis, HML analysis, FSN analysis, SDE analysis etc., make & buy decision.
- Scheduling – objectives, elements of scheduling, master scheduling, priority planning, facility loading, sequencing problem of scheduling.
- Network Analysis – Activity Analysis, Network Diagramming, PERT, CPM, Estimation of Schedule statistics, Earliest and latest start and finishing times, floats, Cost crashing, Estimation of probability of completion of project in a given time, applications in industry.
- Break Even Point Analysis – concept of break even point, utility of BEP analysis in short and long term decision.
- Reliability, Maintenance and Plant Services – objectives, types of Maintenance - breakdown and preventive maintenance, introduction to estimation of system reliability, fault tree analysis.
- Quality Control – Total Quality Control, What is quality, inspection,

- quality control, introduction to control charts & types of control charts - mean, range, proportion defective (P) and (C) charts.
- Emerging Trends – Just-In-Time Manufacturing, Robotics, CAD/CAM/CIM.
- Concepts of productivity – Introduction to Productivity Techniques, Value Analysis, Value Engineering.

## **DDYP 2.9 RESEARCH METHODOLOGY.**

### **1. Objectives**

- To impart knowledge to evaluate and conduct research on management problems/issues
- To provide skills necessary for the conduct of student research projects as a part of the programme requirement
- To highlight importance of research in management.

### **2. Scope**

- The research process -Relevance and scope of research in management, Steps involved in the research process / scientific process. Role of research in the industry.
- Formulation of a research problem-Sources of research problems, management dilemma—management Question – research question hierarchy, how to formulate a research problem? Essential characteristics of research problem
- Objectives, variables and hypotheses:-Objectives of research, identification and types of variables, hypotheses, Concept and types.
- Related literature- Significance and sources of related literature, reviewing of literature, References andreferencing systems. Research paradigms
- Research design -Research design-meaning and significance, Types of research designs...exploratory, descriptive, (survey and case study methods), Explanatory ( ex-post facto and experimental ) Factors affecting internal and external validity of experiments.
- The sampling process-Sampling – types - probability and non-probability, Sampling error, sample size confidence interval and determination of sample size.
- Tools and techniques of data collection- Validity and reliability of tools. Quantitative tools----questionnaire, ranking and rating scales and scale, Construction psychometric tools. Qualitative techniques interviews, focus groups, participant and non-participant observation. Primary and secondary sources of data, Use of library and the internet sources for collection of data, data clustering. Data mining and data warehousing,
- Application of data analysis techniques- Types of data-nominal, ordinal, interval and ratio conditions on data for the use of parametric and non-

parametric Tests. Testing of hypothesis-chi-square test, t-test, Z test , F test. Multivariate analysis, cluster analysis, discriminant analysis, correlation and regression analysis, factor analysis. Relation between the type of data and the statistical techniques to be used. Use of SPSS in data analysis

- Research proposal Significance and preparation of a research proposal.
- Report writing -Mechanics of report writing

### **3. Prescribed text**

- Cooper, Donald , R.Schindler, Pamela.S ,Business Research Methods, Tata McGraw Hill, Sixth edition 2002
- Dr. Uma Sekaran , Research Methods for Business – A Skill Building Approach, John Wiley and Sons, Fourth edition,2003
- Zikmund . Business Research Methods,Thomson S.W.,Seventh Edition,2004

### **4. Internet References**

- [http://www.wadsworth.com/psychology\\_d/templates/student\\_resources/workshops/workshops.html](http://www.wadsworth.com/psychology_d/templates/student_resources/workshops/workshops.html)
- [http://www.slais.ubc.ca/resources/research\\_methods/index.htm](http://www.slais.ubc.ca/resources/research_methods/index.htm)

## **DDYP2.10 FOREIGN LANGUAGE.**

### **1. Scope :**

- Theory  
Parts of the body  
Related adjectives and verbs.
- Time  
12 hour & 24 hour clock.  
Days of the week.  
Months of the year.
- Seasons  
talk about the weather  
festivals celebrated in each season.  
Weight scale.
- Grammar  
Negation & plural form with indefinite articles.  
possessive adjectives.  
demonstrating adjectives.  
articles contract's.  
imperative mode.
- Verbs  
Basic "er" verbs
- Conversation skills  
General conversation about weather.  
Complex sentences.  
3)Read simple passages and answer questions.  
4)Self-introduction.

### **SEM III**

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2.	Business Policy and Strategic Management	DDYP3.2	23
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5.	Computational Biology 2	DDYPBI3.1	125
6.	Concepts in Computing and Programming	DDYPBI3.2	126
7.	Introduction to Database Management System	DDYPBI3.3	127
8.	Structural Bioinformatics	DDYPBI3.4	128
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10.	Molecular Biology	DDYPBI3.6	130

### **SEM IV**

1.	International Business	DDYP4.1	28
2.	Environment Management & Ethics in Business	DDYP4.2	29
3.	Management Control Systems	DDYP4.3	31
4.	Foreign Language.	DDYP4.4	32
5.	Perl Programming	DDYPBI4.1	133
6.	Molecular modelling and Drug Design	DDYPBI4.2	134
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# **MBA in BIOINFORMATICS**

## **SEM III**

### **DDYP3.1 MANAGEMENT INFORMATION SYSTEMS**

#### **1. Objectives**

- To make the students appreciate the role of information systems in the effective functioning of the organisation and the need for effective Management Information Systems as a support for decision making
- To familiarize the participants with the process of creating and implementing a Management Information System.

#### **2. Scope**

- Structured Systems Analysis & Design
- Tools & Techniques
- Documentation
- Detailed SAD procedure
- Design of commercial systems
- Information Systems Concepts & Trends
- Overview of Information System in:
  - Marketing
  - Finance
  - Production
  - Personnel

#### **3. Prescribed Text**

- James A O'Brien, - Management Information Systems
- Turban, McLean and Wetherbe – Information Technology for Management

#### **4. References**

- Robert Schultheis and Mary Sumner, - Management Information Systems
- Kenneth C. Laudon, Jane P. Laudon-Management Information Systems

#### **5. Internet References:**

- [www.techrepublic.com](http://www.techrepublic.com)

### **DDYP3.2 BUSINESS POLICY AND STRATEGIC MANAGEMENT**

#### **1. Objectives**

- To familiarize the participants with the basic concepts of business strategy.
- To facilitate the participants to apply the concepts to live corporate situations
- To explain contemporary concepts of strategy

## **2. Scope**

- Evolution and basic concepts, Vision, Mission and business definition.
- Contributions by Mintzberg, Ansoff, Porter and Prahalad, Gary Hammett
- Environment survey and appraisal -Industry and competitive analysis-
- Dominant economic features, strength of competition and competitive forces.
- The Strategic management Process- Situation analysis, Formulating Corporate Level Strategy, Portfolio Strategy.
- Formulating Business level Strategy – Porter’s competitive Forces and Strategies, Cooperative Strategies. Strategic implications of five competitive forces, Evaluating company resources and competitive capabilities, Competencies, core and distinctive competencies and competitive advantages.
- Formulating Functional level Strategies – Putting strategy into action- leadership- structural design, Information and control systems, human resources- Implementing global strategies.
- Corporate goals and strategic gap, Five generic strategies
- To use Case Studies on a Cross Functional Basis
- To Understand the Dynamics of Growth
- Change and Turnaround Strategies – To Apply Existing Models
- Decision Making and Corporate Planning
- General Management –Emphasis on Projects & Development of Cases in Indian Industry Porter’s model)
- Managing internal organization for Strategy implementation

## **3. Prescribed text**

- Strategic Management “Gregory G. Dess and Alex Miller” Published By McGraw-Hill, Inc
- Management Policy and Strategic Management, R.M.Srivastava
- Strategic Management and Business Policy, Nitin Balwani
- Competitive Strategic Techniques for Analysing Industries, Micheal Porter
- Business Policy, Azhar Kazmi
- Business Policy, P Subba Rao
- Strategic Management, Francis Cherunilam
- Strategic Management Arthur A. Thompson, Jr. and A.J. Strickland III Published by “Irwin/Mc Graw-Hill
- Strategic Management, the Indian Context, R Srinivasan, Prentice Hall of India Pvt. Ltd., New Delhi 2005

#### 4. References

- Strategic Management In The Asian Context-A Casebook In Business Policy and Strategy:Luis Ma. R. Calingo Publisher John Wiley & Sons
- Strategic Planning- Formulation of Corporate Strategy (Text Cases- The Indian Context) V.S. Ramaswamy and S. Namakumari Publisher Macmillan”
- Strategic Management- Competitiveness and Globalization by: Michael A. Hitt, R. Duane Ireland And Robert E. Hoskisson Published by “South-Western College Publishing”.
- Commitment- Business Unit Strategy –Eli Segev – Wiley Series in Practical Strategy, 1997.
- Strategic Management- A Fresh Approach To Developing Skill, Knowledge And Creativity, by: Paul Joyce & Adrian Woods Published by Kogan Page Limited.
- Business Policy and Strategic Management by: William F. Glueck And Lawrence R. Jauch Published by McGraw-Hill International Book Company.
- Exploring Techniques of Analysis And Evaluation In Strategic Management by: Veronique Ambrosini with Gerry Johnson And Kevan Scholes Published by Prentice Hall Europe.
- Commitment- The Dynamic of Strategy, Pankaj Ghemawat, Published by - The Free Press.
- Digital Storm- Fresh Business Strategies From The Electronic Marketplace,by Philipp Gerbert Alex Birch with Gerd Schnetkamp Dirk Schneider published by Capstone Publishing Limited.
- Strategic Information Technology: Opportunities for Competitive Advantage, Raymond Papp, Published by Idea Group Publishing.
- Harvard Business Review Articles.
- Management Review
- Business Barons- A Monthly Indian Journal Published by Minhaz Merchant, Mumbai.
- Effective Executive- A Monthly Indian Journal Published by A.V. Vedpuriswar, Hyderabad.
- Business India- A Weekly Indian Journal
- Business Today- A Weekly Indian Journal
- Business World

#### 5. Internet References

- [www.strategy-business.com](http://www.strategy-business.com)
- [www.planware.org/strategy.htm](http://www.planware.org/strategy.htm)
- [www.fortune.com](http://www.fortune.com)
- [www.bsstrategist.com](http://www.bsstrategist.com)

## **DDYP3.3 ENTREPRENEURSHIP MANAGEMENT.**

### **1. Objectives**

- To enhance appreciation of the role of entrepreneurship in the economic progress of the country through wealth creation and innovative strategies
- To impart knowledge about entrepreneurial competencies and skills required for starting and sustaining a successful enterprise.

### **2. Scope**

- Concept of Entrepreneurship and Emergence of Entrepreneurial class
- Theories of entrepreneurship
- Characteristics of entrepreneurial leadership, risk taking, decision taking and business planning
- Analysis of business opportunities
- Environmental scanning, sectoral studies
- Process of generating business ideas, screening and selection
- Techno-economic feasibility studies
- Developing detailed project report for implementation
- Ancillary industry development, identification of opportunities for ancillary industries
- Entrepreneurial opportunities in service industry transportation, distribution and agro industries
- Institutional framework for entrepreneurship development in our country
- Government policy, agency supporting entrepreneurial development
- Industrial estates
- Financial incentives, backward area benefits
- Schemes for educated unemployed
- Fiscal incentives
- Procurement of industrial equipment, marketing support
- Sources of finance – Institutional and others
- Training for entrepreneurship development
- Entrepreneurial behaviour, techno economics innovation and entrepreneurship, socio-psychological factors influencing entrepreneurship development.
- Lessons from success stores of Indian and International entrepreneurs (case studies)

### **3. Prescribed Text**

- Dynamics of Entrepreneurship Management, Vasant Desai, Himalaya Publications.

### **4. References**

- Innovation & Entrepreneurship - Peter Drucker (Heinmann - London)

- Entrepreneurship Strategies and resources, Marc J.Dollinger, Pearson Education (Singapore) Pvt. Ltd, 2003.
- Opportunities - Edward De Bono (Associated Business Programmes - London)
- Entrepreneurial Development - S S Khanka (S Chand)
- Thought Leaders - Shrinivas Pandit (Tata McGraw Hill)
- Made in Japan - Akio Morita (Penguin Books)
- The New Alchemists - Charles Handy (Random House)
- Managing Radical Change - Sumantra Ghoshal & Gita Piramal (Penguin)
- The Amul Story - Ruth Heredia (Tata McGraw Hill)
- Roadmap to Entrepreneurial Success - Robert W Price (American Management Association)
- Handbook for New entrepreneurs – ed P.C. Jain, Entrepreneurship Development Institute of India, Oxford University Press
- Industrial Entrepreneurship in India, Rao V Lakshmana Rao [A], Chugh Publication
- Entrepreneurship Development, Bhanushali S G [A], Himalaya Publishing House
- Training Entrepreneurs for Small Business Creation Lessons, Loucks Kenneth [A], International Labor Organization
- Developing New Entrepreneurs, Entrepreneurship Development Institute Of India [A], Entrepreneurship Development Institute Of India
- Entrepreneurial Development The Entrepreneur...And Policies, Desai Vasant [A], Himalaya Publishing House
- Defining Success (Small Enterprise) In Entrepreneurship...and Policies, Gibb Allan A [A], International Labor Organization
- Entrepreneurial Connection, Narola Gurmeet [A], Tata McGraw-Hill Publishing Company Limited
- Net Entrepreneurs Only, Erickson Gregory K [A], John Wiley and Sons
- Entrepreneurship by Hisrich Peters (Tata McGraw-Hill Edition)

## 5. Internet References

- [www.cln.org/themes/entrepreneurship.html](http://www.cln.org/themes/entrepreneurship.html)
- [www.esc.com/esonline](http://www.esc.com/esonline)
- [www.zeromillion.com](http://www.zeromillion.com)
- [www.hbswk.hbs.edu](http://www.hbswk.hbs.edu)
- [www.kipnotes.com/Entrepreneurship.htm](http://www.kipnotes.com/Entrepreneurship.htm)
- [www.thinkingmanagers.com/business-management/entrepreneurship](http://www.thinkingmanagers.com/business-management/entrepreneurship)
- [www.entrepreneur.com](http://www.entrepreneur.com)
- [www.ediindia.org](http://www.ediindia.org)

## DDYP3.4 FOREIGN LANGUAGE

**Theory:-**

**1)nouns relating to the rooms**

- \*living room
- \*kitchen
- \*bathroom
- \*bed room

## **2)relations**

- \*help to make their own family tree.

## **3)meals**

- \*break fast
- \*lunch
- \*dinner

## **Grammer:-**

### **1)Past tense**

- \*with etre
- \*with avoir

### **2)interrogation & negation in Past tense.**

### **3)Partitive articles**

### **4)Future tense**

Verbs:-dire, commencer, monter, descendre, mettre, prendre, aller, venir, boire, servir, manger.

## **Conversation skills:-**

- 1)Ask directions.
- 2)etiquettes.
- 3)order meals
- 4)table manners.

## **DDYPBI3.1. Computational Biology II**

### **1. Scope :**

- Information theory and applications in Biology –Stochastic processes, Markov chains
- Introduction to biological databases- DNA protein databases-NCBI, Genbank, EMBL, DDBJ, Swissprot, PIR. Primary and secondary databases .
- Structural, genomic, cellular, microbial, expression and other related databases

- Methods to predict 3D structure of nucleic acids- rRNA
- Patterns, motifs, rules, consensus in sequences, profiles in Sequences. Secondary databases-prosite, Pfam, PRINTS.
- Predictive methods, pattern searching, evolutionary basis of Sequence analysis, SMART, PRODOM
- Exon-intron finder, sequence logo, gene finding, HMMs for motif searching, metabolic pathway data .
- Biodiversity and phylogenetic analysis (Maximum likelihood, parsimony, nearest neighbourhood methods etc.) .
- Human genome Project, microarray analysis, gene expression Profiling (Cluster analysis, location analysis, footprinting etc.)
- Comparative genomics .

## **2. Prescribed Text :**

- A Primer of Genome Science, 2nd Edition by Greg Gibson, Spencer V. Muse;Sinauer Associates Released: 01 December, 2004
- Fundamental Concepts of Bioinformatics by Dan E. Krane, Michael L. Raymer;Benjamin Cummings Released: 12 September, 2002
- Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, Third Edition;by Andreas D. Baxevanis, B. F. Francis Ouellette Wiley-Interscience;Released: 15 October, 2004
- An Introduction to Bioinformatics Algorithms (Computational Molecular Biology);by Neil C. Jones, Pavel A. Pevzner The MIT Press;Released: 01 August, 2004

## **DDYPBI3.2 Concepts in computing and Programming**

### **1. Scope :**

- Fundamentals of computing.
- Introduction to operating systems. WINDOWS, UNIX / LINUX
- Comparative advantages of security (hacking, cracking) Installation
- Portability and programming of operating systems
- Computer viruses- An Introduction .
- Elements of programming in C – Pointers, Pointers to functions.
- Macros definition.
- Graphs, Data structure-linked list, stack, queue; binary trees, threaded binary trees; file handling, exception handling C.
- Use of Internet and world wide web, searches on Medline, bibliographic databases.
- Networking-LAN, WAN, MODEM, optical versus electronic networking, security of networks, firewalls.
- Network goals: applications of network, network structure and architecture.
- Hierarchical networks, Ethernet and TCP/IP family protocols, transport protocol design.
- UNIX: Unix architecture, Unix file system, Unix commands, Pipes and filters.
- Shell programming, Useful utilities, Vi editor, communication and networking.

### **2. Prescribed Text :**

- Let us C by Yeswanth Kaetkar VI Edition, 2004 BPB Publication
- Programming in C by E. Balagurusamy Tata McGraw Hill publication
- The complete reference C, fourth edition, 2002 by Schildt Tata McGraw Hill publication

- Computer Networks- fourth Edition by Andrew S. Tanenbaum Prentice Hall India 2003 Edition
- Linux in a Nutshell, Fourth Edition – Ellen Siever-Oreilly (2002)
- Computer Fundamentals III edition – Pradeep sinha & Priti sinha BPB publication(1999)

### **DDYPBI3.3. INTRODUCTION TO DATABASE SYSTEMS**

#### **1. Scope :**

- Data abstraction, data models, instances and schemes.
- ER model, entity and entity sets, relationships and relationship sets, ER diagrams, reducing ER diagrams to tables.
- Network data model basic concepts, hierarchical data model basic concepts
- Multimedia databases basic concepts and applications.
- Indexing and hashing, ISAM, B+ tree indexed files, B tree indexed files,
- static hash functions, dynamic hash functions, text databases, cluster analysis,
  - nearest neighbor search, search using stem numbers, search using text signatures.
- Introduction to distributed database processing.
- Oracle, SQL, Relational database design, oracle architecture, oracle objects
- tables, views, indexes, sequences, synonyms, snapshots, clusters.
- Database – table space, datafiles, blocks, extents, segments.
- Oracle background processes, PMON, SMON, LWGR, CKPT,
- oracle instance, startup, shutdown/Init. Ora.control files, oracle memory management – SGA, rollback segments, redo logs/archival, transaction control and locking/dead lock, security, grants, roles, privileges.
- Oracle reports – reports features, full integration with forms and.
  - graphics, data model and layout editors.
- Layout objects – frames, fields, boiler plate, anchor, interface Components, report formats, example reports, single query, Multi query, matrix, master-detail etc.,

user defined columns, PL/SQL interface/ triggers, packaged procedure, Calling report from a form.

- Menu – default menus, custom menus, menu objects, menu
- module, main menu, individual menus, sub menus, menu items, menu editor, PL/SQL in menu modules, menu security.
- **Visual Basic**
- An introduction to computers and Visual Basic
- Problem solving .
- Fundamentals of programming in VB.
- General procedures
- Decisions.
- Repetition.
- Arrays Sequential files1
- Sequential and Random Access files. .
- Introduction to Graphics
- Additional control and objects.
- Database management
- Object oriented programming .
- Communicating with other applications .

## **2. Prescribed Text :**

- Complete reference Visual basic by Tata McGraw Hill publication.
- Database system concepts by Hanery korth and Abraham.
- Parallel and distributed databases by Wilteach *et al.*
- Introduction to database systems by J.M. Martin.

## **DDYPBI3.4. STRUCTURAL BIOINFORMATICS I**

### **1. Scope :**

- Type of interaction: Conformational principles
- Conformational space: Type of movements: vibration, rotation, translation .

- Torsion angle, Ramachandran Plot- An introduction
- Different levels of protein structural organizations- primary, secondary, tertiary and quaternary.
- Nucleic acids – Introduction, structure of DNA – types-structure and function, carbohydrates-Introduction, monosaccharides, oligosaccharides, polysaccharides, structure and function
- Internal and external co-ordinate system
- Generation of co-ordinates of biopolymer in Cartesian and cylindrical
- co-ordinate system.
- Potential energy calculations using semiempirical and Quantum
- mechanics, potential energy function
- Electrostatics energy surface generation.
- Methods to predict secondary structures of biopolymers
- Methods to predict three-dimensional structure of proteins and nucleic acids using dynamic programming methods

## **2. Prescribed Text :**

- Biophysical Chemistry by Charles, R., Cator and Paul, R., Schimmel, wW.H
- Bioinformatics: A practical guide to the analysis of genes and proteins by Baxevanis
- Computational molecular biology. Sources and methods for sequence analysis by Lesk A.M.
- Introduction to computational molecular biology by Setubal J., Meidanis.
- Proteome research new frontiers in functional genomics by Wilkins M.R., Williams K.L, Appel

## **DDYPBI3.5. NUMERICAL METHODS AND ENERGY OPTIMIZATION TECHNIQUES**

### **1. Scope :**

Errors involved in the construction of mathematical of the real physical process

- Errors in the numerical approximation of the mathematical Model (truncation errors)
- Errors in the actual computation using a computer (round off errors)..
- **Minimization or Maximization of Functions:**
- Golden Section Search in One Dimension, Parabolic Interpolation and Brent's Method in One dimension, One – Dimensional Search with First Derivatives. Downhill Simplex Method in Multidimensions, Direction Set (Powell's) Methods in Multidimensions, Conjugate Gradient Methods in Multidimensions.
- **Randomized\_Minimization Techniques:**
- Monte-Carlo Minimization
- Simulated Annealing
- Genetic Algorithms
- **Fourier Transform:.**
- Fourier Transform of Discretely Sampled Data, Fast Fourier Transform (FFT)
- **Integration of Ordinary Differential Equations:**
- Runge -Kutta Method, adaptive stepsize control for Runge – Kutta, Modified Midpoint Method, and other related methods. Methods to solve stiff equations.

## 2. Prescribed Text :

- Introductory methods of numerical analysis Prentice hall of India by Sastry S.S
- Numerical methods for Engineers with personal computer applications by Chopra S.C Raman and P.Canale.
- International student Edition numerical methods in science and engineering by Venkatraman M.K

## DDYPBI3.6 Molecular Biology

### 1. Scope :

- **DNA Replication :**
  - Enzymes in replication : Gyrase, Helicase, Topoisomerase,
- DNA polymerase I, II and III, DNA ligase.

- Replication fork : events at replication fork, termination of replication
- Types of replication : D loops, rolling circle replication, uni and
- bi-directional replication.
  - Replication of Eukaryotic chromosomes : Multiple forks
- in eukaryotic DNA
- Nucleosomes:
  - Structure: Subunits, core particles, Histone octamer, Super
- coiling and periodicity of DNA.
  - Path of nucleosomes in fibre, Organisation of histone
- octamer, regulations of domains.
- Operons Regulation.
  - Lac operon
  - Trp operon
  - Catabolite repression
- Transcription :
- *Prokaryotic*
  - Enzymes (RNA pol.6 + core factor), Promoter recognition .
  - Transcription factors .
  - Control of initiation, Termination and Poly A additions
- *Eukaryotic*
  - Enzymes (RNA pol sub units), RNA pol I: bipartite promoter,
    - RNA pol II: basal apparatus, RNA pol III: use of downstream
    - and upstream factors
  - Termination and cleavage reactions, Rho dependent and
    - independent terminations .
  - Regulation of transcription in prokaryotes and eukaryotes.
- **Translation:**
- tRNA: Translational adaptor.
- Ribosomes: Translational factory : ribosomal sites of action,
- structure of ribosome, mRNA as template.

- Models during translation.
- Initiation factors, Elongation factors, Translocation and
- Termination
- Comparison of translation in prokaryotes and eukaryotes
- Regulation of Translation in prokaryotes and eukaryotes.
- Recombination and Repair:
- Homologous recombination, Non reciprocal, Site specific recombination, Illigetemate recombination
- Excision, Mis match, SOS, Eukaryotic repair system
  
- *Genomes Sequestered in Organelles*
- Organelle genomes: Chloroplast Mitochondria.
  
- *Apparatus for Nuclear Splicing*
- Lariat formation.
- Spliceosomes and SnRNAs and SnRNPs
- Alternative splicing and junctions and Cis and trans splicing.
- Yeast tRNA splicing involves cutting and rejoining.
  
- Mobile DNA:
- Transposon : IS modules, TnA, Ds, P elements, Tn 10.
- Replicative and non replicative models of transporitin : Transposase and resolvase.
- Multiple Controls and Hybrid dysgenesis.
- Reterovirus and Retroposons : Transduction of cellular sequences,
  - Yeast Ty elements, Viral and non-viral super family.
- Recovery of DNA, plasmid, from electrophoretic gels.
- Immobilization of nucleic acids and hybridization analysis.

## 2. Prescribed Text :

- 1.Molecular Biology; David Freifelder, Narosa Publishing House,2<sup>nd</sup> edition (2004)
  - 2.Microbial Genetics; David Freifelder, Narosa Publishing House, 2<sup>nd</sup> edition(2004)
  - 3.Principles of Gene Manipulations; S. B. Primrose, R. M. Twyman, R. W. Old, Blackwell Science,6<sup>th</sup> Edition (2003).
  - 4.Gene VIII; Benjamin Lewin; Oxford Univ. Press ,8<sup>th</sup> edition (2004)
  - 5.Advanced Molecular Biology ;R. M. Twyman, 1<sup>st</sup> Edition , (2003)
- 6.Instant Notes on Molecular Biology; P.C. Turner, A. G. McLennan, A. D. Bates & M. R. H. White, 2<sup>nd</sup> Edition (2002)

# **MBA in BIOINFORMATICS**

## **SEM IV**

### **DDYP4.1 INTERNATIONAL BUSINESS**

#### **1. Objectives**

- To focus on emerging business environment in India and the world.
- To bring out the importance of international business; and to analyze global business principles and practices with reference to various Indian firms.

#### **2. Scope**

- Considering the importance of International Business in general and that of products and business practices in Indian environment in particular, the course will flow in many parallel streams.
- While lectures and concept elaboration will constitute the mainstream, class seminars, article review and projects will form the other pedagogic streams. Lectures will be conducted in the form of discussions to avoid monologue, and class-participation would be generated, whenever necessary. The following aspects of international business would be covered along with other contemporary issues:
  - Introduction to International Business
  - Major Decisions in International Business
  - International Business Environment and Assessing Political Risks
  - Barriers to International Trade
  - Methods of Entering International Business
  - International Strategic Alliance
  - Strategy-making in International Business Management: Achieving
  - Competitive Advantage

#### **4. Prescribed text**

- Strategic International Marketing
- Philip R. Cateora (Homewood I.L. : Dow Jones – Irwin)
- International Marketing – Analysis and Strategy
- Sak Onkvisik and John J. Shaw (P.H.I.)
- Global Strategies (Harvard Business Review)
- International Business : A Strategic Management Approach Alan Rugman
- International Management: Concept and Cases

- Takur, Burtan and Srivastava

## 5. References

- International Business
- James Taggart, Michael Dermott (Prentice Hall India, New Delhi)
- International Business, Issues and Concepts - Reed Moyer
- International Business: Dryden -Czinkota Ronkainen Moffett
- International Business – Charles W.L. Hill – Richard D. Irwin, Inc.
- The Essence of International Business – Prentice Hall India, New Delhi – Taggart/McDermott
- International Business – Macmillan Business – Edgar P. Hibbert
- International Business – The Challenge of Global Competition – Irwin – Ball/McCulloch
- The dynamics of International strategy – Thomson Press – Susan Segal/David Faulkner

## DDYP4.2 ENVIRONMENT MANAGEMENT & ETHICS IN BUSINESS

### ENVIRONMENT MANAGEMENT

50 Marks

#### 1. Objectives

- To provide the candidates the knowledge on the emergence of strategic options for environmental decision making.
- To provide the skills to prepare corporate environmental and social reports for the triple bottom line.
- To provide the foundations for corporate governance –non-financial implications and the significance of environmental governance and best practices.

#### 2. Scope

- Overview of the nature and significance of emerging environmental issues and trends with specific reference to the developing countries.
- Major industrial and other environmental disasters like Bhopal Tragedy and their long lasting impact and the need to regulate the environmental activities-sector wise impacts
- Global Environmental issues and the role of national government as signatory and participatory bodies.
- Discussion on International conventions like Earth Summit and similar other developments and their significance in policy formulation and policy enactment.

- Industrial Pollution- types of industrial pollution, - Air pollution, Water pollution, soil pollution, Noise pollution, Role of the industries in managing the industrial pollution.
- Corporate environmental responsibility, pollution prevention, Total Quality Environmental Management, ISO 14000 EMS certification.
- Role of the Government in managing the environmental activities in all sectors. Organisational set up in the Central and state level to manage the environment.
- Regulatory and legal instruments available for Environmental Management & Specific Environmental Laws.
- Garbage disposal and management, solid waste management options for waste minimisation.

### **3. Prescribed text**

- Environment Management by Dr. (Smt.) Bala Krishnamoorthy, Prentice Hall of India, new Delhi, 2006 Environmental Laws, Kailash Thakur.

### **4. References**

- Environment planning and management in India Vol. I by Sapru R. K
- Environment planning and management in India Vol.II by Sapru R. K
- Human Health and Environment by Sinha A.K.
- Handbook of environmental health and safety by Koren H.
- Environmental issues and Themes by Agarwal S.K.
- Environmental Divide: The Dilemma of Developing countries by Das R.C. and Others
- Encyclopaedia of environment, pollution, planning and conservation: State of India's environment: (A set of 6 volumes) by Trivedi
- Earth summit 2002: A new deal by Dodds Felix
- Economics of the Environment: Selected readings by Stavins Robert N.
- Business Today Survey on Green Corporation
- Journal of Down to earth published by Centre for science and education

### **6. Internet References**

- [www.unep.org](http://www.unep.org)
- [www.sdn.org](http://www.sdn.org)
- [www.envifor.nic.in](http://www.envifor.nic.in)
- [www.cpcb.nic.in](http://www.cpcb.nic.in)
- [www.worldbank.org/nipr/india](http://www.worldbank.org/nipr/india)
- [www.teriin.org](http://www.teriin.org)
- [www.narmada.org](http://www.narmada.org)
- [www.sanctuaryasia.com](http://www.sanctuaryasia.com)
- [www.undp.org](http://www.undp.org)
- [www.iema.net](http://www.iema.net)

## **ETHICS IN BUSINESS**

**50 Marks**

- Evolution of thought of Ethics in Business
- Culture and Ethics – Overview of Ethics Value Systems, Attitudes, Beliefs & Life Patterns
- Social and Economic Values and Responsibilities
- Trusteeship Management – Gandhian Philosophy of Wealth Management
- Ethics and Indian Management
- Ethics and Decision making
- Corporate Social Responsibility of Business
- Ethical Aspects of Corporate Policy
- Corporate Governance
- Morality and Rationality in Formal Organisation
- Moral Relationship between Individual and Organisations
- Relationship between Ethics and Corporation Excellence
- Approaches for developing various orientate towards Ethical Business Behaviour.
- Case Studies

**Prescribed Text :**

### **DDYP 4.3 MANAGEMENT CONTROL SYSTEMS**

#### **MANAGEMENT PLANNING AND CONTROL SYSTEM**

**242 BUP**

##### **1. Objectives**

- Developing a conceptual understanding of planning and control systems in functional areas of management. Operations Planning and Control systems, Finance Planning and Control, Resources Planning and control. Strategic planning in a dynamic business environment

##### **2. Scope**

- Understanding strategies, Perspectives of management control systems – basic concepts, boundaries of management controls, goals, concepts of corporates and business unit strategies.
- Economic Value added EVA.
- Organizational hierarchies and behavior – goal congruence, informal factors that influence goal congruence, types of organizations and formal control system, functions of the controller.
- Responsibility centers -responsibility center revenues, expenses and investment center, administrative support, and R&D center.
- Responsibility Budgeting –Case studies.

- Profit center, profit centers for control and decentralization – case studies
- Transfer pricing, objectives, cost, market and margin based methods, pricing, corporate services and administration of Profit centers.
- Measuring and controlling of Assets.
- Operations strategies, Resources Management, Aggregate planning, Master Operations Schedule, Planning Material Requirement, MRP, MRP II, Capacity Planning & Control
- Services planning and control systems
- Design of Continuous, Flow Systems, Intermittent Systems, Job Scheduling, Flexible Manufacturing System, Group Technology, CAD / CAM / CIM
- Theory of Constraints, Project planning and control, event planning.
- Technological Innovations in Operations. Financial goal setting
- Analysis of Incremental ROI
- Concept and Technique of Responsibility Budgeting
- Sensitivity Analysis & Developing financial goals along organizational hierarchy

### 3. Prescribed text

- Management Control Systems by Anthony and Govindarajan –Tata McGraw - Hill 9th edition, 1998
- Operations Planning and Control by Vollman, Berry and Whybark

### 4. References

- Management control systems Text and Cases Sharma, Subhash
- Management Text and Cases – Dearden John and Anthony Robert N.

## **DDYP4.4 FOREIGN LANGUAGE**

### **Theory:-**

#### **1)Clothes**

\*male

\*female

#### **2)Toiletries.**

#### **3)Travelling**

\*train

\*ship

\*bus

\*taxi

#### **4)Hotel reservations.**

**Grammar:-**

- 1)Future Proche.
- 2)Pass? Recent.
- 3)Reflexive verbs.

Verbes:- Tenir, Remplir, R?pondre, ?crire, lire, connaitre, conduire.

**Conversation Skills:-**

- 1)Booking a room in a hotel.
  - 2)Photo description.
  - 3)Railway station
- \*vocabulary
  - \*conversation.

## **DDYPBI4.1. PERL PROGRAMMING**

### **1. Scope :**

- Introduction and Installation1
  - Your first program in perl1
  - Data types: Arithmetic and Logical operators.1
  - Conditionals and Loops.2
  - List and Arrays2
  - Working with files.3
  - Regular Expression and Pattern Matching2
  - Hashes2
  - Functions and Subroutines2
  - Advanced features in Perl: Advanced functions and operators, files and Directories, System Interaction, Using Perl's command line tool, References and Structures, Using Modules .5
  - Using Perl for CGI.3
- **Application of Perl in Biotechnology:**
  - Transcription1
  - Translation 1

- Finding the repeat sequence .1
- Finding Motifs 1
- Inter conversions of different sequence file formats.2
- Generation Random DNA.2
- Analysis of DNA sequence 2
- Separating and annotation.2
- Parsing annotation arsing2
- PDB file 2
- Parsing BLAST output .2

## 2. Prescribed Text :

- Perl in nutshell -Ellen silver –Oreilly publications(1999)
- Perl cookbook -Tom Christiansen - Oreilly publications(1999)
- Perl in 24 hours –Clinton pierce - SAMS(2000)
- Solution and examples for Perl Programmers by Nathan Torkington and Tom Chistiansen
- Network Programming with Perl 1st Edition by Lincoln Stein.

## DDYPBI4.2. MOLECULAR MODELING AND DRUG DESIGN

### 1. Scope :

- Introduction to the concepts of molecular modeling. Molecular structure and internal energy
- Application of molecular graphics
- Energy minimization of small Molecules
  - Empirical representation of molecular energies.
  - Use of force fields and the molecular mechanics method
  - Local and global Energy minima- An introduction
- The techniques of molecular dynamics and Monte Carlo.
- Simulation for Conformational analysis.
- *Ab initio* and semi empirical method.

- Macromolecular modeling.
- Design of ligands for known macromolecular target sites
- Drug – receptor interaction. SAR/QSAR studies
- 2-D and 3-D data base searching,3
- Pharmacophore identification and novel drug design.
- Finding new drug targets to treat disease, new drug targets for cancer.
- Structure-based drug design, enzyme inhibition strategies

## **2. Prescribed Text :**

- Molecular modeling principles and applications;By Andrew R Leach Wiley (2004)
- Foundations of Systems Biology by Hiroaki Kitano ; MIT Press (2000)
- A Primer of Genome Science, 2nd Edition by Greg Gibson, Spencer V. Muse;Sinauer Associates Released: 01 December, 2004
- Fundamental Concepts of Bioinformatics, by Dan E. Krane, Michael L. Raymer;Benjamin Cummings, Released: 12 September, 2002
- Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, Third Edition;by Andreas D. Baxevanis, B. F. Francis Ouellette, Wiley-Interscience, Released: 15 October, 2004
- An Introduction to Bioinformatics Algorithms (Computational Molecular Biology);by Neil C. Jones, Pavel A. Pevzner, The MIT Press,Released: 01 August, 2004
- Microarray Bioinformatics,by Dov Stekel,Cambridge University Press;Released: 08 September, 2003
- Structural Bioinformatics (Methods of Biochemical Analysis, V. 44);by Philip E. Bourne, Helge Weissig, Wiley-Liss,Released: 07 February, 2003
- Bioinformatics: Sequence, Structure and Databanks: A Practical Approach;by Des Higgins, Willie Taylor, Oxford University Press,Released: 15 October, 2000
- Support Vector Machines: Theory and Applications (Studies in Fuzziness and Soft Computing,by Lipo Wang, Springer,Released: August, 2005

- Bioinformatics. Hidden Markov Models of Bioinformatics (Computational Biology);by Timo Koski,Kluwer Academic Publishers,Released: 01 May, 2002

### **DYPBI4.3. JAVA BASICS**

#### **1. Scope :**

- Working with basics .
- Data types, Variables and Arrays .
- Operators
- Conditions and loops.
- Introduction to classes and Methods.
- Inheritance.
- Packages and Interfaces.
- Exception Handling.
- Multithreading .
- Streams and IO .
- JAVA applets basics .
- Graphics, Fonts and colour .
- Simple Animation and Threads
- Managing Simple Events and Interactivity
- Creating User Interfaces with AWT .
- Windows, Networking and other Titbits.
- Modifiers, Access Control and Class Design
- Java Programming Tools
- Working with Data Structures and Java
- Bio Java: Writing the Programs based on basic .
- problems in Biotechnology.

#### **2. Prescribed Text :**

- Programming with Java - A Primer by E. Balaguruswamy ; Prentice Hall - 2004
- Building Java Applets for Netscape 2.0 - Tim Ritchey ;O'Reilly - 2002

- Hooked on Java - Arthur Van Hoff; O'Reilly – 2003
- Internet World 60 Minute Java - Ed Tittel ;WROX - 2004
- Learning Java by Patrick Niemeyer, Jonathan Knudsen - O'reilly – 2003

#### **4. Internet References**

- <http://www.sun.com/>
- <http://www.biojava.org>

#### **DDYPBI4.4. BIO MARK UP LANGUAGES**

- **HTML**- Introduction ., Frames, Forms, Tables, CSS.
- **XML**- Introduction., Document type definition, XSD, XSLT, DOM.
- **CML**- Introduction, Validation file., JchemPaint, Applications
- **BSML**- Introduction, Validation file., Genome XML Viewer, Applications

#### **2. Prescribed Text :**

- HTML Unleashed – Rick Darnell, SAMS publication(2003)
- HTML & XHTML: The Complete Reference IV edition (Osborne Complete Reference) -Thomas Powell; Tata Mcgraw Hill publishing company limited (2002)
- HTML for the World Wide Web with XHTML and CSS: Visual QuickStart Guide, Fifth Edition - Elizabeth Castro(2003)
- HTML and XML for Beginners 1<sup>st</sup> edition (2000) - Michael Morrison Microsoft Press
- XML in nutshell –Elliotte Rusty Harold-Oreilly 2001

#### **4. Internet References**

- [www.cml.org](http://www.cml.org)
- [www.xml.org](http://www.xml.org)
- [www.bsml.org](http://www.bsml.org)

#### **DDYPBI4.5 - VISUAL PROGRAMMING CONCEPTS, BASIC WEB SCRIPTS & WEB PROGRAMMING**

- OS Management with Window Server 2000

- Database Management with SQL Server
- Principles of GUI design and ergonomics
- GUI Programming with VB
- MS Web Development Tools
- XML Fundamentals
- Scripting Technology and Application
- Web Programming with Advanced Java
- Java Trends with ASP
- Software Engineering
- Component Technology with COM/ DCOM

#### **DDYPBI4.6. FINAL PROJECT**

The student will work independently on a project in one of the areas of Bioinformatics management in the final year of their M.B.A. program. They will work under a Faculty Advisor for the entire year and publish a thesis.

