COURSE CODE:	MTT 309
COURSE TITLE:	SUMMER TRAINING REPORT
COURSE OBJECTIVES:	The objective of this course is to enable students to • develop and relate theory to practice • help themselves in making an informed career choice after exposure to the actual work environment • observing the systems, processes, interactions and human relations in the organization • get an opportunity to understand the expectations of industry • prepare themselves for final placements.
REFERENCES:	**Evaluation:** Student presentations would be organised based on their on-the-job training reports. Presentations would be organized according to a predetermined schedule. A panel of teachers would evaluate the presentations, draft reports and participations. They would give students feedback on their summer training reports. Based on feedback, students would submit a final report which would be evaluated by an external/internal examiner, nominated by the University, out of 100 points.

Course Matrix:

Course Code	Course Title	L	T	P	Hours Per Week	Credit	CIA	MSE	ESE	Total
MTT 309	Summer Training report	0	0	0	0	3	0	0	100	100

L : Lecturers per week , T : Tutorials per week ,P : Practical per week ,CIA: Continuous Internal Assessment ,MSE : Mid Semester Exam, ESE : End Semester Exam

000107

COURSE CODE:	MTT 310
COURSE TITLE:	Viva Voce
COURSE OBJECTIVES:	There shall be an oral examination at the end of third semester of the programme that will test student on his comprehension of the subject knowledge acquired during the first semester of learning.
EVALUATION	This comprehensive oral examination would be evaluated by a panel of external/internal examiners, nominated by the University, out of 50 points. This viva would cover whole curriculum of first semester of programme and general understanding of tourism business

Course Matrix:

Course Code	Course Title	L	T	P	Hours Per Week	Credit	CIA	MSE	ESE	Total
MTT 310	Viva Voce	0	0	0	0	3	0	0	100	100

L : Lecturers per week , **T :** Tutorials per week ,**P :** Practical per week ,**CIA:** Continuous Internal Assessment ,**MSE :** Mid Semester Exam, **ESE :** End Semester Exam

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FOURTH SEMESTER									
Course Code	Course Title	L	T	P	Hours Per Week	Credit	CIA	MSE	ESE	Total
*MTT 401	Dissertations: Project Report and Presentation	0	0	0	0	4	0	0	100	100
**MTT402	On-the- Job Training: Report Presentation	0	0	0	0	6	0	0	200	200
MTT403	Comprehensive Viva Voce	0	0	0	0	6	0	0	200	200
	Total					16				500
	Grand Total									3400

Legends:

L:- Lectures per week T: Tutorials per week P: Practical per week CIA: Continuous Internal Assessment

MSE: Mid Semester Exam   ESE: End Semester Exam

NOTE:-

*MTT 401- The Internal mentors shall be allocated to the students in 3rd Semester for the guidance of the Dissertation and students needs to submit their report before going for the OJT in 4th Semester.

**MTT402- OJT is the compulsory course and will be of at least 4 months

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COURSE CODE:	MTT 401
COURSE TITLE:	DISSERTATIONS: PROJECT REPORT AND PRESENTATION
COURSE OBJECTIVES:	The objective of this course is to enable students to develop an aptitude of research aptitude; the course shall develop the ability and expertise from where to conduct a review/situational/observational analysis of the tourism industry.
COURSE CONTENT :	The guidelines and detailed instructions to complete dissertations will be given by the mentors allocated by the Department.
Evaluation	This report would be evaluated by an external/internal examiner, nominated by the University, out of 100 points.

COURSE CODE:	MTT 402
COURSE TITLE:	ON-THE- JOB TRAINING: REPORT PRESENTATION
COURSE OBJECTIVES:	The objective of this course is to enable students to • develop and relate theory to practice • help themselves in making an informed career choice after exposure to the actual work environment • observing the systems, processes, interactions and human relations in the organization • get an opportunity to understand the expectations of industry • prepare themselves for final placements.
REFERENCES:	**Evaluation:** Student presentations would be organised based on their on-the-job training reports. Presentations would be organized according to a predetermined schedule. A panel of teachers would evaluate the presentations, draft reports and participations. They would give students feedback on their training reports. Based on feedback, students would submit a final report which would be evaluated by an external/internal examiner, nominated by the University, out of 200 points.

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COURSE CODE:	MTT 403
COURSE TITLE:	Comprehensive Viva Voce
COURSE OBJECTIVES:	There shall be an oral examination at the end of fourth semester of the programme that will test student on his comprehension of the subject knowledge acquired during the two years of learning.
EVALUATION	This comprehensive oral examination would be evaluated by a panel of external/internal examiners, nominated by the University, out of 200 points. This viva would cover whole curriculum of degree programme and general understanding of tourism business

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Annexure-IX

Department of Human Resource Management & Organizational Behavior

Tab-II, Central University of Jammu,

E-Extension, Sainik Colony, Jammu-180011

COMPARATIVE ANALYSIS OF ACCEPTED AND PROPOSED SCHEME OF SYLLABUS III SEMESTER

APPROVED SCHEME OF SYLLABUS

Course Code	Course Title
301	Summer Project Report
302	Labour Legislation
303	Compensation Management
304	Human Resource Information Management
305	Global Human Asset Management
306	Organisation Development and Change
307	International Business
308	Team Building and Leadership

PROPOSED SCHEME OF SYLLABUS

(CORE COURSES)

Course Code	Course Title
MHRM 301	Industrial/Organizational Psychology
MHRM 302	Strategic Human Resource Management
MHRM 303	Strategic Compensation Management
MHRM 304	Labour Laws and Legal Aspects of Human Resource
MHRM 305	Personal Effectiveness and Self Leadership
MHRM 306	Summer Project Report
MHRM 307	Viva Voce

(ELECTIVE COURSES) (Any two)

Course Code	Course Title
MHRM 308	International HRM
MHRM 309	Managerial Competencies and Career Development
MHRM 310	Power Dynamics and Impression Management in Organizations
MHRM 311	Team Building and Leadership
MHRM 312	Managing Diversity

(BOUQUET COURSE)

Course Code	Course Title
MHRM 375	Business Environment and Corporate Ethics

Course code: : MHRM-301   **Contact Hours/Week: 4Hrs**

Course Title: Industrial/Organizational Psychology

Objectives

The purpose of this course is to familiarize and equip the students with the applications of psychological principles and techniques to minimize the problems related to work

Unit I

Concept of Industrial Psychology:

Nature, Scope, Aims and Objectives of Industrial Psychology, History and development of the field of Industrial Psychology, Growth and Development of Industrial Psychology in India, Major problems of Industrial Psychology

Unit II

Testing in Organisations and Job Analysis

Significance of Psychological Tests in Industries and Organizations, Approaches of Psychological Testing, Psychological Testing-Aptitude, Personality, Interest and achievement Tests,

Job Analysis: Concept, Uses, Job Analysis Procedures, Job Psychograph, Composite Job Psychograph

Unit III

Hawthorne Studies- Experiments on illumination, Relay assembly test room, Mass interviewing programme, Bank Wiring Observation Room, Personnel Counseling, Implications and Criticism of Hawthorne Studies

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Attitude: Need and Importance of studying attitude in Industry, Consequences of unfavorable attitude, Measurement of attitude

Unit IV

Job Satisfaction, Industrial Morale and Counseling:

Job Satisfaction: Determinants and measurement

Industrial Morale: Determinants, measurement, Methods of increasing Industrial Morale

Counseling: Types and functions, Counseling with special groups at work like handicapped, aged, women.

Unit V

Men and Machines:

Industrial accident: Causes, Reduction and Prevention of Accidents

Industrial Fatigue: Nature, Measurement, Causes and Mitigation of Fatigue

Ergonomics: Concept and Importance.

Human Engineering: Importance and Problems

* Case studies related to entire topics are to be taught

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include simulation, case studies, role plays and games.
- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested Readings:

- ➤ Blum & Neyler , Industrial Psychology, Sage Publications , New delhi
- ➤ Ghosh ,P.K. ,Industrial Psychology, Himalya Publications , New Delhi
- ➤ Schein E.H., Organisational Psychology, Prentice Hall Inc.

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- Prem Kr. Ghosh ,Industrial Psychology Management , Anmol Publications Pvt. Ltd.

- Sharan A.K. ,Encyclopedia of Industrial Psychology, Anmol Publications Pvt. Ltd.

- Jucius, J.Michael : Personnel Management. Richard D Irwin Inc: Illinois

- Ghiselli, Edwin E. Snd Brown C.W. Personnel and Instruct psychology. McGraw -Hill Book Co. Inc: New York

- Dunnette M.D. and Hough, L.M. Handbook of Industrial and Organizational Psychology. Vol. 2 and 3, Jaico Publishing House: Delhi

- Schultz & Schultz, Psychology and Work Today. Pearson Publishers; 8th Ed.

- Miner, J.B., Industrial- Organisation Psychology. Tata McGraw Hill
- Riggio, Industrial/Organisational Psychology. Prentice Hall India; 4th

MBA -Human Resources Management (HRM)
III Semester

Course code: MHRM-302

Course Title: Strategic Human Resource Management   Contact Hours/Week: 4Hrs

Objectives

Paper has been designed such that it acquaints the students with the basic understanding about human resource strategic processes in the organization. The course also develops an understanding of the concepts, frameworks and strategic issues in Human Resource Management

UNIT I

Strategic Intent and Vision, Mission and Objectives, Nature and Scope of Strategic Management, Process of Strategic Planning and Implementation, Strategic Human Resource Management: Concept, Need, Process, Aims, Approaches, The 5P Model of SHRM, Criteria for Sustainable Competitive Advantage and Limitations of SHRM.

UNIT II

Global Human Resource Environment, Strategy Formulation: Corporate Level Strategy, Business Level Strategy, Functional Level Strategy, Characteristics of HR Strategy, Process of Strategic Formulation, Formulation of HR strategy.

UNIT III

Strategy Implementation: Aspects and Issues in Strategy Implementation, Roles in Strategic HRM- Role of Top Management, Role of HR Director, HR Specialist and Role of Front-line management.

UNIT IV

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UNIT V

Organization HR Strategies- Strategies for Organizational Development, Cultural Management Strategies, Change Management Strategies, HR Strategies in Globalization, HR Process Restructuring: Virtual Organizations

* Case studies related to entire topics are to be taught

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include simulation, case studies, role plays and games.

- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested Readings:

- ➢ Michael Armstrong, "Strategic Human Resource Management", Kogan Page India Pvt. Ltd.

- ➢ Charles R. Greer., "Strategic Human Resource Management", Pearson Education Asia, Delhi, 2001

- ➢ Azhar Kazmi, Business Policy; Tata Mc Graw Hill Publishing Co. Ltd. New Delhi

- ➢ P.K. Ghosh: Strategic Planning and Management- Sultan Chand & Sons; New Delhi

- ➢ Goswami and Sitlani, Strategic Human Resource Management, RBD Publication, Jaipur

- ➢ Thompson & Strickland: Strategic Management- Concepts and Cases; Tata Mc Graw Hill Publishing Co. Ltd. New Delhi; 12th Ed. 2001

- ➢ Ramaswamy and Namakumari: Strategic Planning- Formulation of Corporate strategy: Mc Milaan India Ltd. New delhi

Anjali Pathrania

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Course Code: : MHRM- 303   **Contact Hours/Week: 4Hrs**

Course Title: Strategic Compensation Management

Course Objective: To acquaint the students with strategic dynamism of compensation management and its role for achieving competitive advantage, contemporary issues related to compensation.

Unit I

Employee Compensation Management. Concept, Process of determining, Economic and behavioral Issues. Wage concepts Minimum Wage, Fair wage, Living Wage Compensation - Introduction, Forms of pay, Significance of Employee Compensation.

Unit II

Pay model, Steps in developing a total compensation strategy internal alignment – determining the structure Job analysis – Job based approach, job analysis procedures, Job evaluation – concept, methods of job evaluation, Person based structures – skill plans, skill analysis, competency analysis, perfect structure.

Unit III

Salary survey: how to design the survey, interpretation of survey results, Employee contribution – Pay for performance plans, specific plans – short term, Team incentive plans, long term incentive plans, Performance appraisal – role & importance in compensation decisions.

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Unit IV

Employee benefits – key issues in benefit planning, Components of benefit plan, administering the\benefit program Benefit Options Role of union in wage & salary administration –impact of union in wage determination, alternative reward system.

Unit V

International Pay Systems, Legal and taxation issues in Compensation, Compensation of special groups (Executive Directors, scientists and engineers), Payment of Gratuity act 1972, Payment if PF act 1952.

* Case studies related to entire topics are to be taught

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include simulation, case studies, role plays and games.
- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested reading

- ➢ Milkovich& Newman, Compensation, Tata McGraw Hill Ed. 2008Other Specific Book:
- ➢ Bhattacharyya Dipak; Compensation Management, Oxford Higher Education.
- ➢ Murlis and Armstrong, Reward Management, Kogan Page Publishers, 2007
- ➢ Compensation: What's the Big Secret?, Tom Krattenmaker, Harvard Business Publishing Newsletters, Oct 01, 2002.
- ➢ The Coming Battle over Executive Pay , Karen Dillon, Harvard Business Review, Sep 01, 2009.

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- Six Dangerous Myths About Pay, Jeffrey Pfeffer, Harvard Business Review, May 01, 1998.

- Performance Appraisals with More Gain, Less Pain Peter L. Allen, Harvard Business Publishing Newsletters, Mar 01, 2003.

- E-Pay Changes Compensation--Forever (Guest Column), Patricia K. Zingheim, Jay R. Schuster, Harvard Business Publishing Newsletters, May 01, 2000

- How Much Should an Executive Make?-Stephen F. O'Byrne, et.al. , HBR, May 22, 2009

MBA -Human Resources Management
III Semester

Course Code: MHRM-304   Contact Hours/Week: 4Hrs

Course Title: Labour Laws and Legal Aspects of Human Resource

Course Objective: The purpose of this course would be to develop an understanding of the labour laws as the legal aspects of HR have a pervasive impact on business activities. Decisions of HR executives frequently raise issues which should be carefully evaluated as to their legal consequences before they are implemented.

The specific objectives are as follows:

- To enhance the understanding of the students vis-à-vis application of labour laws related to employment, labour welfare, wages and bonus, specific situations and social security
- To expose the students with the administration of labour laws in India and to equip them with the necessary tools to apply the law to a given a set of facts

Unit I Introduction

Introduction to labour legislation: Need for studying labour legislation, Principles of labour legislation, brief history of labour legislation in India, Labor Welfare: concept, agencies of labor welfare in India, types of labour welfare services

Unit II Laws Related to Labour Employment

Industrial Disputes Act 1947: objective, scope, basic provisions of authorities under this act, Rules governing layoff, strikes, lockouts under ID act 1947, Major provisions of Employment Exchange Act, 1959, Contract Labour Act, 1970

Unit III Laws related to Compensation

Major provisions of Payment of Wages Act, 1936; Major provisions of Payment of Minimum Wages Act, 1948; The Payment of Bonus Act, 1965

Unit IV Laws related to specific situations

The Bonded system Act, 1976, The Sales Promotion Employee Act, 1976, The Child Labour (Prohibition and Regulation) Act, 1986

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Unit V Social Security Laws and ILO

Social Security: concept and constituents: social insurance, social assistance and public services; Social security in organised sector in India: Employees State Insurance Act, 1948: objective, scope, coverage, benefits, role of ESI Corporation and ESI Hospitals, Maternity benefit Act, 1961: objective, coverage, benefits, penalties; Social security in the unorganized sector in India: Major provisions of the Unorganised Workers' Social Security Act, 2008

International labour organization (ILO): Scope, objectives, membership structure of ILO. International labour Conference (ILC)

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include cases based on apex court decisions that relate to labour laws
- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested reading:

- ➤ Misra, S. N. Labour And Industrial Laws, Central Law Publications
- ➤ Padhi, P. K.; Labour And Industrial Laws; PHI, New Delhi, 4th ed. 2007
- ➤ Srivastava, S. C. Industrial Relations and Labour Laws, Vikas Publishing House Pvt. Ltd.
- ➤ Sarma, A.M., Aspects of Labour Welfare and Social Security, Himalaya Publishing House. 2008
- ➤ Sinha P. R. N, Industrial Relations, Trade Union and Labour Legislation, Pearson Education. 4th impression 2009
- ➤ Sarma, A.M., Industrial Relations – A conceptual and legal frame work
- ➤ Saharay, H.K. Industrial and Labour laws of India

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MBA -Human Resources Management (HRM)
II Semester

Course code: MHRM-305   **Contact Hours/Week: 4Hrs**
Course Title: Personal Effectiveness and Self-Leadership

Objective:
To identify the course participants strengths and weakness as a person and a member of group or organization using personality typing

UNIT I

Introduction to Neuro Linguistic Programming (NLP); History and Origins of NLP; Foundations of NLP; Presuppositions of NLP- Basic rules, beliefs and understanding; Sensory Acquity ; Concept of Internal Maps

UNIT II

Mirroring and Matching; Rapport Building ; Concept of Psychgeography; NLP Techniques – Anchoring, Pacing and Leading, Reframing and Metaphor

UNIT III

NLP Modeling; Milton Model; Representational systems and Predicates; Meta Model; Mapping Across- Unresourceful states to Resourceful states; Fears vs. Phobia; Resolving Fears;

UNIT IV

TA and Self Awareness, Concept of script, Winners and Losers, Structural Analysis, Life positions, Transactions, Games and Strokes, Life Script. TA Application in Motivation, Leadership and Team work. TA in counseling.

UNIT V

Introduction to Emotional Intelligence; Models of Emotional Intelligence – Ability Model, Mixed Model and Trait Model; Cultural Intelligence – Concept, Dimensions and Importance; Social Intelligence .

Note:

- ❖ Teaching Pedagogy besides classroom .... include simulation, case studies, role plays and games.

- ❖ Teaching- Learning Process will invo... 20% input from ... who demonstrated excellence in the area i.e. Practioner's view will b... incorporated.

BOOKS / REFERENCES

1. Essential Neuro Linguistic Programming .... Amanda Vickers, Steve Bavister, Tata McGraw Hills (ISBN: 978 ....

2. Selling with NLP ,Kerry l.Jhonson, Nich... ....ealey Publish... ...N: 978-1-85788-047-2)

MBA -Human Resources Management (HRM)
III Semester

Course Code: : MHRM-308   **Contact Hours/Week: 4Hrs**

Course Title: International HRM

Course Objective:

Globalization, growing presence of multinationals with expatriate managers, cross border mergers and acquisitions and increasing diversity of workforce demands human resource to be more sensitive to cross-cultural issues and understanding of international approaches to dealing with people in organizations.

Unit I

Introduction to Global HRM, Model of IHRM, variables that moderate differences between HRM and GHRM. Factors influencing the global work environment.

Unit II

HR Planning; Staffing in International Business: HCNs, PCNs, TCNs, Recruitment & selection for international projects, Challenges of employees selection for international assignments; Dual – career couples

Unit III

Global Training and development: Training strategies, Developing staff through international Assignment, Challenges of training employees for overseas assignments, standardization and adaption of work practices,

Unit IV

Compensation Strategy; International compensation: key components of an international compensation programme, Flexibilty and Worklife Balance , Employee Relations and communication

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Unit V

Managing IHRM, Talent Management, employee Branding, Global Knowledge Management Strategies Global HRM trends and future challenges

* Case studies related to entire topics are to be taught

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include simulation, case studies, role plays and games.

- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested reading

- Dowling, P.J. and Welch, D. E. International Human Resources Management.4th ed. CENGAGE Learning. 8th ed. (2010)

- Ashwathappa K, & Dash, S. (2008). International Human Resources Management, Tata McGraw Hill, New Delhi.

- Edwards, T. & Rees, C. (2006). International Human Resources Management. Pearson Education

- Rao, P. S. (2009) International Human Resources Management. Himalaya publishers

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Course code: MHRM-309   Contact Hours/Week: 4Hrs

Course Title: Managerial Competencies and Career Development

Objectives

> Appreciate the importance of career strategies in a rapidly changing environment

> Develop an awareness of various career orientations and strategies of individual career planning.

> Develop an understanding in designing appropriate systems of organisational career development.

UNIT I: Introduction to Managerial Competencies

Meaning, Definitions, Concept of Competencies, Evolution of Competencies, Categorization of Competencies - Generic Competencies, Managerial Competencies, Technical, Functional, Human Competencies, Core Competencies, Behavioral Competencies, Threshold Competencies. Business Competencies, HRD Competencies, Competencies in Career Development, Assessment Centre Approach to Competence Building.

UNIT II: Identification of Career Opportunities in Various Industries

Industry scenario and identifying career opportunities, Key position competencies at entry level in different industries and growth prospects, Career Recruitment / selection processes in various industries and companies, Career Paths, Career Transition and Plateauing, Succession Planning and Fast-Tracking, Dual-Ladder for Career Development

UNIT III: Career Development Process

Career Development: Theoretical Foundations, Concept of Career Anchor, Diagnostic instruments, Steps in Career Development, Career Counseling, Seeking, giving and receiving

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face-to-face feedback, Strategies for improving Managerial Competencies, Opportunities and tactics for developing Managerial Competencies

UNIT IV: Developing Skills for Career Prospects

How to succeed in interviews, Mock interviews and GDs, Special focus areas, Career Clusters, Role of Mentor in career development, Importance of Entrepreneurial and Leadership skills in Career Development, Becoming a Professional, Breaking-in Process, People, Relationships and Politics

UNIT V: Enhancing Learning through Experience Sharing

Mentoring for Employee Development, Career Development in a Changing Environment, Special Issues in Career Development, Experience sharing of Successful Industry Professionals, Entrepreneurs, Alumni and Career Specialists.

* Case studies related to entire topics are to be taught

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include simulation, case studies, role plays and games.
- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested Readings:

- ➢ Kolb, Osland, & Rubin (1995). Organizational Behavior, Prentice Hall
- ➢ Harnold R.Wallace (2004). Personal development for life and work, Thompson Learning ,India, New Delhi

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- Greenhaus (2004). Career Management , Thompson Learning, India, New Delhi

- Dubois, D., & Rothwell, W. (2004). Competency-Based Human Resource Management. Davies-Black Publishing

- Dubois, D., & Rothwell, W. (2000). The Competency Toolkit (Volumes 1 & 2). HRD Press

- Shandler, D. (2000). Competency and the Learning Organization. Crisp Learning.

- Wood. R., & Payne, T. (1998). Competency-Based Recruitment and Selection. Wiley

- Tripathi, PC, Human Resource Development, Sultan Chand & Sons, Delhi

- Gary Dessler, Human Resource Management, Pearson education India

- Edwin B. Flippo, U S (1979). Personnel Management, Mc Graw Hill Inc.

- T.V. Rao , HRD Missionary, Pearson Education India

MBA -Human Resources Management (HRM)
III Semester

Course Code: MHRM-310   **Contact Hours/Week: 4Hrs**

Course Title: Power Dynamics and Impression Management

Course Objective: Power and Influence in Organizations and Politics is to develop students understanding of power and techniques of analyzing influence processes. After students have completed the course, students will be able to identify more effectively the reasons for others' behavior and influence events toward the ends. Students will get acquainted what power means &the role it to plays in their career.

UNIT I

Understanding power dynamics; Bases of power, Formal and Informal sources; Power tactics and their contingencies; Power in groups; Politics: power in action. Distribution of power in society

UNIT II

Understand the role of resources in power dynamics; how power is exercised; barrier in acquiring and exercising power; distribution of power in crises and disasters; Effective and Ineffective use of power.

UNIT III

Leadership and Influence Process;- Explore the importance of interpersonal relationships in exercising influence; different types of relationship and their roles in the influence process; Leader's reputation and power ; Use of power in effective negotiation and conflict resolving

UNIT IV

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Ethical issues in the use and abuse of power;differences between men's and women's attitudes about and uses of power;discrimination and harassment in the workplace;role of information and language in power dynamics.

UNIT V

Impression Management an Overview;- Image building& Role of Impression in employee career; Understand the many forms of impression management—why they occur and how they function.Role of power on employee loyalty;

* Case studies related to entire topics are to be taught

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include simulation, case studies, role plays and games.
- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested reading

- ➢ David , Badham Power, Politics and Organizational Change Sage Publication
- ➢ W.Gilbert ; organization Power Politics , Tactics in organization Leadership Greenwood Publishing
- ➢ Leary, M. R. Self-presentation: Impression management and interpersonal behavior. Boulder, CO: Westview Press.

MBA -Human Resources Management (HRM)
III Semester

Course Code: MHRM-311   **Contact Hours/Week: 4Hrs**

Course Title: Team Building and Leadership

Course Objective: To discuss with students various aspects of leadership and Team Building and to develop basic understanding about the leadership and help in working as team members . To enhance one's own self-awareness and to be able to understand other to work effectively in Teams

UNIT I

Introduction to leadership, Leadership for building effective teams, Corporate Leadership. Compare and contrast Management of Leadership. Leadership and Leader Behavior, Leadership ethics.

UNIT II

Traits , Motives and Characteristics of Leaders , Leadership Approaches and Models , Leadership Theories , Trait, McGregor Theory , X and Y , SLT Theory , Value Based Leadership , Path Goal Theory , Leadership Member Exchange theory , Transformation Leadership Theory , Transactional Leadership Theory , Psychodynamic approach to leadership

UNIT III

Emotional Intelligence and leadership, Authentic leadership , leadership Experience from Indian corporate leaders ,Developing powerful persuasion strategies, Spiritual Foundations of leadership , Impression Management and formation .

UNIT IV

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Psychological Understanding for effective teams, Theory and Issues in Psychological testing, Aptitude testing –D.A.T, Personality assessment –Theoretical background, Self report Inventories. The M.M.P.I; Multifactor personality tests –The 16 PF; Projective techniques, The T.A.T, assessment centers.

UNIT V

Work teams, dynamics of work teams, Shared vision , Visionary leadership , Team Leadership , Leadership development for effective teams , Team Interventions

* Case studies related to entire topics are to be taught

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include simulation, case studies, role plays and games.

- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested reading

- ➤ Luthans Fred, Organizational Behavior ,McGraw Hill
- ➤ Covey ,S,Seven Habits of Highly Effective people
- ➤ Myers , Salma ,G Team Building for diverse work groups , Wheeler Publishing

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MBA -Human Resources Management (HRM)
III Semester

Course Code: : MHRM-312   **Contact Hours/Week: 4Hrs**
Course Title: Managing Diversity

Course Objective: To acquaint the students with global aspect of human asset management, various challenges and opportunities in cross cultural organization.

Unit I

Introduction to cross cultural management dimensions of culture, communication across culture, challenges of cross cultural Management, Globalization

Unit II

Negotiation across cultures, Negotiation framework, Negotiation styles in different countries, Negotiation process, Interpretation, Translation and Mediation

Unit III

Culture Influence on Motivation, Content theories of motivation and process theories of motivation .Cultivating a Global mindset, developing cross cultural skills

Unit IV

Leadership and global relevance.Leadership theories in other cultures .Leadership style in Europe , South east Asia and In middle east .HRM in Globalizing world

Unit V

Expatriate Management issues, Selection of expatriate, cross cultural training , ethics framework , ethical binding for global managers

* Case studies related to entire topics are to be taught

Note:

- ❖ Teaching Pedagogy besides classroom teaching will essentially include simulation, case studies, role plays and games.

- ❖ Teaching- Learning Process will involve 20% input from those who demonstrated excellence in the area i.e. Practioner's view will be incorporated.

Reference Books and Suggested reading

- Mead R, "International Management cross cultural dimensions

- Cross cultural Marketing, Robert Rugimbana&Sonny Nwankwo , Thomas Asia Pte. Ltd Singapore

- Alder N J, International Dimensions of Organizational Behavior , Kent Publishing
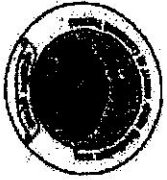
Department of Human Resource Management & Organizational Behavior

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COMPARATIVE ANALYSIS OF ACCEPTED AND PROPOSED SCHEME OF SYLLABUS

IV SEMESTER

APPROVED SCHEME OF SYLLABUS		PROPOSED SCHEME OF SYLLABUS	
Course Code	Course Title	Course Code	Course Title
		(CORE COURSES)	
401	Trade Unionism and Collective Bargaining	MHRM 401	Performance Management Systems and Strategies
402	Creativity and Innovation	MHRM 402	Training and Development
403	HR in Composite Cultural Environment	MHRM 403	Human Resource Information Systems
404	Sustainable Development and Corporate Sustainability	MHRM 404	Organization Development and Change
405	Stress Management	MHRM 405	Talent Management
406	Training and Development	MHRM 406	Viva Voce
407	Performance Management Systems and Strategies		**(ELECTIVE COURSES) (Any two)**
408	Strategic Human Resource Management	MHRM 407	Conflict Resolution and Collective Bargaining
		MHRM 408	Counseling, Coaching and Mentoring
		MHRM 409	HR in Composite Cultural Environment
		MHRM 410	Competency Mapping
		MHRM 411	Role of HR in Knowledge Management
			(BOUQUET COURSE)
		MHRM 475	Transformational Leadership and Group Dynamics

CENTRAL UNIVERSITY OF JAMMU

SUBJECT: M.Sc ENVIRONMENTAL SCIENCES

Semester III, Session - 2013-14

COURSE NO. MEVS 301

COURSE TITLE: Biodiversity and Conservation Biology

CREDITS: 4

OBJECTIVES:

The subject of biodiversity is of social, economic, biological and ecological concern, hence there is a need to prepare teacher taught who could bring awareness amongst the masses about biodiversity. The present course is designed to introduce students to the concept of classification, nomenclature and extant diversity of plants, animals and microbes. The role biodiversity plays in homeostasis of ecological system as well as sustenance of life. The course has been specifically designed to educate students about the human role, past and present, in exploitation and conservation of biodiversity.

BIODIVERSITY AND CONSERVATION BIOLOGY

Credits: 4
Course No. 301
Total Lectures: 60

Unit I

i. Introduction: Definition, History, components and importance of Biodiversity
ii. Biodiversity climatic zones ,resources of India
iii. Nomenclature and classification; International code of Zoological, Botanical(ICBN); bacteria and viruses
iv. An overview of classification of animals and plants
v. Biodiversity hotspots and their characteristic flora and fauna, threatened plants and animals of India

Unit II

i. Levels of Biodiversity (alpha, beta and gamma), gradients of biodiversity (latitudional, altitudional and insular)
ii. Ecosystem diversity: Mangroves, coral reefs, wetlands and terrestrial
iii. Species diversity: magnitude of biodiversity (global and Indian data) ,richness, evenness, loss of species, species diversity indices
iv. Genetic Diversity: sub species, breeds, race, variety and genes. Variation in genes and alleles; consequences of monotypic culture practice (agriculture)

Unit III

i. Threats to biodiversity:
   a. Natural processes (Mass extinction)
   b. Anthropogenic processes: Habitat destruction, fragmentation
   c. Exploitation and effect on target species
   d. Land use and its impact
ii. Ecosystem degradations influences on biodiversity (grassland, fresh water, coastal, agriculture)
iii. Impact of non-native or invasive species
iv. Population, metapopulation, extinction of local population, inbreeding; minimum viable population and extinction vortex.

Unit IV

i. Conservation history, practice and ethics
ii. Insitu and exsitu conservation, Red data book (IUCN Red list category)

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iii.   Gene bank (field gene bank and gene bank in India), seed bank, pollen, tissue and cryopreservation, sperm and egg bank, genomic resource bank).

iv.   Applications of Assisted Reproductive Technology in conservation of endangered species Bioprospecting (molecular techniques like RAPD, RFLP, AFLP, DNA sequencing)

v.   Organizations involved in environmental conservation: CITES, IUCN, WWF, UNEP, GREEN PEACE

Unit V

i.   Indigenous knowledge and biodiversity use value: biodiversity use, Direct: food, medicine, industrial, recreational and ecotourism; indirect: biocultural, biomedication, environmental modulation, ecosystem function, ecological series.

ii.   Case studies related to biodiversity conservation; honey bee, mushroom culture, neem tree, Tulsi

iii.   Traditional use and ecological value of indigeneous plants and animals

Suggested Readings:

1. Botkin, Daniel B. and Keller, Edward A. *Environmental Science: Earth as a Living Planet*. 6th ed. John Wiley & Sons, USA. 2007.

2. Enger, E.D. and Smith, B. F. *Environmental Science: A Study of Interrelationships*. 11th ed. McGraw Hill Inc., USA. 2006.

3. Frankel, O.H., Brown A.H.D. and Burdon, J.J. *Conservation of Plant Biodiversity*. Cambridge University Press, UK. 1995.

4. Gadgil, Madhav and Rao, P.R.S. *Nurturing Biodiversity: An Indian Agenda*. Centre for Environment Education, Ahmadabad, India.

5. Meffe G. K. and C. Ronals Corroll (1994) Principles of Conservation Biology, Sinaur Associates, Inc., Sunderland. Massachusetts.

Note to Examiner for End Semester Examination

End Semester Examination for the course will be of 100 marks and 3hour duration. It will comprise following three sections

Section A to contain 10 MCQs and all are compulsory carrying 1 Mark each.

Section B to contain 8 short answer questions of 6 Marks each. Any five are to be attempted.

Section C to contain 5 long answers questions with internal choice. Each question carries 12 Marks and should represent a unit, i.e., five questions with internal choice representing five units.

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CENTRAL UNIVERSITY OF JAMMU

SUBJECT: M.Sc ENVIRONMENTAL SCIENCES

Semester III, Session - 2013-14

COURSE NO. MEVS 302

COURSE TITLE: ECOTOXICOLOGY

CREDITS: 2

OBJECTIVES:

This course addresses issues concerning ecotoxicology and aims at acquisition of knowledge from both ecological and biochemical point of view. It provides a general understanding of toxicology related to environment. This course includes an overview of chemodynamics of contaminants in the environment including their fate and transport. It also focuses on the chemicals of environmental interest and how they are tested and regulated.

ECOTOXICOLOGY

Course Credits: 2
Course No. : 302
Total Lectures: 30

Unit I (9 Lectures)

i. Principles and importance of Toxicology/ Ecotoxicology
ii. Impact of environment on human health, Toxic chemicals in the environment: organic/ inorganic and radionuclides, pesticides, genotoxicity, and teratogenicity.
iii. Biological, chemical processes affecting toxic substances- biotransformation, bioaccumulation, biomagnifications
iv. Toxicant effects: cellular, tissue and organismic changes, population and ecosystem level effects, acute and chronic effects

Unit II (10 lectures)

i. Toxicology, epidemiology and occupational health
ii. Environmental carcinogens , mutagens and human adaptation to cold, hot climates, high altitude environments
iii. Global transport of chemicals: degradable and nondegradable toxic substances, food chain. Ecosystem influence on the fate and transport of toxicants
iv. Impact of toxic substances on human health- asbestos, lead, PCB's, pesticides

Unit III (11 Lectures)

i. Biotransformation of xenobiotics, Biochemical effects: uptake, biotransformation, detoxification, bioaccumulation; indices of toxicology
ii. Statistical concepts- LD_{50}, LC_{50}, concepts of dosimetry: lethal , sublethal and chronic tests
iii. Dose effect and dose response curves; Bioassays/ toxicity tests
iv. Hospital waste management, food toxicity and case studies like Bhopal gas tragedy, Japan nuclear disaster, Minamata Bay incident, lead toxicity in Ludhiana, Endosulphan toxicity in Kerala.

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Suggested Readings

1. Manhan, S. E. Environmental Chemistry. Lewis Publishers, New York
2. Levin, S. A. Ecotoxicology: Problems and Approaches. Springer-Verlag New York, LLC.
3. Carson and Rachel. Silent Spring. Botson, Houghton Mifflin.
4. Botkin, D. B. and Keller E. A .Environment Science: Earth as a living Planet, John Wiley & Sons Inc., New York.
5. Calow, P. Handbook of Ecotoxicology, Vol. No. I, Oxford, Blackwell Scientific Publications.

Note to Examiner for End Semester Examination

In two credit course,the End Semester Examination paper shall be of 50 marks ,2 hours duration and shall comprise following three sections:

Section A to contain 10 (Ten) MCQs and all are compulsory carrying 1 Mark each.

Section B to contain 6 short answer questions of 4 Marks each. Any four are to be attempted.

Section C to contain 3 Essay/long answers questions (atleast one question from each unit) with internal choice. Each question carries 8 Marks.

CENTRAL UNIVERSITY OF JAMMU

SUBJECT: M.Sc ENVIRONMENTAL SCIENCES

Semester III, Session - 2013-14

COURSE NO. MEVS 303

COURSE TITLE: Environmental Technology

CREDITS: 4

OBJECTIVES:

This course provides a comprehensive foundation in the green chemistry, nanotechnology together with modules in biotechnology and microbiology. There is continual green ethos throughout the course to stimulate students to become expert of sustainability by the provision of green and nano-technical modules. There are modules covering GMO, bio-mining, bio-piracy and Atom economy to ensure that students are fully up-to-date with the legal and technical aspects of these key topics.

Environmental Technology (Biotechnology, Microbiology and Nanotechnology)
Course No. MEVS-303
Course Credits: 4

Unit I

   i. Environmental Microbiology: definition, concept, scope and Importance
   ii. Classification and structure of Microorganisms (Fungi, Bacteria, Virus)
   iii. Microbes in Agriculture : bio-fertilizers
   iv. Food Microbiology - micro-organisms of food ,microbes in food production, Food spoilage – fish and meat, Food poisoning and its prevention
   v. Air Microflora: Microflora of atmosphere – different sampling techniques, identification of aeroallergens; Airborne diseases and allergies

Unit II

   i. Microbial Methods: Types of Culture, Techniques used in Enrichment of Culture, Method of Pure Culture, Preparation, Maintenance and Preservation of Microbial Culture (Pour plate, Streak plate and Spread plate) Sterilization and Disinfection,
   ii. Microbes and Environment: Role of microorganisms in natural system and artificial system; Influence of Microbes on the Earth's Environment and Inhabitants;
   iii. Ecological impacts of microbes; Microbes and Nutrient cycles; Microbial communication system; Quorum sensing; Microbial fuel cells; Prebiotics and Probiotics; Vaccines.

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iv. Environmental problems & Environmental monitoring through microorganism, microbiology of water, air and soil, microbes as pathological agent in plant, animal and man. Environmental Aspects of Infectious Diseases (Water Born Diseases),

Unit III

i. Environmental Biotechnology: definition, concept, scope and importance
ii. Genetic engineering, restriction endonucleases, properties of restriction enzymes, introduction of cloned genes into hosts using plasmid and phage vector systems, cloning of single stranded DNA, shuttle vector and environmental applications of genetic engineering
iii. Recombinants DNA technology, development of Genetically modified organisms microorganisms, GMO (transgenic plants and animals) for human welfare, consequences of GMOs on environment; issues realted to Bt brinjal and Bt cotton
iv. Polymerase chain reaction (PCR) and development of gene probes for environmental remediation;

Unit IV

i. Environmental Biotechnology for Environmental Protection: Scope of Biotechnology in Pollution Control,
ii. Use of GEMs for environmental remediation, Bioremediation: role of plants and microbes ;Phytoremediation (Metals and Organic)
iii. Integrated system for biodegradation of PCBs, halogenated hydrocarbons , PAHs, pesticides and detergents; biodegradable plastics production from microorganisms
iv. Role of biotechnology in reclamation of wasteland, Bioprospecting and biopiracy
v. Biocomposting: Microbial process involvement, biopesticides production, Biomining, biomethanation

Unit V

i. Nanotechnology: Introduction, scope and application
ii. Nanostructures, properties, metal nanoparticles, application in environmental remediation, Production of Green Nanotechnology based products
iii. Introduction, basic principles of Green technology; concept of Atom economy, Tools of Green Technology, Zero waste technology
iv. Biopolymers and Bioplastic

Suggested Readings

1. Scragg, A. H., Environmental Biotechnology. Oxford University Press.
2. Rittmann, B. E. and McCarty, P.L., Environmental Biotechnology: Principles and Applications. McGraw Hill.

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3. Evans, G.M. and J.C. Furlong. Environmental Biotechnology: Theory and Application. John Wiley and Sons Publication.
4. Microbiology 6th ed: Purohit, Agrobios
5. Global environmental Biotechnology : D. L. Wise
6. Methods in Biotechnology : Hans Peter Schmauder
7. Ratledge, C. and Kristiansen, B. Basic Biotechnology. Cambridge University Press, Cambridge.
8. Jjemba, P.K. Environmental Microbiology – Theory and Application. Science Pub. Inc., USA.
9. Olguin, C. J., Sanchez, G., Hernandez. E. Environmental Biotechnology and Cleaner Boprocesses. Taylor & Francis.

Note to Examiner for End Semester Examination

End Semester Examination for the course will be of 100 marks and 3hour duration. It will comprise following three sections

Section A to contain 10 MCQs and all are compulsory carrying 1 Mark each.
Section B to contain 8 short answer questions of 6 Marks each. Any five are to be attempted.
Section C to contain 5 long answer questions with internal choice. Each question carries 12 Marks and should represent a unit, i.e., five questions with internal choice representing five units.

CENTRAL UNIVERSITY OF JAMMU

SUBJECT: M.Sc ENVIRONMENTAL SCIENCES

Semester III, Session - 2013-14

COURSE NO. MEVS 304

COURSE TITLE: Environmental Pollution and Control

CREDITS: 4

OBJECTIVES:

The course has been designed to create awareness regarding pollutants and their effect. This course aims at introduction of different types of pollutants, their sources and the pollution caused by their release into the environment. The course also includes the effects of pollutants on the environment and human health. The course contains detailed study about the technology and methods being used for abatement of pollution caused by various sources and management aspect.

ENVIRONMENTAL POLLUTION AND CONTROL

Course No. 304
Course credits: 4
Total Lectures: 60

Unit I

i. Air Pollution: Types, sources and classification of air pollutants; gaseous pollutants and particulate matter (PM_{10}, $PM_{2.5}$).
ii. Air pollution due to automobile: sources, emissions from gasoline, Petrol and diesel powered vehicles exhaust emission.
iii. Effect of air pollution on plants, animals and human health.
iv. General methods of control of gaseous pollutants-scrubbers, condensers, control equipment for particulate matter-gravity settling chambers, cyclone, fabric filters, electrostatic precipitators, Hybrid filter(combination of ESP and Bag house)
v. Control of automobile sources of emissions

Unit II

i. Water Pollution: Types, sources and classification,
ii. industrial effluents characteristics of effluents from different industries (pulp and paper mills, oil exploration and refinery) water quality standards proposed by national and international agencies
iii. Estuarine pollution, marine pollution, Eutrophication – causes, effects and control measures
iv. Waste water characteristics-Domestic waste water, Sewage treatment: preliminary, primary, secondary and tertiary treatment; Biological treatment: biology of sewage treatment, process description of aerobic and anaerobic processes: aerobic fixed film bed reactor, anaerobic fluidized bed reactor, Upflow Anaerobic Sludge Bioreactor(UASB)

Unit III

i. Noise Pollution: Types, sources and consequences; measurement sound pressure level,
ii. impact of noise on human health, noise control and abatement measures
iii. Radio-active Pollution: Types, sources and consequences
iv. Biological effects of ionizing radiation's: the interactions of radiation's with cells – various stages, somatic and genetic effect; maximum permissible dose
v. Parameters affecting the radiation monitoring - personal monitoring equipment's; Disposal and management of radioactive waste

Unit IV

i. Sources of soil pollution-industrial effluents, fertilizers, pesticides, heavy metals And waste disposal
ii. Effects of soil pollutants on flora , fauna and ground water
iii. Solid-waste Pollution: Types, sources and consequences; Classification of wastes
iv. Effect of wastes on the water bodies (surface, ground and marine)

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v.   Waste management practices: Conversion of solid wastes to energy

Unit V

i.   Thermal pollution : Chemical and biological effects on aquatic environment
ii.   Thermal pollution from power plants and their control;
iii.   Biosensors to detect environmental pollutants
iv.   Oil pollution ;sources of oil spillage and impact, factors effecting fate of oil spillage
v.   E-waste : generation, sources, types and constituents; environmental consequences and management of E-waste

Suggested Readings

1. Introduction to Environmental Engineering and Science- Gilbert M Masters.
2. Environmental Engineering –Peavy and Rowe. McGraw Hill.
3. Environmental Engineering-Gerard Kiely (Tata McGraw-Hill Publishing Company
4. De, A. K. Environmental Chemistry. New age International (P) Ltd., New Delhi, India.2000
5. Baird, S.K. Environmental Chemistry. W. H. Freeman & Co.
6. Environmental pollution and Control-C. S Rao
7. Environmental Pollution Monitoring and Control: S. M Khopkar
8. Ecotechnology for Pollution Control and Environmental Management by Trivedy R. K. And Arvind Kumar

Note to Examiner for End Semester Examination

End Semester Examination for the course will be of 100 marks and 3hour duration. It will comprise following three sections

Section A to contain 10 MCQs and all are compulsory carrying 1 Mark each.
Section B to contain 8 short answer questions of 6 Marks each. Any five are to be attempted.
Section C to contain 5 long answer questions with internal choice. Each question carries 12 Marks and should represent a unit, i.e., five questions with internal choice representing five units.

CENTRAL UNIVERSITY OF JAMMU

SUBJECT: M.Sc. ENVIRONMENTAL SCIENCES

Semester III, Session - 2013-14

COURSE NO. MEVS 305

COURSE TITLE: Atmospheric Science and Climate Change

CREDITS: 2

OBJECTIVES:

This course aims to introduce the basic concepts of atmospheric science and their role in governing climate change and its implications. Along with the structure and composition of atmospheric layers, it includes the fundamental meteorological parameters and atmospheric processes, known for affecting the climate at local, regional and global level. It combines atmospheric science with climate change to understand extreme weather events like El-Nino, La-Nina, Tropical cyclones etc. It also covers the present status, mitigation measures and research programmes related to climate change at national and international level.

Atmospheric Science and Climate Change

Course No. 305
Course credits: 🔺
Unit I

 i. Atmosphere: evolution, Composition and Structure(Modern Views Regarding the Structure of the Atmosphere)

 ii. Earth Radiation Balance, Particles, Ions and Radicals in the Atmosphere.

 iii. Process of Heat Energy Transfer- Radiation, Conduction and Convection.

 iv. Hydrological cycle, Evaporation, Condensation, Forms of Condensation – Dew, Frost, Fog, Mist, Smog, Insolation Factors Affecting the Distribution of Insolation. Atmospheric Depletion of Solar Radiation.

Unit II

 i. Climatology: Definition Objectives and scope of Climatology, climate classification (Koppen and Thornwaite),Monsoon variability, jet stream, western disturbances

 ii. Cloud Formation, Classification of Clouds , cloud seeding, aerosol and its role in climate change

 iii. Components of climate system, paleoclimatology, external and internal causes of climate change, feedback processes

 iv. Impact of climate change on important sectors: agriculture, water , forest, biodiversity, health, IPCC, UNFCCC.

Unit III

 i. Meteorology: Definition, and Scope, Aims and Objectives of Meteorology.

 ii. Primary Meteorological Parameters and their Measurement—Temperature, Wind Direction and Wind Speed. Secondary Meteorological Parameters and their Measurement—Humidity, Relative Humidity, Absolute Humidity, Pressure and Solar Radiation.

 iii. Green House Effect, Effect on Global Climate, Consequences & Control. Implications of Climate Change, Monitoring, Assessment, Research and Prediction Programs. International and national effort to mitigate climate change

 iv. Extremes of Temperature and precipitation (Elnino, Lanina, cold/heat waves, flood/droughts, heavy rainfall), tropical cyclones, sea level rise

Suggested Readings
1. Byers, H R: General Meteorology
2. W. D. Sellers : Physical Climatology
3. Lamb: Climate Present, Past and Future

Note to Examiner for End Semester Examination

In two credit course, the End Semester Examination paper shall be of 50 marks ,2 hours duration and shall comprise following three sections:

Section A to contain 10 (Ten) MCQs and all are compulsory carrying 1 Mark each.

Section B to contain 6 short answer questions of 4 Marks each. Any four are to be attempted.

Section C to contain 3 Essay/long answers questions (at least one question from each unit) with internal choice. Each question carries 8 Marks.

Course Title: Real Analysis
Duration of Examination: 3 hours

Course Code: MAMT-107
Maximum Marks: 100

Unit-1

- Euclidean space $\mathbb{R}^n$, Open ball and open set in $\mathbb{R}^n$. Structures of open sets in $\mathbb{R}$, Closed sets, Adherent and accumulation points, Closure of a set, Derived set
- Bolzano's Weierstrass theorem, Cantor Intersection theorem, Lindeloff covering theorem, Heine-Borel theorem, Compactness in $\mathbb{R}^n$

Unit-2

- Definition and existence of Riemann-Stieltjes integral, Conditions for R-S integrability, Properties of the R-S integral, Integration and differentiation.
- Fundamental theorem of Calculus, Integration of vector valued functions, Rectifiable curves

Unit-3

- Sequences and series of functions, Pointwise and uniform convergence, Cauchy's criterion for uniform convergence.
- Weierstrass M-test, Abel's and Dirichlet's tests for uniform convergence, uniform convergence and continuity

Unit-4

- Uniform convergence and Riemann-Stieltjies integration, Uniform convergence and differentiation. Weierstrass approximation theorem.
- Power series. Uniqueness theorem for power series, Abel's and Tauber's theorems
- Functions of bounded variation, Continuous functions of bounded variation

Unit-5

- Functions of several variables, Linear transformations, Derivative of a real-valued function, Directional derivatives, Chain rule, Partial derivatives, Interchange of the order of the differentiation
- Higher order derivatives, Taylor's theorem , Inverse function theorem, Implicit function theorem, Jacobians, Extremum problems with constraints, Lagrange's multiplier method

Text books:

- T M Apostol, Mathematical Analysis, 2nd Edition, Narosa Publishing House, 2002.(For Unit-1)
- W Rudin, Principles of Mathematical Analysis, 3rd Edition, McGraw-Hill International Editions, 1976.

Reference books:

- H L Royden and P M Fitzpatrick, Real Analysis, 4th Edition, PHI Learning Private Limited, 2004.
- D Somasundaram and B Choudhary, A First Course in Mathematical Analysis, Corrected Edition, Narosa Publishing House, 2011.

As per the decision of the **academic council** meeting held on **13/05/2013** with regard to **item 14** : *Introduction of Integrated M.Sc. Computer Science--MCA programme*, the scheme of syllabi for **third year (semester 5 and semester 6)** for the students who were admitted in M.Sc. Computer Science in **previous** year (year **2012**) in order to extend their M.Sc. programme to MCA programme along with their detailed syllabi of M.Sc. 3rd and 4th semesters for their respective examinations to be held in years/months and which have been recommended by the **Adhoc Board of studies in Computer Science & IT** in its meeting held on **20th July, 2013** and as given in **annexure 1,** is submitted for approval.

M.Sc. Computer Science-MCA Integerated	For the examination to be held on	Valid upto (for failure/reappear candidates)
3rd Semester	Dec. 2013	Dec. 2014, Dec. 2015
4th Semester	June, 2014	June 2015, June 2016
5th Semester	Dec., 2014	Dec. 2015, Dec. 2016
6th Semester	June, 2015	June 2016, June 2017

Also the scheme of syllabi for integrated **M.Sc. Computer Science--MCA** programme for the students who have been admitted in the **current** year (year **2013**) along with their **detailed syllabi of 1st and 2nd semesters** for their respective examinations to be held in years/months as given below and which have been recommended by the **Adhoc Board of studies in Computer Science & IT** in its meeting held on **20th July, 2013** and as given in **annexure 2** is submitted for approval.

M.Sc. Computer Science/MCA	For the examination to be held on
1st Semester	Dec. 2013
2nd Semester	June, 2014
3rd Semester	Dec. 2014
4th Semester	June, 2015
5th Semester	Dec., 2015
6th Semester	June, 2016

The **elective courses** offered by the Department for the students of other department for semesters 1 to 4, as given in annexure 3, are also submitted for approval.

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Head,
Department of Computer Science
Central University of Jammu,
Jammu.

Department of Computer Science& IT
Central University of Jammu

Minutes of Meeting of Adhoc Board of Studies in Computer Science& IT

A meeting of Adhoc Board of Studies in Computer Science & IT was held on 20th July 2013 at 11.30 am in the meeting room of Central University of Jammu,Tab-II, Sainik Colony, Jammu.

The following were present:

1. Prof. S.D. Sharma, Convener
2. Prof. Devanand, Member Expert
3. Dr.Vinod Sharma – Expert from Jammu University
4. Dr.Pavinder Singh, Member Expert
5. Dr.Bhavna Arora, Member
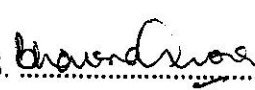6. Mr.Neerendra Kumar, Co-opted member
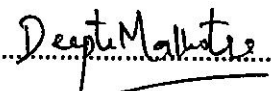7. Dr.Deepti Malhotra, Co-opted member
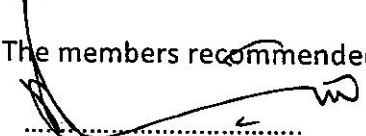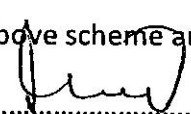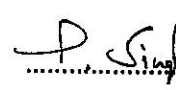
The following are the minutes of the meeting items:-

As per the decision of the **academic council** meeting held on **13/05/2013** with regard to **item 14** : *Introduction of Integrated M.Sc. Computer Science-MCA programme*, the board recommended the scheme of syllabi for **third year (semester 5** and **semester 6)** for the students who were admitted in M.Sc. Computer Science in **previous** year (year **2012)** along with their detailed syllabi of MSc third semester and fourth semesters. The final draft is enclosed as annexure 1.

The members of the Board also discussed the new scheme of MSc-MCA Integrated programme and deliberated on the detailed syllabus of the MSc-MCA-1st and 2nd semesters which is to be implemented for the students who are admitted in M.Sc. Computer Science-MCA programme in the current (year 2013). The final draft of the scheme and syllabi is given as annexure 2.

The Board also discussed the detailed syllabus of the bouquet courses of the Department.The final draft of is enclosed as annexure 3.

The members recommended the above scheme and syllabi for approval.

1. ....
2. ....
3. ....

4. ....P. Singh............
5. .....Neerendra.........
6. ....

7. .....Deepti Malhotra.....   000155

Semester V (for the examination to be held December 2014)
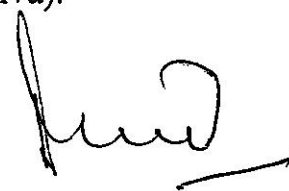
Course No	Course Title	Credits	Marks
MCSC-501	Object Oriented Programming	4	100
MCSC-502	Advance Database Systems	4	100
MCSC-503	E-Commerce	4	100
MCSC-504	Artificial Intelligence	4	100
MCSC-505	Lab (based on MCSC-501)	4	100
MCSC-506	Lab (based on MCSC-502)	4	100
	Elective course offered by other Departments	4	100
	Total	28	700

Semester VI (for the examination to be held June 2015)

Course No	Course Title	Credits	Marks
MCSC-601	Major Project	24	600
	Total		600

Evaluation of the Project

The project submitted by the students will be evaluated by Internal and External examiners. The internal examiner will evaluate for 200 marks (150 marks for project evaluation and project report and 50 marks for the project viva). The external examiner will evaluate for 400 marks (300 marks for project evaluation and project report and 100 marks for the project viva).

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Semester-III (for the examination to be held in December 2013)

Course No.	Title	Credits	Total Marks
MCSC-301	Theory of Computation	4	100
MCSC-302	Distributed computing	4	100
MCSC-303	Computer Graphics	4	100
	Elective-I	4	100
MCSC-305	Lab-I (based on MCSC-302)	4	100
MCSC-306	Lab-II (based on MCSC-303)	4	100
	Elective Course offered by other Department	4	100
	Total	28	700

Semester-IV (for the examination to be held in June 2014)

Course No.	Title	Credits	Total Marks
	Elective-II	4	100
	Elective-III	4	100
MCSC-400	Project	16	400
	Elective Course offered by other Department	4	100
	Total	28	700

Elective-I	
MCSC-311	Knowledge Based Systems
MCSC-312	Mobile Computing
MCSC-313	Software Quality Assurance & Testing
MCSC-314	Computer Based Optimization Techniques
MCSC-315	Information Systems
Elective-II & Elective-III	
MCSC-411	Image Processing
MCSC-412	Business Intelligent Systems
MCSC-413	Network Security
MCSC-414	Cloud Computing
MCSC-415	Open Source Technologies
MCSC-416	Simulation & Modelling
MCSC-417	Software Project Management
MCSC-418	Natural Language Processing
MCSC-419	Cryptography
MCSC-420	Numerical Computing

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Continuous Assessment = 25 Duration of the End Sem Examination: 3 Hrs
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100 **4 hours per week**

MCSC301 - THEORY OF COMPUTATION

UNIT I

Introduction:-Basic concepts of strings, Symbols, string Concatenation, alphabet, Language, Tree, States, Transition Tables,Sets,Relations, Finite Automata, Regular Expressions, Compilers and translators, structure of a compiler.

UNIT II

Finite State Systems: - Deterministic Finite Automata (DFA) and Non- deterministic finite Automata (NFA),Equivalence of the DFA and NFA,Converting NDFA to equivalent DFA,Minimization of DFA,Finite Automata with Output(Moore and mealy machines), Transformation of a Mealy Machine into a Moore Machine, FSM properties and limitations.

UNIT III

Regular Expressions: - Regular expression designing, Equivalence of finite Automata and Regular Expressions, Algebraic method using Arden's theorem Conversion of NFA with ε moves into an equivalent NFA without ε-moves, Construction of FA equivalent to a regular expression, Pumping lemma of regular sets, Closure properties of regular sets, Comparison of automata models, application of regular expressions and Finite automata.
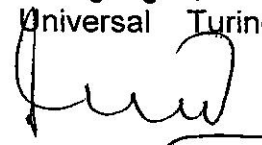
UNIT IV

Context free Grammars, Derivation Tree(Left and right Derivation), Ambiguous Grammar(Removal of Ambiguity in the CFGs), Grammar Simplifications: Reduced Grammar, Removal of ε productions from a Grammar, Nullable Symbols, Removing Unit Productions, Applications of Context- free Grammar
Normal Forms: Chomsky Normal Form, Greibach Normal Form, Chomsky Hierarchy, Regular Grammars and FA
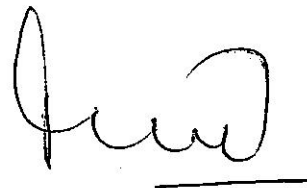
UNIT V

Pushdown Automata(PDA),Non-Deterministic PDA,Context-Free Grammars and Push-down Automata, Construction of a PDA from the Context-Free Grammar, Properties of Context-Free Languages,PDA with two Stacks.
Turing Machines: Turing Machine Model, Representation ,Non- deterministic Turing Machines, Recursive and Recursively Enumerable languages, Turing Machine Limitations(Unsolvability) ,Church's Hypothesis, Universal Turing machines, decidability, Halting problem. 000158

Text &Reference Books:

- Introduction to Automata Languages & Computation
- by A.V. AHO, J. E. Hopcreft & J.D. Ullman
- Introduction Theory of Computer Science
- by E. V. Krishna Moorthy
- K L P Mishra and N Chandrasekaran, "Theory of Computer Science ",Prentice Hall Inc,.2002.
- Theory of computer Science by Shirish S Sane
- Theory of Computation by Adesh K Pandey.

Continuous Assessment = 25
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100

Duration of the End Sem Examination: 3 Hrs

4 hours per week

MCSC302 -DISTRIBUTED COMPUTING

UNIT-I

Introduction: - Definition, Goals, Scope and issues of parallel and distributed computing, Hardware Concepts, Software Concepts, the Client Server Model, Layered Protocols. Characterization of Distributed Systems, Examples of distributed systems, Resource sharing and the World Wide Web, Challenges, System Models, Design issues and user requirements.

UNIT-II

Models Of Parallel Computing: Taxonomy of parallel structures, Control mechanism, Address-Space Organization, Interconnection connection networks: Static and Dynamic interconnection networks, evaluating static interconnection networks, embedding other networks (Linear Array, Mesh, Binary Tree) into a hypercube; Routing mechanisms for static interconnection networks: Store and Forward (SF) Routing; Cut - Theory (CT) Routing; Cost-Performance trade-off; Architectural Models for Parallel Algorithm design.

Basic Communication Operation: Simple message transfer between two processors; One-to-all broadcast; All-to-all broadcast; Reduction and prefix sums; One-to-all personalized communication; All-to-all personalized communication; circular shift.

UNIT-III

Models Of Distributed Computing: Mini computer model; Workstation pool model; Client-server model; Pool of processors model; Hybrid model.
Networking And Internetworking: Network technologies and Protocols related to distributed computing.
Inter process Communication: Sockets , Building blocks; Client-server communication; group communication; Case study: Inter processor communication in UNIX.
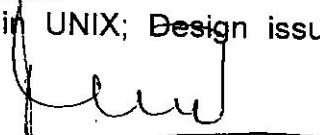
UNIT-IV

Networking And Internetworking: Network technologies and Protocols.
Inter process Communication And Remote Procedure Calling: The API for the Internet protocols, characteristics of inter process communication, Building blocks; Client-server communication; group communication.
Case study: Inter processor communication in UNIX; Design issues in Remote procedure calling
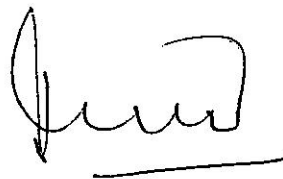
000160

UNIT-V

Consistency & Replication: Data Centric, Consistency Model, Distribution Protocols, Consistency Protocols, casually-consistent, Lazy replication.

Fault Tolerance: Basic Concepts, process, Resilience, Reliable Client- Server communication, Group Communication, distributed Commit, Recovery.

Text &Reference Books:

- Vipin Kumar, Ananth Grama, Anshul Gupta and George Karypis Introduction to Parallel Computing, Addison Wesley (2003) 2nd ed.
- George Coulouris, Jean Dollimore and Tim Kindberg; Distributed Systems Concepts and Design, Addison-Wesley (2000) 3rd ed.
- S G Akl, The Decision and Analysis of Parallel Algorithms, Prentice Hall (1989).
- Hwang, Kai, Advanced Computer Architecture: Parallelism, Scalability, Programmability, McGraw Hill (1992).
- J Jaja, An Introduction to Parallel Algorithms, Addison Wesley (1992).
- T G Lewis and H El Rewini; Introduction to Parallel Computing, Prentice-Hall (1992).
- M J Quinn,Parallel Computing: Theory and Practice, McGraw Hill (1994) 2nd ed.
- Distributed Systems: "Principles & Paradigms" by Andrew S. Tannenbaum, Martin Ransteen.
- Distributed Systems: "Concepts & Design" by Couloris G., Dollimore and Kindberg T, P.K.Sinha.

Continuous Assessment = 25   Duration of the End Sem Examination: 3 Hrs
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100   **4 hours per week**

MCSC303- COMPUTER GRAPHICS

UNIT –I

Introduction to Computer Graphics: Basics of Computer Graphics, Applications of computer graphics, Bitmap and Vector- Based Graphics,Random and Raster scan systems, Graphics input and output devices, Graphics software and standards,color models.

UNIT-II

Concept of Graphic Primitives: Coordinate system overview, points, lines, circles and ellipses as primitives. Line generation algorithms (DDA and Bresenhams),Circle and its properties, generation of circle (Bresenham's Method , midpoint algorithms), Point and Line clipping((cohen-sutherland, Liang-Barsky algorithms).

UNIT-III

Two-Dimensional transformations: Basic Transformations-Translation, Rotation, Scaling, Reflection, Shear Transformations, Combined Transformation, rotation about an Arbitrary point,inverse transformations

Three-dimensional transformations: Translation, rotation, scaling, rotation about an Arbitrary axis, reflection

UNIT-IV

Viewing Transformations: Introduction, objectives of viewing transformation. World Coordinates and Viewing Coordinates. Concept of projections: parallel projection, orthographic and oblique projections, isometric projections, perspective projections-concept of vanishing points, single point, perspective transformation, window-to-viewport transformations.

UNIT-V

Introduction to polygons and curves: Polygon representation methods -polygon surfaces, polygon tables, plain equation, polygon meshes. Hermite and Bezier curves and their properties.B-Spline Curves, Fractals and its applications.
Concept of visible surface detection. Methods of visible surface detection (depth buffer, scan line, area sub division)
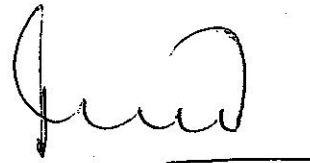
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Text &Reference Books:

- Hearn, D., Baker, and P.M.: Computer Graphics, Prentice-Hall.
- A.P Godse "Computer Graphics", Technical Publication.
- Rogers, D.F.: Procedural Elements for Computer Graphics, McGraw-Hill, 1985.
- Harrington, S.: Computer Graphics: A Programming Approach, TataMcGraw-Hill, 1983.
- Foley, J.D., Van Dam, A.: Fundamentals of Interactive Computer Graphics, Addison Wesley, 1982.
- Giloi, Wk.: Interactive Computer Graphics, Prentice-Hall, 1978.
- Tosijasu, L.K.: Computer Graphics, Springer Verlog, 1983.
- Rogers, D.F. McGraw Hill: Mathematical Elements of Computer Graphics,
- Newman, W., Sproul, R.F.: Principles of Interactive Computer Graphics, McGraw-Hill, 1980.
- Computer Graphics C Version, D.Hearn And P.Baker, Pearson Education
- Zhingang Xiang,Roy Plastock,Computer Graphics,Schaum's Outlines

Text &Reference Books:

- Rajendra A. Akerkar and Priti S. Sajja, Knowledge-Based Systems; Jones & Bartlett Publishers, 1st
- Edition, 2009
- A. Gonzalez and D.Dankel, "The Engineering of Knowledge-Based Systems" second
- Edition (Preprint), Prentice Hall, 2004.
- Introduction to Expert Systems (3rd Edition) by Peter Jackson; Addison Wesley Longman Publishing
- Company; January 1999.
- Artificial Intelligence: A Modern Approach (Latest Edition) by Stuart Russel, Peter Norvig, Prentice
- Hall.
- Artificial Intelligence: Structures and Strategies for Complex Problem Solving by George F. Luger,
- Benjamin/Cummings Publishing.
- The Engineering of Knowledge-Based Systems by A. Gonzalez and D. Dankel; 2nd Edition (Preprint),
- Prentice Hall, 2004.
- Expert Systems: Principles and Programming by Joseph C. Giarratano, Gary D. Riley;PWS Publishing

Continuous Assessment = 25   Duration of the End Sem Examination: 3 Hrs
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100

4 hours per week

MCSC312 –MOBILE COMPUTING

UNIT-I

WIRELESS COMMUNICATION FUNDAMENTALS: Introduction , Wireless transmission, Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread spectrum, Cellular Wireless Networks .

UNIT-II

MAC And Telecommunication System: MAC, Space Division Multiple Access (SDMA), Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Classical ALOHA, Slotted ALOHA, Reservation TDMA, Collision Avoidance, CDMA, Comparison, GSM-Mobile Services, Architecture, radio Interface.
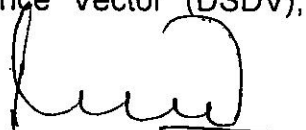
UNIT-III

TELECOMMUNICATION NETWORKS: Telecommunication systems – General Packet Radio Service (GPRS), Digital Enhanced Cordless Telecommunications (DECT), Universal Mobile Telecommunications System (UMTS), International Mobile Telecommunications 2000 (IMT2000).
WIRLESS LAN: Wireless LAN - IEEE 802.11 Family of Standards, Architecture, Services. BlueTooth Protocol Stack

UNIT-IV

MOBILE NETWORK LAYER :Mobile IP, Goals, Assumptions, requirement, Entities, Terminology. IP packet delivery, Agent advertising discovery, registration, tunneling,optimization,IPV6. Dynamic Host Configuration Protocol (DHCP), Routing Protocols – Destination Sequenced Distance Vector (DSDV), Dynamic Source Routing (DSR).

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UNIT-V

TRANSPORT AND APPLICATION LAYERS:TCP in Wireless Mobile Networks – Indirect TCP, Snooping TCP, Mobile TCP, Fast Retransmit/Recovery, Freezing, Selective Retransmission, Wireless Application Protocol (WAP), WAP 2.0, Wireless Transport Layer Security (WTLS),Wireless Transport Layer Security , telephony application .

Text &Reference Books:

- Jochen Schiller, "Mobile Communications", PHI/Pearson Education, Second Edition, 2003.
- (Unit I Chap 1,2 &3- Unit II chap 4,5 &6-Unit III Chap 7 Unit IV Chap 8- Unit V Chap 9&10.)
- William Stallings, "Wireless Communications and Networks", PHI/Pearson Education, 2002. (Unit I Chapter – 7&10-Unit II Chap 9)
- A. Mehrotra. GSM System Engineering. Artech House, 1997.
- Charles Perkins. Mobile IP. Addison Wesley, 1999.
- Charles Perkins (ed.) Adhoc Networks. Addison Wesley, 2000
-
- Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
- Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, New York, 2003.
- Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and Sons Ltd, 2002.

Continuous Assessment = 25
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100

Duration of the End Sem Examination: 3 Hrs

4 hours per week

MCSC-313 SOFTWARE QUALITY ASSURANCE & TESTING

UNIT-I

Software Quality concepts: Meaning and scope, software quality factors, software quality metrics, relationship between quality factors and quality metrics, quality management system,
Concepts of Quality Control, Quality Assurance, Quality Management - Total Quality Management; Cost of Quality; QC tools, Business Process Re-engineering - Zero Defect, Six Sigma, Quality Function Deployment, Benchmarking, Statistical process control.

UNIT-II

Software Testing Techniques: Testability and features of test cases, WBT, BBT, Ticking Box testing; static analysis, symbolic testing, program mutation testing, software testing strategies, alpha, Beta testing etc. Object Oriented Testing: Class Testing, GUI Testing, Object Oriented Integration and System Testing.

UNIT-III

Comparative evaluation of techniques: Testing tools; Dynamic analysis tools, test data generators, Debuggers, test drivers etc.
Software measurement: Fundamentals of measurement, Measurements in Software Engineering, Measurement of internal product attributes - size and structure, External product attributes - measurement of quality,
Technical Metrics for Software: Quality Factors, framework; Metrics for analysis, design, testing source code , Software Process, Project and Product Metrics, metrics for software maintenance.

UNIT-IV

Object Oriented Testing: OOT strategies and issues, Test Case design, interface testing.
Software Reliability: SW Reliability, validation, Software Safety and Hazards Analysis; Features affecting software quality, reliability modeling - Jelinski Moranda model, Musa's basic execution time model.

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UNIT-V

Software Quality Assurance: concept, importance and essence; FTR, structured walk through technique, correctness proof, statistical quality assurance, clean room software engineering.

Quality assurance models: ISO-9000 Series and SEI-CMM standards of software quality assurance. People Capability Maturity Model, Capability Maturity Model Integration, Malcolm Baldrige Award.

Text &Reference Books:

- Software Quality: Concepts and Plan, By Robert H Dunn, Prentice Hall International.
- Software Reliability: Measurement, Prediction and Applications, By John D Musa, McGraw Hill.
- Foundations of Software Testing, Mathur Aditya P., 2008, Pearson Education.
- Software Reliability Engineering by Michele R Lyu, McGraw Hill.
- Effective Methods of Software Testing, By William E Perry, Wiley.
- Concepts of Reliability, By L Srinath.
- Reliability Engineering, By K K Aggarwal Kluwer Academic Publishers.
- Software Reliability, By H Koptez.
- Software testing by Boris Beizer, Academic Press.
- The Art of Software Testing, 2e, by G.J.Myers, Wiley India Pvt. Ltd.
- Software Quality by Robert H.Dunn, Prentice Hall.
- Software Reliability by J. D. Musa, Okumota, Janino, McGraw Hill.

Continuous Assessment = 25
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100

Duration of the End Sem Examination: 3 Hrs

4 hours per week

MCSC314-COMPUTER BASED OPTIMIZATION TECHNIQUES

UNIT-I

Overview: Introduction to Operation Research, techniques, tools, phases, limitations and applications in OR.
Linear programming-I: (Graphical method) Introduction, Formulation of a linear programming problem with different types of constraints, requirements, assumptions, merits and demerits, applications of LP, Graphical analysis, Graphical solution, Multiple, unbounded solution and infeasible problems and its applications
Linear programming-II: (Simplex method (SM)) Introduction, SM with several decision variables. Two phase simplex method, M-method, multiple, unbounded solution, infeasible problems, Sensitivity and duality analysis in LP, Dual Simplex Problems.

UNIT-II

Transportation Problem (TP): Structure and formulation of TP, Procedure for TP, Methods for finding initial feasible and optimal solution, Unbalanced TP, maximization TP, degeneracy problems in TP.
Assignment Problem (AP): Approach, procedure and maximization, unbalanced assignment problems,Hungarian Method.
Project Scheduling: Network analysis concept, CPM/PERT methods for scheduling of projects.

UNIT-III

Sequencing problems: Processing n-jobs through two, three, M machines, Processing of n-jobs through M machines.
Replacement decisions: Replacement of items that deteriorate with time (with and without change in money value), Staff replacement problem.
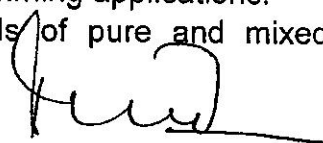
UNIT-IV

Integer and dynamic programming: Integer programming, formulation techniques, unimodularity, cutting plane method, branch and bound method.

UNIT-V

Dynamic programming: Methodology and its programming applications.
Game Theory:Basic terminology, solution methods of pure and mixed strategy games, principle of dominance, limitations.
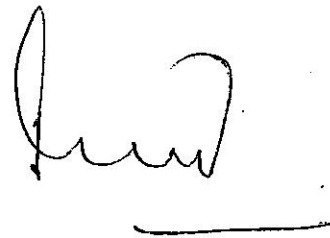
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Text &Reference Books:

- V K KAPOOR, Operations Research, Techniques for Management, Edition 7, Publishers: Sultan Chand and sons, 2004.
- S S Rao optimization theory and applications, Wiley Eastern Ltd., New Delhi.
- S.D.Sharma: Operations research, Kedar nath, Ram Nath & co.
- H.A.Taha, Operations Research-An introduction, Macmillan Publishing co.inc.New york
- Kanti Swarup, P K Gupta and Man Mohan, Operations Research, Sultan chand and sons, New Delhi.
- Prem Kumar Gupta and D.S, Hira, Operations Research-An introduction, S.Chand and Company Ltd, New Delhi.

Continuous Assessment = 25   Duration of the End Sem Examination: 3 Hrs
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100

4 hours per week

MCSC315- INFORMATION SYSTEMS

UNIT- I

Introduction to Information Systems: A Definition, Types of Information (Strategic Information, Tactical Information, Operational Information),Information Quality, Dimensions of Information (Economic Dimension, Business Dimension, Technical Dimension), System : Definition (Multiple Meaning of the Word 'System'); Kinds of Systems (Abstract and Physical Systems, Deterministic and Probabilistic Systems, Open and Closed Systems, User-Machine Systems), System Related Concepts (Boundary, Interface and Black Box, System Decomposition, Integration of Sub-Systems), Elements of a System, Human as an Information Processing System (Information Filtering, Human Differences in Information Processing, Implications for Information Systems).

UNIT -II
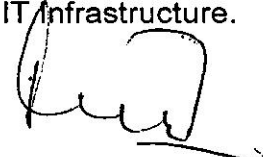
Information Systems Components: Data, Hardware, Software, Telecommunications, The factor affecting the value of information in organization: Completeness, Accuracy, Correctness, Timeliness etc.
The Information Processing Cycle: Acquisition, Input, Validation, Processing, Storage, Retrieval, Output, Communication and Disposal.
Types of information systems: Transaction processing system and its types, Office automation system (OAS) and its types, Management information system (MIS),Executive information system (EIS),Decision support system (DSS), Understanding Ethics Related To Information Systems , Information Privacy, Accuracy, Property and Accessibility, The Need of Ethical Behavior Computer Crimes and the Impact on Organizations.

UNIT -III

Information System Planning: Planning Terminology (Mission, Objectives, Strategies, Policies), The Nolan Stage Model, The Four Stage Model of IS Planning (Strategic Planning, Information Requirement Analysis, Resource Allocation, Project Planning), Selecting a Methodology, Information Resource Management (IRM), Organization Structure and Location of MIS.
Information Systems for Competitive advantage, and Primary Uses of Information Systems, Information Systems Roles in the Value Chain Making a Business, Case Business, Case Development ,Issues Assessing Value for IT Infrastructure.

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UNIT- IV

Approaches to information system development: The Traditional Systems Lifecycle Alternative System-Building Approaches (Prototyping, Application Software Packages & End-User Development), System Building Methodologies and Tools, Structured Methodologies, Object Oriented Software Development, CASE &RAD),Causes of IS Success and Failure, Ensuring System Quality.

Information System as an Enabler: Introduction, Changing Concepts of IS (Information as a necessary Evil, Information for General Management Support, Information for decision making, Information as a Strategic Resource); IS as an Enabler (Competitive advantage, Organizational Change, Organizational Learning).

UNIT- V

Information Systems Security and Control: Introduction to Information Security, Intruders, Intrusion Detection, Password Management, Malicious Software: Viruses and Related Threats, Virus Countermeasures, Firewalls: Firewall Design Principles, Trusted Systems.
Authentication, Authorization, Threats, Attacks, types of attacks, Cryptographic Techniques.

Text &Reference Books:

- Information Systems Today 2nd Edition by Leonard Jessup.
- Management Information systems :Organization and Technology,6th Edition by Kenneth C.
- Laudon
- Marakas, G.M. Decision Support Systems in the 21st Century. Prentice Hall, Upper Saddle River,
- NJ, 2003.
- D. Boddy, A. Boonstra, and G. Kennedy.," Managing Information Systems: An Organizational
- Perspective", 2nd Edition, Prentice Hall, 2004. D.
- K.C. Laudon. and J.P. Laudon.," Management Information Systems: Managing the Digital Firm",
- 8th Edition, Prentice Hall, 2004.
- E. Turban, E. McLean and J. Wetherbe," Information Technology for Management: Transforming
- Organizations in the Digital Economy", 4th edition, Wiley, 2004.
- Mudricm, R G , Ross J E , Clogget J R,"Information system for Modern Management", Printce Hall
- Effyoz, "Management Information System"Cengage Learning, New Delhi
- "Network Security" by Atul Kahatae

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CENTRAL UNIVERSITY OF JAMMU
M.Sc. (Computer Science)- MCA Integrated Programme

SCHEME OF M. Sc. (COMPUTER SCIENCE) -- MCA Integrated

COURSE STRUCTURE

Total No. of Credits = 136

Semester – I (for the examination to be held in December 2013)

Course No.	Title	Credits	Total Marks
MCSA101	Programming Methodology and C Language	4	100
MCSA102	Computer Organization And Architecture	4	100
MCSA103	Operating System	4	100
MCSA104	Database Management Systems	4	100
MCSA150	Laboratory- Practical's based on MCSA101 & MCSA104	8	200
	Elective course offered by other Departments	4	100
Total		28	700

Semester-II (for the examination to be held in June 2014)

Course No.	Title	Credits	Total Marks
MCSA201	Data structures using C	4	100
MCSA202	Object Oriented Programming Using C ++	4	100
MCSA203	Computer Networks And Data Communication	4	100
MCSA204	Discrete Mathematics	4	100
MCSA250	Laboratory- Practical's based on MCSA201 & MCSA202	8	200
	Elective course offered by other Departments	4	100
Total		28	700

Semester-III (for the examination to be held in December 2014)

Course No.	Title	Credits	Total Marks
MCSA301	Analysis & Design of Algorithms	4	100
MCSA302	Internet & Java Programming	4	100
MCSA303	Theory of Computation	4	100
MCSA304	Software Engineering	4	100
MCSA350	Laboratory- Practical's based on MCSA301 & MCSA302	8	200
	Elective course offered by other Departments	4	100
	Total	28	700

Semester-IV (for the examination to be held in June 2015)

Course No.	Title	Credits	Total Marks
MCSA401	Advanced Technology(.NET Programming)	4	100
MCSA402	Computer Graphics	4	100
MCSA403	Artificial Intelligence	4	100
	Elective-I	4	100
MCSA450	Minor Project	8	200
	Elective course offered by other Departments	4	100
	Total	28	700

Semester-V (for the examination to be held in December 2015)

Course No.	Title	Credits	Total Marks
MCSA501	Neural Networks And Genetic Algorithms	4	100
MCSA502	Data Warehousing And Data Mining	4	100
MCSA503	Network Security & Cryptography	4	100
	Elective-II	4	100
MCSA550	Laboratory- Practical's based on MCSA501,MCSA502 & MCSA503	8	100
	Elective course offered by other Departments	4	100
	Total	**28**	**700**

Semester-VI (for the examination to be held in June 2016)

Course No.	Title	Credits	Total Marks
MCSA-600	Major Project	24	600
	Total	**24**	**600**

Evaluation of the Project

The project submitted by the students will be evaluated by Internal and External examiners. The internal examiner will evaluate for 200 marks (150 marks for project evaluation and project report and 50 marks for the project viva). The external examiner will evaluate for 400 marks (300 marks for project evaluation and project report and 100 marks for the project viva).

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Elective-I	
MSCA411	Probability and Statistics
MSCA412	Numerical Computing
MSCA413	Microprocessors
MSCA414	Computer Based Optimization Techniques
MSCA415	Compiler Design
MSCA416	Information Systems
Elective-II	
MSCA511	Image Processing
MSCA512	Mobile Computing
MSCA513	Grid And Cloud Computing
MSCA514	Advanced Database Systems
MSCA515	Parallel Processing And Distributed Systems
MSCA516	Simulation And Modeling

Instructions for the Paper setter

The question paper for the end semester examination will be of 3 hours duration and shall be of 100 marks. There shall be 3 sections in all. Section A shall be of 10 minutes duration.

1. **Section A-** shall comprise of 10 (Ten) objective type (Multiple choice) questions of one mark each (2 from each unit). All questions in this section shall be compulsory **(Total 10 Marks)**.

2. **Section B-** shall have 8(Eight) short answer questions (SAQ), at least one from each unit, of 6 (six) marks each, out of which the examinees shall be required to attempt any 5(five) questions **(Total 30 Marks)**.

3. **Section C-** shall have 10 (Ten) long answer questions, two from each unit, and the examinees shall have to answer one question from each unit. Each question carries 12 marks **(Total 60 Marks)**.

M.Sc. (Computer Science) -- MCA Integrated - First Semester

FOR EXAMINATION TO BE HELD FROM DECEMBER 2013

Continuous Assessment = 25   Duration of the End Sem Examination: 3 Hrs
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100   **4 hours per week**

MCSA101 -Programming Methodology and C Language

UNIT – I
Introduction to problem solving and notion of algorithm: Flow charting, Pseudo code, Algorithms, Corresponding C-program, Testing the code; Fundamental data types in C: Integer, Short, Long, Unsigned, Character, Single and double precision floating point, Complex, Boolean, Constants; Basic input/ output in C: printf, scanf, eof errors.

UNIT – II
Operators and Expressions: Using numerical and relational operators, Mixed operands and type conversion, Logical operators, Bitwise operators, Operators precedence and associativity; Functions in C: Standard function, Defining a function, Inter function communication- Passing arguments by value, reference, recursion; Scope rules, Global variables.

UNIT – III
Conditional statements in C: If and Switch statements, if and else, nested if and else, Use of break and default with switch; Loops and iterations in C: while, do-while, for loops; use of break and continue; Arrays in C: Notation and representation, Manipulating array elements, Multi-dimensional arrays, arrays of unknown and varying size.

UNIT – IV
Structures in C: Purpose and usage of structure, Structure declaration, Assigning of structures; Pointers in C: Pointers and address arithmetic, Pointer declarations and operations, Pointers as function arguments, dynamic memory allocation.

UNIT – V
Sequential search, Sorting arrays, Strings, Text files; Standard C pre-processors: Defining and calling macros, Passing value to the compiler; Standard C library: File input/ output: fread, fopen, fwrite etc.; String handling functions, Math functions.

Text &Reference Books:
- Problem Solving and Program Design in C by Jeri R. Hanly, Elliot B. Koffman; Pearson Addison-wesely, 2006.
- Computer Science- A Structured Srogramming Approach Using C by Behrouz A. Forouzan, Richard F. Gilberg; 3rd Edition(India Edition), 2007.
- Balagurusamy, E., Programming in ANSI C, McGraw-Hill
- Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison Wesley.
- Yashwant Kanetker, Let us C, BPB
- Norton, Peter, Introduction to Computer, McGraw-Hill
- Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World
- Rajaraman, V., Fundamentals of Computers, PHI
- Rajaraman, V., Computer Programming in C, PHI

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M.Sc. (Computer Science)--MCA Integrated - First Semester

FOR EXAMINATION TO BE HELD IN DECEMBER 2013

Continuous Assessment = 25
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100

Duration of the End Sem Examination: 3 Hrs

4 hours per week

MCSA102- Computer Organization and Architecture

UNIT – I
Number System: Binary, Octal, Hexadecimal and Decimal, 1's and 2's Complements, Interconversion of numbers. Codes: BCD Code, Character codes – ASCII, EBCDIC, Gray code. Binary Addition, Binary Subtraction, Signed Numbers, Addition /Subtraction of numbers in 2's compliment notation, Binary Multiplication, Binary division, Floating point representation of numbers, Arithmetic operations with normalized floating point numbers.

UNIT – II
Binary Logic: Boolean algebra, Boolean functions, Truth tables, Canonical and Standard forms, Simplification of Boolean functions, Digital logic gates.
Boolean Expressions- Variables and Literals, Boolean Expressions–Equivalent and Complement, Theorems of Boolean Algebra, Minimization Techniques, SOPs & POSs forms, Karnaugh Map Method.
Sequential circuits and its types, Flip-Flops, Latches, Registers and Counters.

UNIT – III
Combinational Circuits, Implementing Combinational Logic, Arithmetic Circuits –Basic Building Blocks, Adder- Subtractor, BCD Adder, Magnitude Comparator, Parity Generator and Checker, De-multiplexers and Decoders, Encoders, Read Only Memory (ROM), Programmable Logic Array (PLA).
R-S Flip Flop,J.K Flip Flop, Master-slave Flip Flops, T-flip Flop, D-flip Flop.

UNIT – IV
Synchronous Counter, Modulus of a Counter, Ripple Counter, Propagation Delay in Ripple Counters, Binary Ripple Counters, Up/Down Counters, Decade and BCD Counters , Pre-settable Counters, Shift Register, Controlled Shift Registers.
RAM Architecture, Static RAM (SRAM), Dynamic RAM (DRAM)

UNIT-V
CPU Organization: Processor organization, Machine instructions, instruction cycles, instruction formats and addressing modes, microprogramming concepts, and micro program sequencer.
I/O Organization: I/O interface, Interrupt structure, transfer of information between CPU/memory and I/O devices, and IOPs.

Text &Reference Books:
- Hayes, J.P., Computer Architecture and Organization, McGraw Hill
- Tanebaum A.S., Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
- Stallings W., Computer Organization and Architecture, Prentice Hall of India Pvt. Ltd.
- Mano, M.M.: Digital Logic and Computer Design, Prentice-Hall of India.
- Mano, M.M.: Digital Design, Prentice-Hall of India.
- Tokheim: Digital Electronics, TMH.
- Fundamentals of computers by V. Rajaraman

Continuous Assessment = 25
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100

Duration of the End Sem Examination: 3 Hrs

4 hours per week

MCSA103- Operating System

UNIT – I
Introduction: Definition of The Operating System, Functions Of An Operating System, Different Types Of Systems - Simple Batch System, Multi-Programmed Batched System, Time Sharing System, Personal Computer Systems, Parallel Systems, Distributed Systems, Real Time Systems, Computer System Structure- operation, I/O structure, storage structure, hardware protection, Operating System Services.

UNIT – II
Process Management: Process, Process Concept, Process Scheduling, Operation On Processes, Cooperating Processes, Threads, Inter-Process Communication, CPU Scheduling– scheduling criteria, scheduling algorithms, FCFS, SJF, priority scheduling, round robin scheduling, multilevel queue scheduling, multilevel feedback queue scheduling, multiple processor scheduling, real time scheduling.
Process Synchronization: The Critical Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions.

UNIT – III
Memory Management: Logical & Physical Address Space, Swapping, Continuous Allocation (single partition, multiple partition), Internal , External fragmentation, Paging, Segmentation, Segmentation With Paging, Virtual Memory, Demand Paging, Performance Of Demand Paging, Page Replacement, Page Replacement Algorithms, FIFO, optimal, LRU, LRU approximation algorithms, counting algorithms Thrashing, Demand Segmentation.

UNIT – IV
Deadlocks: Deadlock Characterization, Methods For Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery From Deadlock.

I/O Management: I/O system, I/O strategies, buffering.

File System Interface: File Concept, Access Methods–sequential, direct, index, Directory Structure–single-level, two–level, tree-structured, acyclic-graph, general graph.

UNIT – V
File System Implementation: File System Structure, Allocation Methods-contiguous allocation, linked allocation, indexed allocation, Free Space Management, Directory Management, Directory Implementation, Efficiency and Performance.

Secondary Storage Structure: Disk Structure, Disk Scheduling, FCFS, SSTF, SCAN, C-SCAN, Look Scheduling, Selection of A Scheduling Algorithm, Disk Management-disk formatting, boot block, bad blocks.

Case Study : UNIX, LINUX , WINDOWS.   000181

Text &Reference Books:

- Silberschatz, Galvin, "Operating System Concepts", Addison Wesley Publishing Company, 1989.
- William Stallings, "Operating Systems", Macmillan Publishing Company.
- Deitel H.M., "An Introduction To Operating System", Addison Wesley Publishing Company, 1984.
- Tanenbaum, A.S., "Modern Operating System", Prentice Hall of India.
- Milenkovic M, "Operating system-concepts and design", McGraw Hill, International editions.

M.Sc. (Computer Science)-- MCA Integrated - First Semester

FOR EXAMINATION TO BE HELD IN DECEMBER 2013

Continuous Assessment = 25
Mid Term Examination = 25
End Term Examination = 50
Total Marks=100

Duration of the End Sem Examination: 3 Hrs

4 hours per week

MCSA104-Database Management Systems

UNIT- I

Basic Concepts: File Systems vs. DBMS, Purpose of Database Systems, view of data, Characteristics of the Data Base Approach, Advantages and Disadvantages of DBMS. Conventional Data Models: An overview of Network and Hierarchical Data Models. Data Base Systems Concepts and Architecture: Relational Data Model, DBMS architecture, Data Independence, Database design, Data storage and querying, Database users and DBA, Database Languages.

UNIT- II

Entity Relationship Model: E-R Diagrams, Constraints Entity Types, Entity Sets, Attributes & keys, Relationships, Relationships Types, Design of an E-R Database Schema, Reduction of an E-R schema to relational schemas and vice-versa, Design issues.
Relational Data Model: Relational model concepts, Integrity constraints over Relations, Aggregation, Generalization and Specialization.

UNIT- III

Relational Algebra and Relational calculus– Basic Operations.
Relational Data Base Management System: Introduction to software-RDBMS, Basic structure, Date Base Structure & its manipulation.
SQL: DDL, DML, and DCL, views & Queries in SQL, Specifying Constraints & Indexes in SQL.

UNIT- IV

Relational Data Base Design: Features of good relational designs, need for Normalization, Functional Dependencies, Multi-valued Dependencies,Join dependencies Decomposition, Normal forms (1 NF, 2 NF, 3 NF, & BCNF, 4 NF, , 5 NF, Domain key normal form) ,Loss less joins, closures and covers.

UNIT- V

Transaction Processing Concepts: Introduction to Transaction Processing, Transaction & System Concepts, ACID Properties of Transaction, Schedules, Serializability of Schedules.

000183

Concurrency Control Techniques: Locking Techniques-Two Phase Locking, Time stamp ordering, Multi-version schemes, Deadlock handling

Recovery Techniques: Recovery concepts, Recovery Techniques in centralized DBMS.Two Phase commit, Save points, Shadow Paging.

Data Base Security: Introduction to Data base Security issues.

Text & Reference Books:

- Korth & Silberschatz: Database System Concept, 4th Edition, McGraw Hill International Edition.
- C.J. Date: An Introduction to Data Bases Systems 8th Edition, Addison Wesley N. Delhi.
- Bipin C. Desai: An Introduction to Database System, Galgotia Publication, N. Delhi.
- Nawathe, Database Concepts
- Ivan Bayross: SQL, PL/SQL- The Program Language of ORACLE, BPB Publication.
- Peter Rob, Carlos Colonel: Database system Design, Implementation, and Measurement, Cengage Learning, 2nd Ed.
- Raghu Ramakrishnan & Johannes Gehrke: Database Management Systems, 2nd edition, Mcgraw Hill International Edition.

COURSE TITLE: Data Structure Using C   **COURSE No.:** MCSA-201
Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100
DURATION OF EXAM: 3 HOURS   **Lectures: 4 hours per week**

UNIT - 1

Preliminaries: Concept & notation, common operation on data structures, algorithm complexity, time-space trade off between algorithm, physical & logical representation of different data structures. Arrays: Arrays defined, representing arrays in memory, various operation (traversal, insertion, deletion), Multidimensional arrays, Sequential allocation, Address calculation, Sparse arrays. Linked List: Definition, type (linear, circular, doubly linked, inverted), representing linked lists in memory, advantages of using linked list over arrays, various operations on Linked list (traversal, insertion, deletion)

UNIT- 2

Stacks: Definition & concepts of stack structure, Implementation of stacks, Operation on stacks (push & pop), Application of stacks (converting arithmetic expression from infix notation to polish and their subsequent evaluation, quick sort technique to sort an array, recursion). Queue: Definition &concept of queues, implementation of queue, operation on queues (insert & delete), Type of queues (circular queue, priority queue).

UNIT - 3

Trees Structures: Tree, Binary Trees, Tree Traversal Algorithms (Pre-Order, In-Order, Post-Order), Threaded Trees, Trees in various sorting & Searching Algorithms & their Complexity (Heap Sort, Binary Search Trees). Graphs: Description of graph structure, Implementing graphs in memory, Graph traversals (Depth First Searching, Breadth first searching, Shortest Paths Problems)

UNIT-4

Storage Management: Fixed block storage allocation, First-fit Storage Allocation, Storage Release, Buddy System, Garbage Collection. Sorting & Searching: Selection sort, Bubble sort, Merge sort, Radix sort, Quick sort, Sequential search, Linear search and their complexity.

Unit - 5

File Structures, Concepts of fields & records, Classification of files, File operations, File organizations, variable length records and text files. Indexing structures like B – trees, ISAM. Hashing techniques for Direct Files

Laboratory Work: Implementation of various algorithms in C.

Text & Reference Books:

1. Symour Lipschutz,'' Theory and Problems of Data Structures'', St. Schaum's Outline series in Computers, Tata McGraw – Hill.
2. Horowitz, E. , and Sahni, S. , ''Fundamentals of data structures'' , Computer Science Press.
3. Tanhenbaum, A.M., and Augenstein, M.J. , "Data Structures with C" , Prentice – Hall.
4. "Tremblay & Sorenson , An introduction to Data Structures with Applications:, Tata McGraw – Hill.
5. Aho, A.V. , Hopcraft, and Ullman, J.E., ''Data structures and Algorithms'' , Addison Wesley.
6. Thomas Coremen, Introduction to Algorithms, Second edition, Prentice Hall of India (2007) 2nd ed.
7. Mark Allen Weiss, Data Structures & Algorithm analysis in C, Dorling Kingsley (2002) 3rd ed.

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM JUNE 2014
M.Sc. (Computer Science)-MCA IInd Semester

COURSE TITLE: Object Oriented Programming using C++   COURSE No.: MCSA202

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100
DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT - 1

Introduction: Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Advantages of OOPs, Applications of OOPs. OO Concepts: Abstraction, Encapsulation, Inheritance, Polymorphism, Basic program construction, working with variables and constants in C++.

UNIT - 2

Programming in C++ : Input output statements, cin, cout, comments, escape sequence, manipulators, type conversion, operators, and library functions. Control statements, Structures, Enumeration, Functions, passing arguments to functions, reference arguments, overloaded functions, inline functions, default arguments, variables and storage class and returning by reference, Arrays and Strings.

UNIT - 3

Objects and Classes: Concept of Object and Classes, defining class, C++ objects as physical objects, object data types, object as function argument, constructors and destructors, constructor as function argument, overloaded constructors, copy constructors, returning objects from functions, this pointer, new and delete, structures and classes, static class data, static functions, friend functions, array of objects. Overloading unary and binary operator

UNIT - 4

Inheritance &Virtual Functions: Concept of Inheritance, derived class, base class, derived class constructors, overloading member functions, class hierarchies, public, private& protected inheritance, levels of inheritance, multiple inheritance, Virtual Inheritance, Virtual functions.

UNIT - 5

Files : File Input/Output, Using istream/ostream, implementation of Files, Functions of files, Templates, Function templates, Class templates, Exception handling

Text & Reference Books:

1. Bjarne Stroustrup, The C++ Programming Language, (3rd edition), Addison Wesley.
2. Herbert Schildt, C++ The Complete Reference, McGraw Hill.
3. Robert Lafore, Object Oriented Programming In C++, Galgotia publ.
4. E. Balagursamy , Object Oriented Programming using C ++ ,Tata Mcgraw Hill.
5. D. Ravichandran," Programming with C++", Tata Mcgraw Hill.
6. Scott Meyers, Effective C++: 50 Specific Ways to Improve Your Programs andDesigns, Addison Wesley.
7. S. B. Lippman and J. Lajoie, "C++ Primer", 3rd Edition, Addison Wesley.
8. Bruce Eckel, "Thinking in C++", President, Mindview Inc., Prentice Hall, 2nd Ed.

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM JUNE 2014
M.Sc. (Computer Science)-MCA IInd Semester

COURSE TITLE: Data Communication & Networks　　　**COURSE No.:** MCSA203
Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100
DURATION OF EXAM: 3 HOURS　　　　　　　Lectures: 4 hours per week

UNIT - 1
Introduction to Data communication, Advantages of Networks, Structure of communication networks, Point to Point and Multi-drop Circuits, Data flow and Physical Circuits, Network Topologies, Topologies and design goals, Hierarchical Topology, Horizontal Topology, Star Topology, Ring Topology, Mesh Topology, Network models Channel Speed, bit rate, Baud, Band Width and frequency spectrum, Modem.

UNIT - 2
Connection oriented and connection less Networks, Classification Of communication protocols, Polling and selection systems, Selective and Group Polling, stop and wait Polling, Multiplexing: Definition, TDM, FDM, Phase Multiplexing, Carrier Sense System. Transmission Media: Guided Media, Unguided Media: wireless, switching, circuit switched networks, datagram networks. Reference Models: OSI Reference Models and TCP/IP Reference Models.

UNIT - 3
Analog & Digital System: Advantages , Signal Conversion, Analog to Digital techniques, Asynchronous and Synchronous transmission, Data Link layer, Design issues, Frame, Error detection and correction, Flow Control, Elementary Data link protocols, Character-Oriented and Bit-oriented Protocols, Sliding window protocols. Channel allocation methods, TDM, FDM, ALOHA, Carrier sense Multiple access protocols, Collision free protocols, Ethernet, Token Bus, Token ring.

UNIT - 4
Network Layer, Store and Forward Packet Switching, Connectionless and Connection-oriented services, Virtual Circuit, Routing Algorithms, Shortest path, Flooding, Link State, Distant vector, Hierarchical, Broadcast and Multicast Routing. Congestion, Congestion control algorithms.

UNIT - 5
TCP/TP Protocol, IP Addresses, Classes of IP Addresses, Subnets, IPv6, Network layer in the Internet and ATM, Internet Control Protocols, ARP, RARP, BOOTP, DHCP, OSPF, BGP.
Transport Layer: Protocol Stack-UDP, TCP, SCTP, Transport Services Primitives, Sockets, Socket Programming with TCP and UDP.
Application layer, Name service (DNS) Domain Hierarchy, Name servers, Name resolutions, traditional applications, SMTP, MIME World wide web-HTTP,FTP.

Text & Reference Books:
1. Data communication & Networking, Fourth Edition by Behrouza A. Forouzan, TMH.
2. Computer Networks, A.S Tanenbaum, 4th edition, Pearson Education.
3. Introduction to Data communications and Networking, W.Tomasi, Pearson education.
4. Data and Computer Communications, G.S. Hura and M.Singhal, CRC Press,Taylor and Francis Group.
5. An Engineering Approach to Computer Networks-S. Keshav, 2nd Edition, Pearson Education.
6. Understanding communications and Networks, 3rd Edition, W.A. Shay, Cengage Learn.
7. Computer Network , S.S.Shinde, New Age International Publisher.
8. Data & Computer communication, William Stallings, Pearson

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM JUNE 2014
M.Sc. (Computer Science)-MCA IInd Semester

COURSE TITLE: Discrete Mathematics   COURSE No.: MCSA 204

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100

DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT-1: Fundamentals of Set Theory: Set operations, Algebra of sets, combination of sets, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relations, Binary Relations, Equivalence relations and partitions, Partial ordering relations and lattices, Mathematics Induction, Principle of Inclusion & Exclusion, Propositions. Function and its types, Composition of function and relations, Cardinality and inverse relations. Functions & Pigeon hole principles.

UNIT-2: Propositional Calculus: Basic operations: AND (^), OR (v), NOT (~), Truth-value of a compound statement, propositions, tautologies, contradictions.
Counting Techniques: Rules of Sum of products, Permutations with and without repetition, Combination.

UNIT-3:Recursion and Recurrence Relation : Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

UNIT-4: Introduction to Algebraic Structures Definition, elementary properties of algebraic structures, examples of a Monoid, Submonoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem, Rings, Division Ring.

UNIT-5: Graphs and Trees: Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eurelian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Trees, Rooted Trees, Spanning Trees & cut-sets, Binary trees and its traversals

Text & Reference Books:

1. Elements of Discrete Mathematics C.L Liu, 1985, McGraw Hill
2. Schaum's Outline series: Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore
3. Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
4. Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
5. Applied Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985,SRA
6. Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London,
7. Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
8. Discrete Mathematical Structures with Applications to Computers by Trembley & Manohar, 1995, Mc Graw Hill.

COURSE TITLE: Image Processing   COURSE No.: MCSC 411
Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100
DURATION OF EXAM: 3 HOURS   .   Lectures: 4 hours per week

UNIT-1

Image Processing Fourier Transform and Z-Transform, Causality and Stability, Toeplit and Circulate Metrics, orthogonal and unitary Matrices and Kroenker product, Markov Processes KI Transform Mean Square Estimates and Orthogonal Principles.

UNIT-2

Image Sampling quantization, Band Limited Image Sampling Versus Replication, Reconstruction of image from samples Sampling Theorem, Sampling Theorem for Random Fields, Sampling Optimal Sampling, Nonrectangular Grid Sampling, Sampling Aperture, Display Aperture/Interpolation Functions, Lang range Interpolation, Moire Effect, Image Quantization Uniform Optimal Quantizer, Properties of Mean Square Quantizer, Commands Design Visual Quantization.

UNIT-3

Image Transforms: Two Dimensional Orthogonal and Unitary Transforms and their properties. One Dimensional and Two Dimensional DFT Cosine and Sine Transforms Iiadmard, slant, IIARR and KI, Transforms and their properties, Approximation to KI Transforms. Image representation by stochastic model, One Dimensional Causal Models, AR and ARMA models, Non Causal Representation Spectral factorization, Image Decomposition

UNIT-4

Image Enhancement and Restoration: Point Operation, Histogram Modeling, Spatial Operations, Transform Operations. Multispectral Image Enhancement. Image Observation Models, Inverse and Wiener Filtering FIR wiener Filters, Filtering using Image Transform Casual Models and recursive filtering Maximum entropy restoration. Extrapolation of band limited signal.

UNIT-5

Image Analysis and Image Compression: Spatial feature extraction, Edge detection and boundary extraction boundary, region and moment representations structures, Texture, Image Segmentation, Reconstruction from Projections, Pixel Coding, Productive Techniques, Transform Coding Theory, Coding of Image, Coding of two-tone image.

Text & Reference Books:
1. Anil Jain: Digital Image Processing, Pearson Publication, New Delhi
2. Gonzalez Woods: Image Processing, Pearson Publication, New Delhi

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM JUNE 2014
M.Sc. (Computer Science)-MCA 4th Semester

COURSE TITLE: NETWORK SECURITY   COURSE No.: MCSC413

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100

DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT-1

Fundamentals of Network Security: Need, Security levels, OSI security architecture, Security Attacks, Security services: Authentication, Access Control, Confidentiality, Integrity, Availability, Non-repudiation;Entity Authentication

Threats & Vulnerabilities : Unauthorized Access, Impersonation, Denial of Services, Malicious Software, Trap Doors, Logic Bomb, Trojan Horses, Viruses & Worms, Security Strategies & Processes, Importance of Security Policies and Audits.

UNIT-2

Cryptography: Introduction, Cryptographic principles, Classical encryption techniques, cipher types, substitution ciphers, Transposition ciphers, one time pads. Traditional ciphers, simple modern ciphers, Modern round ciphers.

Symmetric Key Cryptography: DES, AES, Cipher modes. Asymmetric key Cryptography: RSA, Diffie-Hallman

UNIT-3

Authentication: Introduction, Authentication based on a shared- secret key, Digital Signatures, Message authentication, MAC, Entity Authentication-Passwords, challenge response, password and address based, authentication using Kerberos.

Hash functions – Hash function criteria, Security of hash functions, Hash functions based on block ciphers, Hash algorithm-SHA-1,MD5

UNIT-4

Firewalls: Firewall Characteristics & Design Principles, Types of Firewalls : Packet Filtering Router, Application Level Gateway or Proxy, Content Filters, Bastion Host. Firewall Architectures: Dual Homed Host, Screening Router, Screened Host, Screened Subnet. Firewall logs.

Intrusion Detection Systems : Components of an IDS, Placement of IDS Components

UNIT-5

Web Security: Threats, Secure Naming, IPSec, SSL/TLS, Security features, Server privileges, Security configuration setting for browsers. Email Security: PGP, PEM, S/MIME. Public Key Infrastructure, Digital Certificates, Certificate Authorities.

Social Issues: Privacy, Freedom of Speech, Copyright.

Text & Reference Books:

COURSE TITLE: CLOUD COMPUTING   COURSE No.: MCSC414

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100

DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT-1

Cloud Computing Fundamentals: Cloud Computing definition, private, public and hybrid cloud. History of Cloud Computing, Cloud Services; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, role of virtualization in enabling the cloud; Cloud service providers, Cloud Properties, Characteristics, Benefitsand shortfalls of Cloud Computing, Cloud computing vs. Cluster computing vs. Grid computing. Role of Open Standards, CloudApplications.

UNIT-2

Cloud Computing Architecture: Cloud computing Comparison with traditional computing architecture (client/server), Services provided at various levels, Working of Cloud Computing, Role of Networks in Cloud computing, Protocols, Role of Web services , Deployment Models-Public cloud, Private cloud, Hybrid cloud, community cloud.

Cloud Applications: Technologies and processes required for deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages.

UNIT-3

Cloud Services Management: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics : Cloud Computing infrastructures available for implementing cloud based services. Economics of choosing a Cloud platform for an organization, based on application requirements, economic business constraints.

UNIT-4

Application Development: Service creation environments to develop cloud based applications. Development environments for service development; Case studies :-Amazon, Azure, Google App.

Cloud IT Model : Analysis of Case Studies to adopt cloud computing architecture. Cloud based service, applications and development platforms, improving the total cost of ownership (TCO)

UNIT-5

Cloud Security: Infrastructure Security, Network level security. Host level security, Application level security, Data security and Storage, Data privacy and security Issues, Jurisdictional issues raised by Data location, Identity & Access Management, Access Control, Trust, Reputation, Risk, Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations.

Text & Reference Books:

1. *Cloud Computing Bible,* Barrie Sosinsky, *Wiley-India,* 2010
2. *Cloud Computing: Principles and Paradigms,* Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, *Wile,* 2011
3. *Cloud Computing: Principles, Systems and Applications, Editors:* Nikos Antonopoulos, Lee Gillam, *Springer,* 2012
4. *Cloud Security: A Comprehensive Guide to Secure Cloud Computing,* Ronald L. Krutz, Russell Dean Vines. *Wiley-India,* 2010

000191

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM JUNE 2014
M.Sc. (Computer Science)-MCA 4th Semester

COURSE TITLE: OPEN SOURCE TECHNOLOGIES   COURSE No.: MCSC415

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100

DURATION OF EXAM: 3 HOURS   **Lectures: 4 hours per week**

UNIT-1

OST overview: Open Source Definition, Advantages of Open Source, Evolution & development of OST and contemporary technologies, Factors leading to its growth. Open Source Initiative (OSI), Free Software Foundation and the GNU Project, principle and methodologies. Contexts of OST (India & international), Applications of open source (open source teaching and open source media),Risk Factors. Myths regarding open source.

UNIT-2

Free and Open Source Software (FOSS), LAMP (Linux, Apache, MySQL, PHP, Python, and Perl.),Technologies Underlying Open Source Development, The Open Source Platform: Operating Systems, Windowing Systems and Desktops, and GIMP. Linux and Open Source, Overview of Linux Operating System, Linux Distribution, Graphical Environment and Terminal Windows, File System Concepts, Managing File with Graphical Utilities, Linux Graphical Desktop.

UNIT-3

Licenses and Patents: What Is a License, How to create your own Licenses? Important FOSS licenses (Apache, BSD, GPL, LGPL), copyrights and copy lefts, Patents, Social and Financial impacts of open source technology, Economics of FOSS: Zero Marginal Cost, Income-generation opportunities, Problems with traditional commercial software.

UNIT-4

Linux Usage Basics: Logging into the system, changing users and editing text files. Running Commands and Getting Help, Browsing the File system, Users, Groups and permissions. Introduction to Web server, Basics of PHP scripts.
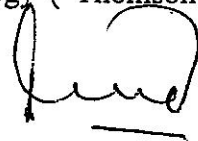
UNIT-5

MySQL Server and Application: Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL backend via the PHP, MySQL API , SQL Commands – INSERT, SELECT, UPDATE, REPLACE, DELETE. Date and Time functions in MySQL.

Text & Reference Books:

1. Red Hat Linux Bible , Christopher Negus Wiley Publishing ISBN : 0-7645-4333-4
2. PHP, MySQL and Apache, Julie C Meloni Pearson Education ISBN : 81-297-0443-9
3. The Complete Reference Linux Peterson Tata McGRAW HILL ISBN : 0-07-044489-7
4. UNIX using Linux Jack Dent, Tony Gaddis Course Technology (Thomson Learning) ISBN : 981- 240-218-7

000192

COURSE TITLE: Simulation & Modelling

COURSE No.: MCSC-416

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100

DURATION OF EXAM: 3 HOURS

Lectures: 4 hours per week

UNIT-1

System and system environment, components of system, discrete and continuous System, static and dynamic systems, model of a system, steps required in deriving a model of a system. Verification and validation of simulation model.

Introduction to the simulation, why and when simulation is an appropriate tool, advantages and disadvantages of Simulation, Areas of application, general steps followed in simulation experiment.

UNIT-2

Simulation of continuous system, description of continuous model using differential equations, chemical reactor system, integration vs. simulation, selection of integration formula, other examples of continuous system simulation, water reservoir system.

Discrete system simulation, fixed time step vs. next event models, use of random numbers, generation of uniform and non uniform random numbers, test of randomness, Monte-Carlo vs. stochastic simulation.

UNIT-3

Simulation of queuing system, elements of queueing theory, Poisson arrival pattern, negative exponential service time, simulation of *single server* queue, *two severs* queue and *more general* queues.

UNIT-4

Simulation of *PERT*, network model of project, critical path computation, uncertainties in the activity durations, normal PERT calculations, simulation of activity network, comparison of normal PERT calculation and PERT calculation through simulations.

UNIT-5

Simulation of inventory system, elements of inventory theory, more complex inventory models, examples of simulation of inventory system : with respect to *service level* considerations and *minimum cost* considerations, generation of *Erlang* distributed variates. simulation languages, continuous and discrete simulation languages, features of some popular simulation languages : SIMSCRIPT, GPSS, SIMULA etc. Factors in selection of simulation language.

Text & Reference Books:

1. Gorden, G. : System Simulation, Parentice Hall, 1978
2. Payer T. A. : Introduction to Simulation, McGraw-Hill, 1982
3. Reitman, J. : Computer Simulation Application, Wiley, 1971
4. Spriet, W.A. : Computer-aided Modeling and Simulation, Academic Press, 1982
5. Barnes, B. : Modelling and Performance measurement of Computer Systems, 1982
6. Deo, N. : Systems Simulation with Digital Computer, Prentice Hall, New Delhi, 1979
7. Banks J., Carson II J.S., Nelson B.L. : Discrete-Event system Simulation, Prentice Hall, New Delhi, 1996

COURSE TITLE: Software Project Management   COURSE No.: MCSC417
Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100
DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT-1

Introduction to Project Management: The characteristics of software projects, Objectives of project management: time, cost and quality, Basics of Project Management, Stakeholders, Stages of Project, The Feasibility Study, Cost-benefit Analysis, Planning, Project Execution, Project and Product Life Cycles, SPM plan

UNIT-2

Software Project Estimation: Size/scope estimation, Decomposition techniques, WBS. **Effort estimation:** Sizing, Function point, LOC, FP vs. LOC.
Schedule estimation: GANTT Charts, Activity networks, PERT/CPM networks. **Cost estimation:** COCOMO I, COCOMO II models. **Measurement and Control:** Measurements for project monitoring, what and when to measure, Plan versus Control, managing the plan, The Deadline Effect. Reviews, feedback and reporting mechanisms, revisiting the plan

UNIT-3

Quality Planning: Quality control, Quality assurance, Formal Technical Reviews, The SQA Plan, ISO and CMM standards. **Project Quality Management:** Quality Planning, quality Assurance, Quality control, Tool & techniques for quality control, Pareto Analysis, Six Sigma, Juran Methodology

UNIT-4

Risk Management: Reactive vs. proactive Risk strategies, Risk projection, Risk Refinement, Risk Monitoring, Monitoring and management, RMMM plan. **Measurement and Tracking Planning:** Earned Value Analysis. **Team Management:** Team structures: hierarchical, Egoless, chief programmer, mixed; Team software Process; Resource levelling, Building a team: Skill sets.

UNIT-5

Project procurement management: Procurement management plans, contract statement of work, planning contracts, requesting seller responses, selecting sellers, administrating the contract, closing the contract **Configuration Management:** Baselines, Configurable items, SCM repository, SCM process, version control change control, configuration audit. **Project Monitoring and Control:** Audits and Reviews.

Text & Reference Books:

1. Pankaj Jalote, Software Project Management in Practice, Pearson Education Asia (2002).
2. Bob Hughes and Mike Cotterell, Software Project Management, Tata McGraw Hill Publishing Company Ltd., New Delhi (2006) 3rd ed.
3. Roger Pressman, A practitioner's Guide to Software Engineering, T. McGraw Hill (2004).
4. Tom Demarco, Controlling Software Project Management, Measurement, Prentice Hall, New Jersey (1982).
5. Watts S. Humphrey, Winning with Software An Executive Strategy, Pearson Education Asia (1998).
6. Philip Metzger, Managing A Programming Project, Prentice Hall, New Jersey (1983).
7. Tom Glib, Finzi Susannah, Principles of Software Engineering Management, Addison Wesley, England (2000).
8. Kathy Schwalbe; Information Technology Project Management fourth edition, Thomson Course Technology.
9. Bob Hughes and Mike Cotterell, Software Project Management, Third Edition, TMH.

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM JUNE 2014
M.Sc. (Computer Science)-MCA 4th Semester

COURSE TITLE: Natural Language Processing   COURSE No.: MCSC-418

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100

DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT-1

Introduction to Natural Language Understanding: The study of Language, Applications of NLP, Evaluating Language Understanding Systems, Different levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems, Linguistic Background: An outline of English syntax.

UNIT-2

Introduction to semantics and knowledge representation, Some applications like machine translation, database interface.

UNIT-3

Grammars and Parsing: Grammars and sentence Structure, Top-Down and Bottom-Up Parsers, Transition Network Grammars, Top- Down Chart Parsing. Feature Systems and Augmented Grammars: Basic Feature system for English, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks.

UNIT-4

Grammars for Natural Language: Auxiliary Verbs and Verb Phrases, Movement Phenomenon in Language, Handling questions in Context-Free Grammars. Human preferences in Parsing, Encoding uncertainty, Deterministic Parser.

UNIT-5

Ambiguity Resolution: Statistical Methods, Probabilistic Language Processing, Estimating Probabilities, Part-of-Speech tagging, Obtaining Lexical Probabilities, Probabilistic Context-Free Grammars, Best First Parsing. Semantics and Logical Form, Word senses and Ambiguity, Encoding Ambiguity in Logical Form.

Text & Reference Books:

1. Akshar Bharti, Vineet Chaitanya and Rajeev Sangal, NLP: A Paninian Perspective, Prentice Hall, New Delhi
2. James Allen, Natural Language Understanding, Pearson Education
3. D. Jurafsky, J. H. Martin, Speech and Language Processing, Pearson Education
4. L.M. Ivansca, S. C. Shapiro, Natural Language Processing and Language Representation
5. T. Winograd, Language as a Cognitive Process, Addison-Wesley

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM JUNE 2014
M.Sc. (Computer Science)-MCA 4th Semester

COURSE TITLE: Cryptography

COURSE No.: MCSC-419

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100

DURATION OF EXAM: 3 HOURS

Lectures: 4 hours per week

UNIT-1

Classical encryption techniques: substitution ciphers and transposition ciphers, cryptanalysis, steganography, Stream and block ciphers.

Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion, fiestal structure, Data encryption standard (DES), Strength of DES, Idea of differential cryptanalysis, block cipher modes of operations, Triple DES

UNIT-2

Introduction to group, field, finite field of the form GF(p), modular arithmetic, prime and relative prime numbers, Extended Euclidean Algorithm, Advanced Encryption Standard (AES) encryption and decryption Fermat's and Euler's theorem, Primality testing, Chinese Remainder theorem, Discrete Logarithmic Problem, Principals of public key crypto systems, RSA algorithm, security of RSA

UNIT-3

Message Authentication Codes: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions, secure hash algorithm (SHA)

Digital Signatures: Digital Signatures, Elgamal Digital Signature Techniques, Digital signature standards (DSS), proof of digital signature algorithm,

UNIT-4

Key Management and distribution: Symmetric key distribution, Diffie-Hellman Key Exchange, Public key distribution, X.509 Certificates, Public key Infrastructure. Authentication Applications: Kerberos Electronic mail security: pretty good privacy (PGP), S/MIME.

UNIT-5

IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management. Introduction to Secure Socket Layer, Secure electronic, transaction (SET)

System Security: Introductory idea of Intrusion, Intrusion detection, Viruses and related threats, firewalls

Text & Reference Books:

1. William Stallings, "Cryptography and Network Security: Principals and Practice", Pearson Education.
2. Behrouz A. Frouzan: Cryptography and Network Security, TMH
3. Bruce Schiener, "Applied Cryptography". John Wiley & Sons
4. Bernard Menezes," Network Security and Cryptography", Cengage Learning.
5. Atul Kahate, "Cryptography and Network Security", TMH

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM JUNE 2014
M.Sc. (Computer Science)-MCA 4ᵗʰ Semester
COURSE TITLE: NUMERICAL COMPUTING   COURSE No.: MCSC420
Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100
DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT - 1

Requirements for computer-oriented solutions to numerical problems. Errors in Numerical Analysis: Absolute Error, Relative Error, Percentage Error. Computer Arithmetic: Floating point numbers, arithmetic Operations.

Numerical Solution of Non Linear Equations: Methods of finding solutions of Non Linear equations: Bracketing Method: Bisection Method, False Position Method, Open end Method: Newton Raphson Method, Secant Method, Successive Approximation Method

UNIT - 2

Solution of Simultaneous Liner Equations: Gauss Elimination Method (Direct Method), Gauss Seidal Method (Iterative Method) ,Difference between Direct and Iterative Method.
Interpolation: Forward difference, Backward Difference, Divided Difference
Finite Differences: Newton's Forward Difference Interpolation Formula, Newton's Backward Difference Interpolation Formula, Interpolation with Unequal Interval: Newton's Divided Difference Interpolation Formula, Langrage's Interpolation Formula, Langrage's Inverse Interpolation Formula

UNIT - 3

Numerical Integration: Trapezoidal Rule, Simpson's 1/3 ʳᵈ Rule for quadratic function, Simpson's 3/8 ᵗʰ Rule for third order Polynomial.

UNIT - 4

Numerical differentiation and Integration, Solutions of Differential Equations; Runga-Kuta methods; Predictor-corrector methods; Automatic error monitoring, stability of solutions, Newton's cotes of Integration and Gaussing Quadratic.

UNIT - 5

Interpolations and Approximations: Polynomial interpolation Newton, Lagranges etc. Spline Interpolation; Difference tables; Curve fitting, Approximation of function by Taylor series.

Text & Reference Books:

1. Stoer, Bullrich: Computer Oriented Numerical Methods, Springer Verlag, 1980.
2. Krishnamurthy, E.V., Sen, S.K.: Computer Based Numerical Algorithm, East West Press, 1984.
3. Rajaraman, V.: Computer Oriented Numerical Methods, Prentice Hall India, 1980.
4. S.S. Sastry: Introductory Methods of Numerical Analysis

000197

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM DECEMBER 2013
Inter disciplinary Course offered by Computer Science & IT Department

COURSE TITLE: Fundamentals of Computers   **COURSE No:MCSA 175**

Internal Assessment= 25 Mid-Term Exam.=25 End-Term Exam.=50 Total Marks=100

DURATION OF EXAM: 3 HOURS   **Lectures: 4 Hours per week**

Unit-1

Introduction: Introduction to Computers, Classification of Computers. Analogvs Digital Computer, Block Diagram of Digital Computer, Input Devices, Output devices, CPU, Memory, Types of Memories, Storage Devices,Types of Softwares, Generations of Computers.

Unit-2

Data Representation: Representation of characters in computers, Representation of integers and fractions, Hexadecimal and octal representation of numbers, number system conversions, Two's complement of numbers, addition/subtraction of numbers using 2's complement notation, Error detection codes

Unit-3

Operating System:-Operating Systems and their overview, Types of Operating System, Introduction to Unix and Windows. Anatomy of Windows, Files and Folders, Searching Files, Desktop, Windows Explorer, GUI Features, Disk Cleanup, Disk Defragmenter.

Word Processing: Introduction to MS-Word and its features, Formatting text and paragraph, Page Formatting, Find and Replace, Inserting page number, Symbols, footnotes, endnotes, textbox, auto text, pictures, tables, Drawing Shapes, Mail Merge, Printing of documents,Spelling &Grammar etc.
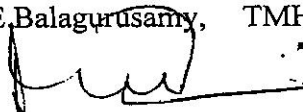
Unit-4

Presentation Software: Introduction to MS-Power point, Slide Layouts, Slide Designs, Task Pane, Header and Footer, Text Formatting, Inserting slide number, Symbols, Comments, Textbox, Pictures, Slide show, Slide Transition, Slide Animation, Customize show, Rehearse Timing, Record Narrations, Notes, Web Page Preview, Pack and go.

Unit-5

Spreadsheet: Introduction, to Ms-excel, Cell-Referencing-relative and absolute, Entering Data and Formula, Excel Workbook, Inserting and Renaming Sheets, Automatic Calculation and Recalculation, Formatting Cells, Rows, Columns and Sheets, Sorting and Filtering data, Formulas-Mathematical, Statistical and Logical Functioning, Preparing Charts and analysing data.

References

1. Fundamentals of Computers, by V.Rajaraman, PHI, Fifth Edition, April 2010.
2. Computer Fundamentals :Pradeep K. sinha, PreetiSinha, BPB Publications, New Delhi
3. Fundamentals of computers , E,Balagurusamy, TMH, second reprint 2010.

000198

Inter disciplinary Course offered by Computer Science & IT Department
COURSE TITLE: Advanced Computer Concept COURSE No:MCSA 275
Internal Assessment= 25   Mid-Term Exam.=25   End-Term Exam.=50 Total Marks=100
DURATION OF EXAM: 3 HOURS   Lectures: 4 Hours per week

Unit-1:

Fundamentals:-Functions and types of operating system,Single User and multi user OS, Multitasking OS, Programming Languages, Program Language Translators –Assembler, Compiler, Interpreter.Utility Programs,Virus and types.

Networking:-Introduction to Networking ,Importance of Networking, Communication Devices -Modems, hubs, switches, routers , gateways. Network Topology-Ring, Star, Bus, etc.Types of Networks-LAN,MAN,WAN,VAN,Internet,Intranet and Extranets

Unit-2:

Database Management System:-Introduction of Database and DBMS, Advantages and disadvantages of DBMS, components of DBMS, Levels of Architecture, Instance andSchemes, DBMS facilities, Database users, Data dictionaries, Entity Relationship models, attributes, Types of keys, Entity sets and Relationship sets, Relational Model.

Unit-3:

Database Management(MS Access): Features of Microsoft Access ,Field types, Record, Data types, Defining relationships, Defining keys, Field Properties, Database Access, Creation of Tables, SQL,DML,DDL,DCL, Queries, Import and Export Data,Queries, Forms, Reports

Unit-4:

Internet Concepts:-Getting connected to Internet, Evolution of Internet, Applications of Internet, Services of Internet, Internet Protocol, IP Addresses, Named Addresses, DNS, URL, World Wide Web(WWW), Characteristics of WWW, Features of web Browsers, Search Engines, Search Directories, Email, Basic Terminology-HTTP, HTML, Hyperlinks, Address Navigation, History, downloading files.

Unit-5:

E-Commerce:-Framework, Architecture, Benefits and Impact of e-Commerce, The Anatomy of e-Commerce applications, e-Commerce Consumer applications, e-Commerce Organisation Applications, e-commerce in India, Prospects of e-commerce.Electronic Payment Systems: Introduction to Payment Systems, On-Line Payment Systems, Requirements Metrics of a Payment System.

Text & Reference Books:

1. Fundamentals of Computers, by V.Rajaraman, PHI, Fifth Edition, April 2010.
2. Computer Fundamentals :Pradeep K. sinha, PreetiSinha, BPB Publications, New Delhi
3. Fundamentals of computers ,E.Balagurusamy, TMH, second reprint 2010.
4.BharatBhaskar,Electronic Commerce-Framework technologies and Applications,McGraw Hill

000199

CENTRAL UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD FROM DECEMBER 2013
Inter Disciplinary Course offered by Computer Science & IT Department

COURSE TITLE: E-Commerce   COURSE No.: MCSA-375

Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100

DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT-1:
Introduction to computers, Classifications of Computers, Analog Vs Digital Computer , Block diagram of Digital Computer, Input Devices, Output devices, CPU, Memory, types of memories, Storage Devices, Types of computer Softwares, History of Computers, Computer Operating systems. Number systems and representations.

UNIT-2: Introduction: Definition Electronic Commerce, Applications of Electronic Commerce, Advantages & Disadvantages of Electronic Commerce, Incentives for Engaging in Electronic Commerce, The Mechanisms of Electronic Commerce.

EDI: Definition of EDI, Electronic Data Interchange (EDI), EDI would Benefit Business Relationships between organizations, Network Enabled business Practices, Applications of EDI, EDI Advantages, EDI Disadvantages, EDI Model, Protocol, Encryption, Data Standards Used in EDI

UNIT-3
E-Commerce Models: Business to consumer, Business to Business, Consumer to Consumer, other models – Brokerage Model, Aggregator Model, Info-mediary Model, Community Model and value chain Model.

UNIT-4
E-payments Systems: Types of Electronic payment Systems, Types of E-payment systems, E-Cash, E-cheque, credit card, Smart Card, Electronic Purses, types of Receipts, Traditional & modern Payments System, Steps for Electronic Payment, Payment Security, Problems With traditional Payment methods, Net banking , The Shopping Process & Advantages of Pay seal.

UNIT-5
E-Marketing, E-Customer Relationship Management, E-Supply Chain Management. Security Issues in E-Commerce: Security risk of E-Commerce, Types of threats, Security tools and risk management approach. Cyber laws, Business Ethics, IT Acts.

Text & Reference Books:

(1) Bharat Bhaskar, Electronic Commerce – Framework Technologies and Applications, Tata McGraw Hill.
(2) Ravi Kalakota & A.B. Whinston, Frontiers of Electronic Commerce, Pearson Education.
(3) Ravi Kalakota & A.B. Whinston, Electronic Commerce – A Manager's Guide, Pearson Education.
(4) Agarwala Kamlesh, N and Agarwala Deeksha, Business on the Net_Introduction to the E-Com., Macmillan India.
(5) P. T. Joseph, E-Commerce: A Managerial Perspective, PHI, 2002

000200

Inter Disciplinary Course offered by Computer Science & IT Department
COURSE TITLE: Information Security and Cyber Law   COURSE No.: MCSA-475
Internal Assessment=25 Mid-term Exam.=25 End –Term Exam. = 50 Total Marks= 100
DURATION OF EXAM: 3 HOURS   Lectures: 4 hours per week

UNIT-1

Introduction to computer Systems, Classifications of Computers, Analog Vs Digital Computer , Block diagram of Digital Computer, Input Devices, Output devices, CPU, Memory, types of memories, Storage Devices, Types of computer Softwares, History of Computers, Computer Operating systems. Number systems and Number representations.

UNIT-2

Basic Concepts of Information Security, Confidentiality, Integrity, Information Classification and their Roles. Security threats to E-Commerce, Virtual organization, Business Transactions on Web, E- Governance and EDI, Concepts in Electronic payments systems, E cash, credit/ debit cards.

UNIT-3

Cryptography concepts, Issues in documents security, Systems of keys, Network Security Concepts, Network attacks, Intrusion detection and systems. Authentication and Authorisation.
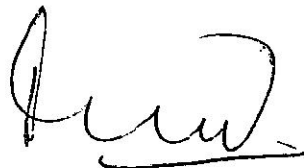
UNIT-4

Laws, Investigation and ethics: cyber crime, Types and overview of cyber crimes, Cyber law issues in E-business Management. Information Security and Laws.

UNIT-5

Overview of Indian IT Act 2000, Ethical issues in Intellectual Property Rights, Copy right, Patents, Data Privacy and Protection, Domain Name, Software Privacy, Plagiarism, Issues in ethical Hacking.

Text & Reference Books:

1. Nina Godbole: Cyber Security, Wiley India
2. N. Godbole : Information System Security, Security Management, Metrics, Framework, Wiley India

3. Sood, Cyber laws Simplified, Mc Graw Hill

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