

SEMESTER	SECTION	SUBJECT NAME	TEACHER NAME	SYLLABUS
4th Sem	A & B	Probability and Statistics	Harpreet Kaur	Introduction to Statistics: Meaning, scope, importance and limitations. Analysis of data: source of data, collection, classification, tabulation, depiction of data. Measures of Central tendency: Arithmetic, weighted, geometric mean, median and mode. Measures of Dispersion: Range, Quartile deviation, Mean deviation, Standard deviation Coefficient of variation, Skewness and Kurtosis. Sampling Distribution & Testing of Hypothesis: Sampling, Distribution of means and variance, Chi – Square distribution, t – distribution, F – distribution. General concepts of hypothesis, Testing a statistical Hypothesis, One and two tailed tests, critical region, Confidence interval estimation. Single and two sample tests on proportion, mean and variance.
		Operating System	Parminder Kaur Wadhwa	Introduction: Introduction to Operating systems, Different types of operating systems - Batch, Multi-programmed, Time sharing, Real time, Distributed, Parallel. Functions of kernel and shell, General structure of Operating System, O/S services, System calls. Process Management: Concept of processes and threads, Process states, Process control block, Process scheduling, Scheduling Algorithms, Inter Process Communication, Process synchronization – Critical sections, Mutual Exclusion, Semaphores, Monitors
		Database Management System	Kiran Jyoti & Jasleen Kaur	Part -A Complete of Syllabus
		Web Technology	Yadvir Kaur	Introduction to HTML: Introduction to web browsers, HTML, XML and XHTML, basic page markup, absolute and relative links, ordered and unordered lists, embedding images and controlling appearance, table creation and use, frames, forms. Style Sheets: Introduction to Cascading Style Sheets(CSS), features, core syntax, separating style from structure with style sheets: internal style specifications within HTML, external linked style specification using CSS, page and site design considerations.
		Computer Architecture and Microprocessor	Manpreet Singh Malhi & Amit Kamra	Basic Computer Organization and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, I/O and Interrupt, Design of Basic Computer, Design of Accumulator Logic Programming the Basic Computer: Machine Language, Assembly Language, Assembler, Program Loops, Programming Arithmetic and Logic Operations, Subroutines, I/O Programming Introduction to Microprocessors, Need of Microprocessor, Basic Microcomputer, history, classification, recent microprocessors, Architecture of 8085 microprocessor.
		Python	Jagdeep Singh & Akshay Gidhar	Introduction to Python Programming Language: History and Origin of Python Language, Python version numbering scheme, Features of Python, Advantages and disadvantages, Major Applications of Python, Installing Python, Setting up Path and Environment Variables, Getting started with Python Programming, Python Interactive Help Feature, Detecting and Correcting syntax errors, Comparison of Python with other languages. Software Development, Data types, Operators and Expressions: The software Development Process, Case study: income tax Calculator, strings, Assignment and Comments, numeric Data types and Character sets, Operators in Python, Expressions, Precedence, Associativity, Non Associative Operators, using Functions and modules. Detecting and Correcting syntax errors. Comparison of Python with other languages. Loops and Selection Statements: Definite Iteration: The for Loop, Formatting Text for Output, Case Study: An Investment Report, Selection: if and if-else Statements, Conditional Iteration: The while Loop, Case Study: Approximating Square Roots.
		Probability and Statistics	Rupinder Kaur	Unit 1: Introduction to Statistics Unit 2: Sampling Distribution and testing of hypothesis

6th Sem	A & B	Software Engineering and Testing	Kulvinder Singh Mann & Sandeep Kumar Singla	<p>Introduction: Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes, Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.</p> <p>Software Requirement Specifications (SRS): Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modeling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEICMM Model.</p>
		Information Security and Assurance	Pradeep Jaswal & Pankaj Bhambri	<p>Security Fundamentals: Introduction, Terminology, Attacks, Security Goals : Authentication, Authorization, Cipher Techniques: Substitution and Transposition, One Time Pad, Modular Arithmetic, GCD, Euclid's Algorithms, Discrete Logarithm, Fermat Theorem, Block Ciphers, Stream Ciphers. Secret Splitting and Sharing, Intrusion Detection and Prevention. (Section-A&B Students)</p> <p>Cryptography: Symmetric Key Algorithms: DES, AES, BLOFISH, Attacks on DES. Modes of Operations, Linear Cryptanalysis and Differential Cryptanalysis. Public Key Algorithms: RSA, Key Generation and Usage, ECC. Hash Algorithms: SHA-1, MD5. (Section- A Students)</p> <p>Network Security: Intrusion Detection Systems: Introduction, Anomaly Based, Signature Based, Host Based, Network Based Systems. (Section- B Students)</p> <p>Cyber Crimes & Laws: Introduction, Computer Forensics, Online Investigative tool, tracing and recovering electronic evidence, Internet fraud, Identity Theft, Industrial Espionage. (Section- B Students)</p>
		Elective- Big Data Analysis	Kiran Jyoti	<p>Introduction to Big Data : W hat is Data, Forms of Data Unstructured Data, Structured data and semi structured data, Big Data Overview, Big Data Fast Data, State of the Practice in Analytics, When to consider Big Data Solutions, Applications of Big Data in Industry</p> <p>Apache Hadoop : Introduction to Hadoop, Understanding distributed systems and Hadoop, Components Of Hadoop (Namenode, Datanode, JobTracker, TaskTracker, etc.),Understanding Map Reduce, Working with files in HDFS, Basic HDFS commands, Introduction to Hive, Working with Hive.</p> <p>Apache Spark :Spark Overview, RDD Fundamentals, Spark SQL and Data Frames, Spark Job Execution, Cluster Architectures for Spark, Intro to Spark Streaming, Machine Learning Basics (SparkML).</p>
		Elective- Information Storage and Management	Mohanjit Kaur	<p>Introduction to Information Storage Technology: Review data creation and the amount of Data being created and understand the value of data to a business, Challenges in Data Storage And Management, Data Storage Infrastructure. Identify Data Centre infrastructure elements and their requirements. Detail disk drive architecture and performance. Data protection: Concept of RAID and its Components Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Comparison of Levels.Intelligent Storage Systems: Intelligent Storage System (ISS) and its components. Implementation of ISS as high- end and midrange storage arrays.</p>
				Introduction to Electronics Commerce: Defining Electronics Commerce, Forces fuelling Electronics Commerce, Electronics

		Elective- E-Commerce	Amit Kamra	Commerce Industry Frame work, Types of Electronics Commerce, E-Commerce Infrastructure: Need for Intelligent Website, Web and Database Integration, Web Software development tools, Multimedia Web extensions (VRML, Real Audio, Internet and Web .based Technology), Directories and search engines, Business to Customer, Business to Business, Consumer to Consumer, Consumer to Business .Legal Framework: General-Shrink-Weap-Contracts, Laws relating to online Contracts , Jurisdiction of Owner Website, Domain Name- Strategy of holding certain Names, Legal Issues, Trademark, Current Global and Indian, Standardization of Procedure and Practice of Business, Sole Trading, Joint Stock Company, Cooperative Society, Concept and Significance of Foreign Trade
		Elective- Advance JAVA	Sachin Bagga	Enumerations, Autoboxing, and Annotations (Metadata): Enumerations, Type Wrappers, Autoboxing, Annotations (Metadata), Type Annotations, Repeating Annotations Images: File Formats, Image Fundamentals: Creating, Loading, and Displaying, ImageObserver, Double Buffering, Double Buffering, MediaTracker, ImageProducer, ImageConsumer, ImageFilter. Multithreading and Concurrency Utilities: Basics of Multithreading, The Concurrent API Packages, Using Synchronization Objects, Phaser, Using an Executor, The TimeUnit , Enumeration, The Concurrent Collections, Locks, Atomic Operations, Parallel Programming via the Fork/Join Framework, The Concurrency Utilities Versus Java's traditional Approach.
		Open Elective MIS (OEIT-14602)	Mohanjit Kaur	Managing Information Systems in Organizations: Information in organizational functions, types of information technology, types of information systems- transaction processing systemsmanagement information systems, Managing in the Internet Era, Managing Information Systems in Organization-the IT interaction model, Challenges for the manager, Decision making with MIS-Tactical decisions-operational decisions, strategic decisions, communication in organizations- types of communication. Strategy: Information goods-properties-technology lock-in and switching costs-network externalities-positive feedback-tippy markets, information systems and competitive strategyvalue chain, the Role of CIO-information system's plan-vendor coordination-technology updates-return on investment on technology.
		Open Elective (OEIT - 14601)	Sidharath Jain	>1. Bussiness strategy, Challenges and opportunities in IT, Application management & technology strategy of IT, Challenges of IT and Business strategy alignment, Three-D framework of Business - IT alignment. >2. Enterpraise IT Architecture defination and contents, Technology Management Strategy Framework, Program Management - Benefits, desired qualitiesof program office manager, Maturity of PMO, Implementation of PMO strategy, Measuring PMO performance and success factorsof PMO
				>1. Introduction to Enterprise Application and their types, life cycle of raising enterprise application, integration with partners, skills required to build enterprise application, key determinants of successful enterprise application, measuring the succes of enterprise application. ETL - DDL - middleware requirements >2. Inception of Enterprise Application - business modelling

8th Sem	A	Business Enterprise Application	Sidharath Jain	Enterprise application, ETE, DB, middleware requirements. 7.2. Reception of Enterprise Application, business modeling, requirements elicitation, use case modeling, prototyping, non functional requirements, requirement validation, planning and estimation.
		Engineering Entrepreneurship	Jasleen Kaur	Entrepreneurship and the Entrepreneurial Mind-Set: The nature of entrepreneurship, entrepreneur's thinking, the intention to act entrepreneurially, Entrepreneur background and characteristics, Role models and support systems, sustainable entrepreneurship. Corporate Entrepreneurship: Reasons for interest in corporate entrepreneurship, managerial versus entrepreneurial decision making, establishing corporate entrepreneurship in organization. Generating and Exploiting New Entry opportunities: new entry, generation of new entry of opportunity, entry strategy for new entry exploitation, risk reduction strategies for new entry exploitation. Creativity and the Business Idea: ideas from trend analysis, trends, sources of new ideas, methods of generating ideas, creative problem solving, creativity and entrepreneurship, innovation, entrepreneurial innovation, opportunity recognition, product planning and development process, e-commerce and business startup. Identifying and Analyzing Domestic and International Opportunities: Opportunity recognition and the opportunity assessment plan, information sources, sources of information for start-up entrepreneurs in India, the nature of international entrepreneurship, the importance of international business to the firm, international versus domestic entrepreneurship.] Protecting the Idea and Other Legal Issues for the Entrepreneur: intellectual property, need for a lawyer, selection of a lawyer, legal issues in setting up the organization, patents, business methods patents, startup without a patent, trademarks, copyrights, trade secrets and noncompetition agreements, licensing, product safety and liability, insurance, Sarbanes-Oxley act, Contracts.
		ICT in Agriculture and Rural Development	Harjot Kaur Gill	Introduction: Introduction to ICT, ICT in Agricultural and Rural Development. ICT Infrastructure, Appliances and Services : Making ICTs Affordable in Rural Areas, Mobile Money Moves to Rural Areas, M-PESA's :Pioneering Money Transfer Service, Delivering Content for Mobile Agricultural Services. Impact of Mmobile Devices on Agriculture and Rural Development: Key Benefits and Challenges Related to Mobile Phones and Agricultural Livelihoods, General Principles for Using Mobile Phones in Agricultural Projects.
		Elective 1- Computer Forenics	Pankaj Bhambri	Computer Forensics Fundamentals – Introduction to Computer Forensics, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/ Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists Computer Forensics Technologies – Types of Military Computer Forensics Technology, Types of Law Enforcement: Computer Forensics Technology, Types of Business Computer Forensics Technology, Specialized Forensic Techniques, Hidden Data, Spyware and Adware, Encryption Methods and Vulnerability, Protecting Data from being Compromised, Internet Tracing Methods, Security and Wireless Technologies, Avoiding Pitfalls with Firewalls, Biometric Security Systems Computer Forensics Systems –Internet Security Systems, Intrusion Detection Systems, Firewall Security Systems, Storage Area Network Security Systems, Network Disaster Recovery Systems, Public Key Infrastructure Systems, Wireless Network Security Systems, Satellite Encryption Security Systems, Instant Messaging Security Systems, Net Privacy Systems, Identity Management Security Systems, Identity Theft, Biometric Security Systems, Homeland Security Systems
		Elective 2- Corporate IT Management	Kamaljit Kaur Dhillon	Basic concepts: Understanding information systems - data and information, creating information, quality of information, categorization of corporate information systems. IT management: Overview, IT infrastructure, IT management disciplines, IT managers, disadvantages of IT management. Acquiring and developing BIS : Methods of software acquisition - initiating system development, BIS acquisition, rapid application development. Corporate Project Management : project management process and methodology, System Analysis, System Design, Implementation and Maintenance. Case Study: Falling at the final hurdle. End user computing: End user IS services, managing network services, end user development, providing end user services, Case Study: Using network computers to reduce the total cost of ownership.
				Introduction to Mobile: Development :Brief History of Mobile ,Beginning and evolution, Mobile ecosystem, Operator,

		Elective 3- Mobile Application Development	Ranjodh Kaur	<p>Network, Devices, Platforms, Operating System, Application, Frameworks, Types of Mobile applications, Seven rules for developing mobile strategy.</p> <p>Android User Interface Design: XML Naming scheme, XML syntax, XML Referencing, XML constants, XML Styles, XML Colors, View Group Class, View Class, Activity Class, UI Design from scratch: Checkbox, TextView, Button element to interface, Error elimination using XML Editor, Working with Relative, Linear Table and Grid Layouts, Understanding Activity Life Cycle.</p> <p>Android Development Environment: Introduction to android, Advantage of Android over other development environment, Android execution environment, Components of android application, Android activity and service lifecycle, Android 7.0 nougat and comparison with older version, Assembling android 7 development workstation, Downloading and installing Android Studio2, Introduction to Android Studio IDE.</p>
		Elective 4- Cloud Infrastructure and Services	Sachin Bagga	<p>Overview of Computing Paradigm: Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing, Roots of cloud computing, the Business driver for adopting Cloud Computing, Cloud Computing vs. Cluster computing vs. Grid computing.</p> <p>Introduction to Cloud Computing: Cloud Types: The NIST Model, The Cloud Cube Model, Deployment models, Service Models, Benefits of Cloud Computing, Disadvantages of Cloud Computing, Role of Open Standards</p> <p>Cloud Concepts and Technologies: Virtualization: Definition, Characteristics and benefits of virtualization, Virtualization and cloud computing</p> <p>Cloud-based services and applications: Cloud computing for healthcare, Energy systems, Transportation systems, Manufacturing industry, Government, and Education. Cloud deployment models: Public, Private, Community, and Hybrid cloud.</p>
M.Tech		MAC-102 Pedagogy Studies	Amit Kamra	<p>Introduction and Methodology: Aims and rationale, Policy background, Conceptual framework and terminology, Theories of learning, Curriculum, Teacher education, Research questions, Overview of methodology and Searching, Thematic overview: Pedagogical practices being used by teachers in formal and informal classrooms in developing countries.</p>
M.Tech		MIT-109 Data Analytics	Sandeep Kumar Singla	<p>Data Analytics and Project Management: Key role of data analytics in the process of driving change in project management, Elements, Variables, and Data categorization, Levels of Measurement, Data management and indexing, Introduction to statistical learning and R-Programming.</p> <p>Categories of Analytics and Risk Management: Descriptive Analytics, Predictive Analytics, Perspective Analytics, Measures of central tendency, Measures of location of dispersions, Practice and analysis with R, Risk Management Process, Establishing Tolerance, Data Collection risk and risk collection, Exploratory risks in data analytics, Confirmatory Analytics risks, predictive risks in data analytics, risks in communicating results, resolving data analytics risks.</p>
M.Tech		Digital Forensics	Kulwinder Singh Mann	<p>Introduction to Computer Forensics:- Digital Forensics Science: Forensics science, computer forensics, and digital forensics. Computer Crime: Criminalistics as it relates to the investigative process, analysis of cyber-criminalistics area, holistic approach to cyber-forensics.</p> <p>Cyber Crime Scene Analysis: Discuss the various court orders etc., methods to search and seizure electronic evidence, retrieved and un-retrieved communications, Discuss the importance of understanding what court documents would be required for a criminal investigation.</p>

M.Tech		Machine Learning - II	Manpreet Singh	<p>Introduction: Statistical Learning Perspective, Computer Science Perspective, Models and Algorithms: Learning a Function, Learning a Function to Make Predictions, Techniques For Learning a Function, Supervised, Unsupervised and Semi-Supervised Learning, Steps in Machine Learning Process, Loss Functions in Machine Learning, Gradient Descent, Gradient Descent Variations, Model Selection and Evaluation, Machine Learning Visualization, Classify images, regression, classify structured data, text classification, underfitting and overfitting, save and restore models.</p> <p>Nonlinear Algorithms: Classification and Regression Trees (CART): Decision Trees, CART Model Representation, Making Predictions, Learn a CART Model From Data, Preparing Data For CART, Making Predictions on Data, Naive Bayes: Introduction to Bayes' Theorem, Naive Bayes Classifier, Gaussian Naive Bayes, Preparing Data For Naive Bayes, Make Predictions with Naive Bayes, Gaussian Naive Bayes: Gaussian Probability Density Function, Learn a Gaussian Naive Bayes Model, Make Prediction with Gaussian Naive Bayes, K-Nearest Neighbors (KNN): KNN Model Representation, Making Predictions with KNN, Curse of Dimensionality, Preparing Data For KNN, KNN and Euclidean Distance, Making Predictions with KNN .</p> <p>Third Generation Neural Networks: Introduction, Spiking Neural Networks: Architecture</p>
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