

K.J.SOMAIYA COLLEGE OF SCIENCE AND COMMERCE Autonomous (Affiliated to University of Mumbai) Vidyavihar-Mumbai-40077 Re-accredited-"A" Grade by NACC						
SYLLABUS OF ATKT AND RE-EXAM FEB/MARCH2020						
DEPARTMENT OF MATHEMATICS						
CLASS	SEMESTER	PAPER	STUDENT HAVING ATKT UPTO MAY 2018	STUDENTS HAVING ATKT OF AY 2018-2019	STUDENTS HAVING ATKT/RE-EXAM OF AY 2019-2020	
FYBCOM	1		1 Commission and Brokerages , Discounts: Trade discounts Cash discounts , Profit and Loss ,Shares: Concept of share, market value, dividend , Addition and Multiplication of Matrices ,Determinant: Crammers rule– simultaneous linear equations up to three variables , Permutations and Combinations , Arithmetic mean, Median and Mode. Quartiles, Percentile	Commission and Brokerages , Discounts: Trade discounts Cash discounts , Profit and Loss ,Shares: Concept of share, market value, dividend , Addition and Multiplication of Matrices ,Determinant: Crammers rule– simultaneous linear equations up to three variables , Permutations and Combinations , Arithmetic mean, Median and Mode. Quartiles, Percentile	Commission and Brokerages , Discounts: Trade discounts Cash discounts , Profit and Loss ,Shares: Concept of share, market value, dividend , Addition and Multiplication of Matrices ,Determinant: Crammers rule– simultaneous linear equations up to three variables , Permutations and Combinations , Arithmetic mean, Median and Mode. Quartiles, Percentile	
	2	1+	Total Revenue, Average Revenue, Total Cost, Average Cost and Profit function Equilibrium Point. Break Even point. Derivative of the simple function , Constant function, x^n , $\log x$, e^x , a^x , Marginal revenue, Marginal cost, Simple Interest and Compound Interest, Decision Theory, computation of Karl Pearson's coefficient of correlation, Estimation of Trend using moving averages (three yearly and four yearly).	Total Revenue, Average Revenue, Total Cost, Average Cost and Profit function Equilibrium Point. Break Even point, Derivative of the simple function , Constant function, x^n , $\log x$, e^x , a^x , Marginal revenue, Marginal cost, Simple Interest and Compound Interest, Decision Theory, computation of Karl Pearson's coefficient of correlation, Estimation of Trend using moving averages (three yearly and four yearly).	Total Revenue, Average Revenue, Total Cost, Average Cost and Profit function Equilibrium Point. Break Even point. Derivative as rate measure. Derivative of the simple function Constant function, x^n , $\log x$, e^x , a^x . Scalar multiplication rule, Sum rule, difference rule, product rule, quotient rule, composition rule. Second order Derivatives , Marginal Cost, Marginal Revenue, Bivariate Linear Correlation: Scatter Diagram, computation of Karl Pearson's coefficient of correlation, Spearman's Rank correlation coefficient. Bivariate Linear Regression: Finding Regression lines by the method of Least Squares: Relationship between the Regression coefficients and Correlation coefficient, the point of intersection of the two regression lines	
FYBSC	1		1 Dot product, cross product of two vectors, unit vector in the direction of a given vector, direction ratio and direction cosine of a line, finding equation of plane, volume of parallelepiped, absolute value function and its properties, monotonic sequences, bounded sequences, Real number and its properties, Hausdorff's property for real number, Problems on ϵ - δ definition, Definition of limit in terms of ϵ - δ , finding value of δ for given ϵ .	Homogeneous differential equation, order and degree of differential equation, Linear and Bernoulli differential equation, Solving differential equation by writing it in variable, separable form, exact, non-exact differential equation, Integrating factor, Solving a non-exact differential equation by multiplying with suitable integrating factor, Solving a homogeneous differential equation by making suitable substitution, Finding differential equation of a family of curves, Real numbers and its properties, ϵ -neighbourhood of a real number, AM-GM inequality (Statement only), Cauchy-Schwarz inequality (Statement only), Law of trichotomy, Problems based on AM-GM inequality and Cauchy Schwarz inequality	Homogeneous differential equation, order and degree of differential equation, Linear and Bernoulli differential equation, Solving differential equation by writing it in variable, separable form, exact, non-exact differential equation, Integrating factor, Solving a non-exact differential equation by multiplying with suitable integrating factor, Solving a homogeneous differential equation by making suitable substitution, Finding differential equation of a family of curves, Real numbers and its properties, ϵ -neighbourhood of a real number, AM-GM inequality (Statement only), Cauchy-Schwarz inequality (Statement only), Law of trichotomy, Problems based on AM-GM inequality and Cauchy Schwarz inequality	
	1		2 No students	set theory, equivalence relations, functions, divisibility of integers, linear diophantine equations	set theory, equivalence relations, functions, divisibility of integers, linear diophantine equations	
	2		1 Definition of derivative, Finding derivative using definition of derivative, Left hand derivative, Right hand derivative, Finding derivative using rules of derivative, Differentiability implies continuity but converse is not true, Higher order derivatives, Problem based on Leibnitz rule, Lagrange's Mean value theorem (Statement only), Rolle's mean value theorem (Statement only), Problems based on Lagrange's Mean value theorem and Rolle's mean value theorem, Derivative of inverse function, Chain rule (Statement only), Concave upward and concave downward, Increasing and decreasing function, example of functions which are differentiable n times but not n+1 times.	Graphs, Definition and problems based on limit epsilon-delta definition, left hand and right hand limit, continuity, statement and applications of Sandwich theorem, statement and applications of Intermediate value theorem, derivative, higher order derivative, increasing-decreasing function, maxima-minima, Rolle's theorem, LMVT, Inverse function theorem.	Graphs, Definition and problems based on limit epsilon-delta definition, left hand and right hand limit, continuity, statement and applications of Sandwich theorem, statement and applications of Intermediate value theorem, derivative, higher order derivative, increasing-decreasing function, maxima-minima, Rolle's theorem, LMVT, Inverse function theorem.	
	2		2 polynomials and graph theory(complete units)	congruences polynomials and group theory complete units	full syllabus	
SYBSC	3		1 Entire Syllabus	Entire Syllabus	Entire Syllabus	
	3		2 Matrices, system of linear equations, Vector spaces and subspaces inner product spaces	Matrices, system of linear equations, Vector spaces and subspaces inner product spaces	Matrices, system of linear equations, Vector spaces and subspaces inner product spaces	
	3		3 Graph theory - counting triangles, BFS trees, minimal spanning tree, Dijkstra's algorithm	Graph theory - counting triangles, BFS trees, minimal spanning tree, Dijkstra's algorithm	Graph theory - minimal spanning tree, Dijkstra's algorithm. Principles of inclusion exclusion, Pigeon hole principle, multinomial.	
	4		1 Riemann integration and multiple integration full units	Riemann integration and multiple integration full units		
	4		2 Linear transformations, matrix associated with a linear transformation, dual basis, determinants, eigen values and eigen vectors.	Linear transformations, matrix associated with a linear transformation, dual basis, determinants, eigen values and eigen vectors.	Full revised syllabus	
	4		3 Newton-Raphson method, LU decomposition by Dolittle method, Interpolation, Gauss Seidel method, Derivative using Lagrange's method, Simpson method for integration, Taylor's method, Euler's method, multi step fourth order method to solve DE, to solve DE Financial Mathematics- Arbitrage, forward contract, call/ put option	Newton-Raphson method, LU decomposition by Dolittle method, Interpolation, Gauss Seidel method, Derivative using Lagrange's method, Simpson method for integration, Taylor's method, Euler's method, multi step fourth order method to solve DE, to solve DE Financial Mathematics- Arbitrage, forward contract, call/ put option	full syllabus	
TYBSC	5		1 Entire Syllabus	Entire Syllabus	Entire Syllabus	
	5		2 full syllabus	full syllabus	no students	
	5		3			
	5		4 full syllabus	full syllabus	full syllabus	
	5		5 C programming use of for loop, conditional statements and Mathematical functions. JAVA array, constructor, inheritance	C programming use of for loop, conditional statements and Mathematical functions. JAVA array, constructor, inheritance	C programming use of for loop, conditional statements and Mathematical functions. JAVA array, constructor, inheritance	
	6		1			
	6		2 full syllabus			
	6		3			
	6		4 full syllabus	full syllabus	full syllabus	
	6		5 overloading, overriding, Applet	overloading, overriding, Applet	overloading, overriding, Applet	

FYCS	1	Discrete Mathematics	Injective, Surjective and bijective functions, composition of functions, Matrix representation of a relation, Equivalence relation, Hasse diagram for partial order relation, Solving homogeneous recurrence relation, Permutations with distinct objects, Binomial numbers, Combinations, Sum rule and Product rule of counting, Adjacency matrix of graph, Prim's algorithm for minimum spanning tree, Traversing binary tree.	Injective, Surjective and bijective functions, composition of functions, Matrix representation of a relation, Equivalence relation, Hasse diagram for partial order relation, Solving homogeneous recurrence relation, Permutations with distinct objects, Binomial numbers, Combinations, Sum rule and Product rule of counting, Adjacency matrix of graph, Prim's algorithm for minimum spanning tree, Traversing binary tree	Injective, Surjective and bijective functions, composition of functions, Matrix representation of a relation, Equivalence relation, Hasse diagram for partial order relation, Solving homogeneous recurrence relation, Permutations with distinct objects, Binomial numbers, Combinations, Sum rule and Product rule of counting, Adjacency matrix of graph, Prim's algorithm for minimum spanning tree, Traversing binary tree
	2	Calculus	Derivative of a function, deciding whether the function is differentiable, Increasing and decreasing functions, upward and downward concave, Relative extrema (Second derivative test), Newton's method, Indefinite Integral and definite integrals (Integration by parts and Substitution method), Area between the curves, Numerical integration (Simpson's rule), Euler's method, Partial derivatives, Gradient, Tangent plane	Derivative of a function, deciding whether the function is differentiable, Increasing and decreasing functions, upward and downward concave, Relative extrema (Second derivative test), Newton's method, Indefinite Integral and definite integrals (Integration by parts and Substitution method), Area between the curves, Numerical integration (Simpson's rule), Euler's method, Partial derivatives, Gradient, Tangent plane	Full syllabus
FYIT	1	Discrete Mathematics	Properties of sets, Algebraic proofs of set identities, Checking logical equivalence using truth table, Converse, Inverse and Contrapositive of a quantified statement, Rational numbers, Sequences, Principle of Mathematical induction, Second order linear homogeneous recurrence relation, Injective and surjective functions, composition of functions, Matrix representation of a relation, Equivalence relation, Matrix representation of a graph, Kruskal's algorithm for minimum spanning tree, Sum rule and product rule, Simple probability problems	Properties of sets, Algebraic proofs of set identities, Checking logical equivalence using truth table, Converse, Inverse and Contrapositive of a quantified statement, Rational numbers, Sequences, Principle of Mathematical induction, Second order linear homogeneous recurrence relation, Injective and surjective functions, composition of functions, Matrix representation of a relation, Equivalence relation, Matrix representation of a graph, Kruskal's algorithm for minimum spanning tree, Sum rule and product rule, Simple probability problems	Properties of sets, Algebraic proofs of set identities, Checking logical equivalence using truth table, Converse, Inverse and Contrapositive of a quantified statement, Rational numbers, Sequences, Principle of Mathematical induction, Second order linear homogeneous recurrence relation, Injective and surjective functions, composition of functions, Matrix representation of a relation, Equivalence relation, Matrix representation of a graph, Kruskal's algorithm for minimum spanning tree, Sum rule and product rule, Simple probability problems
FYBT	1	Mathematics	Determinant of a matrix, roots of quadratic polynomials, properties of logarithm, Solving system of linear equations by LU decomposition, Limit of a function, Checking continuity of a function, Second derivative test for relative extrema, Sum rule and product rule, Permutation and combination, Simple probability problems.	Determinant of a matrix, roots of quadratic polynomials, properties of logarithm, Solving system of linear equations by LU decomposition, Limit of a function, Checking continuity of a function, Second derivative test for relative extrema, Sum rule and product rule, Permutation and combination, Simple probability problems.	Determinant of a matrix, roots of quadratic polynomials, properties of logarithm, Solving system of linear equations by LU decomposition, Limit of a function, Checking continuity of a function, Second derivative test for relative extrema, Sum rule and product rule, Permutation and combination, Simple probability problems.
SYBAF	3	IT IN ACCOUNTANCY. - I	MODULE 1 Introduction to Computers History of Computers Parts of Computers Hardware: Specifications and Data Storage Management Software: Concept of System Software and Applications Networking: Introduction and types of network topologies MODULE2 Office Productivity Tools MS Word: Creating, Editing, Formatting and Printing of Documents, Using Tools, Mail merge and Print Review and Set-up MS Excel: Creating Worksheet, Creating Various Formulae, Creating Charts, Rename and Copy of Worksheets, Using Tools, Printing Review and Set-up Power Point: Create Project Report, Create Slides, Animation, Page Designing, Insert Image, View Page, Print Review and Set-up. Use of Tools In Accounting : Preparation of vouchers, invoices and reports, Calculation of Interest, Depreciation, TDS, Salary, Taxes, inventory and reconciliation	MODULE 1 Introduction to Computers History of Computers Parts of Computers Hardware: Specifications and Data Storage Management Software: Concept of System Software and Applications Networking: Introduction and types of network topologies MODULE2 Office Productivity Tools MS Word: Creating, Editing, Formatting and Printing of Documents, Using Tools, Mail merge and Print Review and Set-up MS Excel: Creating Worksheet, Creating Various Formulae, Creating Charts, Rename and Copy of Worksheets, Using Tools, Printing Review and Set-up Power Point: Create Project Report, Create Slides, Animation, Page Designing, Insert Image, View Page, Print Review and Set-up. Use of Tools In Accounting : Preparation of vouchers, invoices and reports, Calculation of Interest, Depreciation, TDS, Salary, Taxes, inventory and reconciliation	MODULE 1 Introduction to Computers History of Computers Parts of Computers Hardware: Specifications and Data Storage Management Software: Concept of System Software and Applications Networking: Introduction and types of network topologies MODULE2 Office Productivity Tools MS Word: Creating, Editing, Formatting and Printing of Documents, Using Tools, Mail merge and Print Review and Set-up MS Excel: Creating Worksheet, Creating Various Formulae, Creating Charts, Rename and Copy of Worksheets, Using Tools, Printing Review and Set-up Power Point: Create Project Report, Create Slides, Animation, Page Designing, Insert Image, View Page, Print Review and Set-up. Use of Tools In Accounting : Preparation of vouchers, invoices and reports, Calculation of Interest, Depreciation, TDS, Salary, Taxes, inventory and reconciliation

	4	IT IN ACCOUNTANCY. - II	<p>MODULE 1 Business Process Introduction, Definition and Meaning of business process Flow of business process for accounting, purchase, sales and finance Classification of business processes Introduction, Definition and Meaning of Business Process Management Principles and practices of Business Process Management Business Process Management life cycle Theories of Business Management Process Implementation of Business process Management – need, key factors and importance Automation of business Processes – benefits, risks, challenges Accounting systems automation IT and Business Process Management Information systems – Meaning, Use of IT in accountancy</p> <p>MODULE 2 Computerized accounting system& Auditing Introduction and meaning Uses and Benefits Role Need and requirements of computerized accounting Basic requirements of computerized accounting system Limitations of computerized accounting system Understand the development and design of a computerized accounting system; determining how the accounting data will be processed, i.e. what accounts and books are needed and what is the desired output i.e. financial reports and other reports.</p>	<p>MODULE 1 Business Process Introduction, Definition and Meaning of business process Flow of business process for accounting, purchase, sales and finance Classification of business processes Introduction, Definition and Meaning of Business Process Management Principles and practices of Business Process Management Business Process Management life cycle Theories of Business Management Process Implementation of Business process Management – need, key factors and importance Automation of business Processes – benefits, risks, challenges Accounting systems automation IT and Business Process Management Information systems – Meaning, Use of IT in accountancy</p> <p>MODULE 2 Computerized accounting system& Auditing Introduction and meaning Uses and Benefits Role Need and requirements of computerized accounting Basic requirements of computerized accounting system Limitations of computerized accounting system Understand the development and design of a computerized accounting system; determining how the accounting data will be processed, i.e. what accounts and books are needed and what is the desired output i.e. financial reports and other reports.</p>	FULL SYLLABUS
SYBMS	3	IT IN BUSINESS MANAGEMENT - I	<p>MODULE 1 Introduction to IT Support in Management Information Technology concepts Concept of Data, Information and Knowledge Concept of Database Introduction to Information Systems and its major components. Types and Levels of Information systems. Main types of IT Support systems Computer based Information Systems (CBIS). Types of CBIS - brief descriptions and their interrelationships/hierarchies. Office Automation System(OAS). Transaction Processing System(TPS) Management Information System(MIS), Decision Support Systems (DSS), Executive Information System(EIS), Knowledge based system, Expert system Concept of Digital Economy and Digital Organization. MODULE 2 Office Automation using MS Office and Email Learn Word: Creating/Saving of Document Editing and Formatting Features Designing a title page, Preparing index, Use of SmartArt Cross Reference, Bookmark and Hyperlink. Mail Merge Feature. Spreadsheet application (e.g. MS-Excel/openoffice.org) Creating/Saving and editing spreadsheets Drawing charts. Using</p>	<p>MODULE 1 Introduction to IT Support in Management Information Technology concepts Concept of Data, Information and Knowledge Concept of Database Introduction to Information Systems and its major components. Types and Levels of Information systems. Main types of IT Support systems Computer based Information Systems (CBIS). Types of CBIS - brief descriptions and their interrelationships/hierarchies. Office Automation System(OAS). Transaction Processing System(TPS) Management Information System(MIS), Decision Support Systems (DSS), Executive Information System(EIS), Knowledge based system, Expert system Concept of Digital Economy and Digital Organization. MODULE 2 Office Automation using MS Office and Email Learn Word: Creating/Saving of Document Editing and Formatting Features Designing a title page, Preparing index, Use of SmartArt Cross Reference, Bookmark and Hyperlink. Mail Merge Feature. Spreadsheet application (e.g. MS-Excel/openoffice.org) Creating/Saving and editing spreadsheets Drawing charts. Using Basic Functions: text, math (sum, round, power), statistical(count, countblank, mod, corrol, min, max), date & time, database, financial, logical functions if and nested-if. Using Advanced Functions : Use of Lookup data, filtering data (AutoFilter , Advanced Filter), data validation, what-if analysis (using data tables/scenarios), creating sub-totals and grand totals, pivot table/chart, goal seek/solver</p>	<p>MODULE 1 Introduction to IT Support in Management Information Technology concepts Concept of Data, Information and Knowledge Concept of Database Introduction to Information Systems and its major components. Types and Levels of Information systems. Main types of IT Support systems Computer based Information Systems (CBIS). Types of CBIS - brief descriptions and their interrelationships/hierarchies. Office Automation System(OAS). Transaction Processing System(TPS) Management Information System(MIS), Decision Support Systems (DSS), Executive Information System(EIS), Knowledge based system, Expert system Concept of Digital Economy and Digital Organization. MODULE 2 Office Automation using MS Office and Email Learn Word: Creating/Saving of Document Editing and Formatting Features Designing a title page, Preparing index, Use of SmartArt Cross Reference, Bookmark and Hyperlink. Mail Merge Feature. Spreadsheet application (e.g. MS-Excel/openoffice.org) Creating/Saving and editing spreadsheets Drawing charts. Using Basic Functions: text, math (sum, round, power), statistical(count, countblank, mod, corrol, min, max), date & time, database, financial, logical functions if and nested-if. Using Advanced Functions : Use of Lookup data, filtering data (AutoFilter , Advanced Filter), data validation, what-if analysis (using data tables/scenarios), creating sub-totals and grand totals, pivot table/chart, goal seek/solver</p> <p>Power Presentation Creating a presentation with minimum 20 slides with a script. Presenting in different views,</p>
	4	IT IN BUSINESS MANAGEMENT - II	<p>MODULE 1 Management Information System Overview of MIS Definition, Characteristics • Subsystems of MIS (Activity and Functional subsystems) Structure of MIS Reasons for failure of MIS. Understanding Major Functional Systems Marketing & Sales Systems Finance & Accounting Systems Manufacturing & Production Systems Human Resource Systems Inventory Systems, Sub systems, description and organizational levels, Decision support system Definition Relationship with MIS, Evolution of DSS, Characteristics, classification, objectives, components, applications of DSS. MODULE 2 ERP/E-SCM/E-CRM Concepts of ERP , Architecture of ERP Generic modules of ERP Applications of ERP ERP Implementation concepts ERP lifecycle Concept of XRP (extended ERP) Features of commercial ERP software Study of SAP, Oracle Apps, MS Dynamics NAV, Peoplesoft Concept of e-CRM E-CRM Solutions and its advantages, How technology helps? CRM Capabilities and customer Life cycle Privacy Issues and CRM Data Mining and CRM CRM and workflow Automation Concept of E-SCM Strategic advantages, benefits E-SCM Components and Chain Architecture Major Trends in e-SCM Case studies ERP/SCM/CRM</p>	<p>MODULE 1 Management Information System Overview of MIS Definition, Characteristics • Subsystems of MIS (Activity and Functional subsystems) Structure of MIS Reasons for failure of MIS. Understanding Major Functional Systems Marketing & Sales Systems Finance & Accounting Systems Manufacturing & Production Systems Human Resource Systems Inventory Systems, Sub systems, description and organizational levels, Decision support system Definition Relationship with MIS, Evolution of DSS, Characteristics, classification, objectives, components, applications of DSS. MODULE 2 ERP/E-SCM/E-CRM Concepts of ERP , Architecture of ERP Generic modules of ERP Applications of ERP ERP Implementation concepts ERP lifecycle Concept of XRP (extended ERP) Features of commercial ERP software Study of SAP, Oracle Apps, MS Dynamics NAV, Peoplesoft Concept of e-CRM E-CRM Solutions and its advantages, How technology helps? CRM Capabilities and customer Life cycle Privacy Issues and CRM Data Mining and CRM CRM and workflow Automation Concept of E-SCM Strategic advantages, benefits E-SCM Components and Chain Architecture Major Trends in e-SCM Case studies ERP/SCM/CRM</p>	FULL SYLLABUS

FYBFM	2	COMPUTER SKILLS-I	<p>MODULE 1 Computer Hardware Personal Computers-identification/demonstration of different storage Devices like CD and CD drive, hard disk- HDD, storing and retrieving data from various storage devices, identification of various input and output devices. Primary memory, RAM and ROM- Processor- CPU, it's speed-machine cycle, ports, computer buses, Different types of printers. Introduction to trouble shooting of personal computers.</p> <p>MODULE 2 Windows Introduction, features, various versions of windows, My computer, my documents, recycle bin, network neighbourhood, start menu, taskbar, file and folder operation (creating, copying, moving, deleting), system tools, creating shortcuts, system tools, creating shortcuts.</p> <p>MODULE 3 Internet What is internet, most popular internet services , functions of internet like email, WWW, FTP, usenet, Instant messaging, internet telephony, using address book, working with task list, scheduling appointments, reminders, events</p>	<p>MODULE 1 Computer Hardware Personal Computers-identification/demonstration of different storage Devices like CD and CD drive, hard disk- HDD, storing and retrieving data from various storage devices, identification of various input and output devices. Primary memory, RAM and ROM- Processor- CPU, it's speed-machine cycle, ports, computer buses, Different types of printers. Introduction to trouble shooting of personal computers.</p> <p>MODULE 2 Windows Introduction, features, various versions of windows, My computer, my documents, recycle bin, network neighbourhood, start menu, taskbar, file and folder operation (creating, copying, moving, deleting), system tools, creating shortcuts, MODULE 3 Internet What is internet, most popular internet services , functions of internet like email, WWW, FTP, usenet, Instant messaging, internet telephony, using address book, working with task list, scheduling appointments, reminders, events</p>	<p>MODULE 1 Computer Hardware Personal Computers-identification/demonstration of different storage Devices like CD and CD drive, hard disk- HDD, storing and retrieving data from various storage devices, identification of various input and output devices. Primary memory, RAM and ROM- Processor- CPU, it's speed-machine cycle, ports, computer buses, Different types of printers. Introduction to trouble shooting of personal computers. MODULE 2 Windows Introduction, features, various versions of windows, My computer, my documents, recycle bin, network neighbourhood, start menu, taskbar, file and folder operation (creating, copying, moving, deleting), system tools, creating shortcuts, MODULE 3 Internet What is internet, most popular internet services , functions of internet like email, WWW, FTP, usenet, Instant messaging, internet telephony, using address book, working with task list, scheduling appointments, reminders, events</p>
SYBFM	3	COMPUTER SKILLS-II	<p>MODULE 1 Advanced Spreadsheet Pivot, Advanced formulae, Lookups, Macros, Working with other programs, Inserting a spreadsheet sheet in word document, modifying an inserted spreadsheet, Inserting a linked chart in a Word Document, Inserting graphic in a spreadsheet. MODULE 2 Data Based Management Systems Concepts, Tables, Fields, Data types RDBMS Primary Key, Foreign Key MODULE 3 Modern E Business Software Systems Introduction : Enterprise Resource Planning – ERP Supply chain Management- SCM Customer Relationship Management- CRM Sales Force Automation- SFA</p>	<p>MODULE 1 Advanced Spreadsheet Pivot, Advanced formulae, Lookups, Macros, Working with other programs, Inserting a spreadsheet sheet in word document, modifying an inserted spreadsheet, Inserting a linked chart in a Word Document, Inserting graphic in a spreadsheet. MODULE 2 Data Based Management Systems Concepts, Tables, Fields, Data types RDBMS Primary Key, Foreign Key MODULE 3 Modern E Business Software Systems Introduction : Enterprise Resource Planning – ERP Supply chain Management- SCM Customer Relationship Management- CRM Sales Force Automation- SFA</p>	FULL SYLLABUS
TYBMS	6	OPERATIONS RESEARCH	<p>a) Introduction To Operations Research- Operations Research - Definition, Characteristics of OR, OR Techniques, Areas of Application, Limitations of OR. b) Linear Programming Problem- Introduction to Linear Programming - Applications of LPP - LPP Formulation (Decision Variables, Objective Function, Constraints, Non Negativity Constraints). c) Linear Programming Problems: Graphical Method - Maximization & Minimization Type Problems. (Max. Z & Min. Z) - Two Decision Variables and Maximum Three Constraints Problem - Constraints can be "less than or equal to", "greater than or equal to" or a combination of both the types i.e. mixed constraints. - Concepts: Feasible Region of Solution, Unbounded Solution, Redundant Constraint, Infeasible Solution, Alternative Optima. d) Transportation Problems , Methods to calculate IBFS , u-v method , Assignment Problems , Hungarian Method to solve Assignment Problems.</p>	<p>a) Introduction To Operations Research- Operations Research - Definition, Characteristics of OR, OR Techniques, Areas of Application, Limitations of OR. b) Linear Programming Problem- Introduction to Linear Programming - Applications of LPP - LPP Formulation (Decision Variables, Objective Function, Constraints, Non Negativity Constraints). c) Linear Programming Problems: Graphical Method - Maximization & Minimization Type Problems. (Max. Z & Min. Z) - Two Decision Variables and Maximum Three Constraints Problem - Constraints can be "less than or equal to", "greater than or equal to" or a combination of both the types i.e. mixed constraints. - Concepts: Feasible Region of Solution, Unbounded Solution, Redundant Constraint, Infeasible Solution, Alternative Optima. d) Transportation Problems , Methods to calculate IBFS , u-v method , Assignment Problems , Hungarian Method to solve Assignment Problems.</p>	full syllabus
SYCS	3	COMBINATORICS AND GRAPH THEORY	<p>Introduction to Combinatorics: Strings, Sets, and Binomial Coefficients: Strings-Combinations, Combinatorial, Induction: Introduction, The Positive Integers are Well Ordered, Graph Theory: Eulerian and Hamiltonian Graphs, Graph Coloring, Planar Counting, Labeled Trees Network Flows: Example on the Ford-Fulkerson Labeling Algorithm.</p>	<p>Introduction to Combinatorics: Strings, Sets, and Binomial Coefficients: Strings-Combinations, Combinatorial, Induction: Introduction, The Positive Integers are Well Ordered, Graph Theory: Eulerian and Hamiltonian Graphs, Graph Coloring, Planar Counting, Labeled Trees Network Flows: Example on the Ford-Fulkerson Labeling Algorithm.</p>	<p>Introduction to Combinatorics: Strings, Sets, and Binomial Coefficients: Strings-Combinations, Combinatorial, Induction: Introduction, The Positive Integers are Well Ordered, Graph Theory: Eulerian and Hamiltonian Graphs, Graph Coloring, Planar Counting, Labeled Trees Network Flows: Example on the Ford-Fulkerson Labeling Algorithm.</p>
SYCS	4	LINEAR ALGEBRA USING PYTHON	<p>Vector Space: Vectors are functions, Vector Space: Vectors are functions, Solving a triangular system of linear equations. Linear combination, Span, Linear systems, homogeneous, linearly dependent and linearly independent . Matrix: Matrices as vectors, vector-matrix multiplication in terms of linear combinations, Matrix-vector multiplication in terms of dot-products, Null space, Basis, Dimension: Dimension and rank, Dimension and linear functions, Gaussian elimination: Echelon form.</p>	<p>Vector Space: Vectors are functions, Vector Space: Vectors are functions, Solving a triangular system of linear equations. Linear combination, Span, Linear systems, homogeneous, linearly dependent and linearly independent . Matrix: Matrices as vectors, vector-matrix multiplication in terms of linear combinations, Matrix-vector multiplication in terms of dot-products, Null space, Basis, Dimension: Dimension and rank, Dimension and linear functions, Gaussian elimination: Echelon form.</p>	FULL SYLLABUS
FYBAF	2	BUSINESS MATHEMATICS	<p><u>Ratio- Definition, Continued ratio, Inverse Ratio, Proportion - Continued proportion, Direct proportion, Inverse proportion, Variation - Inverse variation, Joint variation, Percentage - Meaning and computation of percentage Terms and formulae, Discount - Trade discount, Cash discount, problems involving cost price, selling price, trade discount, cash discount, Commission and brokerage Problems based on a mix of above types can be included. Matrices and Determinants : Symmetric matrices, Skew-symmetric matrices, Diagonal Matrices with their examples, Finding inverse of a square matrix , if it exists by Adjoint method, Finding Adj(A) for any square matrix A, Solving System of equations by Cramer's Rule and Matrix inversion method, Properties of Matrices, Finding determinant of a square matrix, Evaluating determinants by using properties of determinants.</u></p>	<p><u>Ratio- Definition, Continued ratio, Inverse Ratio, Proportion - Continued proportion, Direct proportion, Inverse proportion, Variation - Inverse variation, Joint variation, Percentage - Meaning and computation of percentage Terms and formulae, Discount - Trade discount, Cash discount, problems involving cost price, selling price, trade discount, cash discount, Commission and brokerage Problems based on a mix of above types can be included. Matrices and Determinants : Symmetric matrices, Skew-symmetric matrices, Diagonal Matrices with their examples, Finding inverse of a square matrix , if it exists by Adjoint method, Finding Adj(A) for any square matrix A, Solving System of equations by Cramer's Rule and Matrix inversion method, Properties of Matrices, Finding determinant of a square matrix, Evaluating determinants by using properties of determinants.</u></p>	FULL SYLLABUS

FYIT	2	NUMERICAL AND STATISTICAL METHODS	Network Flows: Example on the Ford-Fulkerson Labeling Algorithm.	Significant figures, types of errors, the Newton-Raphson method, Lagrange-interpolation formula, Gauss-Siedel method, Trapezoidal rule, Euler's method, Least square method for regression, Graphical method to solve LPP, Discrete Random variable, Binomial Distribution.	FULL SYLLABUS
FYBFM AND FYBMS	1	BUSINESS MATHEMATICS	Ratio- Definition, Continued ratio, Inverse Ratio, Proportion - Continued proportion, Direct proportion, Inverse proportion, Variation - Inverse variation, Joint variation, Percentage - Meaning and computation of percentage Terms and formulae, Discount - Trade discount, Cash discount, problems involving cost price, selling price, trade discount, cash discount, Commission and brokerage Problems based on a mix of above types can be included. Matrices and Determinants : Symmetric matrices, Skew-symmetric matrices, Diagonal Matrices with their examples, Finding inverse of a square matrix, if it exists by Adjoint method, Finding Adj(A) for any square matrix A, Solving System of equations by Cramer's Rule and Matrix inversion method, Properties of Matrices, Finding determinant of a square matrix, Evaluating determinants by using properties of determinants.	Ratio- Definition, Continued ratio, Inverse Ratio, Proportion - Continued proportion, Direct proportion, Inverse proportion, Variation - Inverse variation, Joint variation, Percentage - Meaning and computation of percentage Terms and formulae, Discount - Trade discount, Cash discount, problems involving cost price, selling price, trade discount, cash discount, Commission and brokerage Problems based on a mix of above types can be included. Matrices and Determinants : Symmetric matrices, Skew-symmetric matrices, Diagonal Matrices with their examples, Finding inverse of a square matrix, if it exists by Adjoint method, Finding Adj(A) for any square matrix A, Solving System of equations by Cramer's Rule and Matrix inversion method, Properties of Matrices, Finding determinant of a square matrix, Evaluating determinants by using properties of determinants.	Ratio- Definition, Continued ratio, Inverse Ratio, Proportion - Continued proportion, Direct proportion, Inverse proportion, Variation - Inverse variation, Joint variation, Percentage - Meaning and computation of percentage Terms and formulae, Discount - Trade discount, Cash discount, problems involving cost price, selling price, trade discount, cash discount, Commission and brokerage Problems based on a mix of above types can be included. Matrices and Determinants : Symmetric matrices, Skew-symmetric matrices, Diagonal Matrices with their examples, Finding inverse of a square matrix, if it exists by Adjoint method, Finding Adj(A) for any square matrix A, Solving System of equations by Cramer's Rule and Matrix inversion method, Properties of Matrices, Finding determinant of a square matrix, Evaluating determinants by using properties of determinants.
FYFM and FYBMS	2	BUSINESS STATISTICS	arithmetic mean, median mode for grouped and ungrouped data, combined mean, Quartiles, Percentile. Concept of dispersion, absolute and relative measures of dispersion, range, quartile deviation, coefficient of quartile deviation, variance, standard deviation, coefficient of variation. Correlation - Concept of correlation, positive and negative correlation, Karl Pearson's Coefficient of Correlation, Regression - meaning of regression, two regression equations, Regression coefficients and properties. Time Series: Least Square Method, Moving Average Method, Determination of Seasonal component	arithmetic mean, median mode for grouped and ungrouped data, combined mean, Quartiles, Percentile. Concept of dispersion, absolute and relative measures of dispersion, range, quartile deviation, coefficient of quartile deviation, variance, standard deviation, coefficient of variation. Correlation - Concept of correlation, positive and negative correlation, Karl Pearson's Coefficient of Correlation, Regression - meaning of regression, two regression equations, Regression coefficients and properties. Time Series: Least Square Method, Moving Average Method, Determination of Seasonal component	FULL SYLLABUS
FYCS	1	Descriptive Statistics and Introduction to Probability	Measures of Central tendency: Mean, Median, mode for grouped frequency distribution. Measures dispersion: Variance, standard deviation, coefficient of variation for grouped frequency distribution, Quartiles, quantiles Real life examples, correlation, Karl Pearson's coefficients of correlation, Linear regression: fitting of linear regression using least square regression, coefficient of determination	Measures of Central tendency: Mean, Median, mode for grouped frequency distribution. Measures dispersion: Variance, standard deviation, coefficient of variation for grouped frequency distribution, Quartiles, quantiles Real life examples, correlation, Karl Pearson's coefficients of correlation, Linear regression: fitting of linear regression using least square regression, coefficient of determination	Measures of Central tendency: Mean, Median, mode for grouped frequency distribution. Measures dispersion: Variance, standard deviation, coefficient of variation for grouped frequency distribution, Quartiles, quantiles Real life examples, correlation, Karl Pearson's coefficients of correlation, Linear regression: fitting of linear regression using least square regression, coefficient of determination
FYCS	2	Statistical Methods and Testing of Hypothesis:	Standard distributions: Expectation and variance of a random variable, pmf, pdf, cdf, Introduction and properties without proof for following distributions; binomial, normal, chi-square, t, F. Examples Hypothesis testing: one sided, two sided hypothesis, critical region, p-value, tests based on t, Normal and F, confidence intervals, one way analysis of variance	Standard distributions: Expectation and variance of a random variable, pmf, pdf, cdf, Introduction and properties without proof for following distributions; binomial, normal, chi-square, t, F. Examples Hypothesis testing: one sided, two sided hypothesis, critical region, p-value, tests based on t, Normal and F, confidence intervals, one way analysis of variance	FULL SYLLABUS
SYIT	3	Applied Mathematics	Matrices: Inverse of a matrix, Properties of matrices, Rank of Matrix, Characteristics roots and characteristics vectors, Cayley Hamilton Theorem. Differential Equation: Separation of Variables, Exact differential Equation, Linear differential equation f(D) y = X, The complimentary Function, Particular integral: Short methods, Particular integral. The Laplace Transform: Properties of Laplace Transformation, First Shifting Theorem, Second Shifting Theorem, Laplace Transform of an Integral, Laplace Transform of Derivatives	Matrices: Inverse of a matrix, Properties of matrices, Rank of Matrix, Characteristics roots and characteristics vectors, Cayley Hamilton Theorem. Differential Equation: Separation of Variables, Exact differential Equation, Linear differential equation f(D) y = X, The complimentary Function, Particular integral: Short methods, Particular integral. The Laplace Transform: Properties of Laplace Transformation, First Shifting Theorem, Second Shifting Theorem, Laplace Transform of an Integral, Laplace Transform of Derivatives	Matrices: Inverse of a matrix, Properties of matrices, Rank of Matrix, Characteristics roots and characteristics vectors, Cayley Hamilton Theorem. Differential Equation: Separation of Variables, Exact differential equation f(D) y = X, The complimentary Function, Particular integral: Short methods, Particular integral. The Laplace Transform: Properties of Laplace Transformation, First Shifting Theorem, Second Shifting Theorem, Laplace Transform of an Integral, Laplace Transform of Derivatives
SYIT	4	Computer Oriented Statistical Techniques	The Mean, Median, Mode, and Other Measures of Central Tendency, Quartiles, Deciles, and Percentiles, statistical Decision Theory: Statistical Decisions, Statistical Hypotheses, Tests of Hypotheses and Significance, or Decision Rules, Type I and Type II Errors, Level of Significance, Tests Involving Normal Distributions, Two-Tailed and One-Tailed Tests; The Chi-Square Test for Goodness of Fit, Contingency Tables, The Least-Squares Regression Lines	The Mean, Median, Mode, and Other Measures of Central Tendency, Quartiles, Deciles, and Percentiles, statistical Decision Theory: Statistical Decisions, Statistical Hypotheses, Tests of Hypotheses and Significance, or Decision Rules, Type I and Type II Errors, Level of Significance, Tests Involving Normal Distributions, Two-Tailed and One-Tailed Tests; The Chi-Square Test for Goodness of Fit, Contingency Tables, The Least-Squares Regression Lines	FULL SYLLABUS