NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)

(Introduced from June 2016 onwards)

Sem V (CBCS)

Course Code	Title Of Course	Credits	Evaluation Schema (Marks)		
			Internal Marks	Theory Marks	Total
MT501	**Compiler Techniques**	**4**	**20**	**80**	**100**
MT502	**Software Engineering**	**4**	**20**	**80**	**100**
MT503	**Computer Networks**	**4**	**20**	**80**	**100**
MT504	**Computer Graphics**	**4**	**20**	**80**	**100**
MT505	**Departmental Elective** **1. Web Technology** **2. PHP with MySQL** **3. Android Programming** **4. Advanced Java**	**4**	**20**	**80**	**100**
MT506	**Lab Work**	**4**	**--**	**100**	**100**
Total	**--**	**24**	**--**	**--**	**600**

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)
(Introduced from June 2016 onwards)
Paper: MT501 (CBCS)

Compiler Techniques

Units **No. of Lectures**

Unit I: **15 Lectures**

Overview of Compilation process: - Phase Structure, Grouping of phases, Bootstrapping and cross compilation, Compiler Construction tools. **Lexical Analysis**: - Preliminaries, Functions of Scanner, Error Recovery Strategies, Input Buffering, Specification of Tokens, Regular expressions, Role of DFA.

Unit – II: **15 Lectures**

Syntax Analysis: - Functions of Parser, Error Recovery Strategies, CFG, Derivation tree, Ambiguous Grammar and removing Ambiguity, Left Recursive Grammar, Left Factoring, **Top-Down parsing:** Recursive descent parser, non-recursive predictive parser, LL Grammar, Bottom-up parsing: SLR, LL, LALR conflicts, Operator precedence Grammar, Operator precedence Parsing. **Syntax directed translation**: - Syntax directed translation, Attribute Grammar, Synthesized Attributes, Inherited Attributes, S-attributed and L-attributed definitions.

Unit – III: **15 Lectures**

Symbol table organization: - Data Structures used, Operations, Top-down translation. **Run time memory management:** - Storage Organization - Activation record, Activation tree, storage allocation - Static, dynamic, stack and heap allocation, Allocation in block structured language.

Unit – IV: **15 Lectures**

Compilation Generation (Processing):- Issues in design of a code generator – Input to code generator, Target Program, Memory Management, Instruction Selection, Approaches to code generation – The target machine, Instruction cost**. Code Optimization**: - The Principle sources of optimization, Optimization of basic blocks, loop in flow graphs – Dominators, Natural loops, Inner loops, Pre headers, reducible, flow graphs.

Recommended Reading:

a) Basic Reading :-

1) Compliers – Principles, Techniques & Tools by Alfred V. Aho, Ravi Sethi, Jeffrey D. Ulman
2) Theory and Practice of Complier Writing, by Trembly and Sorenson

b) Additional Reading :-

1) Compliers Principles, Techniques and Tools, by Dhamdhere.

c) References:-

i) Books: Systems Programming and Operations, by Dhamdere.

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)
(Introduced from June 2016 onwards)
Paper: MT502 (CBCS)

Software Engineering

Units **No. of Lectures**

Unit I : **15 Lectures**

Introduction – Software problem, Software Engineering problem, Software Engineering approach . **Software process** - Software process, characteristics, Software development process project management process, Software configuration management process, process management process.

Unit II: **15 Lectures**

Software requirement analysis and specification – Software requirement, problem analysis, requirement specification validation matrices , case study. **Planning a Software project** – Cost estimation, project scheduling ,staff and personal planning, Quality assurance plan, project maintaining plans, Risk management case study.

Unit III: **15 Lectures**

Function oriented design – Design principles modulo level concepts ,design notation and specification ,structured design , verification, metrics case study, **object oriented design** –object oriented analysis and design, UML, design methodology metrics ,case study.

Unit IV: **15 Lectures**

Detailed design – modulo specification, detailed design verification, metrics, **Testing** - fundamentals of testing, structural Testing, testing object oriented program, testing process, metrics

Recommended Reading :

a) Basic Reading :-

An interpreted approach to software engineering- Pankaj Jalote

b) Additional Reading :- -

1. Software Engineering – A Practitioners Approach 5th and 6th edition, Roger Pressman
2. Software engineering concepts – Richard Fairley
3. The Practical guide to Structural design – Miller Paige Jones
4. Software Engineering – Martin Shooman

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)

(Introduced from June 2016 onwards)

Paper: MT503 (CBCS)

Computer Networks

Units **No. of Lectures**

Unit I : **15 Lectures**

Use of Application of networks,Network Hardware and Software, Reference Models: OSI,TCP/IP,Physical Layer:Transmission Media,Digital Modulation and Multiplexing, Direct link networks, hardware building blocks, encoding, error detection, reliable transmission, Ethernet (802.3), token rings (802.5,FDDI), wireless (802.11), network adaptors.

Unit II : **15 Lectures**

Packet switching, switching and forwarding, bridge and LAN switches, implementation and performance. InternetworkingIP, routing, global internet, multicast, multiprotocol label switching.

Unit III : **15 Lectures**

end to end protocols, UDP, TCP, RPC, performance, Network Layer Design Issues, Routing Algorithms, Congestion control, congestion Avoidance.

Unit IV : **15 Lectures**

Network security, cryptographic algorithms, security mechanisms, Examples, Application DNS, SMPT, MIME, HTTP, SNMP, RTP, SDP, overloading network, End-to-End data-representation, compression.

Recommended Reading :

a) Basic Reading :-

1) computer networks by A.Tannenbaum.

b) References :-

1. data and computer communication by w. stalliys
2. computer networks –Peterson and Davis

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)

(Introduced from June 2016 onwards)

Paper: MT504 (CBCS)

Computer Graphics

Units **No. of Lectures**

Unit I : **15 Lectures**

Input/Output devices- Light Pens, joystick, Digitizers, Refreshing display devices. Random and raster scan display devices. Line Generation and Area Filling algorithms. Scan line. Flood-fill and boundary-fill algorithms for polygonal domains. Character generation method, Line Clipping Algorithms- Cohen-Sutherland algorithm, midpoint subdivision, Cyrus-Beck algorithm, Liang-Barsky algorithm.

Unit II : **15 Lectures**

Transformation in 2D- Translation, rotation, scaling and shearing transformation. Reflection about any arbitrary line, Homogeneous Coordinates. Projections: Parallel projection. Isometric projection, Cabinet and Cavalier oblique projections, perceptive projections. Vanishing points, 1-point and 2-point perspective projections.

Unit III : **15 Lectures**

Representing Curves and Surfaces- Polygon Meshes. Hermite and Bezier cubic Curves. B-spline Curves. Uniform, Non-uniform, open and non-open B-splines. Bicubic surface, patches. Conditions for smooth- joining of curves and surface patches. Hidden surface elimination algorithms- Z-buffer algorithm, depth-sort algorithm, area-subdivision method, floating horizon algorithm.

Unit IV : **15 Lectures**

Effect of lights- Ambient and diffuse reflection models, Phong's specular reflection model. Grourand and Phong shading models. Fractals: self-similar fractals, self affine fractals, self-squaring fractals, Mandelbrot sets.

Recommended Reading:

a) Basic Reading:-

1) Mathematical Elements for Computer Graphics- Roger and Adams (McGraw- Hill)

b) Additional Reading:-

1) Computer Graphics C Version- Hearn and Baker (Pearson Education)
2) Procedural Elements for Computer Graphics – David Rogers (Tata McGraw-Hill).
3) Computer Graphics – A P Godse

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)

(Introduced from June 2016 onwards)

Departmental Electives-I

Paper: MT505 (CBCS)

Web Technology

Units **No. of Lectures**

Unit I : **15 Lectures**

Introduction of .NET: .NET framework and its architecture, CLR, JIT, CTS, advantages of working .NET. **Introduction of HTML:** What is HTML, HTML Basic Tags, HTML Tables, HTML Image, HTML List. **Introduction of JavaScript:** Introduction to JavaScript, JavaScript Variables, Operators, Control and looping structure, Functions.

Unit II : **15 Lectures**

ASP .NET Basics: ASP .NET page structure, directives, code declaration blocks, code render blocks, ASP .NET server controls, server side include directives. **VB. Net and C# programming basic:** Control event, Variables and variable declaration, Arrays, Functions, Operators, Conditional logic, Loops, namespace, OOP concepts, Objects, Classes, Scope, Inheritance, Delegates, Interface.

Unit III : **15 Lectures**

ASP.Net State Management: Server side State management, Client Side state management.
Validation Controls: Client side v/s servers side validation, RequiredFieldValidator, CompareValidator, RangeValidator, RegularExpressionValidator, CustomValidator.

Unit IV : **15 Lectures**

Database Design and development: Introduction, creating database, Defining the Database Connection, Executing the Command, Working With GridView Control, Working With DetailsView Control, Working With FormView Control.

Recommended Reading :

a) Basic Reading :-

1. Build Your Own ASP.NET 3.5 Web Site Using C# & VB by Cristian Darie and Wyatt Barnett (SitePoint)

b) Additional Reading:

1. ASP .NET Bible. – Mridula Parihar
2. HTML : the complete reference by Thomas A. Powell
3. Learning Web Design 4th Edition (A Beginner's Guide to HTML, CSS, JavaScript and Web Graphics) by Jennifer Niederst Robbins
4. .NET 4.5 Programming (Black Book)- Dreamtech Press

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)

(Introduced from June 2016 onwards)

Departmental Electives-II

Paper: MT 505 (CBCS)

PHP with MySQL

Units **No. of Lectures**

Unit I : **15 Lectures**

Introduction of HTML: What is HTML, HTML Basic Tags, HTML Tables, HTML Image, HTML List. **Introduction of JavaScript:** Introduction to JavaScript, JavaScript Variables, Operators, Control and looping structure, Functions. **Introduction of PHP:** What is PHP, Installation, PHP Syntax.

Unit II : **15 Lectures**

PHP Variables, Data Types, Constants, Operators, flow control & loops, Arrays, string, functions **PHP Forms:** PHP Form Handling, PHP Form Validation, Cookies, Session Tracking.

Unit III : **15 Lectures**

Login Administration, Files Open, Read, Write, Create, Upload with PHP, Sending Email using PHP, Building Web sites ,Updating Web sites Scripts, PHP Exception Handling.

Unit IV : **15 Lectures**

MySQL:Getting Started with MySQL – Basic Data Types –Database and Table Creation – Performing Operations on Table Data – Running Calculations on Table Data – Grouping the Data – Functions in MySQL - Database Access with PHP and MySQL. Eclipse, an Integrated Development Environment.

Recommended Reading :

a) Basic Reading :-

1. Complete Reference HTML - Thomas A. Powell (TMH Publication)

2. Beginning PHP6, Apache, MySql web development- Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Michael K(Wrox Press)

b) Additional Reading:

1 Beginning PHP and MySQL - Jason Gilmore(Apress Publications)

2.PHP and MySQL Web Development-Luke Welling,Laura Thomson

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)

(Introduced from June 2016 onwards)

Departmental Electives-III

Paper: MT 505 (CBCS)

Android Programming

Units **No. of Lectures**

Unit I : **15 Lectures**

Getting Started with Android Programming -

What Is Android :-Android Versions , Features of Android, Architecture of Android , Android Devices in the Market, The Android Market , **Obtaining the Required Tools:-** Eclipse, Android SDK, Android Development Tools (ADT), Creating Android Virtual Devices (AVDs), Creating Your First Android Application, Anatomy of an Android Application, **Understanding Activities:-** Applying Styles and Themes to Activity, Hiding the Activity Title, Displaying a Dialog Window, Displaying a Progress Dialog

Unit II : **15 Lectures**

Linking Activities Using Intents :- Resolving Intent Filter Collision, Returning Results from an Intent, Passing Data Using an Intent Object, **Calling Built-In Applications Using Intents** :- Understanding the Intent Object, Using Intent Filters, Adding Categories, **Displaying Notifications,Understanding the Components of a Screen** :- Views and ViewGroups, LinearLayout, AbsoluteLayout, TableLayout, RelativeLayout, FrameLayout, ScrollView, **Adapting to Display Orientation** :- Anchoring Views, Resizing and Repositioning.

Unit III : **15 Lectures**

Designing Your User Interface Using Views:- Basic Views: TextView View, Button, ImageButton, EditText, CheckBox, ToggleButton, RadioButton, and RadioGroup Views, ProgressBar View, AutoCompleteTextView View, **Picker Views:** TimePicker View, Displaying the TimePicker in a Dialog Window, DatePicker View, Displaying the DatePicker View in a Dialog Window, **Displaying Pictures and Menus with Views : Using Image Views to Display Pictures:-** Gallery and ImageView Views, ImageSwitcher, GridView**.**

Unit IV : **15 Lectures**

Data Persistence : **Saving and Loading User Preferences:** Using getSharedPreferences(), Using getPreferences() , **Persisting Data to Files** : Saving to Internal Storage, Saving to External Storage (SD Card), Choosing the Best Storage Option, Using Static Resources, **Creating and Using Databases** : Creating the DBAdapter Helper Class, Using the Database Programmatically, Adding, Retrieving, Updating, Deleting, Bundling the Database with an Application

Recommended Reading :

a) Basic Reading :-

1. Beginning Android 4 Application Development - Wei-Meng Lee(Wiley Publishing, Inc.)

b) Additional Reading:

1. Professional Android 4 Application Development-Reto Meier Wrox
2. Apress Pro Android 4 (2012) - Satya Komatineni
3. Head First Android Development - Jonathan Simon(O'Reilly)
4. Android Application Development: Programming with the Google SDK 2009 by Rick Rogers, John Lombardo, Zigurd Mednieks, G. Blake Meike

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)
(Introduced from June 2016 onwards)
Departmental Electives-IV
Paper: MT505 (CBCS)

Advanced Java

Units **No. of Lectures**

Unit I : **15 Lectures**

Overview of features of java, Java virtual machine, JIT, Garbage collection, Exception handling, object serialization , Threading Swings: Introduction of JFC, swing features, model-view architecture, Heavyweight v/s lightweight components, setting pluggable look and feel for components, Swing components.

Unit-II : **15 Lectures**

JDBC overview , Architecture , Drivers, database connection statements , Result sets, transaction, Java Beans: Basics of designing JavaBeans, creating and using properties, using events to communicate with other components.

Unit-III : **15 Lectures**

Java Networking: Remote Method –introduction , architecture, defining remote objects, creating stubs and skeleton, object serialization, dynamically loaded classes, RMI activation, registrating remote objects, marshaled objects. CORBA-concepts, object bus, distributed objects, interoperability of distributed objects, concept of open object bus, a java interface to CORBA, creating a basic CORBA server, creating CORBA clients with JavaIDL , RMI v/s CORBA. Basics of EJB

Unit-IV : **15 Lectures**

JSP(Java Server Pages: Introduction to JSP, Use of JSP, JSP Architecture, JSP tags, Implicit and Explicit objects, Request forward, Request –time include ,use of Beans in JSP and their scopes . Introduction to Hibernet and Strut. Java Servlets : servlet life cycle , servlet basics , HTTP servlets, The Servlets API , request server side – Cookies , session tracking , databases and non-HTML content , request dispatching , shared attributes, resource abstraction.

Recommended Reading :

1. The Complete Reference : Herbert Schildt-Tata McGraw Hill
2. Java Primer : Balguruswamy
3. Java 2.0 : Ivan Bayross
4. Java developer- Erik Hatcher, Steve Loughran
5. Java server pages
6. Advanced Java programming- Rajendra Salokhe, Suresh Nalawade- Aruta Publication
7.Black Book-Java 6—Kogent solution Inc, Dreamtech.

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester V)

(Introduced from June 2016 onwards)

Paper: MT506 (CBCS)

Lab Work

The programs related to **Departmental Electives Subject.**

Practical :50 Marks(Internal Examiner).

Project : 50 Marks(External Examiner).

NEW/REVISED SYLLABUS FOR

M. Sc. Tech. Mathematics (Part III) (Semester VI)
(Introduced from June 2016 onwards)
Paper: MT601 (CBCS)

Industrial Project

Course Code	Title Of Course	Credits	Evaluation Schema (Marks)			
				Internal	External	Total
MT601	A. Industrial Project	24	Mid Term Viva	50	---	50
			Final Viva	50	50	100
			Final Report	---	150	150
	B. Technical Communication	6	Presentation	50	--	50
			Report	50	--	50
Final Total		30	--	--		400

Technical Communication

Unit	No. of Lectures
	15 Lectures

Written Communication:
Letter Writing - Personal Letter, Business Letter and Letter for Application. Report Writing. Preparation of CV. Summarizing.

Oral Communication: Interview, Group Discussion.