GANPAT UNIVERSITY

FACULTY OF COMPUTER APPLICATIONS

Programme	B.sc.IT (Cyber Security)	**Semester**	V
Effective from Academic Year	2021-22	**Effective for the batch Admitted in**	June 2019

Programme Outcomes(POs):	
PO1:	Ability to understand the various security aspects of operating system, network and data,web applications and mobile apps.
PO2:	To analyze the application threat detection, network forensics, digital forensics and analytics, malware analysis and its terminology.
PO3:	Develop basic understanding of information and cyber security, cryptography, attacks and threats, identify and classify cybercrime, cyber-attacks and its methods, static and dynamic malware analysis.
PO4:	Implement security tools and technologies to protect systems and information.
PO5:	Ability to develop various vulnerabilities report as per industry requirement for security updates.
PO6:	Ability to apply knowledge of mathematics, algorithms, logical reasoning to solve real time problems.
PO7:	To understand the information security management system and information security standards.
PO8:	Ability to understand basic web designing concepts and develop web pages and prepare well formatted project documents.
PO9:	Able to understand the legal procedure against the cyber offence and ethics in cyber security.
PO10:	To learn logic building and programming languages.
PO11:	Able to develop knowledge, interpersonal skills, judgment around the human communication that facilitates their ability to work collaboratively.

TEACHING AND EXAMINATION SCHEME – SEM.- V																			
Subject Code	**Subject Name**	**Teaching scheme**												**Examination scheme (Marks)**					
		Credit						Hours (per week)						Theory			Practical		
		Lecture(DT)			Practical(Lab.)			Lecture(DT)			Practical(Lab.)			CE	SEE	Total	CE	SEE	Total
		L	TU	Total	P	TW	Total	L	TU	Total	P	TW	Total						
U65A1MAS	MOBILE APPLICATION AND SECURITY	3	-	3	2	-	2	3		3	4	-	4	40	60	100	20	30	50
U65A2WDT	WEB DEVELOPMENT TECHNOLOGY	3	-	3	2	-	2	3		3	4	-	4	40	60	100	20	30	50
U65A3GUI	GUI PROGRAMMING	3	-	3	2	-	2	3		3	4	-	4	40	60	100	20	30	50
U65A4DT	DIGITAL TECHNOLOGIES	3	-	3	-	-	-	3		3	-	-	-	40	60	100	-	-	-
U65A5IP1	INDUSTRIAL PROJECT-I	-	-	-	4	-	4	-		-	8	-	8	-	-	-	150	100	250
U65B6SE	SOFTWARE ENGINEERING	3	-	3	-	-	-	3		3	-	-	-	40	60	100	-	-	-
		15		15	10	-	10	15		15	20		20	200	300	500	210	190	400

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FACULTY OF COMPUTER APPLICATIONS

Programme	B.Sc. IT (Cyber Security)	**Branch/Spec.**	Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2021-22	**Effective for the batch Admitted in**	June 2019
Subject Code	U65A1MAS	**Subject Name**	MOBILE APPLICATION AND SECURITY

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	3	-	2	-	5	Theory	40	60	100
Hours	3	-	4	-	7	Practical	20	30	50

Objective:

To provide awareness and skill of mobile application development and security through standard concept.

Pre-requisites:

One should have knowledge of OOPs Concepts and basic knowledge of JAVA.

Course Outcomes:

Name of CO	Description
CO1	Mobile application development life cycle.
CO2	Implementation of Android Application.
CO3	Understanding of database concepts in Mobile technology.
CO4	Android application reverse engineering.
CO5	Mobile application security concepts.

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11
CO1	2	0	0	1	0	1	0	0	0	1
CO2	2	0	0	1	0	1	0	0	0	1
CO3	2	0	0	1	0	1	0	0	0	0
CO4	1	1	2	1	0	0	0	0	0	0
CO5	1	1	2	1	0	0	1	0	0	0

Content:		
Unit		Hrs
1	**Android Concepts** History of android, The Open Handset Alliance, Android SDK installation, Android SDK & their codenames, Advantages of android, The Android O/S Architecture, Over view of IDE for Android application, What is AVD, How to launch and start the AVD (android virtual device), Android Application Resources, Android Application Components	09
2	**User Interface Elements** Form Widgets **–** Text View, Button, Check Box, Radio Buttons, Radio Group, Spinner Control, Date Picker, Time Picker, Progress bar, Option menu, Image View Text Fields **-** Various type of Text Filed (Plain text, PasswordText, NumericText, EmailText, PhoneText, MultilineText, etc.) Working with dialog **-** Simple dialog, alert dialog, date picker dialog	09
3	**Features of Android** Various Layouts - What is layout, Layouts common attribute, Types of Layout (Linear layout, Relative layout, Table layout, Constraint layout) Using Data-Driven Containers - List View, Grid View, and Gallery View (Using the Array Adapter)	09
4	**Data Storage** Shared Preferences, SQLite Database: Creating a SQLite Database, Creating Tables, Creating, Updating, and Deleting Database Records, Querying SQLite Databases, Closing and Deleting a SQLite Database.	09
5	**Reverse Engineering Android Apps** APK extraction - Investigating layout, manifest, permissions, Extracting the content of the classes.dex file, Decompilation Using dex2jar, JDGUI, APKTool, Reverse engineer the app and change its behavior, Code patching - Modifying the code, Recompile, Resign the APK.	09
Practical Content:		
List of programs specified by the subject teacher based on above mentioned topics		
Reference Books:		
1	Android Wireless Application Development By Shane Conder & Lauren Darcy, Published by Addision-Wesley Professional	
2	Android Developer Fundamental: Concept Reference By Google Developer Team	
3	Kotlin in Action By Dmitry Jemerov and Svetlana Isakova, Published by Manning	
4	Team Learning Pentesting for Android Devices by Aditya Gupta, Published by	

	Packt Publishing Ltd.
MOOC	
1	https://www.youtube.com/watch?v=fis26HvvDII
2	https://www.youtube.com/watch?v=yaZ66V0mKSM&list=PLlyCyjh2pUe9wv-hU4my-Nen_SvXIzxGB
Question Paper Scheme:	
	University Examination Duration: 3 Hours Note for Examiner: - Q-1 must be common from any topics from syllabus. Q-2 and onwards must be from specific topics and internal choice or option can be given. **SECTION – I** Q-1 (Attempt any Five Out of Seven: each question must be 6 marks) – 30 Questions must be covered all possible section. **SECTION – II** Q-2 (Must be from topics: 1 and 2 (6+6)) Q-3 (Must be from topics: 3 and 4(6+6)) Q-4 (Must be from topic: 5(6))

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FACULTY OF COMPUTER APPLICATIONS

Programme	B.Sc. IT (Cyber Security)	**Branch/Spec.**	Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2021-22	**Effective for the batch Admitted in**	June 2019
Subject Code	U65A2WDT	**Subject Name**	WEB DEVELOPMENT TECHNOLOGY

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	3	-	2	-	5	Theory	40	60	100
Hours	3	-	4	-	7	Practical	20	30	50

Objective:

To provide awareness and skill of web development through standard concept.

Pre-requisites:

One should have knowledge PHP, Web Application and its Components

Course Outcomes :

Name of CO	Description
CO1	Web Development concepts
CO2	Implementation of Dynamic Web Application
CO3	Understanding of preserving state
CO4	Web page designing concepts

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11
CO1	0	0	2	1	0	1	0	2	0	1
CO2	0	0	0	2	0	0	0	3	1	1
CO3	2	0	0	0	0	0	2	1	0	0
CO4	1	1	1	2	0	0	2	0	0	0

Content:

Unit		Hrs
1	**Working with OOP** Basic PHP construction for OOP, Class and Object, Methods and Properties, Scope, Constructor and Destructor, Inheritance,	09

	Constants in OOP	
2	**Advance OOP** Static Methods and Properties, Abstraction and Inheritance, Object Iteration, Object Cloning, Serialization, Namespaces	09
3	**Working with data using PDO** Introduction to PDO, Driver installation for PDO, Database manipulation using PDO, Prepared Statement to Avoid SQL Injection	09
4	**Introduction of WordPress** Introduction to CMS, Benefits of CMS, Why WordPress?, Downloading and Installing WordPress, Dashboard and Settings, Page v/s Post	09
5	**Working with WordPress** Working with Content, Working with Page, Creating Bog, Working with Themes, Users and Roles, plugging.	09

Practical Content:	
List of programs specified by the subject teacher based on above mentioned topics	
Reference Books:	
1	The Complete Reference PHP 1st edition by Steven Holzner, TATA McGraw-Hill Publication
2	Learning PHP Data Objects, 1st Edition by Dennis Popel, Packt Publishing
3	Beginning WordPress 1st edition by Stephanie Leary, Apress Publication
MOOC	
1	https://www.youtube.com/playlist?list=PLz_6dB4PItBEQEbVSAt6vrTOACQZD1K1E
2	https://www.youtube.com/playlist?list=PLjVLYmrlmjGfC44WZSTvlsZFzxnQsysJb
Question Paper Scheme:	
	University Examination Duration: 3 Hours Note for Examiner: - Q-1 must be common from any topics from syllabus. Q-2 and onwards must be from specific topics and internal choice or option can be given. **SECTION – I** Q-1 (Attempt any Five Out of Seven: each question must be 6 marks) – 30 Questions must be covered all possible section. **SECTION – II** Q-2 (Must be from topics: 1 and 2 (6+6)) Q-3 (Must be from topics: 3 and 4(6+6)) Q-4 (Must be from topic: 5(6))

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FACULTY OF COMPUTER APPLICATIONS

Programme	B.Sc. IT (Cyber Security)	**Branch/Spec.**	Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2021-22	**Effective for the batch Admitted in**	June 2019
Subject Code	U65A3GUI	**Subject Name**	GUI PROGRAMMING

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	3	-	2	-	5	Theory	40	60	100
Hours	3	-	4	-	7	Practical	20	30	50

Objective:

To provide awareness and skill of web development through standard concept.

Pre-requisites:

One should have knowledge of OOPs Concepts, .Net Framework, C#, ADO.Net

Course Outcomes:

Name of CO	Description
CO1	Able to understand the concepts of .Net framework
CO2	Able to understand the concept of Web Development
CO3	Able to Design Web Pages
CO4	Implementation of Dynamic Web Application
CO5	Understanding Security aspects in Web development

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11
CO1	0	0	0	0	0	0	0	2	0	1
CO2	0	0	0	0	0	0	0	2	0	2
CO3	1	0	0	0	0	0	0	2	0	2
CO4	0	0	0	0	0	0	0	2	0	2
CO5	2	0	0	1	0	0	1	0	0	0

Content:

Unit		Hrs

1	**Introducing .NET:** The .NET Framework, C#, VB, and the .NET Languages, The Common Language Runtime, The .NET Class Library, The Just-In-Time(JIT) Compiler **The C# Language:** C# Language Basics, Variables, and Data Types, Variable Operations, OPPs Concept, Conditional Logic, Loops, Methods, debugging, and error handling.	09
2	**ASP.Net Fundamentals:**ASP.Net application life cycle event, ASP.Net Page life cycle event,IsPostBack,Code Management and Resource management in Visual Studio,IIS,Web.Config. **Controls** **ASP.Net Server Controls:Standard Controls:** Label, Button, TextBox, Hyperlink, DropDownList, RadioButton, RadioButtonList, CheckBox, CheckBoxList, ListBox, Image, Calendar, AdRotator, FileUpload, MultiView **Validation Controls:** RequiredFieldValidator,RangeValidator,RegularExpressionValidator, CompareValidator, CustomValidator, ValidationSummary **Navigation Controls:** SiteMapPath, Menu, TreeView	09
3	**ASP.Net Page Designing Perspectives and Concepts:** Master Page, Skin File, Theme, Stylesheet, Introduction to AJAX,Working with the ASP.NET AJAX Control Toolkit. **State Management Techniques:** Introduction to state management, State management Techniques - Session, Application, Cache, Cookie, ViewState, QueryString,Hidden Field	09
4	**Database Manipulation** **ADO.NET Fundamentals:** Understanding Databases, Configuring Your Database, Understanding SQLServer Basics, Understanding the Data Provider Model, Using Direct Data Access, Using Disconnected Data Access. **The Data Controls:** The GridView, Formatting the GridView, Selecting a GridView Row, Editing with the GridView, Sorting and Paging the GridView, Using GridView Templates, The DetailsView and FormView,Data Manipulation	09
5	**Security Fundamentals:** Understanding Security Requirements, Authentication and Authorization, Forms Authentication, Windows Authentication,SQL Injection,Cross site Request Forgery(CSRF),Session Hijacking	09
Practical Content:		
List of programs specified by the subject teacher based on above mentioned topics		
Reference Books:		
1	Beginning ASP.NET 3.5 in C# 2008, 2nd edition by Matthew MacDonald, Apress	

2	Pro ASP.NET 3.5 in C# 2008, 2nd edition by Matthew MacDonald and Mario Szpuszta, Apress
3	C# 2008 Programming Covers .NET 3.5, Black Book, Dreamtech Press
4	ASP .Net 3.5. Unleashed, SAMS, Pearson Education
MOOC	
1	https://www.youtube.com/playlist?list=PLWPirh4EWFpGdA3VPS9umbvP6YGT3hUU9
Question Paper Scheme:	
	University Examination Duration: 3 Hours Note for Examiner: - Q-1 must be common from any topics from syllabus. Q-2 and onwards must be from specific topics and internal choice or option can be given. **SECTION – I** Q-1 (Attempt any Five Out of Seven: each question must be 6 marks) – 30 Questions must be covered all possible section. **SECTION – II** Q-2 (Must be from topics: 1 and 2 (6+6)) Q-3 (Must be from topics: 3 and 4(6+6)) Q-4 (Must be from topic: 5(6))

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FACULTY OF COMPUTER APPLICATIONS

Programme	B.Sc. IT (Cyber Security)	**Branch/Spec.**	Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2021-22	**Effective for the batch Admitted in**	June 2019
Subject Code	U65A4DT	**Subject Name**	DIGITAL TECHNOLOGIES

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	3	-	-	-	3	Theory	40	60	100
Hours	3	-	-	-	3	Practical	-	-	-

Objective:

To learn the fundamentals of Cloud Computing, Cryptocurrency, Blockchain Technology, Big Data, Dark & Deep web and retrieving sensible information from wearable sensors.

Pre-requisites:

- Knowledge of Web Technology
- Knowledge of Encryption
- Basic Knowledge of Database Management System
- Knowledge of Cyber Safety and Cyber Crime.

Course Outcomes:

Name of CO	Description
CO1	Compare between the various cloud providers based on the services and security provided to the customer
CO2	Evaluate the use and risks involved with Blockchain
CO3	Understating concept of big data and learn various analytical tools used in Big data analytics
CO4	Understanding of deep and dark web techniques used for commutations.
CO5	Recovering sensible information from wearable device/gadgets.

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11
CO1	3	2	0	0	0	1	1	0	2	2
CO2	3	2	0	0	0	1	0	0	1	0
CO3	0	0	0	0	1	0	0	0	0	0
CO4	0	0	0	0	1	0	0	0	0	0

CO5	3	0	2	0	0	0	0	1	1	0

Content:

Unit		Hrs
1	**Cloud Computing Fundamentals** Definition, private, public and hybrid cloud. Cloud types: IaaS, PaaS, SaaS. Benefits and challenge of cloud computing, public vs private clouds, role of virtualization in enabling the cloud, Business Agility: Benefits and challenges to Cloud architecture. Cloud Applications, concept of virtualization, Virtualization System-Specific Attacks	09
2	**Cryptocurrency and Blockchain Technology** Bit coins and cryptocurrency technology, use of block chain for cryptocurrency, success of cryptocurrency, cryptocurrency trading and wallets. Cryptocurrency and Markets: Cryptocurrency - talk about Bitcoin / Ethereum, Methods to purchase Bit- coins/Ethereum Setting up a Wallet. Issues with Blockchain: Security and Safe guards, Protection from attackers, Hacks On exchanges, What is stopping adoption? Scalability problems, Network attacks to destroy bitcoin, Legal adoption in various countries and laws.	09
3	**Big Data Analytics** Introduction to Big Data Platform, Traits of Big data, Challenges of Conventional Systems, sources, technologies, applications, Introduction of Big Data analytics tools: Hadoop, Hive, MapR, Sharding, NoSQL Databases	09
4	**Dark and Deep Web** Introduction to dark web, deep web, crawling the data from hidden web, data pre-processing and data analysis, tor network, onion share, i2p	09
5	**Wearable Sensors** Implementation of wearable sensors, acquiring data from wearable sensors, applications: crowd sourced applications. Data from smart phones like call logs, sensor data(from GPS, accelerometer etc.), messages, photos, location history, mobility patterns etc, data from wearable sensors, geo spatial data	09

Practical Content:

List of programs specified by the subject teacher based on above mentioned topics

Reference Books:

1	Cloud Computing: From beginning to end by Ray J Rafaels
2	Analytics in Practice, by Soumendra Mohanty, Tata Mcgraw hill Education

3	Blockchain: The Complete Step-by-step Guide to Understanding Blockchain and the Technology Behind It by Jay Isaac
4	The Dark Net: Inside the Digital Underworld , Jamie Bartlett
MOOC	
Question Paper Scheme:	
	University Examination Duration: 3 Hours Note for Examiner: - Q-1 must be common from any topics from syllabus. Q-2 and onwards must be from specific topics and internal choice or option can be given. **SECTION – I** Q-1 (Attempt any Five Out of Seven: each question must be 6 marks) – 30 Questions must be covered all possible section. **SECTION – II** Q-2 (Must be from topics: 1 and 2 (6+6)) Q-3 (Must be from topics: 3 and 4(6+6)) Q-4 (Must be from topic: 5(6))

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Programme	B.Sc. IT.(Cyber Security)	**Branch/Spec.**	Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2021-22	**Effective for the batch Admitted in**	June 2019
Subject Code	U65A5IP1	**Subject Name**	INDUSTRIAL PROJECT – I

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	-	-	4	-	4	Theory	-	-	-
Hours	-	-	8	-	8	Practical	150	100	250

Objective:

Industrial Project -II course is an organized method or activity of enhancing and improving skill set and knowledge of computer science students which boost their performance and consequently helping them to meet their career objectives. Industrial Project is crucial for students because it is the best way to acquire as much mastery about their field as possible which helps in building confidence of the students.

Pre-requisites:

SDLC, Models for Software Engineering, OOPs, Basic DBMS concepts, Design Techniques like DFD or UML etc., Basic Information of Business Processes according to project title.

Course Outcomes:

Name of CO	Description
CO1	Apply their technical knowledge and skills in industry
CO2	Gain hands on practice to solve real world problems
CO3	Enhance their self-confidence and understand job responsibilities
CO4	Cultivate their leadership skill to execute a given task
CO5	Enhance their practical knowledge and become updated with latest to and technology

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	0	0	2	2	3	3	2
CO2	3	3	3	0	0	2	2	3	3	2
CO3	0	0	0	0	2	0	0	0	0	0
CO4	0	0	0	0	2	0	0	0	0	0
CO5	3	3	3	0	0	2	2	3	3	2

Content:

Unit		Hrs
	Rules: • The students can develop their project individually or in a group of not more than 2 students. Group size can be increased with prior approval of head of institution. • The passing standard is 40% in internal and external examination jointly. • The detail study of any enterprise application or any major IT infrastructure setup can also be accepted as a project work. The project can be developed in any language or platform but it is required to get approved by the head of the institution. For the purpose of approval, Students have to submit their project titles and proposals with the name of internal and external guides to the Head of Institution In case, if the student proposal is rejected, the revised proposal in the same or other area is required to submit and get it sanctioned. Failing to do this, his/her term will not be granted. • The students have to report to the internal guide for at least 4 times during the project life span. Students are required to submit their presentation in soft copy as per format to assigned internal guide at least before 4 days of internal presentation schedule. • The external examiners appointed by the University will give the external marks on the basis of the heads like Presentation, Demonstration, Viva Voce, and Documentation etc. The distribution of marks to different heads may be decided at the time of evaluation of the project but it is expected to have the same distribution. • The Internal Guide or Head of the Institution will give the internal marks. These marks may be given on the bases of regular reporting of the student to the internal guide.	

Examination Weightage:

Internal Examination		**External Examination**	
Internal Head	**Weightage (60%)**	**External Head**	**Weightage (40%)**
Presentations	25 %	Final Viva Presentation (Project Analysis, Project Designing, Technical aspects etc)	25 %
Project Analysis	10 %		
Project Designing	10 %		
Technical aspects	10 %		
Project Outcomes	5 %	Report Submission	15%

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FACULTY OF COMPUTER APPLICATIONS

Programme	B.Sc. IT (Cyber Security)	**Branch/Spec.**	Computer Applications
Semester	V	**Version**	1.0.0.0
Effective from Academic Year	2021-22	**Effective for the batch Admitted in**	June 2019
Subject Code	U65B6SE	**Subject Name**	SOFTWARE ENGINEERING

Teaching scheme						**Examination scheme (Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	3	-	-	-	3	Theory	40	60	100
Hours	3	-	-	-	3	Practical	-	-	-

Objective:

To learn the fundamental concepts of Software Engineering, Process Models, Requirement Engineering, Analysis Model, Design Engineering and Testing.

Pre-requisites:

Basic Knowledge of Software Development

Learning Outcome:

Name of CO	Description
CO1	Able to understand general view of Software
CO2	Able to learn about different type of process models
CO3	Able to understand system and requirement engineering
CO4	Able to learn about data model
CO5	Able to learn about different type of design model and testing

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO7	PO8	PO9	PO10	PO11
CO1	0	1	0	0	1	0	0	0	0	0
CO2	0	0	0	0	0	2	0	2	0	0
CO3	0	0	0	0	1	0	0	1	0	0
CO4	0	0	0	0	1	0	0	2	0	0
CO5	0	0	0	0	1	0	1	2	0	1

Content:		
Unit		Hrs
1	**Introduction to Software Engineering and A Generic View of Software :** The Evolving Role of Software, Software, The Changing Nature of Software, The Quality of legacy Software, Software Evolution, Software Myths, Software Engineering: A layered Technology, Process framework, The Capability Maturity Model Integration (CMMI), Process Patterns	9
2	**Process Models:** The Waterfall Model, Incremental Process Models: The Incremental Model, The RAD Model, Evolutionary Software Process Models: Prototyping, The Spiral Model, Concurrent Development Model, A Final Comment on Evolutionary Processes, Specialized Process Models: Component-Based Development, Formal Methods Model, Aspect Oriented Software Development	9
3	**System and Requirement Engineering :** Computer Based Systems, System Engineering Hierarchy, Business Process Engineering, Product Engineering, System Modeling, Requirement Engineering Tasks : Inception, Elicitation, Elaboration, Negotiation, Specification, Validation, Requirement Management, Requirement Engineering Process	9
4	**Analysis Model :** Analysis Modeling Approaches, Data Modeling concepts: Data Objects, Data Attributes, Relationships, Cardinality and Modality, Object Oriented Analysis, Scenario Based Modeling, Flow Oriented Modeling, Class Based Modeling	9
5	**Design Engineering and Testing :** Design Concepts, Design Model: Data Design Elements, Architectural Design Elements, Interface Design Element, Component Level Design Model, Deployment Level Design Model, Approach to Software Testing, Unit Testing, Integration Testing, Validation testing, System Testing	9
Reference Books:		
1	Software Engineering, by Roger Pressman (6th Edition)	
2	System Analysis, Design and Introduction to Software engineering 10th Edition, - S.Parthasarthy & B.W.Khalkar, MasterAcademy	
MOOC		
	https://www.youtube.com/watch?v=ITlyBV4ttts&list=PLWPirh4EWFpG2b1L3CL-OAPYcM25jLjXH&index=2	
	https://www.youtube.com/watch?v=HnZEswKmHUg&list=PL0s3O6GgLL5eLjSEe4ZO0CRUondu v9LxP	
Question Paper Scheme:		

	University Examination Duration: 3 Hours Note for Examiner: - Q-1 must be common from any topics from syllabus. Q-2 and onwards must be from specific topics and internal choice or option can be given. **SECTION – I** Q-1 (Attempt any Five Out of Seven: each question must be 6 marks) – 30 Questions must be covered all possible section. **SECTION – II** Q-2 (Must be from topics: 1 and 2(6+6)) Q-3 (Must be from topics: 3 and 4(6+6)) Q-4 (Must be from topic: 5(6))