

## FACULTY OF COMPUTER APPLICATIONS

### TEACHING AND EXAMINATION SCHEME

Programme	MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MOBILE APPLICATION M.SC IT (MOBILE APPLICATION)	Branch/Spec.	Computer APPLICATIONS																
Semester	I																		
Effective from Academic Year		2018-19	Effective for the batch Admitted in												June- 2018				
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						
P51A1ADT	APPLICATION DEVELOPMENT & TESTING	2	-	2	2	0	2	2	-	2	4	0	4	40	60	100	20	30	50
P51A2WAD	WEB APPLICATION DEVELOPMENT	2	-	2	2	0	2	2	-	2	4	0	4	40	60	100	20	30	50
P51A3CNA	CELLULAR NETWORK ARCHITECTURE	4	-	4	-	-	-	4	-	4	-	-	-	40	60	100	-	-	-
P51A4DA	DEVICE ARCHITECTURE	4	-	4	-	-	-	4	-	4	-	-	-	40	60	100	-	-	-
P51A5EL1	(ELECTIVE-I) – INTERNET OF THINGS)	2	-	2	2	0	2	2	-	2	4	0	4	40	60	100	20	30	50
P51A6EL2	(ELECTIVE-II) - OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML	4	-	4	-	-	-	4	-	4	-	-	-	40	60	100	-	-	-

<b>Total</b>	18	00	18		6	-	6	18	-	18	12	-	12	240	360	600	60	90	150
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# GANPAT UNIVERSITY

## FACULTY OF COMPUTER APPLICATION

Programme	MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MOBILE APPLICATION M.SC IT (MOBILE APPLICATION)	Branch/Spec.	Computer Application						
Semester	I	Version							
Effective from Academic Year	2018-19	Effective for the batch Admitted in	June– 2018						
Subject code	<b>P51A1ADT</b>	Subject Name	Application Development and Testing						
Teaching scheme			Examination scheme (Marks)						
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	1	2		5	Theory	40	60	100
Hours	3	1	4		8	Practical	20	30	50
<b>Pre-requisites:</b>									
Basic knowledge of core java programming.									
<b>Learning Outcome:</b>									
Common programming languages used in mobile application development - Appropriate usage of the mobile programming languages.									
<b>Theory syllabus</b>									
Unit	Content								Hrs
1	<b>Mobile Application Principles</b> <ul style="list-style-type: none"> <li>• Mobile Application Evolutions</li> <li>• Thin &amp; Fat Client Applications</li> <li>• Client Server Architecture</li> <li>• Mobile Client Server Computing</li> <li>• Platform Dependencies</li> <li>• Portable Application Design</li> </ul>								05
2	<b>Mobile Programming Languages and Best Practices</b> <ul style="list-style-type: none"> <li>• Compilers and Interpreters</li> <li>• Programming Methodology</li> <li>• J2ME</li> <li>• Symbian C++ Programming</li> <li>• User Analysis</li> <li>• Organizational Analysis</li> <li>• General Programming Practices</li> </ul>								10
3	<b>Application Deployment</b> <ul style="list-style-type: none"> <li>• Deployment Environments</li> <li>• Mobile Device Emulators</li> <li>• Mobile Application Binary</li> <li>• Testing Environment</li> <li>• Application Provisioning</li> </ul>								8

4	<b>Mobile Applications</b> <ul style="list-style-type: none"> <li>• Web Applications</li> <li>• Mobile Web Applications</li> <li>• Pros &amp; Cons of Mobile Web Applications</li> <li>• SIM Based Applications</li> <li>• Principles of UI Design</li> </ul>	08
5.	<b>Mobile Services</b> <ul style="list-style-type: none"> <li>• Evolution of Mobile Services</li> <li>• Types of Mobile Services</li> <li>• Consumer Services</li> <li>• Value Added Services</li> <li>• Developer Services</li> <li>• Mobile Service Eco-Systems</li> </ul>	07
6.	<b>Application Server</b> <ul style="list-style-type: none"> <li>• Introduction to Application Server</li> <li>• Context of Application Server</li> <li>• Application Server Architecture</li> <li>• Advantages and Disadvantages of Application Server</li> <li>• Importance of Application Server</li> <li>• VAS Enabling with Application Server</li> </ul>	07
<b>Practical content</b>		
<b>Application Development</b>		
<ol style="list-style-type: none"> <li>1. Downloading and Installing JDK and JRE</li> <li>2. Compiling and Running Simple Java Program</li> <li>3. Writing Java Program using while and for loops</li> <li>4. Writing Java Program reading and writing data from and to a file respectively using IO classes</li> <li>5. Writing Java Program using Threads</li> <li>6. Downloading and Installing Android SDK and Configuring Eclipse to Design Android Application</li> <li>7. Developing Simple Android Application and Testing on Emulator</li> <li>8. Developing Simple Android UI Application and Testing on Emulator</li> <li>9. Testing Android Application using Android enabled devices</li> </ol>		
<b>Text Books</b>		
1		
2		
<b>Reference Books</b>		
1		
2		
<b>Paper Structure</b>		
<b>Q-1 (Attempt any Six Out of Eight: each question must be 5 marks ) --- 30</b>		

**Questions must be covered all possible section.**

**Q-2 (Must be From topics: Unit-1: (5 marks))**

**Q-3 (Must be From topics: Unit-2 (5 marks))**

**Q-4 (Must be From topics: Unit-3 (5 marks))**

**Q-5 (Must be From topics: Unit-4(5 marks))**

**Q-6 (Must be From topics: Unit-5 (5 marks))**

**Q-7 (Must be From topics: Unit-6(5 marks))**



# GANPAT UNIVERSITY

## FACULTY OF COMPUTER APPLICATION

<b>Programme</b>	MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MOBILE APPLICATION M.SC IT (MOBILE APPLICATION)				<b>Branch/Spec.</b>	Computer Application			
<b>Semester</b>	I				<b>Version</b>				
<b>Effective from Academic Year</b>	2018-19				<b>Effective for the batch Admitted in</b>	June– 2018			
<b>Subject code</b>	P51A2WAD		<b>Subject Name</b>		WEB APPLICATION DEVELOPMENT				
<b>Teaching scheme</b>					<b>Examination scheme (Marks)</b>				
<b>(Per week)</b>	<b>Lecture(DT )</b>		<b>Practical(Lab.)</b>		<b>Total</b>	<b>CE</b>	<b>SEE</b>	<b>Total</b>	
	L	T U	P	TW					
<b>Credit</b>	2	-	2	-	4	Theory	40	60	100
<b>Hours</b>	2	-	4	-	6	Practical	20	30	50
<b>Pre-requisites:</b>									
Basic knowledge of HTML, C and JAVA programming									
<b>Learning Outcome:</b>									
At the end of this paper, students should be able to familiarise with Mobile Web architectures, technologies and standards - Mobile Web Design tools - Web services, XML, RIA.									
<b>Theory syllabus</b>									
<b>Unit</b>	<b>Conte nt</b>								<b>Hrs</b>
1	<b>Web Architecture</b> <ul style="list-style-type: none"> <li>• Web Architecture</li> <li>• Web Technologies and Standards</li> <li>• Client Side Programming</li> <li>• Server Side Programming</li> </ul>								08
2	<b>Mobile Web Architecture and Standards</b> <ul style="list-style-type: none"> <li>• Mobile Web Standards</li> <li>• WAP, XHTML, WML</li> <li>• Content Adaption</li> <li>• Mobile Phone Detection</li> <li>• Conversion Engines and Emulators</li> </ul>								07
3	<b>Dynamic Content and RIA</b> <ul style="list-style-type: none"> <li>• Dynamic Content</li> <li>• Web Feeds and RSS</li> <li>• Python Features and Limitations</li> <li>• RIA Architecture</li> <li>• RIA Features</li> </ul>								08

4	<b>Web Services and Development Practices</b> <ul style="list-style-type: none"> <li>• Web ServicesArchitecture</li> <li>• XML, DTD and DOM</li> <li>• SMS Application using Web Services</li> <li>• Delivery Context</li> </ul>	07
Practical content		
List of programs on the above mentioned topics as per decided by subject faculty		
Text Books		
1	Introduction To Internet and HTML Scripting 4th edition BhaumikShroff	
2		
Reference Books		
1	Online sources	
2		
Paper Structure		
	<p><b>(Attempt any Six Out of Eight: each question must be 5 marks ) --- 30 Questions must be covered all possible section.</b></p> <p><b>(Must be From topics: Web Architecture: (10 marks))</b></p> <p><b>(Must be From topics: Mobile Web Architecture and Standards (8 marks))</b></p> <p><b>Q-4 (Must be From topics: Dynamic Content and RIA(6 marks))</b></p> <p><b>Q-5 (Must be From topics: Web Services and Development Practices (6 marks))</b></p>	



# GANPAT UNIVERSITY

## FACULTY OF COMPUTER APPLICATIONS

Programme	MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MOBILE APPLICATION M.SC IT (MOBILE APPLICATION)				Branch/Spec.	Computer Application			
Semester	I				Version				
Effective from Academic Year	2018-19				Effective for the batch Admitted in	June– 2018			
Subject code	P51A3CNA		Subject Name		Cellular Network Architecture				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	4	0	-	-	4	Theory	40	60	100
Hours	4	0	-	-	4	Practical	-	-	-
Pre-requisites:									
Learning Outcome:At the end of this paper, students should be able to familiarize with the prevailing cellular wireless network architectures and standards such as GSM and CDMA - the prevailing and future generations of wireless technologies: 2G, 2.5G, 3G and 4G, and typical wireless network architectures - the various voice and data services available on wireless cellular networks.									
Theory syllabus									
Bloc k	Content								Hrs
1	<b>Communications Principles &amp; Network Fundamentals</b> <ul style="list-style-type: none"> <li>Analog and Digital Communications</li> <li>Modulation Techniques</li> <li>Multiplexing Techniques</li> <li>Computer Networks</li> <li>OSI Model</li> <li>Circuit Switched &amp; Packet Switched Networks</li> </ul>								10
2	<b>Basic Telephony</b> <ul style="list-style-type: none"> <li>Telephone Networks</li> <li>Digital Trunking and Numbering Plan</li> <li>Call Processing</li> <li>Signaling System 7</li> </ul>								14
3	<b>Mobile Network</b> <ul style="list-style-type: none"> <li>Cellular Network Fundamentals</li> <li>Mobile Network Architecture</li> <li>Mobility Management</li> <li>SMS Network Architecture</li> </ul>								11







# GANPAT UNIVERSITY

## FACULTY OF COMPUTER APPLICATIONS

Programme	MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MOBILE APPLICATION M.SC IT (MOBILE APPLICATION)				Branch/Spec.	Computer Application			
Semester	I				Version				
Effective from Academic Year	2018-19				Effective for the batch Admitted in	June– 2018			
Subject code	<b>P51A4DA</b>		Subject Name		Device Architecture				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	4	0	-	-	4	Theory	40	60	100
Hours	4	0	-	-	4	Practical	-	-	-
Pre-requisites: Basic knowledge of the different types of device.									
<p><b>Learning Outcome:</b> At the end of this paper, students should be able to familiarize with mobile handset architectures, modern mobile operating systems such as Symbian, BREW, Windows Mobile, Android, Blackberry, PalmOS, iPhone etc - the strengths and weaknesses of the various mobile operating systems - Handset embedded software components.</p>									
Theory syllabus									
Bloc k	Content								Hrs
1	<b>Device Fundamentals</b> <ul style="list-style-type: none"> <li>• Mobile Handset Evolution</li> <li>• Mobile Handset Features</li> <li>• Mobile Handset Categories</li> <li>• Assembling a Mobile Handset</li> </ul>								06
2	<b>Handset Hard Ware Architecture and Sub Systems</b> <ul style="list-style-type: none"> <li>• Hard Ware Architecture</li> <li>• Processing Sub System</li> <li>• Radio Sub System</li> <li>• Power Management</li> <li>• SIM Sub Systems</li> </ul>								09
3	<b>Handset Software Architecture and Components</b> <ul style="list-style-type: none"> <li>• Handset Software Architecture</li> <li>• OS Services</li> <li>• Device Drivers</li> <li>• Mobile Handset Middleware</li> <li>• Developers SDKs</li> </ul>								07

4	<b>Mobile Operating Systems</b> <ul style="list-style-type: none"> <li>• Mobile OS</li> <li>• Resource Constraints</li> <li>• Mobile OS Features and Evolution</li> <li>• Real Time OS</li> <li>• Android OS</li> <li>• iPhone OS</li> </ul>	08								
Practical content										
Text Books										
	<ul style="list-style-type: none"> <li>• Mobile Computing Principles: Designing and Developing Mobile Applications by Reza B'Far, Cambridge University, 2005</li> <li>• Mobile Applications: Architecture, Design, and Development by Valentino Lee, Heather Schneider and Robbie Schell, Pearson Education, 2004</li> </ul>									
Reference Books										
	<ul style="list-style-type: none"> <li>• Next Generation Wireless Applications: Creating Mobile Applications in a Web 2.0 and Mobile 2.0 World by Paul Golding, John Wiley &amp; Sons, 2008</li> <li>• Wireless and Mobile Network Architectures by Yi-Bang Lin and Imrich Chlamtac, Wiley-India, 2008</li> </ul>									
Paper Structure										
	<p>(Attempt any Six Out of Eight : each question must be 5 marks ) --- 30</p> <p>Questions must be covered all possible section.</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">( Must be From topics :Block 1)</td> <td style="text-align: right;">- 8 Marks</td> </tr> <tr> <td style="padding-left: 20px;">( Must be From topics :Block 2)</td> <td style="text-align: right;">- 8 Marks</td> </tr> <tr> <td style="padding-left: 20px;">( Must be From topics :Block 3)</td> <td style="text-align: right;">- 8 Marks</td> </tr> <tr> <td style="padding-left: 20px;">( Must be From topics :Block 4)</td> <td style="text-align: right;">- 6 Marks</td> </tr> </table>		( Must be From topics :Block 1)	- 8 Marks	( Must be From topics :Block 2)	- 8 Marks	( Must be From topics :Block 3)	- 8 Marks	( Must be From topics :Block 4)	- 6 Marks
( Must be From topics :Block 1)	- 8 Marks									
( Must be From topics :Block 2)	- 8 Marks									
( Must be From topics :Block 3)	- 8 Marks									
( Must be From topics :Block 4)	- 6 Marks									



# GANPAT UNIVERSITY

## FACULTY OF COMPUTER APPLICATION

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Semester	I	Version	1.0.0.0						
Effective from Academic Year	2018-19	Effective for the batch Admitted in	June 2018						
Subject code	P51A5EL1	Subject Name	Elective-1 (Internet of Things)						
Teaching scheme			Examination scheme (Marks)						
(Per week)	Lecture(DT)	Practical(Lab.)	Total	CE	SEE	Total			
	L	TU	P	TW					
Credit	2	-	2	-	4	Theory	40	60	100
Hours	2	-	4	-	6	Practical	20	30	50
Pre-requisites:									
Required Knowledge of Linux operating system, basics of networking, Web services									
Learning Outcome:									
<ul style="list-style-type: none"> <li>- Able to programming in Python</li> <li>-Understand IoT in market's perspective</li> <li>-Understand State of the Art – IoT Architecture</li> <li>- Data and Knowledge Management and use of Devices in IoT Technology.</li> </ul>									
Theory syllabus									
Unit	Content								Hrs
1	<b>IoT System Logical design using Python</b> Introduction, Installing Python, Data Types and Data Structures, Control Flow, Functions, Modules, Packages, File Handling, Date/Time Operations, Classes, Python Packages of Interest for IoT.								08
2	<b>Introduction to Internet of Things</b> Definition and Characteristics of IoT, Physical design of IoT, IoT protocols, IoT Enabling technologies, Domain specific IoTs – Applications of IoT <b>IoT and M2M</b> M2M, Difference between IoT and M2M, SDN and NFV for IoT								07
3	<b>Developing Internet of Things</b> IoT Design methodology, IoT physical devices and Endpoints – IoT Device, basic building block of an IoT device, Mini-Computer(Raspberry Pi),Other IoT Devices, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python								08
4	<b>IoT Physical Servers &amp; Cloud Offerings</b> WAMP(Web Application Messaging Protocol) – AutoBahm for IoT, Introduction of Xively Cloud for IoT, Python Web Application Framework – Django, Amazon Web Services for IoT								07

<b>Practical content</b>		
List of programs specified by the subject teacher based on above mentioned topics		
<b>Text Books</b>		
1	Internet of Things A Hands-On Approach by Arshdeep Bagha, Vijay Madiseti, Universities Press	
<b>Reference Books</b>		
1	Rethinking the Internet of Things: A Scalable Approach to Connecting Everything by Francis daCosta , 1st Edition, Apress Publications, 2013	
2	From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence by Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, 1st Edition, Academic Press, 2014	
<p><b>Question Paper Scheme:</b></p> <p><b>Note for Examiner</b></p> <p>must be common from any topics from syllabus.</p> <p>and onwards must be from specific topics and internal choice or option can be given</p> <p><b>Paper Structure</b></p> <p>(Attempt any Six Out of Eight: each question must be 5 marks ) --- 30</p> <p>Questions must be covered all possible section.</p> <p>(Must be From topics : IoT System Logical design using Python(8 marks))</p> <p>(Must be From topics: Introduction to Internet of Things and IoT and M2M (7 marks) ) Q-4</p> <p>(Developing Internet of Things (8 marks))</p> <p>Q-5 (IoT Physical Servers &amp; Cloud Offerings (7 marks))</p>		



# GANPAT UNIVERSITY

## FACULTY OF COMPUTER APPLICATION

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Semester	I				Version				
Effective from Academic Year	2018-19				Effective for the batch Admitted in	June– 2018			
Subject code	P51A6EL2		Subject Name		OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	4	-	-	-	04	Theory	40	60	100
Hours	4	-	-	-	04	Practical	-	-	-
Pre-requisites:									
It requires basic knowledge of Business Processes, OOPs Concepts, SDLC, Web Engineering For Any Website and knowledge of Design Tools Like rational Rose & Visio.									
Learning Outcome:									
By completing this course students are able to model any Object Oriented Software system using UML. They are also able to understand any software system modeled using UML.									
Theory syllabus									
Unit	Content								Hrs
1	<b>Introduction to UML and Basic Structural Modeling:</b> Overview of UML, Conceptual Model of UML, Common Mechanisms in the UML, Architecture, Software Development Life Cycle, UML modeling with example <b>Classes:</b> Names, Attributes, Operations, Organizing Attributes and Operations, Responsibilities <b>Relationships:</b> Dependency, Generalization, Association, <b>Diagrams:</b> Structural Diagrams, Behavioral Diagrams. <b>Class Diagrams:</b> Common Uses, Common Modeling Techniques, Forward and Reverse Engineering								12
2	<b>Advanced Structural Modeling:</b> <b>Advanced Classes:</b> Classifiers, Visibility, Scope, Abstract Root Leaf and Polymorphic Elements, Multiplicity, Attributes, Operations, Template Classes, Standard Elements, <b>Advanced Relationships:</b> Dependency, Generalization, Association, Realization, <b>Interface Types and Roles:</b> Operations, Relationships, Understanding an Interface, Types and Roles, <b>Packages:</b> Names, Owned Elements, Visibility, Importing and Exporting, Generalization, and Standard Elements								15
3	<b>Behavioral Modeling (15)</b> <b>Interactions:</b> Object and Roles, Links, Messages, Sequencing, Creation, Modification and Destruction, Representation, <b>Use Cases:</b> Names, Use Cases and Actors, Use Cases with Flow of Elements, Scenarios, Collaboration, Organizing Use Cases, <b>Use Case Diagrams:</b> Common Uses, Common Modeling Techniques, <b>Interaction Diagram:</b> Sequence Diagram, Collaboration Diagram, Common Modeling Techniques, <b>Activity</b>								12

	<b>Diagram:</b> Action States and Activity States, Transition, Branching, Forking and Joining, Swim lances, Object Flow, Common Uses, Statechart Diagrams	
4	<b>Architectural Modeling:</b> <b>Components:</b> Names, Component and Classes, Component and Interface, Binary Replace ability, Kinds of Components, Organizing Components, <b>Deployment:</b> Names, Nodes and Components, Organizing Nodes, Connections, <b>Collaborations:</b> Name, Structure, Behavior, Organizing Collaborations, <b>Patterns and Framework:</b> Patterns and Architecture, Mechanisms, Frameworks, <b>Component Diagrams:</b> Common Properties, Contents, Common Uses, <b>Deployment Diagrams:</b> Common Properties, Contents, Common Uses	10
5	Case Study	10
Practical content		
Text Books		
1	<b>The Unified Modeling Language User Guide</b> By Booch, Rumbaugh, Jacobson, Pearson Publication	
Reference Books		
1	<b>Object Oriented Analysis and Design using UML</b> , By Mahesh P. Matha, PHI Publication	
	<p><b>Note for Examiner</b> must be common from any topics from syllabus. and onwards must be from specific topics and internal choice or option can be given</p> <p><b>Paper Structure</b></p> <p>Q-1 (Attempt any six out of eight: each question must be of 05 marks) --- 30 Questions must be covered all possible section.</p> <p>Q-2( Must be From topics : Introduction to UML and Basic Structural Modeling (08 marks))</p> <p>Q-3( Must be From topics : Advanced Structural Modeling (08 marks))</p> <p>Q-4( Must be From topics : Behavioral Modeling (08 marks))</p> <p>Q-5(Must be From topics: Architectural Modeling (06 marks))</p>	