MOBILE APPLICATION DEVELOPMENT  
[As per Choice Based Credit System (CBCS) scheme]  
(Effective from the academic year 2016 -2017)  
SEMESTER – VI

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>IA Marks</th>
<th>Total Number of Lecture Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>15CS661</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

**Course objectives:** This course will enable students to

- Learn to setup Android application development environment
- Illustrate user interfaces for interacting with apps and triggering actions
- Interpret tasks used in handling multiple activities
- Identify options to save persistent application data
- Appraise the role of security and performance in Android applications

<table>
<thead>
<tr>
<th>Module – 1</th>
<th>Teaching Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get started, Build your first app, Activities, Testing, debugging and using support libraries</td>
<td>8 Hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module – 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interaction, Delightful user experience, Testing your UI</td>
<td>8 Hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module – 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Background Tasks, Triggering, scheduling and optimizing background tasks</td>
<td>8 Hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module – 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All about data, Preferences and Settings, Storing data using SQLite, Sharing data with content providers, Loading data using Loaders</td>
<td>8 Hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module – 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissions, Performance and Security, Firebase and AdMob, Publish</td>
<td>8 Hours</td>
</tr>
</tbody>
</table>

**Course outcomes:** The students should be able to:

- Create, test and debug Android application by setting up Android development environment
- Implement adaptive, responsive user interfaces that work across a wide range of devices.
- Infer long running tasks and background work in Android applications
- Demonstrate methods in storing, sharing and retrieving data in Android applications
- Analyze performance of android applications and understand the role of permissions and security
- Describe the steps involved in publishing Android application to share with the world

**Question paper pattern:**
The question paper will have TEN questions.
There will be TWO questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer FIVE full questions, selecting ONE full question from each module.

**Text Books:**

   https://www.gitbook.com/book/google-developer-training/android-developer-fundamentals-course-concepts/details (Download pdf file from the above link)
<table>
<thead>
<tr>
<th>Reference Books:</th>
</tr>
</thead>
</table>
## Course Objectives:
This course will enable students to
- Interpret the data in the context of the business.
- Identify an appropriate method to analyze the data
- Show analytical model of a system

### Module 1: Teaching Hours

**Introduction to Data Analytics and Decision Making**
- Describing the Distribution of a Single Variable
- Finding Relationships among Variables

### Module 2: Teaching Hours

**Probability and Probability Distributions**
- Normal, Binomial, Poisson, and Exponential Distributions

### Module 3: Teaching Hours

**Decision Making under Uncertainty**
- Introduction, Elements of Decision Analysis, Payoff Tables, Possible Decision Criteria, Expected Monetary
Value(EMY), Sensitivity Analysis, Decision Trees, Risk Profiles, The Precision Tree Add-In, Bayes' Rule, Multistage Decision Problems and the Value of Information, The Value of Information, Risk Aversion and Expected Utility, Utility Functions, Exponential Utility, Certainty Equivalents, Is Expected Utility Maximization Used?


Module – 4

Confidence Interval Estimation: Introduction, Sampling Distributions, The t Distribution, Other Sampling Distributions, Confidence Interval for a Mean, Confidence Interval for a Total, Confidence Interval for a Proportion, Confidence Interval for a Standard Deviation, Confidence Interval for the Difference between Means, Independent Samples, Paired Samples, Confidence Interval for the Difference between Proportions, Sample Size Selection, Sample Size Selection for Estimation of the Mean, Sample Size Selection for Estimation of Other Parameters.


Module – 5


08 Hours

Course outcomes: The students should be able to:

- Explain the importance of data and data analysis
- Interpret the probabilistic models for data
- Define hypothesis, uncertainty principle
- Evaluate regression analysis

**Question paper pattern:**
The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer 5 full questions, selecting one full question from each module.

**Text Books:**

**Reference Books:**
# WIRELESS NETWORKS AND MOBILE COMPUTING

[As per Choice Based Credit System (CBCS) scheme]  
(Effective from the academic year 2016 -2017)

## SEMESTER – VI

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>IA Marks</th>
<th>Exam Marks</th>
<th>Total Number of Lecture Hours</th>
<th>Exam Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>15CS663</td>
<td></td>
<td>80</td>
<td>40</td>
<td>03</td>
</tr>
</tbody>
</table>

**Subject Code 15CS663 IA Marks 20**

**Number of Lecture Hours/Week** 3

**Total Number of Lecture Hours** 40

**CREDITS – 03**

### Course objectives:
This course will enable students to

- Describe the wireless communication.
- Illustrate operations involved in Mobile IP.
- Discover the concepts of mobile computing and databases.

### Module – 1

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours: 8 Hours</td>
</tr>
</tbody>
</table>

### Module – 2

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours: 8 Hours</td>
</tr>
</tbody>
</table>

### Module – 3

<table>
<thead>
<tr>
<th>IP and Mobile IP Network Layers, Packet Delivery and Handover Management Location Management, Registration, Tunnelling and Encapsulation, Route Optimization Dynamic Host Configuration Protocol, VoIP, IPsec Conventional TCP/IP Transport Layer Protocols, Indirect TCP, Snooping TCP Mobile TCP, Other Methods of Mobile TCP-layer Transmission ,TCP over 2.5G/3G Mobile Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours: 8 Hours</td>
</tr>
</tbody>
</table>

### Module – 4

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours: 8 Hours</td>
</tr>
</tbody>
</table>

### Module – 5

<table>
<thead>
<tr>
<th>Communication Asymmetry, Classification of Data-delivery Mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing techniques, Digital Audio Broadcasting (DAB), Digital Video Broadcasting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours: 8 Hours</td>
</tr>
</tbody>
</table>
| Synchronization, Synchronization Software for Mobile Devices, Synchronization Software for Mobile Devices  
SyncML-Synchronization Language for Mobile Computing, Sync4J (Funambol), Synchronized Multimedia Markup Language (SMIL) |
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course outcomes:</strong> The students should be able to:</td>
</tr>
</tbody>
</table>
| - Summarize various mobile communication systems.  
- Describe various multiplexing systems used in mobile computing.  
- Indicate the use and importance of data synchronization in mobile computing |
| **Question paper pattern:** |
| The question paper will have TEN questions.  
There will be TWO questions from each module.  
Each question will have questions covering all the topics under a module.  
The students will have to answer FIVE full questions, selecting ONE full question from each module. |
| **Text Books:** |
| **Reference Books:** |
PYTHON APPLICATION PROGRAMMING
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)
SEMESTER – VI

Subject Code 15CS664 IA Marks 20
Number of Lecture Hours/Week 3 Exam Marks 80
Total Number of Lecture Hours 40 Exam Hours 03
CREDITS – 03

Course objectives: This course will enable students to
• Learn Syntax and Semantics and create Functions in Python.
• Handle Strings and Files in Python.
• Understand Lists, Dictionaries and Regular expressions in Python.
• Implement Object Oriented Programming concepts in Python
• Build Web Services and introduction to Network and Database Programming in Python.

Module – 1 Teaching
Why should you learn to write programs, Variables, expressions and statements, Conditional execution, Functions 8 Hours

Module – 2
Iteration, Strings, Files 8 Hours

Module – 3
Lists, Dictionaries, Tuples, Regular Expressions 8 Hours

Module – 4
Classes and objects, Classes and functions, Classes and methods 8 Hours

Module – 5
Networked programs, Using Web Services, Using databases and SQL 8 Hours

Course outcomes: The students should be able to:
• Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
• Demonstrate proficiency in handling Strings and File Systems.
• Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
• Interpret the concepts of Object-Oriented Programming as used in Python.
• Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

Question paper pattern:
The question paper will have TEN questions.
There will be TWO questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer FIVE full questions, selecting ONE full question from each module.

Text Books:
<table>
<thead>
<tr>
<th>Reference Books</th>
<th></th>
</tr>
</thead>
</table>
# SERVICE ORIENTED ARCHITECTURE

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)

## SEMESTER – VI

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>IA Marks</th>
<th>Number of Lecture Hours/Week</th>
<th>Exam Marks</th>
<th>Total Number of Lecture Hours</th>
<th>Exam Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>15CS665</td>
<td>20</td>
<td>3</td>
<td>80</td>
<td>40</td>
<td>03</td>
</tr>
</tbody>
</table>

## CREDITS – 03

### Course objectives:
This course will enable students to
- Compare various architecture for application development
- Illustrate the importance of SOA in Application Integration
- Learn web service and SOA related tools and governance

### Module – 1


**Teaching Hours:** 8 Hours

**Text 1:** Ch2: 2.1 – 2.4; Ch3:3.1-3.7; Ch4: 4.1 – 4.5

### Module – 2


**Teaching Hours:** 8 Hours

**Text 1:** Ch5:5.1, 5.2, 6.1, 6.2 (PageNo 74-81), 7.1 – 7.5

### Module – 3

**SOA ANALYSIS AND DESIGN:** Need For Models, Principles of Service Design, Design of Activity Services, Design of Data services, Design of Client services and Design of business process services, *Technologies of SOA*; Technologies For Service Enablement, Technologies For Service Integration, Technologies for Service orchestration.

**Teaching Hours:** 8 Hours

**Text 1:** Ch 8: 8.1 – 8.6, 9.1 – 9.3

### Module – 4

**Business case for SOA:** Stakeholder OBJECTIVES, Benefits of SOA, Cost Savings, Return on Investment, SOA Governance, *Security and implementation:* SOA Governance, SOA Security, approach for enterprise wide SOA implementation, *Trends in SOA*; Technologies in Relation to SOA, Advances in SOA.

**Teaching Hours:** 8 Hours

**Text 1:** Ch 10: 10.1 -10.4, Ch 11: 11.1 to 11.3, Ch12:12.2, 12.3

### Module – 5

**SOA Technologies-PoC:** Loan Management System(LMS), PoC-Requirements Architectures of LMS SOA based integration; integrating existing application, SOA best practices, Basic SOA using REST. Role of WSDL,SOAP and

**Teaching Hours:** 8 Hours
Course outcomes: The students should be able to:

- Compare the different IT architecture
- Analysis and design of SOA based applications
- Implementation of web service and realization of SOA
- Implementation of RESTful services

Question paper pattern:
The question paper will have TEN questions.
There will be TWO questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer FIVE full questions, selecting ONE full question from each module.

Text Books:

Reference Books:
# MULTI-CORE ARCHITECTURE AND PROGRAMMING

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)

## SEMESTER – VI

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>IA Marks</th>
<th>Exam Marks</th>
<th>Total Lecture Hours</th>
<th>Exam Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>15CS666</td>
<td>20</td>
<td>80</td>
<td>40</td>
<td>03</td>
</tr>
</tbody>
</table>

### CREDITS – 03

#### Course objectives:
This course will enable students to

- Explain the recent trends in the field of Computer Architecture and describe performance related parameters
- Illustrate the need for quasi-parallel processing.
- Formulate the problems related to multiprocessing
- Compare different types of multicore architectures

### Module – 1

**Teaching Hours**

**Introduction to Multi-core Architecture**
Motivation for Concurrency in software, Parallel Computing Platforms, Parallel Computing in Microprocessors, Differentiating Multi-core Architectures from Hyper-Threading Technology, Multi-threading on Single-Core versus Multi-Core Platforms Understanding Performance, Amdahl’s Law, Growing Returns: Gustafson’s Law. **System Overview of Threading**
Defining Threads, System View of Threads, Threading above the Operating System, Threads inside the OS, Threads inside the Hardware, What Happens When a Thread Is Created, Application Programming Models and Threading, Virtual Environment: VMs and Platforms, Runtime Virtualization, System Virtualization.

#### Module – 2

**Fundamental Concepts of Parallel Programming**

#### Module – 3

**Threading APIs**
Threading APIs for Microsoft Windows, Win32/MFC Thread APIs, Threading APIs for Microsoft. NET Framework, Creating Threads, Managing Threads, Thread Pools, Thread Synchronization, POSIX Threads, Creating Threads, Managing Threads, Thread Synchronization, Signaling, Compilation and Linking.

#### Module – 4

**OpenMP: A Portable Solution for Threading**
Challenges in Threading a Loop, Loop-carried Dependence, Data-race Conditions, Managing Shared and Private Data, Loop Scheduling and Portioning, Effective Use of Reductions, Minimizing Threading Overhead, Work-sharing Sections, Performance-oriented Programming, Using Barrier and No wait, Interleaving Single-thread and Multi-thread Execution, Data Copy-in and Copy-out, Protecting Updates of Shared...
Module – 5


<table>
<thead>
<tr>
<th>Course outcomes: The students should be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identify the issues involved in multicore architectures</td>
</tr>
<tr>
<td>• Explain fundamental concepts of parallel programming and its design issues</td>
</tr>
<tr>
<td>• Solve the issues related to multiprocessing and suggest solutions</td>
</tr>
<tr>
<td>• Point out the salient features of different multicore architectures and how they exploit parallelism</td>
</tr>
<tr>
<td>• Illustrate OpenMP and programming concept</td>
</tr>
</tbody>
</table>

**Question paper pattern:**
The question paper will have TEN questions.
There will be TWO questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer FIVE full questions, selecting ONE full question from each module.

**Text Books:**

**Reference Books:**
NIL