



# **TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

**AN AUTONOMOUS INSTITUTION**

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: [info@tkrcet.ac.in](mailto:info@tkrcet.ac.in), web site: [www.tkrct.ac.in](http://www.tkrct.ac.in)



## **DEPARTMENT OF INFORMATION TECHNOLOGY**

R22 B.Tech. IT Syllabus

### **LIST OF OPEN ELECTIVE COURSES OFFERED TO OTHER DEPARTMENTS**

1. D65OE1- JAVA PROGRAMMING
2. D66OE2 - ANDROID APPLICATION DEVELOPMENT
3. D67OE3 - INTERNET OF THINGS
4. D67OE4 - INFORMATION TECHNOLOGY ESSENTIALS



# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

AN AUTONOMOUS INSTITUTION

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: info@tkrcet.ac.in, web site: www.tkrct.ac.in



## DEPARTMENT OF INFORMATION TECHNOLOGY

R22 B.Tech. IT Syllabus

### D65OE1- JAVA PROGRAMMING

L	T	P	C
3	0	0	3

#### Course Objectives:

- To introduce object-oriented programming principles and apply them in solving problems.

**Course Outcomes:** On completion of the course, the students will be able to:

- Implement Java fundamentals: variables, control statements, methods, and constructors. L3
- Manage exceptions using try-catch blocks and custom exception handling. L3
- Utilize file I/O operations and handle streams effectively. L3
- Implement multithreading concepts: thread creation, synchronization, and communication. L3
- Develop GUI applications with Swing, employing event handling mechanisms. L3

#### UNIT - I

Foundations of Java: History of Java, Java Features, Variables, Data Types, Operators, Expressions, Control Statements. Elements of Java - Class, Object, Methods, Constructors and Access Modifiers, Generics, Inner classes, String class and Annotations. OOP Principles: Encapsulation – concept, setter and getter method usage, this keyword. Inheritance - concept, Inheritance Types, super keyword. Polymorphism – concept, Method Overriding usage and Type Casting. Abstraction – concept, abstract keyword and Interface.

#### UNIT – II

Exception Handling: Exception and Error, Exception Types, Exception Handler, Exception Handling Clauses – try, catch, finally, throws and the throw statement, Built-in-Exceptions and Custom Exceptions. Files and I/O Streams: The file class, Streams, The Byte Streams, Filtered Byte Streams, The Random Access File class.

#### UNIT – III

Packages- Defining a Package, CLASSPATH, Access Specifiers, importing packages. Few Utility Classes - String Tokenizer, BitSet, Date, Calendar, Random, Formatter, Scanner. Collections: Collections overview, Collection Interfaces, Collections Implementation Classes, Sorting in Collections, Comparable and Comparator Interfaces.

#### UNIT – IV

Multithreading: Process and Thread, Differences between thread-based multitasking and processbased multitasking, Java thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication. Java Database Connectivity: Types of Drivers, JDBC architecture, JDBC Classes and Interfaces, Basic steps in Developing JDBC



# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

**AN AUTONOMOUS INSTITUTION**

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: [info@tkrcet.ac.in](mailto:info@tkrcet.ac.in), web site: [www.tkrct.ac.in](http://www.tkrct.ac.in)



## DEPARTMENT OF INFORMATION TECHNOLOGY

R22 B.Tech. IT Syllabus

Application, Creating a New Database and Table with JDBC.

### UNIT - V

GUI Programming with Swing – Introduction, limitations of AWT, MVC architecture, components, containers, Layout Manager Classes, Simple Applications using AWT and Swing. Event Handling- The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes.

### TEXT BOOKS:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill Education (India) Pvt. Ltd.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.

### REFERENCE BOOKS:

1. An Introduction to programming and OO design using Java, J. Nino and F.A. Hosch, John Wiley & sons
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Object Oriented Programming through Java, P. Radha Krishna, University Press.
4. Programming in Java, S. Malhotra, S. Chudhary, 2nd edition, Oxford Univ. Press.
5. Java Programming and Object-oriented Application Development, R. A. Johnson, Cengage Learning.



# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

AN AUTONOMOUS INSTITUTION

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: info@tkrcet.ac.in, web site: www.tkrct.ac.in



## DEPARTMENT OF INFORMATION TECHNOLOGY

R22 B.Tech. IT Syllabus

### D66OE2 - ANDROID APPLICATION DEVELOPMENT

L	T	P	C
3	0	0	3

#### Course Objectives

- To demonstrate their understanding of the fundamentals of Android operating systems

**Course Outcomes:** On completion of the course, the students will be able to:

- Apply Android development framework and SDK features for applications. L3
- Implement diverse UI components and layouts for Android interfaces. L3
- Utilize intents for activity launching and broadcast receivers for services. L3
- Manage persistent storage with files and shared preferences effectively. L3
- Implement SQLite databases and content providers for data management. L3

#### UNIT - I

Introduction to Android Operating System: Android OS design and Features – Android development framework, SDK features, Installing and running applications on Android Studio, Creating AVDs, Types of Android applications, Best practices in Android programming, Android tools Android application components – Android Manifest file, Externalizing resources like values, themes, layouts, Menus etc, Resources for different devices and languages, Runtime Configuration Changes Android Application Lifecycle – Activities, Activity lifecycle, activity states, monitoring state changes

#### UNIT - II

Android User Interface: Measurements – Device and pixel density independent measuring unit – s Layouts – Linear, Relative, Grid and Table Layouts User Interface (UI) Components – Editable and non-editable TextViews, Buttons, Radio and Toggle Buttons, Checkboxes, Spinners, Dialog and pickers Event Handling – Handling clicks or changes of various UI components Fragments – Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding, removing and replacing fragments with fragment transactions, interfacing between fragments and Activities, Multi-screen Activities

#### UNIT - III

Intents and Broadcasts: Intent – Using intents to launch Activities, Explicitly starting new Activity, Implicit Intents, Passing data to Intents, Getting results from Activities, Native Actions, using Intent to dial a number or to send SMS Broadcast Receivers – Using Intent filters to service implicit Intents, Resolving Intent filters, finding and using Intents received within an Activity Notifications – Creating and Displaying notifications, Displaying Toasts



# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

AN AUTONOMOUS INSTITUTION

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: [info@tkrcet.ac.in](mailto:info@tkrcet.ac.in), web site: [www.tkrct.ac.in](http://www.tkrct.ac.in)



## DEPARTMENT OF INFORMATION TECHNOLOGY

R22 B.Tech. IT Syllabus

### UNIT - IV

Persistent Storage: Files – Using application specific folders and files, creating files, reading data from files, listing contents of a directory Shared Preferences – Creating shared preferences, saving and retrieving data using Shared Preference

### UNIT - V

Database – Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and etindelg data, Registering Content Providers, Using content Providers (insert, delete, retrieve and update)

### TEXT BOOK:

1. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012

### REFERENCE BOOKS:

1. Android Application Development for Java Programmers, James C Sheusi, Cengage Learning, 2013
2. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013



# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

AN AUTONOMOUS INSTITUTION

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: info@tkrcet.ac.in, web site: www.tkrct.ac.in



## DEPARTMENT OF INFORMATION TECHNOLOGY

R22 B.Tech. IT Syllabus

### D67OE3 - INTERNET OF THINGS OPEN ELECTIVE

L	T	P	C
3	0	0	3

#### Course Objectives:

To introduce the concept of M2M (machine to machine) with necessary protocols ,Python Scripting Language which is used in many IoT devices ,Raspberry PI platform, that is widely used in IoT applications and the implementation of web-based services on IoT devices

**Course Outcomes:** On completion of the course, the students will be able to:

1. Apply IoT concepts to design physical and logical IoT systems. L3
2. Utilize M2M and SDN/NFV for efficient IoT system management. L3
3. Implement IoT systems using Python for logical design and management. L3
4. Configure IoT physical devices like Raspberry Pi and Linux endpoints.L3
5. Design and deploy IoT solutions using cloud storage and APIs. L3

#### UNIT - I

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels and Deployment Templates Domain Specific IoTs – Home automation, Environment, Agriculture, Health and Lifestyle

#### UNIT - II

IoT and M2M – M2M, Difference between IoT and M2M, SDN and NFV for IoT, IoT System Management with NETCOZF, YANG- Need for IoT system Management, Simple Network management protocol, Network operator requirements, NETCONF, YANG, IoT Systems Management with NETCONF-YANG

#### UNIT - III

IoT Systems – Logical design using Python-Introduction to Python – Python Data types & Data structures, Control flow, Functions, Modules, Packaging, File handling, Data/Time operations, Classes, Exception, Python packages of Interest for IoT

#### UNIT - IV

IoT Physical Devices and Endpoints - Raspberry Pi, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry PI with Python, Other IoT devices. IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs, WAMP-AutoBahn for IoT, Xively Cloud for IoT, Python web application framework –Django, Designing a RESTful web API



# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

**AN AUTONOMOUS INSTITUTION**

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: [info@tkrcet.ac.in](mailto:info@tkrcet.ac.in), web site: [www.tkrct.ac.in](http://www.tkrct.ac.in)



## DEPARTMENT OF INFORMATION TECHNOLOGY

R22 B.Tech. IT Syllabus

### UNIT V

Case studies- Home Automation, Environment-weather monitoring-weather reporting- air pollution monitoring, Agriculture.

### TEXT BOOK:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madiseti, Universities Press, 2015, ISBN: 9788173719547.

### REFERENCE BOOK:

1. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759.



# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

AN AUTONOMOUS INSTITUTION

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: info@tkrcet.ac.in, web site: www.tkrct.ac.in



## DEPARTMENT OF INFORMATION TECHNOLOGY

R22 B.Tech. IT Syllabus

### D68OE4 - INFORMATION TECHNOLOGY ESSENTIALS

L	T	P	C
3	0	0	3

#### Course Objectives:

- To introduce the concept of Internet, Networks and its working principles.
- To know scripting languages and understand various applications related to Information Technology.

**Course Outcomes:** On completion of the course, the students will be able to:

- Apply website creation principles using various authoring tools effectively. L3
- Utilize PHP scripting for dynamic web content and functionality. L3
- Implement network configurations and protocols for efficient communication. L3
- Apply mobile communication concepts to cellular network technologies. L3
- Develop interactive and multimedia applications for different information systems. L3

#### UNIT I WEB ESSENTIALS

Creating a Website - Working principle of a Website - Browser fundamentals - Authoring tools – Types of servers: Application Server - Web Server - Database Server

#### UNIT II SCRIPTING ESSENTIALS

Need for Scripting languages - Types of scripting languages - Client side scripting - Server side scripting - PHP - Working principle of PHP - PHP Variables - Constants - Operators – Flow Control and Looping - Arrays - Strings - Functions - File Handling - PHP and MySQL - PHP and HTML - Cookies - Simple PHP scripts

#### UNIT III NETWORKING ESSENTIALS

Fundamental computer network concepts - Types of computer networks - Network layers - TCP/IP model - Wireless Local Area Network - Ethernet - WiFi - Network Routing - Switching – Network components

#### UNIT IV MOBILE COMMUNICATION ESSENTIALS

Cell phone working fundamentals - Cell phone frequencies & channels - Digital cell phone components - Generations of cellular networks - Cell phone network technologies / architecture - Voice calls & SMS

#### UNIT V APPLICATION ESSENTIALS

Creation of simple interactive applications - Simple database applications - Multimedia applications - Design and development of information systems – Personal Information System – Information retrieval system – Social networking applications





# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

**AN AUTONOMOUS INSTITUTION**

Accredited by NBA and NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: [info@tkrcet.ac.in](mailto:info@tkrcet.ac.in), web site: [www.tkrct.ac.in](http://www.tkrct.ac.in)



## DEPARTMENT OF INFORMATION TECHNOLOGY

R22 B.Tech. IT Syllabus

### TEXT BOOKS:

1. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5" Third Edition, O'REILLY, 2014.
1. James F. Kurose, "Computer Networking: A Top-Down Approach", Sixth Edition, Pearson, 2012.

### REFERENCES BOOKS:

1. Gottapu Sasibhushana Rao, "Mobile Cellular Communication", Pearson, 2012.
2. R. Kelly Rainer , Casey G. Cegielski , Brad Prince, Introduction to Information Systems, FifthEdition, Wiley Publication, 2014.