



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

DEPARTMENT OF CS & IT

Semester/Year		V/III		Program		B.Tech – Internet of Things			
Subject Category	DC	Subject Code:	IoT 2051	Subject Name	Microprocessors and Microcontrollers				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks	L	T	P	
ES	MS	Assignment/Quiz	ES	LW					L
70	20	10	30	20	150	3	0	2	4
Prerequisites:									
Basic Computing and Logical Reasoning									
Course Objective:									
<ul style="list-style-type: none"> • To make students familiar with the basic blocks of 8 bit & 16 bit microprocessor device in general. • To provide comprehensive knowledge of the architecture, features and interfacing with peripherals of 8085/8086 microprocessor. • To use assembly and high level languages to interface the microprocessor to various applications. 									
UNITS	Descriptions								Hrs.
I	Introduction to 16 bit Microprocessor-Introduction to 8086 Microprocessor family Architecture, Pin diagram, Instruction set, Assembler directive, Addressing modes, Maximum and Minimum Mode operation, Elementary 8086 Programming.								6
II	Microcontrollers and Embedded processors, overview of 8051 family. 8051 microcontroller hardware, oscillator and clock, CPU registers, Register banks and stack, flags, PSW, SFR's, I/O ports, internal memory, 8051 pin description. 8051 programming model, Assembly, Language programming, Data types, directives. Addressing modes of 8051, memory access using various addressing modes, Bit addresses for I/O and RAM, I/O port programming.								8
III	Arithmetic Operations with 8051: Arithmetic instructions, signed number concepts and arithmetic operations. Branch Instructions: Jump Loop and Call Instructions, Time delay calculations. Logical Operations & Bit manipulation instructions: Logic and compare instructions rotate and swap instructions, data serialization, single bit instructions, operations with carry, reading input pins.								8
IV	Timers: Programming, Counter programming, Serial communication, RS232, 8051 programming for serial port, Serial Port programming, 8051 Interrupts, programming timer interrupts, external hardware interrupts, serial communication interrupts, interrupt priority in 8051, Interrupt programming.								10
V	Interface 8051, LCD Interfacing, memory address decoding, interfacing with external ROM, data memory space, accessing external memory in C, Interfacing 8255, programming 8255, modes of 8255, 8255 connection to stepper motor, LCD,& ADC, 8051 programming for 8255.								8
Total Hours									40
Course Outcomes:									
CO 1: Acquire and demonstrate fundamental knowledge of microprocessors or interfacing and programming CO 2: Understanding the fundamentals of 8051 microcontroller. CO 3: Apply the arithmetic and logical operations with the help of instructions.									

CO 4: Analyze the concept of Timer, Serial Communication and interrupt.
CO5: To understand the interfacing of 8051 microcontroller with peripheral devices.

Text Book

1. A K Ray & K M Bhurchandi, Advanced Microprocessor and Peripheral, Tata McGraw-Hill Publishing Company Limited.
2. M A Mazidi, J G Mazidi and R D McKinlay, The 8051 Microcontroller and Embedded Systems: Using Assembly and C, Pearson.

Reference Books

1. Ramesh S Goankar, Microprocessor Architecture, Programming & Applications with the 8085, Penram International Publishing (India) Pvt. Ltd., Fourth Edition, 2002.
2. Douglas V. Hall, Microprocessors and interfacing programming and hardware Gregg Division, McGraw-Hill, 1986

List/Links of e-learning resource

- <https://archive.nptel.ac.in/courses/108/105/108105102/>

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂	PSO1	PSO2
CO-1	1	1	2										1	2
CO-2	2	1	2		1								1	2
CO-3	2	1	2										1	2
CO-4	2	1	2											2
CO-5	1		1					1	1				2	

Suggestive list of experiments:

1. WAP to add a data byte located at the offset address 0500H in the segment 2000H to another data byte located at the offset address 0600H in the segment 3000H.
2. WAP to move 0500H to register BX and CX, add 05H to each of them and store the result in 0700H. Segment address: 5000H.
3. WAP to add the contents of 2000H: 0500H to the contents of 3000H: 0600H and store the result in 5000H: 0700H.
4. WAP to find the square of a given number.
5. WAP to find the 2's compliment of a given number.
6. WAP to find the square root of a given number.
7. WAP to arrange the given set of bytes in ascending order.
8. WAP to arrange the given set of bytes in the descending order.
9. WAP to find out the largest number in the given set of 8-bit number stored at memory location 0500H in the segment 2000H.
10. WAP to find out the even and odd numbers from the given set of 10 data bytes stored at memory location 4000H: 0400H.

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of CS & IT



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DEPARTMENT OF CS & IT

Semester/Year		V/III		Program		B.Tech – Internet of Things			
Subject Category	DC	Subject Code:	IoT 2052	Subject Name	Foundation of Data Science				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks	L	T	P	
ES	MS	Assignment/Quiz	ES	LW					
70	20	10	30	20	150	3	0	2	4
Prerequisites:									
Basic Knowledge of Mathematics									
Course Objective:									
<ul style="list-style-type: none"> • To provide the knowledge and expertise to become a proficient data scientist; • Demonstrate an understanding of statistics and machine learning concepts that are vital for data science; • Produce Python code to statistically analyze a dataset; • Critically evaluate data visualizations based on their design and use for communicating stories from data; 									
UNITS	Descriptions								Hrs.
I	Data Science-What is Data Science, Need for Data Science, Difference between Data Science & Business Intelligence, Data Science Components, Tools for Data Science, Data Science Life cycle, Applications of Data Science, Data Science Ethics. Representation of Data-Types of data, primary, secondary, quantitative and qualitative data. Types of Measurements, nominal, ordinal, discrete and continuous data.								8
II	Presentation of data by tables, construction of frequency distributions for discrete and continuous data. Graphical representation of a frequency distribution by histogram and frequency polygon, cumulative frequency distributions. Data Pre-processing- Knowing Data, Data Cleaning, Data Integration, Data Selection, Data Transformation								8
III	Descriptive Statistics-Arithmetic mean, Median, Mode, Geometric mean, Harmonic mean. Partition values: Quartiles, Deciles and percentiles. Measures of dispersion: Mean deviation, Quartile deviation, Standard deviation, Coefficient of variation. Moments: measures of skewness, Kurtosis								8
IV	Correlation-Scatter plot, Karl Pearson coefficient of correlation, Spearman's rank correlation coefficient, multiple and partial correlations. Regression: Concept of errors, Principles of Least Square, Simple linear regression and its properties. Types of Regressions.								8
V	Basics of Big Data, Problem handling large data, general techniques for handling large data, Basic concept of Machine Learning, training model, validating model, supervised & unsupervised learning.								8

Total Hours	40													
Course Outcomes:														
<p>CO1: To explain how data is collected, managed and stored for data science.</p> <p>CO2: To understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists.</p> <p>CO3: Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice</p> <p>CO4: To implement data collection and management scripts using MongoDB.</p> <p>CO5: Having computational thinking (Ability to translate vast data into abstract concepts and to understand database reasoning)</p>														
Text Book														
<p>1. “Introducing Data Science” by Davy Cielen, Arno D. B. Meysman, Mohamed Ali, 1st Edition, Manning Publications Co.</p> <p>2. “An Introduction to Probability and Statistics” by Rohatgi V.K and Saleh E, 3rd Edition, John Wiley & Sons Inc., New Jersey,</p> <p>3. “Data Mining Concept & Techniques” by Han & Kember, 3rd Edition, The Morgan Kaufmann,</p>														
Reference Books														
<p>1. Joel Grus, Data Science from Scratch, Shroff Publisher/O’Reilly Publisher Media</p> <p>2. Annalyn Ng, Kenneth Soo, Num sense Data Science for the Layman, Shroff Publisher Publisher</p> <p>3. Cathy O’Neil and Rachel Schutt. Doing Data Science, Straight Talk from The Frontline. O’Reilly Publisher.</p>														
List/Links of e-learning resource														
<ul style="list-style-type: none"> • https://nptel.ac.in/courses/106106179 														
Modes of Evaluation and Rubric														
The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.														
CO-PO Mapping:														
COs	PO₁	PO₂	PO₃	PO₄	PO₅	PO₆	PO₇	PO₈	PO₉	PO₁₀	PO₁₁	PO₁₂	PSO1	PSO2
CO-1	1	3		2									1	2
CO-2	2	2											2	2
CO-3	2	1	3										1	2
CO-4	1	2											3	1
CO-5	3	3		2									2	3
Suggestive list of experiments:														
<ol style="list-style-type: none"> 1. Working with various types of data 2. Experiment on measurement of data 3. Experiments on presentation of Data 4. Develop program for Frequency distributions 5. Develop program for Variability 6. Develop program for Averages 7. Develop program for Normal Curves 8. Develop program for Correlation and scatter plots 9. Develop program for Correlation coefficient 10. Develop program for Simple Linear Regression 														
Recommendation by Board of studies on														
Approval by Academic council on														
Compiled and designed by														
Subject handled by department														
Department of CS & IT														



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Semester/Year		V/III		Program		B.Tech – Internet of Things					
Subject Category	DC	Subject Code:		IoT 2053	Subject Name	Database Management System					
Maximum Marks Allotted											
Theory					Practical		Total Marks	Contact Hours			Total Credits
ES	MS	Assignment/Quiz		ES	LW	L		T	P		
70	20	10		30	20	150	3	0	2	4	
Prerequisites:											
Basic Knowledge of Mathematics and Programming											
Course Objective:											
<ul style="list-style-type: none"> ● To understand the different issues involved in the design and implementation of a database system. ● To represent a database system using ER diagrams and to learn normalization techniques ● To learn the fundamentals of data models, relational algebra, and SQL. ● To understand the basic issues of transaction processing and concurrency control. ● To become familiar with database storage structures and access techniques 											
UNITs	Descriptions									Hrs.	
I	Introduction: Purpose of Database System -- Views of data – data models, database management system, three-schema architecture of DBMS, components of DBMS. E/R Model - Conceptual data modeling - motivation, entities, entity types, attributes relationships, relationship types, E/R diagram notation, examples.									8	
II	Relational Model: Relational Data Model - Concept of relations, schema-instance distinction, keys, referential integrity and foreign keys, relational algebra operators, SQL - Introduction, data definition in SQL, table, key and foreign key definitions, update behaviors. Querying in SQL, notion of aggregation, aggregation functions group by and having clauses.									8	
III	Database Design: Dependencies and Normal forms, dependency theory - functional dependencies, Armstrong's axioms for FD's, closure of a set of FD's, minimal covers, definitions of 1NF, 2NF, 3NF and BCNF, decompositions and desirable properties of them, algorithms for 3NF and BCNF normalization, 4NF, and 5NF.									8	
IV	Transactions: Transaction processing and Error recovery - concepts of transaction processing, ACID properties, concurrency control, locking based protocols for CC, error recovery and logging, undo, redo, undo-redo logging and recovery methods.									8	
V	Implementation Techniques: Data Storage and Indexes - file organizations, primary, secondary index structures, various index structures - hash-based, dynamic hashing techniques, multi-level indexes, B+ trees.									8	
Total Hours										40	
Course Outcomes:											
CO-1: Understand the basic concepts, principles and applications of database systems. CO-2: Discuss the components of DBMS, data models, Relational models. CO-3: Use knowledge to find the functional dependencies and differentiate between different normal forms. CO-4: Execute transaction concepts and concurrency protocols CO-5: Articulate the basic concept of storage and access techniques.											
Text Book											

1. Ramez Elmasri and Sham kant B. Navathe, Fundamentals of Database Systems , Pearson Education
2. Silberschatz, Korth, “Data base System Concepts”, 7th ed., McGraw hill.

Reference Books

1. C. J. Date, “An Introduction to Database Systems”, 8th ed., Pearson.
2. Raghu Ramakrishnan and Johannes Gehrke, Database Management Systems McGraw Hill.
3. Peter Rob and Carlos Coronel, Database System- Design, Implementation and Management , Cengage Learning.

List/Links of e-learning resource

- https://onlinecourses.nptel.ac.in/noc22_cs91/preview

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂	PSO1	PSO2
CO-1	1	1	2										1	2
CO-2	3	2	2										1	2
CO-3	2	1	2		2								1	2
CO-4	2	1	2											2
CO-5	2	2	2											1

Suggestive list of experiments:

1. Design a Database and create required tables. For e.g. Bank, College Database
2. Apply the constraints like Primary Key , Foreign key, NOT NULL to the tables
3. Write a sql statement for implementing ALTER,UPDATE and DELETE
4. Write the queries to implement the joins
5. Write the query for implementing the aggregate functions
6. Write the query to implement the concept of Integrity constraints
7. Write the query to create the views
8. Perform the queries with group by and having clauses
9. Perform the following operation for demonstrating the insertion , updation and deletion using the referential integrity constraints
10. Write the query for creating the users and their role

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Semester/Year		V/III		Program		B.Tech – Internet of Things				
Subject Category	DC	Subject Code:		IoT 2054	Subject Name	Object Oriented Programming				
Maximum Marks Allotted						Contact Hours			Total Credits	
Theory			Practical		Total Marks	L	T	P		
ES	MS	Assignment/Quiz		ES	LW	100	3	1	0	4
70	20	10		-	-	100	3	1	0	4
Prerequisites:										
Fundamentals of Programming Skills										
Course Objective:										
<ul style="list-style-type: none"> • Enable students to understand concepts and principles of Object Oriented Programming methodologies using JAVA as a vehicle. • They will also learn software development and problem solving using this JAVA technology. 										
UNITS	Descriptions									Hrs.
I	Introduction: Procedural Paradigms of programming, Object Oriented Paradigm for programming, Procedural vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP. OOP Concepts: Data Abstraction, Encapsulation, Inheritance and Polymorphism. Introduction of Java, Features of Java, Byte Code and Java Virtual Machine, Java Development Kit (JDK). Basics of objects and classes in Java, tokens, keywords, identifiers, variables, data types, and operators in java, Type casting, strict keyword.									6
II	Control Statements — If, else, nested if, if-else ladders, Switch, while, do-while, for, for-each, break, continue. Command Line Argument, Classes and Objects, Encapsulation, Tightly Encapsulated classes, Nested class, Inner class, and Anonymous inner class. Inbuilt classes: Object, String, String Buffer, Array, Vector. Wrapper classes. Data members, member Function, Data Hiding: Visibility modifiers in java.									8
III	Is-A relationship, Has-A relationship, Inheritance in Java, types of inheritance, Super and sub class, Method Signature. Overloading, Constructor Overloading, Method Overloading, this and static keyword, finalize () method, Casting objects, Instance of operator, Overriding, covariant return type. Super, final keyword, overloading vs. overriding. Static control flow, instance control flow.									8
IV	Abstraction: Abstract class, Interface in Java, differences between classes and interfaces. Defining an interface, implementing interface, applying interfaces, variables in interface, extending interfaces. Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages. Coupling, Cohesion.									9
V	Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally									9

	keywords, Built-in exceptions, creating own exception sub classes. Multithreading: Concepts of Multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface. Synchronization, threads priorities, inter thread communication, daemon threads, deadlocks, thread groups. Introduction of Java Micro services.													
Total Hours														40
Course Outcomes:														
CO-1 Define classes, objects, members of a class and relationships among them needed for a specific program.														
CO-2 Write the java application programs using OOPs principles.														
CO-3 Write java application on constructors, overloading.														
CO-4 Demonstrate package creating and accessing members of a packages.														
CO-5 Understand and develop collection frame work and its application programs.														
Text Book														
1. Naughton & Schildt, "The Complete Reference Java 2", TataMcGraw Hill														
2. E Balaguruswamy, "Programming in Java", TMH Publications														
Reference Books														
1. Deitel "Java-How to Program:" Pearson Education, Asia														
2. Horstmann & Cornell, "Core Java 2" (Vol I & II), Sun Microsystems														
3. Ivan Bayross, "java 2.0", BPB publications														
4. Java Programming for the absolute beginners By Russell, PHI Learning														
5. Java Programming by Hari Mohan Pandey, Pearson.														
List/Links of e-learning resource														
<ul style="list-style-type: none"> https://onlinecourses.nptel.ac.in/noc22_cs47/preview 														
Modes of Evaluation and Rubric														
The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.														
CO-PO Mapping:														
COs	PO₁	PO₂	PO₃	PO₄	PO₅	PO₆	PO₇	PO₈	PO₉	PO₁₀	PO₁₁	PO₁₂	PSO1	PSO2
CO-1	1	1									3	3	3	2
CO-2	1		1	2							2	1	3	2
CO-3	2	1									2	2	1	2
CO-4	3	2	3	2	1			1	2		3		3	1
CO-5	3	3	2	1				2		2	2	3	1	1
Suggestive list of experiments:														
1. Write a java program to find the Fibonacci series using recursive and non-recursive functions.														
2. Write a java program to multiply two given matrices.														
3. Write a java program for Method overloading and Constructor overloading.														
4. Write a java program to display the employee details using Scanner class.														
5. Write a java program that checks whether a given string is palindrome or not.														
6. A. Write a java program to represent Abstract class with example.														
B. Write a java program to implement Interface using extends keyword.														
7. A. Write a java program to create inner classes.														
B. Write a java program to create user defined package.														
8. A. Write a java program for creating multiple catch blocks.														
B. Write a java program for producer and consumer problem using Threads.														
9. Write a Java program that implements a multi-thread application that has three threads.														
10. A. Write a java program to display File class properties.														
B. Write a java program to represent ArrayList class.														
C. Write a Java program loads phone no, name from a text file using hashtable.														
11. Write an applet program that displays a simple message.														
12. A. Write a Java program computes factorial value using Applet.														

- B. Write a program for passing parameters using Applet.
13. A. Write a java program for handling Mouse events and Key events.
 B. Write a java program for handling Key events.
14. Write a java program that connects to a database using JDBC.
15. A. Write a java program to connect to a database using JDBC and insert values into it.
 B. Write a java program to connect to a database using JDBC and delete values from it.
- 16.** Write a java program that works as a simple calculator. Use a Grid Layout to arrange Buttons for digits and for the + - * % operations. Add a text field to display the result

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Subject handled by department	Department of CS & IT



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DEPARTMENT OF CS & IT

Semester/Year		V/III		Program		B.Tech – Internet of Things				
Subject Category	OC	Subject Code:	IoT 2055 (OC -1A)	Subject Name		Computer Networks				
Maximum Marks Allotted						Contact Hours			Total Credits	
Theory			Practical		Total Marks	L	T	P		
ES	MS	Assignment/Quiz	ES	LW						
70	20	10	-	-	100	3	0	0	3	
Prerequisites:										
Fundamental Knowledge of Analog and Digital Communication										
Course Objective:										
<ul style="list-style-type: none"> ● Have fundamental knowledge of the various aspects of computer networking and enables students to appreciate recent developments in the area. ● Be familiar with various types of computer networks. ● Understand the concepts of Network Layer ,Transport Layer, Application Layer 										
UNITS	Descriptions								Hrs.	
I	Computer Network: Definitions, goals, components, structure, Architecture, Classifications & types, Growth, Complexity and applications etc. Layered Architecture: Protocol hierarchy, Connection Oriented & Connectionless Services, Service primitive Design issues & its functionality. ISO-OSI Reference Model: Principle, Model, Descriptions of various layers and its comparison with TCP/IP. Network standardization								6	
II	Transmission Media, Sources of transmission impairment. Network Topology: Mesh, Bus, Star, Ring, Tree, etc. Standards Connecting Devices: Active and Passive Hubs, Repeaters, Bridges, Two- & Three-layer switches & Gateway.								10	
III	Data Link Layer: Need, Services Provided, Framing & its methods, Flow Control, Error control. DLL Protocol: Elementary & Sliding Window. Piggybacking & Pipelining. MAC Sub layer: Static & Dynamic channel allocation, Media access control for LAN & WAN. Collision free & limited contention protocol ALOHA : pure, slotted CSMA, CSMA/CD,CSMA/CA, IEEE 802 standards for LAN & MAN & their comparison.								12	
IV	Network Layer: Need, Services Provided, Design issues, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multicast Routing, Routing Strategies, Congestion Control Algorithms: General Principles of Congestion control, Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram subnets. Comparison of IPv4 & IPv6, Mobile IP.								8	
V	Processes to Processes Delivery: Transmission Control Protocol (TCP) – User Datagram Protocol, Data Traffic, Congestion Control and Quality of Service, Techniques to improve QOS, Integrated Services, and Differentiated Services, DNS,SMTP, FTP, HTTP, WWW, Virtual Terminal Protocol, VoIP: Basic IP Telephone System.								7	
Total Hours									40	
Course Outcomes:										
<p>CO1: Develop a fundamental understanding of network design principles and structure of computer network.</p> <p>CO2: Explain the importance of data communications, how communication works in data networks and the internet, recognize the different internetworking devices and their functions.</p> <p>CO3: Explain the role of protocols in networking, Analyze the role and services and features of the various layers of data networks.</p> <p>CO4: Analyze the features and operations of various routing protocols such as Bellman-ford</p>										

algorithm, Hierarchical Routing, Broadcast Routing, Multicast Routing.

CO5: Describe and examine working of Transport Layer and Application Layer protocol.

Text Book

1. Tanenbaum A. S, “Computer Networks”, Pearson Education , 4th Edition
2. William Stallings, “Data and Computer Communications”, PHI 6th Edition .

Reference Books

1. Douglas E. Comer ,”Computer Network & Internet”, Pearson Education, 6th Edition.
2. Behraj A Forouzan,”Data Communication & Networking”, McGraw-Hill, 4th edition.
3. Natalia Olifar & Victor Olifer,”Computer Networks”, Willey Pub.
4. Prakash C. Gupta, “Data Communications and Computer Networks”, PHI,2end edition.
5. Gallo,”Computer Communication & Networking Technologies”,Cengage Learning.1st edition.

List/Links of e-learning resource

- <https://nptel.ac.in/courses/106105183>

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂	PSO1	PSO2
CO-1	3	2											3	
CO-2	3	3			1								2	
CO-3	3	3	1		1							3		3
CO-4	3	3	2	1								1		3
CO-5	3	3										1	2	

Recommendation by Board of studies on

Approval by Academic council on

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Subject handled by department

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Semester/Year		V/III		Program		B.Tech – Internet of Things			
Subject Category	OC	Subject Code:	IoT 2055 (OC – 1B)	Subject Name	Communication System				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks	L	T	P	
ES	MS	Assignment/Quiz	ES	LW					
70	20	10	-	-	100	3	0	0	3
Prerequisites:									
Signals and Systems									
Course Objective:									
<ul style="list-style-type: none"> • To introduce Analog Modulation Schemes • To impart knowledge in random process • To study various Digital techniques • To introduce the importance of sampling & quantization • To impart knowledge in demodulation techniques • To enhance the class room teaching using smart connectivity instruments 									
UNITs	Descriptions								Hrs.
I	AMPLITUDE MODULATION: Review of signals and systems, Time and Frequency domain representation of signals, Principles of Amplitude Modulation Systems- DSB, SSB and VSB modulations. Angle Modulation, Representation of FM and PM signals, Spectral characteristics of angle modulated signals. SSB Generation – Filter and Phase Shift Methods, VSB Generation – Filter Method, Hilbert Transform, Pre-envelope & complex envelope AM techniques, Superheterodyne Receiver.								8
II	RANDOM PROCESS & SAMPLING: Review of probability and random process. Gaussian and white noise characteristics, Noise in amplitude modulation systems, Noise in Frequency modulation systems. Pre-emphasis and Deemphasis, Threshold effect in angle modulation. 83 Low pass sampling – Aliasing- Signal Reconstruction-Quantization - Uniform & non-uniform quantization - quantization noise - Nyquist criterion- Logarithmic Companding –PAM, PPM, PWM, PCM – TDM, FDM								8
III	DIGITAL TECHNIQUES: Pulse modulation Differential pulse code modulation. Delta modulation, Noise considerations in PCM, Digital Multiplexers, Channel coding theorem - Linear Block codes - Hamming codes - Cyclic codes - Convolutional codes - Viterbi Decoder								8
IV	DIGITAL MODULATION SCHEME: Geometric Representation of signals - Generation, detection, IQ representation, PSD & BER of Coherent BPSK, BFSK, & QPSK - QAM - Carrier Synchronization - Structure of Non-coherent Receivers Synchronization and Carrier Recovery for Digital modulation, Spectrum Analysis – Occupied bandwidth – Adjacent channel power, EVM, Principle of DPSK.								8
V	DEMODULATION TECHNIQUES: Elements of Detection Theory, Optimum detection of signals in noise, Coherent communication with waveforms- Probability of Error evaluations. Baseband Pulse Transmission- Inter symbol Interference, Optimum demodulation of digital signals over band-limited channels.								8

Total Hours	40													
Course Outcomes:														
On successful completion of this course student should be able to:														
CO1: Gain knowledge in amplitude modulation techniques.														
CO2: Understand the concepts of Random Process to the design of communication systems.														
CO3: Gain knowledge in digital techniques.														
CO4: Gain knowledge in sampling and quantization.														
CO5: Understand the importance of demodulation techniques.														
Text Book														
1. Simon Haykins, "Communication Systems", Wiley, 5th Edition, 2009.(Unit I - V) 2. B.P.Lathi, "Modern Digital and Analog Communication Systems", 4th Edition, Oxford University Press, 2011.														
2. Wayner Tomasi, Electronic Communication System, 5th Edition, Pearson Education,2008.														
Reference Books														
1. D.Roody, J.Coolen, Electronic Communications, 4th edition PHI 2006.														
2. A.Papoulis, "Probability, Random variables and Stochastic Processes", McGraw Hill, 3rd edition, 1991.														
3. B.Sklar, "Digital Communications Fundamentals and Applications", 2nd Edition Pearson Education 2007														
List/Links of e-learning resource														
• https://nptel.ac.in/courses/117102059														
Modes of Evaluation and Rubric														
The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.														
CO-PO Mapping:														
COs	PO₁	PO₂	PO₃	PO₄	PO₅	PO₆	PO₇	PO₈	PO₉	PO₁₀	PO₁₁	PO₁₂	PSO1	PSO2
CO-1	1	1	2										1	2
CO-2	1	1	1										1	2
CO-3	1	1	2		1								1	2
CO-4	2	1	1				1							2
CO-5	2	1											1	
Recommendation by Board of studies on														
Approval by Academic council on														
Compiled and designed by														
Subject handled by department										Department of CS & IT				



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

DEPARTMENT OF CS & IT

Semester/Year		V/III		Program		B.Tech – Internet of Things							
Subject Category	DLC	Subject Code:		IoT 2056	Subject Name	Android Programming							
Maximum Marks Allotted										Contact Hours			Total Credits
Theory				Practical		Total Marks	L	T	P				
ES	MS	Assignment/Quiz		ES	LW								
-	-	-		50	-	50	0	0	2	1			
Prerequisites:													
Building an Android app comes down to two major skills/languages: Java and Android.													
Course Objective:													
<ul style="list-style-type: none"> • Explain different techniques for developing applications for mobile devices. • Understand the Android OS architecture. • Understand the operation of the application, application lifecycle, configuration files, intents, and activities, services & Receivers. • Install and use appropriate tools for Android development, including IDE, device emulator, and profiling tools. 													
UNITs	Descriptions									Hrs.			
I	Introduction to Android, A little Background about mobile technologies , Overview of Android - An Open Platform for Mobile development, Open Handset Alliance Developing for Android: First Android Application, setup Android Development Environment. Android development Framework - Android-SDK, Eclipse Emulators, Creating & setting up custom Android emulator Android Project Framework.									6			
II	Android Activities and UI Design, Understanding Intent, Activity, Activity Lifecycle and Manifest, Creating Application and new Activities, Expressions and Flow control, Android Manifest Simple UI - Layouts and Layout properties, Fundamental Android UI Design, introducing Layouts, Creating new Layouts, Drawable Resources, Resolution and density independence (px ,dip, dp, sip, sp) XML Introduction to GUI objects viz. Push Button, Text / Labels, Edit Text, Toggle Button, Weight Sum Padding, Layout Weight.									10			
III	Advanced UI Programming , Event driven Programming in Android(Text Edit, Button clicked etc.),Creating splash screen, Event driven Programming in Android, Android Activity Lifecycle, Creating threads for gaming requirement, Understanding the Exception handler, Toast, Menu, Dialog, List and Adapters, Custom Vs. System Menus Creating and Using Handset menu Button (Hardware), Android Themes, Dialog, create an Alter Dialog, Toast in Android, List & Adapters, Manifest.xml File Update.									12			
IV	Multimedia Programming using Android, Multimedia audio formats - Creating and Playing, Multimedia audio formats - Kill / Releasing (Memory Management),e audio in any application video playback with an event, Database - SQLite, SQLite Open Helper and creating a database, Opening and closing a database, Working with cursors Inserts, updates, and deletes, Location Based Services and Google Maps, Using Location Based Services, Working with Google Maps									8			

V	Notifications Notification Manager, Pending Intent Notifications (Show and Cancel), custom made Web browser, Web View object in XML, Methods for associated with 'Go', 'Back', 'Forward' etc. Android Development using other Tools, Other ways to Develop Android Applications, Graphics / Game development using, Installation of .apk, install .apk into your Android Mobile.	7												
Total Hours		40												
Course Outcomes:														
CO-1: Explain the purpose of different development tools for Android CO-2: Utilize Android Studio to Design simple and complex graphical user interface CO-3: Develop the algorithm to manage simple and complex Event handle CO-4: Develop and design the database design for storage based application CO-5: Plan, prepare, build and Publish an application to the Android Market														
Text Book														
1. Android Developer Tools Essentials by Mike Wolfson - O'Reilly Media Publication														
Reference Books														
1. Learn Java for Android Development, 2 nd Edition- Jeff Friesen- Apress Publications 2. OpenGL ES 2 for Android - Kevin Brothaler - The Pragmatic Programmers.														
List/Links of e-learning resource														
<ul style="list-style-type: none"> https://nptel.ac.in/courses/106106147 														
Modes of Evaluation and Rubric														
The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.														
CO-PO Mapping:														
COs	PO₁	PO₂	PO₃	PO₄	PO₅	PO₆	PO₇	PO₈	PO₉	PO₁₀	PO₁₁	PO₁₂	PSO1	PSO2
CO-1	1	1	2										1	2
CO-2	1	1	1										1	2
CO-3	1	1	1		1								1	2
CO-4	2	1	1				1							2
CO-5	2	1											1	
Suggestive list of experiments:														
1. Introduction to Android Operating System 2. Program for First Android Application. 3. Program for building a simple user interface using a XML for UI layout. 4. Program for developing an Android Application using a linear layout. 5. Program for developing an Android Application using a Relative layout. 6. Program for developing an Android Application using a Table layout. 7. Program for developing an Android Application using a Absolute layout. 8. Program for developing an Android Application using a Frame layout. 9. Developing an android application using Relative layout to display Date and time. 10. Study of android lifecycle and demonstration of it. 11. Study of intents and types of intents 12. Study of list views and adapters 13. Study of dialog interfaces in android 14. Study of Sensors in android 15. Study of Services in android 16. Study of touch in android														
Recommendation by Board of studies on														
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