Detailed Syllabus

Lecture-wise Breakup

Course Code	18M11GE111	**Semester**	**Semester Summer** June –July 2018		
Course Name	Research Methodology & Intellectual Property Rights				
Credits	2		**Contact Hours**	2-0-0	
Faculty (Names)	**Coordinator(s)**	Prof. B.P. Chamola			
	Teacher(s) (Alphabetically)	Prof. B.P. Chamola			

COURSE OUTCOMES		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
CO1	Understand the basic concepts and types of research	Understanding Level (C2)
CO2	Define a research problem, its formulation, methodologies and analyze research related information	Analyzing Level (C4)
CO3	Follow research ethics, understand IPR, patents and their filing related to their innovative works.	Understanding Level (C2)
CO4	Understand and analyze the statistical data and apply the relevant test of hypothesis in their research problems	Analyzing Level (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Research	What is research? Types of research. What is not research? How to read a Journal paper?	3
2.	Report writing	How to write report? Use of Mendeley in report writing. How to write a research paper? Problem identification and solving.	4
3.	Ethics, IPR and Research methodologies	Research ethics, patents, intellectual property rights, plagiarism regulation 2018. Steps in research process and common methodologies to attempt solution to research paper.	8

4.	Basics of statistics and probability distributions	Basic statistical concepts. Handling of raw data, Some common probability distributions.	7
5.	Test of hypothesis and regression analysis	Hypothesis testing. Parametric and non-parametric data, Introduction to regression analysis.	8
		Total number of Lectures (Course delivery method: open ended discussion, guided self-study, lectures)	**30**

Evaluation Criteria

Components	**Maximum Marks**
Viva –1 before T2 1 Exam	15
Viva –2 after End Sem.	20
End Semester Examination	35
Assignments	30 (Quiz, Assignments)
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	**Stuart Melville and Wayne Goddard**, Research methodology: An Introduction for Science & Engineering Students, Kenwyn, South Africa : Juta& Co. Ltd., 1996.
2.	**Kothari, C.R.,** Research Methodology: Methods and Techniques, New Age International, New Delhi, 2009.
3.	**Kumar, Ranjit,** Research Methodology: A Step by Step Guide for Beginners, 2nd Edition, Sage Publications Ltd., 2005.
4.	**Ramappa, T.,** Intellectual Property Rights Under WTO, S. Chand, New Delhi, 2008.
5.	**Wayne Goddard and Stuart Melville,** Research Methodology: An Introduction, Kenwyn, South Africa : Juta& Co, 2001.

Detailed Syllabus

Lab-wise Breakup

Course Code	17M15CS121	**Semester (specify Odd/Even)**	**Semester** Summer
Course Name	Cloud and Web Services Lab		
Credits	0-0-2	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Dr. Sandeep Kumar Singh
	Teacher(s) (Alphabetically)	…

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Recall and show use of core JAVA concepts like classes, files, packages, modules, inheritance, exception handling and data structures.	Remembering Level (Level 1)
CO2	Demonstrate creation, validation and parsing of well-formed XML documents using DTD and XML Schema	Understanding Level (Level 2)
CO3	Experiment with Restful and Soap based web services.	Apply Level (Level 3)
CO4	Make use of Amazon Web Services (AWS) from free tier.	Apply Level (Level 3)
CO5	Utilize some of the real world web services GOOGLE,AMAZON,EBAY,PAYPAL,FEDEX ETC	Apply Level (Level 3)
CO6	Construct simple application using both cloud and web services.	Create Level (Level 6)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Java Programming	Write programs in JAVA based on the concepts of classes, files, packages, modules, inheritance, exception handling and data structures.	CO1
2.	XML, DTD and XML Schema	Given a problem description of the scenario- design and validate DTD and XML Schema as well as XML documents	CO2
3.	XML, DTD and XML Schema	Given a problem description of the scenario- design XML Schema as well as XML documents	CO2

4.	XML DOM and SAX Parsers	Parse and check the validity of XML documents based on XML DTD as well as XML Schema	CO2
5.	SOAP and Restful Web Services	Design and Create Web Services using SOAP and REST API	CO3
6.	Amazon Web Services-IAM	Create Amazon Account and Work with IAM services through Console Interface	CO4,CO5
7.	Amazon Web Services- IAM	Using Command Line SDK Interface work with IAM services through Console Interface	CO4,CO5
8.	Amazon Web Services- EC2	Using AWS Console and Command Line Interface work with EC2 service of Amazon	CO4,CO5
9.	Amazon Web Services- VPC	Create and Configure VPC to manage high availability of resources.	CO4,CO5
10.	Amazon Web Services- Load Balancing	Create and Configure Load balancers to manage high availability of resources.	CO4,CO5
11.	Amazon Web Services- Autoscaling	Create and Configure Auto Scaling groups to manage high availability of resources.	CO4,CO5
12.	Amazon Web Services- CDN Services	Create and Configure Cloud Front groups to manage high availability of resources.	CO4,CO5
13.	Amazon Web Services- Monitoring	Create and Configure Resource Groups, Cloud Watch and TCO to monitor and measure the resource usage.	CO4,CO5
14.	Application Design	Create and Implement Application based on Cloud and Web Services	CO6

Evaluation Criteria

Components	**Maximum Marks**
LT1	20
LT2	20
ASSIGNMENTS &ATTENDANCE	60
Total	**100**

…

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Software Engineering Frameworks for the Cloud Computing Paradigm Zaigham Mahmood and Saqib Saeed
2.	Cloud Computing and Software Services Theory and Techniques Syed A hson and Dr. Mohammad Ilyas
3.	Engineering Long-Lasting Software: An Agile Approach Using SaaS and Cloud Computing Beta Edition 0.9.0 Armando Fox and David Patterson
4.	Cloud Computing: A Hands-On Approach Book by Arshdeep Bahga and Vijay K. Madisetti
5.	Cloud Computing Design Patterns Book by Amin Naserpour, Robert Cope, and Thomas Erl
6.	XML, Web Services, and the Data Revolution Book by Frank P. Coyle
7.	Software Engineering Book by Ian Sommerville
8.	Engineering Software As a Service: An Agile Approach Using Cloud Computing Textbook by Armando Fox and David Patterson
9.	Design Patterns: Elements of Reusable Object-Oriented Software with Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and the Unified Process by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides, 2003
10.	Cloud-Based Software Engineering PROCEEDINGS OF THE SEMINAR NO. 58312107

Detailed Syllabus

Lab-wise Breakup

Course Code	**17M15CS122**	**Semester (specify Odd/Even)**	**Semester** Summer **Session** 2018 - 2019
Course Name	Performance Engineering Lab		
Credits	0-0-2	**Contact Hours**	2 hrs

Faculty (Names)	**Coordinator(s)**	Dr. Kavita Pandey
	Teacher(s) (Alphabetically)	Dr. Kavita Pandey

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Experiment with GProf to calculate the performance and statistics of a program in terms of call counts and timing information of functions.	Apply (level 3)
CO2	Compare the performance of different protocols by simulating various network scenarios in NS2 Simulator.	Analyze (level 4)
CO3	Design wired and wireless networks in NS2 and analyze the simulation results using AWK and Python programming.	Apply (level 3)
CO4	Examine the performance of M/M/1, M/D/1 and D/M/1 Queuing models in NS2.	Analyze (level 4)
CO5	Utilize the Weka Tool for analyzing data file.	Apply (level 3)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	GNU Profiler	Use the Gprof (GNU Profiler) to analyze the performance and statistics of a program	1
2.	Network Simulator	Introduction to Network simulator (NS2) and exploring it's utilities NAM, XGraph etc.	2
3.	Wired Network Simulation	1. Creation of Wired Network Scenarios 2. Exploring the various Traffic Applications with the nodes and introduction of wired Trace file	3

		3. Wired Network Performance Analysis using AWK and Python	
4.	Queuing Analysis	1. Simulation of various queues in NS2 and analyzing their performances on various performance metrics such as throughput, average delay and packet loss 2. Simulation of various queue Scheduling Algorithms	4
5.	Analysis of Wireless Routing Protocols	1. Creation of wireless network scenarios and simulation of various wireless routing protocols 2. Analysis of wireless trace file using AWK and Python	3
6.	Weka Tool	Performance analysis of data file using WEKA tool	5

Evaluation Criteria

Components	**Maximum Marks**
Evaluation-1:	10
Lab test-1 :	20
Lab test-2 :	20
Evaluation-2 :	15
Project:	20
Attendance:	15
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	GPROF Tutorial – How to use Linux GNU GCC Profiling Tool
2.	Marc Greis' Tutorial for the UCB/LBNL/VINT Network Simulator "ns"
3.	Introduction to Network Simulator NS2 by Teerawat Issariyakul, Ekram Hossain
4.	An Introduction to the WEKA Data Mining System by Zdravko Markov
5.	https://www.cs.waikato.ac.nz/~ml/weka/
6.	nile.wpi.edu/NS/
7.	The ns Manual, https://www.isi.edu/nsnam/ns/doc/ns_doc.pdf

Detailed Syllabus

Lecture-wise Breakup

Subject Code	**18B12CS429**	**Semester (specify Odd/Even)**	**Semester – Summer**
Subject Name	Advanced Computer Networks		
Credits	**4 (3-1-0)**	**Contact Hours**	**4**

Faculty (Names)	**Coordinator(s)**	Dr. Sangeeta Mittal
	Teacher(s)	Dr. Nisha Chaurasia, Dr. Sangeeta Mittal

COURSE OUTCOMES		**COGNITIVE LEVELS**
C434-6.1	Demonstrate the concepts of Circuit Switching, Packet switching , TCP/IP, IP addressing, Frame relay, ATM, ISDN, Traffic management in ATM.	Understanding Level (Level 2)
C434-6.2	Apply various concepts related to LAN Ethernet, fast Ethernet, gigabit Ethernet, FDDI, DSL, ADSL to develop a Network model for a given real time scenario.	Creation Level (Level 6)
C434-6.3	Examine various issues and challenges for Wireless Networks and categorize key protocols and standards according to quality requirements.	Analysis Level (Level 4)
C434-6.4	Analyze Wireless Networks, Wireless channels.	Analysis Level (Level 4)
C434-6.5	Evaluate network performance using queuing theory.	Evaluating Level (Level 5)

Module No.	**Subtitle of the Module**	**Topics in the module**	**No. of Lectures for the module**
1.	TCP/IP Protocol	Layered protocols, internet Addressing, mapping internet address to physical address, internet protocol, OSPF, RIP,RARP, BOOTP, DHCP, BGP, ARP, IP, Ipv6, ICMP Transport protocols:	8

		UDP, TCP and SNMP	
2.	Connection oriented networks	Frame relay, B-ISDN, ATM protocol stack, ATM switching, internetworking with ATM Networks, traffic management in ATM.	8
3.	High Speed LAN	LAN Ethernet, fast Ethernet, gigabit Ethernet, FDDI, DSL, ADSL and its working	9
4.	Wireless Communication	Wireless networks, wireless channels, channel access, network architecture, IEEE 802.11, Bluetooth	9
5.	Network Analysis and Modeling	Queuing theory, modeling network as a graph, network management system and standard	8
		Total number of Lectures	**42**

Evaluation Scheme	**A. THEORY Examination**	**Marks**
	I. Test1	30
	II. End Term	40
	B. Internal - including Assignments, Quizzes, attendance, etc	30
	Total	100

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc)	
1.	High performance communication networks by: J. Walrand & Pravin Varaiya , Morgan Kaufman, 1999.
2.	Internetworking with TCP/IP Vol.1: Principles, Protocols, and Architecture (4th Edition) by Douglas E. Comer
3.	ATM networks: Concepts, Protocols, Applications by: Handel, Addision Wesseley.
4.	Computer network protocol standard and interface Uyless, Black

Detailed Syllabus

Lab-wise Breakup

Course Code	17M15CS123	**Semester (Even)**	**Semester** Summer
Course Name	**IoT Systems Development Lab**		
Credits	1	**Contact Hours**	2 Hours

Faculty (Names)	**Coordinator(s)**	Dr Prakash Kumar
	Teacher(s) (Alphabetically)	Dr. Prakash Kumar

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Explain Node-RED IDE platform for IoT application development and demonstrate I/O nodes, flows, third party palettes, import/export of flows in Node-RED.	Understand (level 2)
CO2	Develop user defined functional nodes and deploy it in Node-Red.	Apply (level 3)
CO3	Analyze various IoT Communication protocols using APIs with Arduino and Raspberry Pi along with sensors and actuators.	Analyze (level 4)
CO4	Apply and evaluate the characteristics of different IoT devices.	Evaluate (level 5)
CO5	Design and develop IoT based applications for various challenges and problems related to Sustainable Development, e.g., energy and waste management, water conservation, clean energy, improving public health, sustainable urbanization, smart agriculture etc.	Create (level 6)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Node-Red Installation and Use	Setup and Install Node.js and Node-RED as IDE platform for IoT application development.	CO1
2.		Demonstrate I/O nodes, flows, third party palettes, import/export of flows in Node-RED	CO1
3.		Develop Java Script based IoT applications using functional nodes , flows and dashboard on Node-RED	CO2

		platform	
4.		Developing and implementation of user defined nodes for creating flows in Node-Red.	
5.	Study and use of Arduino and Raspberry Pi, sensors and actuators.	Study and interface of Arduino and Rasberry Pi with different types of sensors and actuators	CO2
6.		Creation of various IoT based applications using Arduino and Rasberry Pi	CO3, CO4
7.	Developing IoT based systems applications using Arduino and Raspberry Pi	Developing smart applications for various challenges and problems related to Sustainable Development, e.g., energy and waste management, water conservation, clean energy, improving public health, sustainable urbanization, smart agriculture etc.	CO5
***n*.**	…	…	…

Evaluation Criteria

Components	**Maximum Marks**
Lab Test# 1	20
Lab Test# 2	20
D2D work	60
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Internet of Things: Architecture and Design Principles, Raj Kamal, McGrawHill.
2	"Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti
3	https://nodered.org/docs/getting-started
4.	**https://www.arduino.cc/en/Tutorial/HomePage**
5.	https://www.raspberrypi.org/documentation/