JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
ACADEMIC CALENDAR (2017-18)
FOR NON-AUTONOMOUS CONSTITUENT & AFFILIATED COLLEGES
B. TECH. & B. PHARM. II, III & IV YEARS I & II SEMESTERS

I SEM

S. No	EVENT	DATE	Duration
1.	Commencement of Instruction	12th July 2017	--
2.	First Mid Term Examinations	6th to 8th Sept. 2017	--
3.	Submission of First Mid Term Exam Marks to University on or before	16th Sept. 2017	--
4.	Dussehra recess	25th to 30th Sept. 2017	1 week
5.	Parent-Teacher Meeting	14th Oct. 2017	--
6.	Second Mid Term Examinations	8th to 10th Nov. 2017	--
7.	Last date of Instruction	10th Nov. 2017	16 weeks
8.	Preparation Holidays and Practical Examinations	13th to 18th Nov. 2017	1 week
9.	Submission of Second Mid Term Exam Marks to University on or before	18th Nov. 2017	--
10.	End Semester & Supplementary Examinations (II Sem. of I, II & III years)	20th Nov. to 12th Dec. 2017	3 weeks

II SEM

S. No	EVENT	DATE	Duration
1.	Commencement of Instruction	14th Dec. 2017	--
2.	First Mid Term Examinations	7th to 9th Feb. 2018	--
3.	Submission of First Mid Term Exam Marks to University on or before	17th Feb. 2018	--
4.	Parent-Teacher Meeting	10th March 2018	--
5.	Second Mid Term Examinations	4th to 7th April 2018	--
6.	Last date of Instruction	7th April 2018	16 weeks
7.	Submission of Second Mid Term Exam Marks to University on or before	13th April 2018	--
8.	Preparation Holidays and Practical Examinations	9th to 14th April 2018	1 week
9.	End Semester & Supplementary Examinations (I Sem. of II, III & IV years)	16th April to 7th May 2018	3 weeks
10.	Summer Vacation	8th May to 7th July 2018	9 weeks

Parbhakar

DIRECTOR
ACADEMIC & PLANNING, JNTUH

TEEGALA KRISHNA REDDY ENGINEERING COLLEGE

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated by JNTUH)

Medbowli, Meerpet, Saroornagar, Hyderabad – 500 097.

Phone: 040-24092838 Fax: +91-040-24092555

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Academic Calendar for II, III, IV B. Tech. I Sem. 2017-18

Description	Date		No. of Weeks
	From	To	
First Spell of Instructions	**12-07-2017**	**05-09-2017**	**08**
First Mid Examinations	**06-09-2017**	**08-09-2017**	**3 DAYS**
Submission of First mid examination marks	**On or before 16-09-2017**		
Second Spell of Instructions	**09-09-2017**	**24-10-2017**	**07**
Second Mid Examinations	**08-11-2017**	**10-11-2017**	**3 DAYS**
Last date of instruction	**On or before 10-11-2017**		**16**
Preparation & Practical Examinations	**13-11-2017**	**18-11-2017**	**01**
Submission of second mid examination marks	**On or before 18-11-2017**		**01**
End Semester Examinations	**20-11-2017**	**12-12-2017**	**03**
Commencement of Class work for the next AY 2017-18			**14-12-2017**

Month	Holidays		
JUL	16,23,30	Sundays	**Holidays are subjected to clearance from Telangana Government**
	17	Bonalu	
AUG	6,13,20,27	Sundays	
	7	Raksha bandan	
	14	janmashtami	
	15	Independence day	
	25	Ganesh chaturthi	
SEP	3,10,17,24	Sundays	
	2	Bakr id	
	5	Ganesh nimajjanam	
	25-30	Dassehra	
OCT	1,8,15,22,29	Sundays	
	02	Mahathma Gandhi jayanthi	
	18	Naraka chaturdasi	
	19	Diwali	
NOV	5,12,19,26	Sundays	
	4	Gurunanak jayanthi	

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Academic Calendar for II, III, IV B. Tech. II Sem. 2017-18

Description	Date		No. of Weeks
	From	To	
First Spell of Instructions	**14-12-2017**	**06-02-2018**	**08**
First Mid Examinations	**07-02-2018**	**09-02-2018**	**3 DAYS**
Submission of First mid examination marks	**17-02-2018**		
Second Spell of Instructions	**10-02-2018**	**03-04-2016**	**08**
Second Mid Examinations	**04-04-2018**	**07-04-2018**	**3 DAYS**
Submission of second mid examination marks	**13-04-2018**		
Preparation & Practical Examinations	**09-04-2018**	**14-04-2018**	**01**
End Semester Examinations	**16-04-2018**	**07-05-2018**	**02**
Summer Vacation	**08-05-2018**	**07-07-2018**	**09**

Month	Holidays		
DEC	06,13,20,27	Sundays	**Holidays are subjected to clearance from Telangana Government**
	2	Eid-Miladun-Nabi	
	25	Christmas	
JAN	7,14,21,28	Sundays	
	14 – 16	Sankranthi	
	26	Republic Day	
FEB	4,11,18,25	Sundays	
	13	Maha Siva Ratri	
MAR	4,11,18,25	Sundays	
	2	Holi	
	30	Good Friday	
	25	SRI RAMA NAVAMI	
	10	Parent teacher meeting	
APR	1,8,15,22,29	Sundays	
	18	UGADI	

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Department of Computer science &Engineering

1. Vision and Mission of the Institute

Vision of the Institute:

Imparting knowledge and instilling skills to the aspiring students in the fields of Engineering, Technology, Science and Management to face the emerging challenges of the society.

Mission of the Institute:

Mission 1: Encouraging scholarly activities that transfer knowledge in the areas of Engineering, Technology, Science and Management.

Mission 2: Ensuring the students of all ability levels are well trained to meet the needs of education and their future endeavors.

Mission 3: Inculcating human values and ethos into the education system for the all-round development of the students

Vision and Mission of the Department / Program

Vision of the Department:

Enhance learning that promotes techno graduates aiming **employability and** entrepreneurship with **human values** to face the challenges in the global technological society.

Mission of the Department:

Mission 1: Empowering students for **professional career** and **higher studies** by providing hands on experience and value education to become successful technocrats in the society.

Mission 2: Nurturing students with interpersonal and **entrepreneurial skills**, so that they gain ability to work as a team.

Mission 3: Imparting quality education, employability skills and techno ethical values among the students for the benefit of the society.

LIST OF COURSES:

I B.Tech I SEM		
Course	**Course code**	**Course Title**
C111	MA101BS	Mathematics-I
C112	CH102BS	Engineering Chemistry
C113	PH103BS	Engineering Physics-I
C114	EN104HS	Professional Communication in English
C115	ME105ES	Engineering Mechanics
C116	EE106ES	Basic Electrical Engineering
C117	EN107HS	English Language Communication Skills Lab
C118	ME108ES	Engineering Workshop
I B.Tech II SEM		
C121	PH201BS	Engineering Physics-II
C122	MA202BS	Mathematics-II
C123	MA203BS	Mathematics-III
C124	CS204ES	Computer Programming in C
C125	ME205ES	Engineering Graphics
C126	CH206BS	Engineering Chemistry Lab
C127	PH207BS	Engineering Physics Lab
C128	CS208ES	Computer Programming in C Lab
II B. Tech I Sem		
C211	MA301BS	Mathematics – IV
C212	CS302ES	Data Structures through C++
C213	CS303ES	Mathematical Foundations of Computer Science
C214	CS304ES	Digital Logic Design
C215	CS305ES	Object Oriented Programming through Java
C216	CS306ES	Data Structures through C++ lab
C217	CS307ES	IT Workshop Lab
C218	CS308ES	Object Oriented Programming through Java
C219	MC300ES	Environmental Science and Technology
II B. Tech II Sem		
C221	A40506	Computer organization
C222	A40507	Database management systems
C223	A40503	Java Programming

C224	A40009	Environmental studies
C225	A40509	Formal languages & Automata theory
C226	A40508	Design and analysis of algorithms
C227	A40585	Java programming lab
C228	A40584	Data base management systems lab
C229	A12434	Gender sensitization
III B.Tech I Sem		
C311	A50511	Principles of programming language
C312	A50117	Disaster Management
C313	A50518	Software engineering
C314	A50514	Compiler Design
C315	A50510	Operating systems
C316	A50515	Computer networks
C317	A50587	Compiler Design lab
C318	A50589	Operating systems lab
C319	A50018	Human Values and Professional Ethics
C31A	A50017	Intellectual Property Rights
III B.Tech II Sem		
C321	A60524	Object oriented analysis & Design
C322	A60525	Software Testing Methodologies
C323	A60522	Information Security
C324	A60521	Distributed Systems
C325	A60010	Managerial Economics & Financial Analysis
C326	A60512	Web Technologies
C327	A60086	Advanced English communication skills lab
C328	A60591	Case Tools & Web Technologies lab
IV B.Tech. I Sem		
C411	A70511	Linux Programming
C412	A70530	Design Patterns
C413	A70520	Data ware housing & Data mining
C414	A70519	Cloud Computing
C415	A70540	Software Project Management
C416	A70532	Image Processing and Pattern Recognition
C417	A70536	Mobile Computing
C418	A70529	Computer Graphics
C419	A70352	Operations Research
C41A	57050	Advanced Computer Architecture
C41B	A70534	Machine Learning
C41C	A70539	Soft Computing
C41D	A70533	Information Retrieval System
C41E	A70526	Artificial Intelligence

C41F	A70628	Computer Forensics
C41G	A70596	Linux Programming Lab
C41H	A70595	Data Mining Lab
IV B.Tech. II Sem		
C421	A80014	Management Science
C422	A80551	Web Services
C423	A80538	Semantic Web and Social Networks
C424	A80537	Scripting Languages
C425	A80547	Multimedia & Rich internet applications
C426	A80542	Adhoc & Sensor networks
C427	A80550	Storage Area Networks
C428	A80543	Database Security
C429	A80439	Embedded Systems
C42A	A80087	Industry Oriented Mini Project
C42B	A80089	Seminar
C42C	A80088	Project Work
C42D	A80090	Comprehensive Viva-Voce

I B.tech I sem for Academic Year 2016-17 (R16 regulation)

Course Name: Mathematics-I (C111)

Items	Course Outcomes
C111.1	Identify whether the given first order differential equations are exact or Not.
C111.2	Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
C111.3	Find the Eigen values and Eigen vectors which come across under linear transformations.
C111.4	Find the extreme values of functions of two variables with/ without constraints.
C111.5	Solve higher order DE's and apply them for solving some real world problems.
C111.6	The student will be able to find a corresponding partial differential equation for an unknown function with many independent variables and find their solutions.

Course Name: Engineering Chemistry (C112)

Items	Course Outcomes
C112.1	Students will gain the basic knowledge of electrochemical procedures related to corrosion and its control.
C112.2	They can understand the basic properties of water and its usage in domestic and industrial purposes.
C112.3	They learn the use of fundamental principles to make predictions about the general properties of materials.
C112.4	They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs
C112.5	The student will be able to reinforce the connection between science and engineering
C112.6	The student will gain an in-depth understanding of chemistry to solve global problems and issues.

Course Name: Engineering Physics-I (C113)

Items	Course Outcomes
C113.1	After completion of this course student will be able to realize the importance of light phenomena in thin films and its applications

C113.2	Student will be able to learn principle, working of various Laser systems and understand its applications.
C113.3	Helps students understand working of Optical fibers & its applications in various fields
C113.4	Student will be able to distinguish various crystal systems & understand its Atomic packing factor.
C113.5	Will help student understand various crystal defects.
C113.6	Will help student to understand how to apply X-Ray diffraction in order to study crystallography.

Course Name: Professional Communication in English (C114)

Items	Course Outcomes
C114.1	Use English Language effectively in spoken and written forms.
C114.2	Comprehend the given texts and respond appropriately.
C114.3	Communicate confidently in formal and informal contexts.
C114.4	Train the students to acquire language skills like (Listening, Speaking, Reading and Writing).
C114.5	Focus to be on the skills development in the areas of vocabulary, grammar, reading and writing.
C114.6	Improve students' Reference and Study Skills in order to face interviews.

Course Name: Mathematics-II (C122)

Items	Course Outcomes
C122.1	Use Laplace transform techniques for solving Differential Equations
C122.2	Ability to apply the concepts of Laplace transforms for analog and digital communication.
C122.3	Evaluate integrals using beta and gamma functions
C122.4	Evaluate the multiple integrals and apply these concepts to find areas, volumes, moment of inertia etc of regions on a plane or in space
C122.5	Using Gradient, divergent, curl to find differential calculus.
C122.6	Evaluate the line, surface and volume integrals and converting them from one to another

Course Name: Mathematics-III (C123)

Items	Course Outcomes
C123.1	Differentiate Among Random Variables Involved In The Probability Models Which Are Useful For All Branches Of Engineering.
C123.2	Calculate Mean, Proportions And Variances Of Sampling Distributions And To Make Important Decisions S For Few Samples Which Are Taken From A Large Data.
C123.3	Solve The Tests Of ANOVA For Classified Data.
C123.4	Find The Root Of A Given Equation And Solution Of A System Of Equations.Fit A Curve For A Given Data.
C123.5	Find The Numerical Solutions For A Given First Order Initial Value Problem.
C123.6	Fitting of a Curve For A Given Data.

Course Name: Computer Programming in C (C124)

Items	Course Outcomes
C124.1	Students are able to analyze algorithms and determine their time complexity.
C124.2	Students are able to implement programming language to solve various problems
C124.3	Student are able to understand and apply various programming concepts such as operators, identifiers,arrays,pointers,sorting to solve various problems
C124.4	Able to implement and know when to apply standard algorithms for searching and sorting.
C124.5	Ability to solve problems independently and think critically
C124.6	Able to implement and know when to apply standard algorithms .

Course Name: Engineering Chemistry Lab (C126)

Items	Course Outcomes
C126.1	Students are able to estimate the impurities present in water.
C126.2	Ability to select lubricants for various purposes.
C126.3	Ability to prepare advanced polymer materials
C126.4	Ability to know the strength of an acid present in secondary batteries.

C126.5	Ability to find the Fe+2, Ca & Cl- present in unknown substances/ ores using titrimetric and instrumental methods.
C126.6	Ability to apply chemical principles in Science & Technology.

Course Name : Engineering Physics Lab (C127)

Items	Course Outcomes
C127.1	The student will be able to learn from this laboratory course the concept of error and it's analysis
C127.2	The student will be able to develop experimental skills to design new experiments in engineering
C127.3	The student can compare the theory and correlate with experiment
C127.4	The student will be able to understand various tools like screw gauge , vernier calipers , physical balance , spectrometer and microscope
C127.5	The student will gain practical knowledge
C127.6	By determining time constant the student would be able to design RC , RLC circuits

II B.tech I sem for Academic Year 2016-17 (R15 regulation)

Course Name: Mathematical Foundation Of Computer Science (C212)

Items	Course Outcomes
C212.1	Students are able to select and apply logic expressions for a variety of applications.
C212.2	Ability to visualize data numerically and/or graphically
C212.3	Students are able to evaluate mathematical principles and logic design.
C212.4	Students can learn and understand how to use the notions of propositions and predicate formulae, satisfiability, and formal proof.
C212.5	Able to apply logical reasoning to solve a variety of problems to build an Expert System.
C212.6	Students are able to solve problems independently and think critically.

Course Name: Digital logic design (C214)

Items	Course Outcomes

C214.1	Apply the principles of number system, binary codes and Boolean algebra to minimize logic expressions
C214.2	Develop K-maps to minimize and optimize logic functions up to 5 variables
C214.3	Acquire knowledge about various logic gates and logic families and analyze basic circuits of these families
C214.4	Design various combinational and sequential circuits such as encoders , decoders and counters using multiplexers, and flip – flops
C214.5	Describe and compare various memory systems, shift registers and analog to digital and digital to analog conversion circuits
C214.6	Design with Complex Programmable Logic, ROM, RAM, and Field-Programmable Gate Arrays.

II B.tech II sem for Academic Year 2016-17 (R15 regulation)

Course Name: Computer Organization(C221)

Items	Course Outcomes
C221.1	Students have sound knowledge in the architecture of modern computer.
C221.2	Understands Input Output organizations in depth.
C221.3	Learn about how cache mapping occurs in computer and can solve.
C221.4	Be familiar with the architecture of 8086 assembly language.
C221.5	Able to write assembly language programming.
C221.6	Gain knowledge on different instruction types.

Course Name: Data Base Management Systems (C222)

Items	Course Outcomes
C222.1	Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect
C222.2	Use an SQL interface of a multi-user relational DBMS package to create, secure, populate, maintain, and query a database
C222.3	Apply normalization for the development of application softwares.
C222.4	Ability to apply concurrency mechanism to real time Data..
C222.5	Ability to manage the data by using hashing techniques
C222.6	Formulate, using relational algebra, solutions to a broad range of query problems.

Course Name: Formal Languages and Automata Theory (C225)

1Items	Course Outcomes
C225.1	Acquire a fundamental understanding of the core concepts in automata theory and formal languages
C225.2	Ability to design grammars and automata (recognizers) for different language classes
C225.3	An ability to identify formal language classes and prove language membership properties
C225.4	An ability to prove and disprove theorems establishing key properties of formal languages and automata
C225.5	Acquire understanding of core concepts relating to the theory of computation.
C225.6	Be familiar with thinking analytically and intuitively for problem-solving situations in related areas of theory in computer science.

Course Name: Data Base Management Systems Lab (C228)

Items	Course Outcomes
C228.1	Ability to design and implement a database schema for given problem data.
C228.2	Be capable to Design and build a GUI application.
C228.3	Apply the normalization techniques for development of application software to realistic problems
C228.4	Ability to formulate queries using SQL DML/DDL/DCL commands
C228.5	Ability to raise triggers as per real time data
C228.6	Ability to implement concurrency control mechanisms.

Course Name: Gender Sensitization lab (C229)

Items	Course Outcomes
229.1	The gender today occupies some space both in national and international policy

	matters.
229.2	The introduction of course on gender indicates that the government recognizes the importance of women in society.
229.3	Many of us understand gender as issue concerning women and their rights .
229.4	An ability to safeguard women's rights to ensure gender justice.
229.5	The struggle of woman to reclaim their sense of being and dignity.
229.6	Sensitizing ourselves to these issues of gender will go a long way.

III B.tech I sem for Academic Year 2016-17 (R13 regulation)

Course Name: Principles of Programming languages (C311)

Items	Course Outcomes
C311.1	Assess programming languages critically and in a scientific manner.
C311.2	Analyze the principles of an imperative, functional, object oriented or logic orier programming language.
C311.3	Use a formalism to describe a programming language.
C311.4	Able to get the overview of programming languages.
C311.5	Ability to solve problems independently and think critically.
C311.6	Students can learn how to use programming concepts for realistic problems.

Course Name: Software Engineering (C313)

Items	Course Outcomes
C313.1	Plan and deliver an effective software engineering process, based on knowledge of widely used development lifecycle models
C313.2	Translate a requirements specification into an implementable design, following a structured and organized process.
C313.3	Make effective use of UML, along with design strategies such as defining software architecture, separation of concerns and design patterns.
C313.4	Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, health and safety and manufacturability.
C313.5	Formulate a testing strategy for a software system, employing techniques such as unit testing, test driven development and functional testing.
C313.6	Evaluate the risks and quality of the requirements, analysis and design work done during the module.

Course Name: Computer Networks (C316)

Items	Course Outcomes
C316.1	To master the terminology and concepts of the OSI reference model and the TCP-IP reference model.
C316.2	To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks
C316.3	To be familiar with wireless networking concepts
C316.4	To be familiar with contemporary issues in networking technologies
C316.5	To be familiar with network tools and network programming
C316.6	To understand the techniques used to share network bandwidth among the multiple users and provide the depth knowledge of DLL fundamentals.

III B.tech II sem for Academic Year 2016-17 (R13 regulation)

Course Name: Object Oriented Analysis and Design (C321)

Items	Course Outcomes
C321.1	Master the fundamental principles of Object Oriented programming.
C321.2	Master key principles in Object Oriented analysis, design, and development.
C321.3	Be familiar with the application of the Unified Modeling Language (UML) towards analysis and design.
C321.4	Master common patterns in Object Oriented design and implement them.
C321.5	Be familiar with alternative development processes, team projects and presentations.
C321.6	Be exposed to technical writing and oral presentations.

Course Name: Software Testing Methodologies (C322)

Items	Course Outcomes
C322.1	The students understands the process to be followed in the software development life cycle
C322.2	Find practical solutions to the problems
C322.3	Solve specific problems alone or in teams
C322.4	Manage a project from beginning to end
C322.5	Define, formulate and analyze a problem
C322.6	Work independently as well as in teams

Course Name: Compiler Design Lab (C317)

Items	Course Outcomes
C317.1	Understand the working of lex and yacc compiler for debugging of programs.
C317.2	Understand and define the role of lexical analyzer, use of regular expression and transition diagrams.
C317.3	Understand and use Context free grammar, and parse tree construction.
C317.4	Learn & use the new tools and technologies used for designing a compiler.
C317.5	Develop program for solving parser problems.
C317.6	Learn how to write programs that execute faster.

Course Name: Information Security (C323)

Items	Course Outcomes
C323.1	Should be able to identify network security threats and determine efforts to counter them.
C323.2	Should be able to Understand security concepts, Ethics in Network Security.
C323.3	Should be able to write code for relevant cryptographic algorithms.
C323.4	Should be able to write a secure access client for access to a server.
C323.5	Should be able to send and receive secure mails.
C323.6	Should be able to determine firewall requirements, and configure a firewall.

Course Name: Managerial Economics & Financial Analysis (C325)

Items	Course Outcomes
C325.1	The student understands and will appreciate practical insight, importance of certain basic issues governing the business operations, demand supply and production function.
C325.2	Student gets familiar with cost analysis, market form of business, organization capital budgeting and financial accounting and financial analysis
C325.3	The students understand the market dynamics, demand forecasting, elasticity of demand and supply, pricing methods and pricing indifferent
C325.4	The students gain knowledge on market structures, an sight into how production is carried out to achieve, least cost combination of inputs and cost analysis.

C325.5	The student will be able to develop an understand capital budgeting decision making.
C325.6	The student understands framework for both manual and computerized accounting process, interpretation of the financial statements through ratio analysis.

Course Name: Advanced English Communication Skills lab (C327)

Items	Course Outcomes
C327.1	Accomplishment of sound vocabulary and its proper use contextually.
C327.2	An ability in writing and felicity in written expression
C327.3	Enhanced job prospects
C327.4	Effective speaking abilities.
C327.5	To take part in social &professional communication
C327.6	To prepare all the students for their placements

IV B.tech I sem for Academic Year 2016-17 (R13 regulation)

Course Name: Linux Programming (C411)

Items	Course Outcomes
C411.1	Identify the basic commands as well as different utilities of the Linux & analyze why to use Linux.
C411.2	Outline about shell and how to write, debug & execute shell script along with different commands.
C411.3	Explain file handling and directory handling using different system calls.
C416.4	Discuss the fundamentals of the Process as well as Signal functions & controlling of process using signals.
C411.5	Demonstrate how two processes communicate with each other using different ways
C411.6	Explain for controlling the execution of two processes simultaneously.

Course Name: Design Patterns (C412)

Items	Course Outcomes
C412.1	Analyze a software development problem and express its essence succinctly and

	precisely.
C412.2	Design a module structure to solve a problem, and evaluate alternatives.
C412.3	Implement a module so that it executes efficiently and correctly.
C412.4	Understand how these patterns related to object-oriented design Dependability.
C412.5	Have a deeper knowledge of the principles of object-oriented design.
C412.6	Design a module structure to solve a problem, and evaluate alternatives

Course Name: Data warehousing and Data Mining (C413)

Items	Course Outcomes
C413.1	To demonstrate the knowledge gained through solving problems.
C413.2	To evaluate the different models used for OLAP and data preprocessing.
C413.3	To study the methodology of engineering legacy databases for data warehouse and data mining to derive business rules for decision support systems.
C413.4	To enlist various algorithms used for data mining techniques.
C413.5	To Overview the developing areas - security, web mining, text mining, and ethical aspects of data mining.
C413.6	To exercise the data mining tools during Projects to build reliable products, and to address the Current demand of the industry.

Course Name: Cloud Computing (C414)

Items	Course Outcomes
C414.1	Understanding the key dimensions of the challenge of Cloud Computing implications
C414.2	Assessment of the economics, financial, and technological own organization
C414.3	Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications.
C414.4	Assessment of own organizations' needs for capacity building and training in cloud

	computing-related IT areas.
C414.5	Be familiar with web architecture.
C414.6	Be familiar with Gps

Course Name: Software Project Management (C415)

Items	Course Outcomes
C415.1	Manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders.
C415.2	Identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders.
C415.3	Implement project management knowledge, processes, lifecycle and the embodied concepts, tools and techniques in order to achieve project success.
C415.4	Utilize technology tools for communication, collaboration, information management, and decision support.
C415.5	Apply project management practices to the launch of new programs, initiatives, products, services, and events relative to the needs of stakeholders.
C415.6	Apply appropriate legal and ethical standards.

Course Name: Image Processing and Pattern Recognition (C416)

Items	Course Outcomes
C416.1	Use image processing and pattern recognition techniques to detect objects and activities in images and video.
C416.2	Use foundational techniques of image processing and analysis such as filtering, segmentation and local features to solve image processing problems of real world application.
C416.3	Identify and describe operation of different smoothing and sharpening filters.
C416.4	Students are able to analyze the different segmentation techniques.
C416.5	Students are able to apply different de-noising models to recover original image.
C416.6	Identify different pattern recognition methods and apply them in problem areas.

Course Name: Mobile Computing (C417)

Items	Course Outcomes
C417.1	Introduction of an advanced element of learning in the field of wireless

	communication.
C417.2	The students to the concepts of wireless devices and mobile computing.
C417.3	To introduce wireless communication and networking principles, that support connectivity to cellular networks, wireless internet and sensor devices.
C417.4	To understand the use of transaction and e-commerce principles over such devices to support mobile business concepts.
C417.5	To appreciate the social and ethical issues of mobile computing, including privacy.
C417.6	Explain for controlling the execution of two processes simultaneously.

Course Name: Computer Graphics (C418)

Items	Course Outcomes
C418.1	Students have sound knowledge in computer graphics
C418.2	Students have knowledge in I/O devices.
C418.3	Students have knowledge in 2D,3D-Geometric Transformations
C418.4	Students can learn how to use latest programming tools for realistic problems Implementation of Algorithms
C418.5	Students are able to analyze algorithms and Design animation movies

Course Name: Operations Research (C419)

Items	Course Outcomes
C419.1	Able to define the phases of operations research, formulate linear programming problem and solve using graphical method. Able to apply knowledge of LPP on technical areas, simplex methodology (Big-M, Two - phase) for solving Linear programming problem.
C419.2	Able to apply the concepts of Operations Research in the solving Transportation problems to minimize cost or maximize profit and understand the principles of assignment of jobs and find optimal assignment. (Applications of Operations Research).
C419.3	Able to Solve problems of sequencing of production runs and replace the machines or equipments in appropriate time.
C419.4	Able to use Game theory to identify the optimal strategies for players and able to maintain the inventory according to discrete and continuous demand.
C419.5	Able to solve problems on queuing theory for finite and infinite models and construct a project network and apply program evaluation review technique and critical path method to find date of completion of project and other project related metrics.
C419.6	Understand the evolution and applications of operations in various fields,

	mathematically formulate linear programming problems and solve them using different techniques

Course Name: Advanced Computer Architecture (C41A)

Items	Course Outcomes
C41A.1	Students can Describe the principles of computer design and Classify instruction set architectures
C41A.2	Student can able to describe the operation of performance enhancements such as pipelines, dynamic scheduling, branch prediction, caches, and vector processors.
C41A.3	They can identify the operation of virtual memory and Compare the performance of different architectures.
C41A.4	Students can describe modern architectures such as RISC, Super Scalar, VLIW (very large instruction word), multi-core and multi-CPU systems
C41A.5	Able to develop applications for high performance computing systems.

Course Name: Machine Learning (C41B)

Items	Course Outcomes
C41B.1	Students can understand a wide variety of learning algorithms.
C41B.2	Able to understand how to apply a variety of learning algorithms to data.
C41B.3	To demonstrate in-depth knowledge of methods and theories in the field of machine learning, understand the principles, techniques, and applications.
C41B.4	Understand and use Bayesian perspective on machine learning, Artificial neural networks, back propagation algorithm
C41B.5	They can assess learning algorithms modeled after biological evolution, including genetic algorithms and genetic programming.
C41B.6	Students able to demonstrate the ability to critically evaluate and compare different learning models and learning algorithms and be able to adapt.

Course Name: Soft Computing (C41C)

Items	Course Outcomes
C41C.1	Students are able to Understand the basics of soft computing techniques and also their

	use in some real life situations.
C41C.2	Learn about soft computing techniques and their applications and Analyze various neural network architectures
C41C.3	Understand perceptions and counter propagation networks.
C41C.4	Able to describe the concept of Genetic Algorithm and its various applications.
C41C.5	To elaborate the basics of Simulated Annealing, Tabu search, Ant colony optimization (ACO), Particle Swarm Optimization (PSO).
C41C.6	Students able to integrate the various soft computing techniques

Course Name: Information Retrieval System (C41D)

Items	Course Outcomes
C41D.1	Understanding the basics of Information retrieval like what is a corpus, what is precision and recall of an IR system.
C41D.2	Understanding the data structures like Inverted Indices used in Information retrieval systems.
C41D.3	Students able to understanding the different components of an Information retrieval system
C41D.4	Understanding the different techniques for compression of an index including the dictionary and its posting list
C41D.5	Developing the ability of develop a complete IR system from scratch

Course Name: Artificial Intelligence (C41E)

Items	Course Outcomes
C41E.1	Understand different types of AI agents.
C41E.2	Know various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, genetic algorithms).
C41E.3	Understand the fundamentals of knowledge representation (logic-based, frame-based, semantic nets), inference and theorem proving.
C41E.4	Know how to build simple knowledge-based systems.
C41E.5	Ability to apply knowledge representation, reasoning, and machine learning techniques to real-world problems.
C41E.6	Given a real world supervised learning problem, choose and implement appropriate

	learning algorithms such as decision trees, support vector machines, and boosting.

Course Name: Computer Forensics (C41F)

Items	Course Outcomes
C41F.1	Student can learn the career of a computer forensics professional
C41F.2	Student can learn how to apply the concepts of computer investigations
C41F.3	Student can learn current computer forensics tools.
C41F.4	Able to Perform e-mail investigations.
C41F.5	Able to Perform basic computer forensic analysis.
C41F.6	Able to Perform basic network forensic analysis.

Course Name: Linux Programming Lab (C41G)

Items	Course Outcomes
C41G.1	Identify the basic commands as well as different utilities of the Linux & analyze why to use Linux.
C41G.2	Outline about shell and how to write, debug & execute shell script along with different commands.
C41G.3	Demonstrate how two processes communicate with each other using different ways
C41G.4	Explain for controlling the execution of two processes simultaneously
C41G.5	To demonstrate the knowledge gained through solving problems.
C41G.6	To explain about shared memory for IPC
C41G.7	To explain about socket programming

Course Name: Data Mining Lab (C41H)

Items	Course Outcomes

C41H.1	To demonstrate the knowledge gained through solving problems.
C41H.2	To evaluate the different models used for OLAP and data preprocessing.
C41H.3	Student should be able to understand why the data warehouse in addition to database systems
C41H.4	Ability to perform the processing of data and apply mining techniques on it
C41H.5	Ability to identify the association rules, classification and clusters in large data sets
C41H.6	Ability to solve real world problems in business and scientific information using data mining

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Course Name: Management Science (C421)

Items	Course Outcomes
C421.1	The student understands the concept of management and organization and functions of management, structure of organization.
C421.2	The student gain knowledge on operations of marketing management and functions of marketing.
C421.3	The student understands the concept of human resource management (HRM), human resource development (HRD) ,PMIR and difference between HRM and PMIR
C421.4	The student understand the concept of PERT and CPM.(project management and methods)
C421.5	The student gain knowledge on strategic management and contemporary strategic issues
C421.6	The student is capable to apply the above conceptual things to real world of management and business application

Course Name: Web Services(C422)

Items	Course Outcomes
C422.1	Understand the fundamental concepts of image and text usage in multimedia and hypermedia in software tools
C422.2	Ability to design the data compression techniques for a video and audio.
C422.3	Students can understand the development of web and blogging.
C422.4	Apply principles of distributed transactions, business processes, business protocols,

	rules, and agents to specify, monitor, and manage the behavior of composed services.
C422.5	Design and launch Web services.
C422.6	Students can Evaluate emerging and proposed standards for the main components of Web services architectures.

Course Name: Semantic Web and Social Networks (C423)

Items	Course Outcomes
C423.1	Students are able to have an appreciation for and understanding of both the achievements of AI and the theory underlying those achievements.
C423.2	Students are able to have an appreciation for the engineering issues underlying the design of AI systems.
C423.3	Student are able to have a basic proficiency in a traditional AI language including an ability to write simple to intermediate programs and an ability to understand code written in that language.
C423.4	Have an understanding of the basic issues of knowledge representation.
C423.5	Ability to have a basic understanding of some of the more advanced topics of AI such as learning, natural language processing, agents and robotics, expert systems, and planning.
C423.6	Will be able to build semantic web applications with social network features.

Course Name: Scripting Languages (C424)

Items	Course Outcomes
C424.1	Students can Describe the principles of computer design and Classify instruction set architectures
C424.2	Student can able to describe the operation of performance enhancements such as pipelines, dynamic scheduling, branch prediction, caches, and vector processors.
C424.3	They can identify the operation of virtual memory and Compare the performance of different architectures.
C424.4	Students can describe modern architectures such as RISC, Super Scalar, VLIW (very large instruction word), multi-core and multi-CPU systems
C424.5	Able to develop applications for high performance computing systems.
C424.6	Students can Describe the principles of computer design and Classify instruction set architectures

Course Name: Multimedia & Rich internet applications (C425)

Items	Course Outcomes
C425.1	Ability to create and design rich internet applications.
C425.2	Ability to develop different multimedia tools to produce web based and independent user interfaces
C425.3	Students can Apply tools and techniques for the design and development of various multimedia objects
C425.4	Integrate user interface and web design principles in their rich internet application development.
C425.5	Students can Evaluate the usage of multimedia technology in various rich internet applications.

Course Name: Adhoc & Sensor networks(C426)

Items	Course Outcomes
C426.1	Able to describe the unique issues in ad-hoc/sensor networks.
C426.2	Able to describe current technology trends for the implementation and deployment of wireless ad-hoc/sensor networks.
C426.3	Discuss the challenges in designing MAC, routing and transport protocols for wireless ad-hoc/sensor networks.
C426.4	Discuss the challenges in designing routing and transport protocols for wireless Ad-hoc/sensor networks.
C426.5	Comprehend the various sensor network Platforms, tools and applications.

Course Name: Database Security (C428)

Items	Course Outcomes
C428.1	Implement identification and authentication procedures, fine-grained access control and data encryption techniques.
C428.2	Able to describe at least one integrity auditing techniques for outsourced databases ()

C428.3	Students can describe at least one access control policy and mechanism for relational databases ()
C428.4	Able to describe (at a high-level) at least one access control policy and mechanism for structured databases ()
C428.5	Ability to Implement at least one security technique of the distributed database systems ()
C428.6	Students can learn how to protect data and databases

Course Name: Embedded Systems (C429)

Items	Course Outcomes
C429.1	Ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
C429.2	ability to conduct standard tests and measurements; to conduct, analyze, and interpret Experiments; and to apply experimental results to improve processes
C429.3	Ability to function effectively as a member or leader on a technical team
C429.4	Understanding of the need for and an ability to engage in self-directed continuing professional development;
C429.5	Understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity
C429.6	Students have knowledge about the applications of embedded systems Outcomes

Course Name: Industry Oriented Mini Project (C42A)

Items	Course Outcomes
C42A.1	The student will acquire practical knowledge within the chosen area of technology for project development
C42A.2	The student will be able to identify and analyze projects with a comprehensive approach
C42A.3	The student will be able to formulate and handle projects with a systematic approach
C42A.4	The student will be able to develop effective communication skills for presentation of project related activities
C42A.5	The student will be able to generate alternative solutions, compare them and select the optimum one
C42A.6	The student will be able to formulate a real world problem and develop its

	requirements

Course Name: Seminar (C42B)

Items	Course Outcomes
C42B.1	The student will be engaged in the integral activities of reading, discussion and composition around a particular topic.
C42B.2	The student will develop presentation skills.
C42B.3	The student will gain confidence to face the interviews.
C42B.4	The student will be able to investigate the advancements in the particular topic.
C42B.5	The student will be able to distinguish opinions from researched calims.
C42B.6	The student will be able to prepare appropriate and participate effectively in the presentation.

Course Name: Project Work (C42C)

Items	Course Outcomes
C42C.1	The student gains knowledge on the basic concepts of electrical engineering and learn the implementation.
C42C.2	The student understands the design and analysis of a particular problems in project.
C42C.3	The students learn MATLAB programming and implementing the Simulink.
C42C.4	The student will be able to develop the hardware.
C42C.5	The student will learn the complete process of a project – designing, programming, module development.
C42C.6	The student will gain practical knowledge.

Course Name: Comprehensive Viva-Voce (C42D)

Items	Course Outcomes
C42D.1	The student will be able to face interview both at the academic and the industrial sector.
C42D.2	The student will be able to exhibit the strength and grip on the fundamentals of the subjects studied in the previous semesters.
C42D.3	The student will be able to comprehend all the courses studied in the entire program
C42D.4	The student will be able to enhance their communication skills and interactiveness.
C42D.5	The student will be able to access themselves in the complete course.
C42D.6	The student will revise all the course right from fundamentals.

Code No: 55051 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, Febuary/March - 2016
COMPUTER NETWORKS
(Information Technology)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

- - -

1.a) What are the responsibilities of Transport layer in the Internet model
b) Define Analog and Digital Signal? Explain the advantages of Digital Signal over an Analog Signal. [7+8]

2. Explain the functions of various layers in ISO-OSI reference model. [15]

3.a) Discuss the usefulness of concept of redundancy in error detection and correction.
b) what is the maximum effect of 2-milli-seconds burst of noise on data transmitted at the following rates:
i) 2000 bps
ii) 300 Mbps
c) Explain the working of Go-Back-N-ARQ sliding window protocol. [5+5+5]

4.a) Explain the frame format of IEEE802.3.
b) Explain the types of services of IEEE802.11. [8+7]

5.a) In a CSMA/CD network with a data rate of 10 Mbps, the maximum distance between any station pair is found to be 2500 m for the correct operation of the collision detection process. What should be the maximum distance if we increase the data rate to 1 Gbps?
b) Show that the channel data rate in GSM is 270.8 Kbps.
c) Name the ATM layers and list their functions. [5+5+5]

6.a) Explain classful IPv4 addressing with examples.
b) Explain the motivation for moving from IPv4 to IPv6. [8+7]

7.a) We have a pure ALOHA network with 100 stations. If frame duration (Tfr) = 1s, what is the number of frames/second each station can send to achieve the maximum efficiency?
b) In a CSMA/CD network with a data rate of 10 Mbps, the maximum distance between any station pair is found to be 2500 m for the correct operation of the collision detection process. What should be the maximum distance if we increase the data rate to:
i) 100 Mbps
ii) 2 Gbps
iii) 10 Gbps.
c) In a CSMA/CD network with a data rate of 10 Mbps, the minimum frame size is found to be 512 bits for the correct operation of the collision detection process. What should be the minimum frame size if we increase the data rate to:
i) 100 Mbps
ii) 2 Gbps
iii) 10 Gbps. [5+5+5]

8. We have four sources, each creating 250 chars/sec. of the interleaved unit is a character and one synchronizing bit is added to each frame, Find:

a) The data rate of each source
b) The duration of each character in each source
c) The frame rate
d) The duration of each frame
e) The data rate of each link. [15]

---ooOoo---