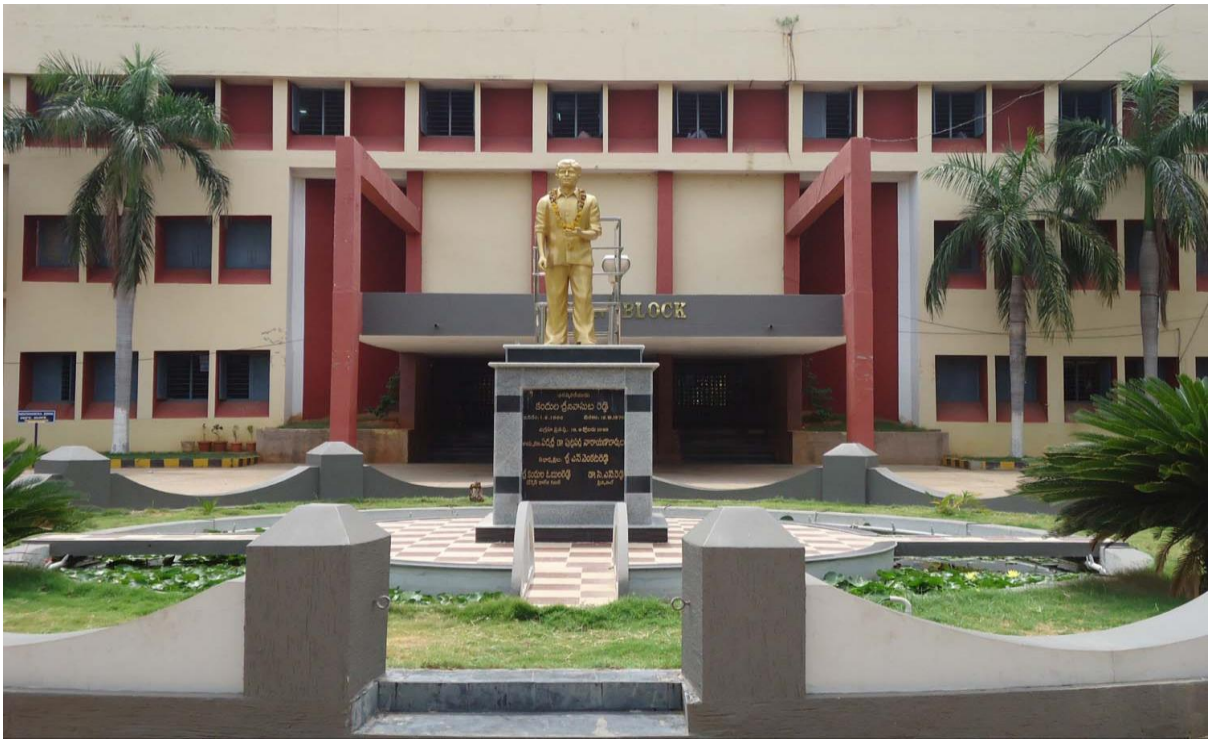
Regulations for
UG Programs in Engineering (R18UG)
Curriculum and Syllabus for

VIII Sem B.Tech

Department of Computer Science and Engineering



KandulaSrinivasa Reddy Memorial College of Engineering
(Autonomous)
Kadapa 516003 AP

(Approved by AICTE, Affiliated to JNTUA, Ananthapuramu, Accredited by NAAC)
(An ISO 9001-2008 Certified Institution)

Semester-8

SL.No	Subject Code	Subject	L	T	P	CR
Theory						
1	**1805801** **1805802** **1805803**	**Professional Elective-4** **1. Cyber Security** **2. Object Oriented Analysis & Design** **3. Deep Learning**	**3**	**0**	**0**	**3**
2		**Open Elective-4**	**3**	**0**	**0**	**3**
Labs						
1	**1805806**	**Project - II**	**0**	**0**	**12**	**6**
			6	**0**	**12**	**12**

Course Title	Cyber Security (Professional Elective-4)				B.Tech CSE VIII Sem (R18)		
Course Code	**Category**	**Hours/Week**		**Credits**	**Maximum Marks**		
1805801	**PC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					**End Exam Duration: 3Hrs**		

Course Objectives:

- To learn about cyber crimes and how they are planned
- To learn the vulnerabilities of mobile and wireless devices
- The learner will gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks.

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

CO 1	Understanding the basic cyber security concepts
CO 2	Classifying the international laws and cyber forensics
CO 3	Remembering to cyber crime
CO 4	Recognizing cyber crime and cyber terrorism
CO 5	Understanding the privacy issues

UNIT - I

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Spectrum of attacks, Taxonomy of various attacks, IP spoofing, Methods of defense, Security Models, risk management, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

UNIT - II

Cyberspace and the Law & Cyber Forensics: Introduction, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace, National Cyber Security Policy.

Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics, Special Techniques for Forensics Auditing.

UNIT - III

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile Computing Era, Laptops.

UNIT- IV

Cyber Security: Organizational Implications: Introduction, cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations.

Cybercrime and Cyber terrorism: Introduction, intellectual property in the cyberspace, the ethical dimension of cybercrimes the psychology, mindset and skills of hackers and other cyber criminals.

UNIT - V

Privacy Issues: Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domains- medical, financial, etc.

TEXT BOOKS:

1. Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, ComputerForensics and Legal Perspectives, Wiley

2. B. B. Gupta, D. P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles,Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335, 2018.

REFERENCES:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.

2. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&F Group.

Course Title	Object Oriented Analysis & Design (Professional Elective-4)				B.Tech CSE VIII Sem (R18)		
Course Code	**Category**	**Hours/Week**		**Credits**	**Maximum Marks**		
1805802	**PC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					**End Exam Duration: 3Hrs**		

Course Objectives:

- To understand the Object oriented life cycle.
- To know how to identify objects, relationships, Services and attributes through UML.
- To understand different UML diagrams.
- To know object oriented design process, software quality and usability.

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

CO 1	Design software applications and document them using UML class diagrams
CO 2	Analyse, design, document the requirements through use case driven approach.
CO 3	Identify, analyse, and model structural and behavioural concepts of the system.
CO 4	Apply the concepts of architectural design for deploying the code for software.
CO 5	Develop, explore the conceptual model into various scenarios and applications.

UNIT I

Introduction to UML: Importance of Modeling, Principles of Modeling, Object Oriented Modeling, Conceptual Model of the UML, Architecture.

UNIT II

Basic Structural Modeling : Classes, Relationships, Common Mechanisms, and Diagrams Interfaces, Types and Roles, Packages.
Class and Object Diagrams : Terms, Concepts, Modeling Techniques for Class and Object Diagrams.

UNIT III

Basic Behavioral Modeling-I : Interactions, Interaction Diagrams.

Basic Behavioral Modeling-II : Use Cases, Use Case Diagrams, Activity Diagrams.

UNIT IV

Advanced Behavioral Modeling : Events and Signals, State Machines, Processes and Threads, Time and Space, State Chart Diagrams.

UNIT V

Architectural Modeling : Component, Deployment, Component Diagrams and Deployment Diagrams,Systems and Models.

Case Study : The Unified Library Application.

TEXT BOOKS:

1. The Unified Modeling Language User Guide, Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.

2. UML 2 Toolkit, Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, WILEY-Dreamtech India Pvt. Ltd.

REFERENCES:

1. Fundamentals of Object Oriented Design in UML, Meilir Page- Jones, Pearson Education.

2. Modeling Software Systems Using UML2, Pascal Roques, Wiley- Dreamtech India Pvt. Ltd.

3. Object Oriented Analysis and Design, Atul Kahate, The McGraw- Hill Companies.

4. Object-Oriented Analysis and Design with the Unified Process, John W. Satzinger, Robert B Jackson and Stephen D Burd, Cengage Learning.

5. Learning UML 2.0, Russ Miles and Kim Hamilton, O'Reilly, SPD.

6. Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

7. UML and C++, R.C.Lee and W.M.Tepfenhart, PHI.

8. Object Oriented Analysis, Design and Implementation, B.Dathan and S.Ramnath, Universities Press.

9. OO Design with UML and Java, K.Barclay, J.Savage, Elsevier.

10. Mark Priestley: Practical Object-Oriented Design with UML, TMH.

Course Title	Deep Learning (Professional Elective-4)				B.Tech CSE VIII Sem (R18)		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**	
1805803	**PC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					**End Exam Duration: 3Hrs**		

Course Objectives:

- Study the neural networks and convolutions networks and their architecture.
- Gain knowledge about recurrent neural networks and deep supervised learning methods.

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

CO 1	Understand the neural networks to solve the real time problems.
CO 2	Understand convolutional neural networks and their architectures.
CO 3	Understand recurrent neural networks and recursive NNs.
CO 4	Understand Deep supervised learning methods.
CO 5	Implement the Deep Learning models in various Applications.

UNIT-I

Introduction: Feed forward Neural networks, Gradient descent and the back propagation algorithm, Unit saturation, vanishing gradient problem, ways to mitigate it. RelU Heuristics for avoiding bad local minima, Heuristics for faster training, Nestors accelerated gradient descent, Regularization, Dropout .

UNIT-II

Convolutional Neural Networks : Architectures, convolution / pooling layers

UNIT-III

Recurrent Neural Networks: LSTM, GRU, Encoder Decoder architectures Recursive neural network (RNN).

UNIT-IV

Deep Unsupervised Learning: Auto encoders (standard, sparse, denoising, contractive, etc), Variational Auto encoders, Adversarial Generative Networks, Autoencoder and DBM Attention and memory models, Dynamic memory networks.

UNIT-V

Applications of Deep Learning to NLP/Computer Vision: Introduction to NLP and Vector Space Model of Semantics, Word Vector representations: Continuous Skip-Gram Model, Continuous Bag-of-Words model (CBOW), Named Entity Recognition, Opinion Mining using Recurrent Neural Networks, Sentence Classification using Convolutional Neural Networks.Image segmentation, object detection, automatic image captioning, Image generation with Generative adversarial networks, Video to text with LSTM models. Attention models for computer vision tasks.

Text Books: 1. Bengio, Yoshua, Ian J. Goodfellow, and Aaron Courville. "Deep learning." An MIT Press book. (2015)..
2. Josh Patterson, Adam Gibson, Deep Learning: A Practitioner's Approach, OReilly, 2017.

Refference Bools:

1. Jeff Heaton, Deep Learning and Neural Networks, Heaton Research Inc, 2015.

2. Mindy L Hall, Deep Learning, VDM Verlag, 2011.

Course Title	Software Engineering (Open Elective-4)				B.Tech CSE VIII Sem (R18)		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**	
1805804	**PC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours					**End Exam Duration: 3Hrs**		

Course Objectives:

- Knowledge of basic Software engineering methods and practices, and their appropriate application also the software engineering layered technology and Process frame work.
- A general understanding of software process models such as the waterfall and evolutionary models.
- Understanding of the role of project management including planning, scheduling, risk management, etc.
- Understanding of data models, object models, context models and behavioural models also different software architectural styles.
- Understanding of software testing approaches such as unit testing and integration testing other testing strategies and Risk management.

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

CO 1	Ability to apply software engineering principles and techniques.
CO 2	Ability to develop, maintain and evaluate large-scale software systems.
CO 3	To produce efficient, reliable, robust and cost-effective software solutions.
CO 4	To gain the knowledge of how Analysis, Design, Implementation, Testing and Maintenance processes are conducted in a software project.

UNIT-I

Software and Software Engineering: The Nature of Software, Software Engineering, Software Process Software Myths. Process Models: A Generic Process Model, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models.

UNIT-II

Understanding Requirements: Requirements Engineering, Establishing the Groundwork, Eliciting Requirements, Building the Requirements Model, Negotiating Requirements, Validating Requirements.

Requirements Modeling: Requirements Analysis, Scenario-Based Modeling, Data Modeling Concepts, Class-Based Modeling.

UNIT-III

Design Concepts: Design within the Context of Software Engineering, Design Process, Design Concepts, The Design Model.

Architectural Design: Software Architecture, Architectural Genres, Architectural Styles, Architectural Design.

UNIT-IV

User Interface Design: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

Coding and Testing: Testing, Testing in the Large versus Testing in the Small, Unit Testing, Integration Testing, Black-Box Testing, White-Box Testing, Debugging, System Testing.

UNIT- V

Software Project Management: Project Planning, Metrics for Project Size Estimation, Project Estimation Techniques, Empirical Estimation Techniques, COCOMO-A Heuristic Estimation Technique, Halstead's Software Science-An Analytical Technique, Risk Management.

TEXT BOOKS :

1. Software Engineering: A practitioner's Approach, Roger S. Pressman, Seventh Edition, 2010, McGrawHill International Edition.

2. Fundamentals of Software Engineering, Rajib Mall, 4th Edition, 2014, PHI.

REFERENCE BOOKS:

1. Software Engineering, Ian Sommerville, Ninth edition, Pearson education.

2. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008

3. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India,2010.

4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.

5. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

6. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition , 2006.

7. Software Engineering Foundations, Yingxu Wang, Auerbach Publications,2008.

Course Title	Cloud Computing (Open Elective-4)					B.Tech CSE VIII Sem (R18)		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
1805805	**PC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exams**	**Total**
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hours						**End Exam Duration: 3Hrs**		

Course Objectives:

- To explain the cloud paradigms.
- To introduce the various levels of services that can be achieved by cloud.
- To know about service providers of cloud.

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

CO 1	Recall different computing paradigms
CO 2	Understand the evolution of cloud computing paradigm and its architecture, and Characterizing different cloud deployment models
CO 3	Explain service models and Virtualization
CO 4	Understand programming models and Software Development in Cloud Computing
CO 5	Identify the Data Center environment and service providers in cloud computing

UNIT I

Computing Paradigms:

High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Biocomputing, Mobile Computing, Quantum Computing, Optical Computing, Nano computing, Network Computing.

Cloud Computing Fundamentals:

Motivation for Cloud Computing: The Need for Cloud Computing. Defining Cloud Computing: NIST Definition of Cloud Computing, Computing Is a Service, Cloud Computing Is a Platform. Principles of Cloud computing: Five Essential Characteristics, Four Cloud Deployment Models, Three Service Offering Models, Cloud Ecosystem, Requirements for Cloud Services, Cloud Application, Benefits and Drawbacks.

UNIT II

Cloud Computing Architecture and Management : Cloud Architecture, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications on the Cloud, Managing the Cloud, Migrating Application to Cloud.
Cloud Deployment Models : Private Cloud, Public Cloud, Community Cloud, Hybrid Cloud

UNIT III

Cloud Service Models : Infrastructure as a Service, Platform as a Service, Software as a Service, Other Cloud Service Models.

Virtualization: introduction, Virtualization opportunities, Approaches to virtualization, Hypervisors, From virtualization to cloud computing,

UNIT IV

Programming Models in Cloud : Cloud Application Development Platforms: Windows Azure, Google App Engine, Force.com, Manjrasoft Aneka

Software Development in Cloud : Introduction, Different perspectives on SaaS development, New challenges, Cloud aware software development using PaaS technology

UNIT V

Networking for Cloud Computing : Introduction, Overview of Data Center Environment, Networking Issues in Data Centers.

Cloud Service Providers : Introduction, EMC, Google, Amazon Web Services, Microsoft, IBM, Salesforce, Rackspace

Text books:

1. K. Chandrasekaran, Essentials of Cloud Computing, CRC Press, 2015

Reference books:

1. Barrie Sosinsky, Cloud Computing Bible, Wiley-India, 2010
2. RajkumarBuyya, James Broberg, Andrzej M. Goscinski, Cloud Computing: Principles and Paradigms, Wiley, 2011
3. Nikos Antonopoulos, Lee Gillam, Cloud Computing: Principles, Systems and Applications, Springer, 2012.