

Bapatla Engineering College

(Autonomous)



B.Tech

Information Technology

**Curriculum Effective from A.Y. 2020-21
(R20 Regulation)**



Bapatla Engineering College :: Bapatla

(Autonomous under Acharya Nagarjuna University)

(Sponsored by Bapatla Education Society)

BAPATLA - 522102 Guntur District, A.P., INDIA

www.becbapatla.ac.in

Automata Theory and Formal Languages

(Common to CSE & IT)
B.Tech – V Semester (20IT501)

Lectures	:	3 Hours / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	30	SEE Marks	:	70	Credits	:	3

Prerequisites:

Discrete Mathematical Structures(20CS205)

UNIT - I (12 Hours)

Automata: Why Study Automata Theory, The central concepts of automata theory - Alphabets, Strings, Languages, Problems.

Finite Automata: An Informal picture of finite automata, Deterministic finite automata (DFA) - Definition of DFA, DFA processing strings, Notations for DFA, Extended transition function, the language of DFA, Non deterministic finite automata (NFA) – Definition of NFA, Extended transition function, the language of NFA, Equivalence of DFA and NFA. Automata with ϵ transitions: Use of ϵ - transition, notation for an ϵ - NFA, Epsilon closures, extended transitions and languages, Eliminating I - transitions.

UNIT - II (12 Hours)

Regular Expressions and Languages: Regular expressions, finite automata and regular expressions, Algebraic laws of regular expressions.

Properties of Regular Languages: Proving languages are not regular – Pumping lemma for regular languages, Applications of the pumping lemma, Closure Properties of Regular Languages, Equivalence and minimization of automata – Minimization of DFA.

UNIT - III (12 Hours)

(Construction based treatment & proofs are excluded)

Context Free Grammars: Context Free Grammars, Parse Trees, ambiguous grammars.

Pushdown Automata: Definition of the Pushdown automata, the languages of PDA, Equivalences of PDA's and CFG's.

Context free languages: Normal form's for context- Free grammars, the pumping lemma for context free languages.

UNIT - IV (12 Hours)

Properties of Context free languages: closure properties for context free languages, Decision properties for CFL's.

Introduction to Turing Machines: The Turing Machine, programming techniques for Turing machines.

Undecidability: a language that is not recursively enumerable, an undecidable problem that is RE, Undecidability problems about TM, Post's Correspondence problem.

TEXT BOOKS:

1. John E Hopcroft, Rajeev Motwani, and Jeffery D Ullman. *Introduction to Automata Theory Languages and Computations*. Pearson, 3 edition, 2008. ISBN 9780321564085

REFERENCES:

1. KLP Mishra and N Chandrasekharan. *Theory of Computation*. PHI, 1 edition, 2020. ISBN 9780321564085
2. H R Lewis and C H Papadimitriou. *Elements of the Theory of Computation*. Pearson, 2 edition, 2003. ISBN 9780321564085

Computer Networks

(Common to CSE & IT)
B.Tech – V Semester (20IT502)

Lectures	:	3 Hours / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	30	SEE Marks	:	70	Credits	:	3

Prerequisites:

None

UNIT - I (12 Hours)

Data Communications & Networking Overview: A Communications Model, Data Communications, Data Communication Networking.

Protocol Architecture: The Need for a Protocol Architecture, A Simple Protocol Architecture, OSI, The TCP/IP Protocol Architecture.

Digital Data Communication Techniques: Asynchronous & Synchronous Transmission, Types of Errors, Error Detection, Error Correction.

UNIT - II (12 Hours)

Data Link Control: Flow Control, Error Control.

Network Layer Design Issues: Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of Connection-Oriented Service, Comparison of Virtual-Circuit & Datagram Subnets.

Routing Algorithms: The Optimality Principle, Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing.

Congestion Control Algorithms: General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets, Load Shedding, Jitter Control.

UNIT - III (12 Hours)

Quality of Service: Requirements, Techniques for Achieving Good Quality of Service

The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols.

The Transport Service: Services Provided to the Upper Layers, Transport Service Primitives, Berkeley sockets

Elements of Transport Protocols: Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery.

UNIT - IV (12 Hours)

The Internet Transport Protocol (UDP): Introduction to UDP, Remote Procedure Call, The Real-Time Transport Protocol.

The Internet Transport Protocol (TCP): Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management, TCP Transmission Policy, TCP Congestion Control, TCP Timer Management.

The Domain Name System(DNS): The DNS Name Space, Resource Records, Name Servers.

TEXT BOOKS:

1. Behrouz A. Forouzan. *Data Communications and Networking*. TMH, 4 edition, 2020. ISBN 9780321564085
2. Tanenbaum. *Computer Networks*. Pearson, 4 edition, 2020. ISBN 9780321564085

REFERENCES:

1. Wayne Tomasi. *Introduction to Data Communications and Networking*. PHI, 1 edition, 2020. ISBN 9780321564085
2. GodBole. *Data Communications and Networking*. TMH, 1 edition, 2020. ISBN 9780321564085
3. Nader F. Mir. *Computer and Communication Networks*. PHI, 1 edition, 2020. ISBN 9780321564085

Software Engineering

(Common to CSE & IT)

B.Tech – V Semester (20IT503)

Lectures	:	3 Hours / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	30	SEE Marks	:	70	Credits	:	3

Prerequisites:

None

UNIT - I (12 Hours)

Introduction to Software Engineering: The Evolving Role of Software, Software, the Changing Nature of Software, Legacy Software, Software Myths.

A Generic View of Process: Software Engineering - A Layered Technology, a Process Framework, the CMMI, Process Patterns, Process Assessment, Personal and Team Process Models, Product and Process.

Process Models: Prescriptive Models, the Waterfall Model, Incremental Process Models, Evolutionary Models, the Unified Process.

UNIT - II (12 Hours)

An Agile View of Process: What Is Agility? , What Is an Agile Process? , Agile Process Models.

Requirements Engineering: A Bridge To Design and Construction, Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Developing Use-cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.

Building The Analysis Model: Requirements Analysis, Analysis Modelling Approaches, Data Modelling Concepts, Flow-Oriented Modelling, Class Based Modelling Creating a Behavioural Model.

UNIT - III (12 Hours)

Design Engineering: Design within the Context of Software Engineering, Design Process and Design Quality, Design Concepts The Design Model, Pattern Based Software Design.

Creating An Architectural Design: Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Assessing Alternative Architectural Designs.

Modelling Component-Level Design: What Is a Component? , Designing Class-Based Components, Conducting Component-Level Design, Designing Conventional Components.

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

UNIT - IV (12 Hours)

Software Process And Project Metrics: Introduction, Metrics Process and Project Domains, Software Measurement, Metrics for Software Quality, Integrating Metrics with Process.

Software Quality Assurance: Quality Concepts, Quality Movement, SQA, Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Software Reliability, ISO 9000 Quality Standards, SQA Plan.

Software Testing Strategies: Strategic Approach, Strategic Issues, Test strategies for Conventional Software, White box testing, Black Box testing, Test strategies for Object Oriented Software, Validation Testing, System Testing, The Art of Debugging.

TEXT BOOKS:

1. Roger S. Pressman. *Software Engineering A Practitioner's Approach*. Pearson, 8 edition, 2020. ISBN 9780321564085

REFERENCES:

1. K.K. Aggarwal and Yogesh Singh. *Software Engineering*. New Age International, 1 edition, 2005. ISBN 9780321564085
2. Pankaj Jalote. *An Integrated Approach to Software Engineering*. Springer, 2 edition, 2020. ISBN 9780321564085
3. Ian Sommerville. *Software Engineering*. Pearson, 6 edition, 2020. ISBN 9780321564085
4. Carlo Ghezzi, Mehdi Jazayeri, and Dino Mandrioli. *Fundamentals of Software Engineering*. PHI, 2 edition, 2020. ISBN 9780321564085
5. RajibMall. *Fundamentals of Software Engineering*. PHI, 2 edition, 2020a. ISBN 9780321564085

Software Engineering Lab

B.Tech – V Semester (20ITL501)

Lectures	:	0 Hours / Week	Tutorial	:	0	Practical	:	3
CIE Marks	:	30	SEE Marks	:	70	Credits	:	1.5

List of Experiments

1. Write down the problem statement for a suggested system of relevance.
2. Do requirement analysis and develop Software Requirement Specification Sheet (SRS) for suggested system.
3. To perform the function oriented diagram: Data Flow Diagram (DFD) and Structured chart.
4. To perform the user's view analysis for the suggested system: Use case diagram.
5. To draw the structural view diagram for the system: Class diagram, object diagram.
6. To draw the behavioral view diagram : State-chart diagram, Activity diagram
7. To perform the behavioral view diagram for the suggested system : Sequence diagram, Collaboration diagram
8. To perform the implementation view diagram: Component diagram for the system.
9. To perform the environmental view diagram: Deployment diagram for the system.
10. To perform various testing using the testing tool unit testing, integration testing for a sample code of the suggested system.

Choose any one of the following projects and do any 8 of the above exercises for that project

1. Student Result Management System
2. Library management system
3. Inventory control system
4. Accounting system
5. Fast food billing system
6. Bank loan system
7. Blood bank system
8. Railway reservation system
9. Automatic teller machine
10. Video library management system
11. Hotel management system
12. Hostel management system

13. E-ticking
14. Share online trading
15. Hostel management system
16. Resource management system
17. Court case management system

Soft Skills
 (Common to all branches)
B.Tech – V Semester (20ITL501/SO03)

Lectures	:	1 Hours / Week	Tutorial	:	0	Practical	:	2
CIA Marks	:	30	SEE Marks	:	70	Credits	:	2

Prerequisites:

None

UNIT - I (12 Hours)

Body Language & Identity Management: Facial Expressions – Kinesics - Occulesics, Haptics - Proxemics, Para Linguistics, Appearance, Identity Management Communication

UNIT - II (12 Hours)

Emotional Intelligence & Life Skills: Self Awareness through Johari Window and SWOC analysis, Self Motivation, Empathy, Assertiveness & Managing Stress, Positive Attitude, Time Management.

Goal Setting: Short term, Long Term, Vision, Mission.

UNIT - III (12 Hours)

Business Presentations: Preparing effective Presentations Power Point Presentations, Power Point Presentations, Using Visual Aids, Mock Presentations.

UNIT - IV (12 Hours)

Employability Skills: Group Discussion, Team Building and Leadership Qualities, Interview Skills.

REFERENCES:

1. Barun K. Mithra. *Personality Development and Soft skills*. Oxford University Press, 2 edition, 2016. ISBN 9780321564085
2. Allan and Barbara. *The Definitive Book of Body Language*. Pease International, 1 edition, 2004. ISBN 9780321564085
3. Daniel Goleman. *Working with Emotional Intelligence*. Bloomsbury, 1 edition, 1998. ISBN 9780321564085
4. Lina Mukhopadhyay. *English for Jobseekers*. Cambridge University Press, 1 edition, 2013. ISBN 9780321564085
5. Stephen R. Covey. *The 7 Habits of Highly Effective People*. St. Martin's Press, 1 edition, 2014. ISBN 9780321564085

Essence of Indian Traditional Knowledge

(Common to all branches)
B.Tech – V Semester (MC03)

Lectures	:	2 Hours / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	30	SEE Marks	:	00	Credits	:	0

Prerequisites:

None

UNIT - I

(10 Hours)

Historical Background: TKS during the Pre-colonial and Colonial Period

Indian Traditional Knowledge System

Traditional Medicine: Ayurveda, Simple Definition, Origin, Texts, The Great Three Classics of Ayurveda, The Lesser Three Classics of Ayurveda, The Branches of Ayurveda, Basic Concepts of Ayurveda, Purusha/Prakruti, Manifestation of Creation, Space, Air, Fire, Water, Earth, Mental Constitution, Satvic Mental Constitutions, Rajasic Mental Constitutions, Tamasic Mental Constitutions, Vata, Pitta and Kapha: The Three Doshas

UNIT - II

(12 Hours)

Traditional Production and Construction Technology: Social Conditions and Technological Progress, The Impetus for Metallurgy, Social Needs and Technological Applications, Scientific Rationalism and Technological Efficacy, Cultural Mores and Technological Innovation, State Support of Technology, Limitations of Pre-Industrial Manufacturing, India and the Industrial Revolution.

History of Physics and Chemistry: Philosophy and Physical Science, Particle Physics, Optics and Sound, Astronomy and Physics, The Laws of Motion, Experimentation versus Intuition, The Social Milieu, The Five Basic Physical Elements, Indian Ideas about Atomic Physics.

Traditional Art and Architecture and Vastu Shashtra: Vastu, The Principles of Vastu are Simple.

UNIT - III

(12 Hours)

Origin of Mathematics

Astronomy and Astrology

TKS and the Indian Union: Protection and the Legislative Frameworks in India, Comment, Sui Generis System, Trade Secrets and Know-how, Geographical Indications Bill, Protection of Plant Varieties and Farmers Rights Bill, Rights of Communities, Monitoring Information on Patent Applications World-wide, Frameworks for Supporting R&D Activities in the Area of TKS.

UNIT - IV

(12 Hours)

Common Yoga Protocol: Introduction, What is Yoga? Brief History and Development of Yoga, The fundamentals of Yoga, Traditional Schools of Yoga, Yogic practices for health and wellness General Guidelines for Yoga Practice: Before the practice, During the Practice, After the Practice, Food for Thought, How Yoga can Help.

1. Invocation
2. Sadilaja/Cālana Kriyās /Loosening Practices,
3. Yogāsanās:

- Standing Postures: Tāḍāsana (Palm Tree Posture), Vṛksāsana (The Tree Posture), Pāda-Hastāsana (The Hands to Feet Posture), Ardha Cakrāsana (The Half Wheel Posture), Trikonāsana (The Triangle Posture)
- Sitting Postures: Bhadrāsana (The Firm/Auspicious Posture), Vajrāsana (Thunderbolt Posture), Ustrāsana (Camel Posture), Śaśakāsana (The Hare Posture), Vakrāsana (The Spinal Twist Posture),
- Prone Postures: Makarāsana (The Crocodile Posture), Bhujāṅgāsana (The Cobra Posture), Śalabhbhāsana (The Locust Posture),
- Supine Postures: Setubandhbhāsana (The Bridge Posture), Uttāna Pādāsana (Raised feet posture), Pavana Muktāsana (The Wind Releasing Posture), Śavāsana (The Corpse/ Dead Body Posture)

4. Kapālabhāti

5. Prāṇāyāma: naḍīśodhana or anuloma viloma prāṇāyāma (Alternate Nostril Breathing), Śītalī Prāṇāyāma, Bhrāmarī Prāṇāyāma (Bhrāmarī Recaka)

6. Dhyāna

7. Sankalpa

8. Śantih pātha

TEXT BOOKS:

1. Amit Jha. *Traditional Knowledge System in India*. Pearson, 1 edition, 2009. ISBN 9780321564085
2. Ministry of Ayush. *Common YOGA Protocol*. Ministry of Ayush, 1 edition, 2020. ISBN 9780321564085

REFERENCES:

1. Basanta Kumar Mohanta and Vipin Kumar Singh. *Traditional Knowledge System and Technology in India*. Pearson, 1 edition, 2012. ISBN 9780321564085