

**Department of Computer Science and Engineering**

### III B. Tech I Semester

**SUBJECT: Formal Languages and Automata Theory (CS501PC)**

**At the end of the course, the student will be able to**

| S.No. | COURSE OUTCOMES                                                                             | BT Level |
|-------|---------------------------------------------------------------------------------------------|----------|
| CO1   | Understand basic concepts of formal languages, grammars, and automata                       | 2        |
| CO2   | Design finite automata and regular expressions for pattern recognition                      | 2        |
| CO3   | Construct context-free grammars and pushdown automata for language processing               | 3        |
| CO4   | Analyze Turing machines and decidability issues in computation                              | 4        |
| CO5   | Apply theoretical foundations to solve problems in compiler design and software engineering | 3        |

## MAPPING

[illegible]



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Kondapur (V), Ghatkesar (M), Medchal - Malkajgiri (D) - 501 301 Phone: +91 96529 10002/3



## SUBJECT: Software Engineering (CS502PC)

At the end of the course, the student will be able to

| S.No. | COURSE OUTCOMES                                                                                     | BT Level |
|-------|-----------------------------------------------------------------------------------------------------|----------|
| CO1   | Understand software engineering principles, process models, and lifecycle phases.                   | 2        |
| CO2   | Apply requirements engineering techniques to gather, analyze, and document software specifications. | 3        |
| CO3   | Design software architectures and models using UML and other design tools.                          | 3        |
| CO4   | Evaluate software testing strategies, quality assurance techniques, and maintenance practices.      | 5        |
| CO5   | Demonstrate teamwork, documentation, and ethical responsibility in software project development.    | 6        |

## MAPPING

| CO      | PO1  | PO2  | PO3  | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------|------|------|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1     | 3    | 2    | 2    | 2   | -   | -   | -   | -   | -   | -    | 2    | 2    | 3    | 2    | -    |
| CO2     | 3    | 3    | 3    | 3   | 2   | -   | -   | -   | -   | -    | 3    | 3    | 3    | 2    | -    |
| CO3     | 3    | 2    | 2    | 3   | 2   | -   | -   | -   | -   | -    | 2    | 2    | 3    | 3    | -    |
| CO4     | 2    | 2    | 2    | 3   | 2   | -   | -   | -   | -   | -    | 3    | 3    | 2    | 3    | -    |
| CO5     | -    | -    | -    | 2   | -   | -   | -   | -   | -   | -    | 2    | 2    | 2    | -    | -    |
| Average | 2.75 | 2.25 | 2.25 | 2.6 | 2   | -   | -   | -   | -   | -    | 2.4  | 2.4  | 2.6  | 2.5  | -    |



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## SUBJECT: Computer Networks (CS503PC)

At the end of the course, the student will be able to

| S.No. | COURSE OUTCOMES                                                         | BT Level |
|-------|-------------------------------------------------------------------------|----------|
| CO1   | Understand the basic concepts of computer networks and reference models | 2        |
| CO2   | Analyze data link layer protocols and error detection techniques        | 4        |
| CO3   | Evaluate medium access control and LAN technologies                     | 5        |
| CO4   | Understand network layer protocols and routing algorithms               | 2        |
| CO5   | Explore transport and application layer protocols and services          | 5        |

## MAPPING

| CO      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1     | 3   | 3   | 2   | 2   | 2   | -   | -   | -   | 2   | -    | -    | 3    | 2    | 3    | -    |
| CO2     | 3   | 3   | 2   | 2   | 3   | -   | -   | -   | 2   | -    | -    | 2    | 1    | 3    | -    |
| CO3     | 2   | 2   | 3   | 3   | 3   | -   | -   | -   | 3   | -    | -    | 3    | 3    | 3    | -    |
| CO4     | 3   | 3   | 3   | 3   | 3   | -   | -   | -   | 3   | -    | -    | 3    | 3    | 3    | -    |
| CO5     | 3   | 2   | 3   | 2   | 3   | -   | -   | -   | 3   | -    | -    | 3    | 3    | 1    | -    |
| Average | 2.8 | 2.6 | 2.6 | 2.4 | 2.8 | -   | -   | -   | 2.6 | -    | -    | 2.8  | 2.4  | 2.6  | -    |

**SUBJECT: Web Technologies (CS504PC)**

**At the end of the course, the student will be able to**

| S.No. | COURSE OUTCOMES                                                                       | BT Level |
|-------|---------------------------------------------------------------------------------------|----------|
| CO1   | Understand the fundamentals of web technologies including HTML, CSS, and XML          | 2        |
| CO2   | Develop dynamic web pages using JavaScript and client-side scripting                  | 5        |
| CO3   | Build server-side applications using PHP and database connectivity                    | 3        |
| CO4   | Apply session management, cookies, and file handling in web applications              | 3        |
| CO5   | Demonstrate debugging, teamwork, and documentation skills in web development projects | 5        |

## MAPPING

| CO      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1     | 3   | 3   | 2   | 2   | 2   | -   | -   | -   | -   | -    | -    | -    | 3    | 3    | -    |
| CO2     | 3   | 2   | 3   | 2   | 3   | -   | -   | -   | -   | -    | -    | -    | 3    | 2    | -    |
| CO3     | 3   | 3   | 3   | 2   | 3   | -   | -   | -   | -   | -    | -    | -    | 2    | 3    | -    |
| CO4     | 2   | 3   | 3   | 3   | 3   | -   | -   | -   | -   | -    | -    | -    | 3    | 2    | -    |
| CO5     | 3   | 3   | 3   | 3   | 3   | -   | -   | -   | -   | -    | -    | -    | 3    | 3    | -    |
| Average | 2.8 | 2.8 | 2.8 | 2.4 | 2.8 | -   | -   | -   | -   | -    | -    | -    | 2.8  | 2.6  | -    |



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## SUBJECT: Principles of Programming Languages (CS515PE)

At the end of the course, the student will be able to

| S.No. | COURSE OUTCOMES                                                                | BT Level |
|-------|--------------------------------------------------------------------------------|----------|
| CO1   | Illustrate concepts of programming languages, syntax, and semantics            | 1        |
| CO2   | Demonstrate structured data objects and programmer-defined types               | 2        |
| CO3   | Construct sequence and data control mechanisms                                 | 3        |
| CO4   | Examine storage management and binding concepts                                | 4        |
| CO5   | Evaluate procedural, non-procedural, and object-oriented programming paradigms | 5        |

## MAPPING

| CO      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1     | 3   | 3   | 2   | 2   | 2   | 3   | -   | 2   | 2   | 2    | -    | 2    | 2    | 2    | -    |
| CO2     | 3   | 3   | 3   | 2   | 3   | 3   | -   | 2   | 2   | 2    | -    | 2    | 3    | 2    | -    |
| CO3     | 2   | 2   | 3   | 3   | 3   | 2   | -   | 2   | 2   | 2    | -    | 3    | 3    | 3    | -    |
| CO4     | 3   | 2   | 3   | 3   | 3   | 2   | -   | 2   | 3   | 3    | -    | 3    | 2    | 3    | -    |
| CO5     | 3   | 3   | 3   | 3   | 3   | 2   | -   | 2   | 3   | 3    | -    | 3    | 3    | 3    | -    |
| Average | 2.8 | 2.6 | 2.8 | 2.6 | 2.8 | 2.4 | -   | 2   | 2.4 | 2.4  | -    | 2.6  | 2.6  | 2.6  | -    |

**SUBJECT: Information Retrieval Systems (CS523PE)**

**At the end of the course, the student will be able to**

| S.No. | COURSE OUTCOMES                                                                     | BT Level |
|-------|-------------------------------------------------------------------------------------|----------|
| CO1   | Understand the fundamentals of information retrieval systems and their architecture | 2        |
| CO2   | Apply indexing, cataloging, and data structures for efficient retrieval             | 3        |
| CO3   | Analyze retrieval models, relevance feedback, and evaluation techniques             | 4        |
| CO4   | Explore web search engines, digital libraries, and multimedia retrieval             | 4        |
| CO5   | Demonstrate teamwork, documentation, and communication in IR system development     | 5        |

## MAPPING

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## SUBJECT: Software Engineering Lab (CS505PC)

At the end of the course, the student will be able to

| S.No. | COURSE OUTCOMES                                                                         | BT Level |
|-------|-----------------------------------------------------------------------------------------|----------|
| CO1   | Understand software development life cycle models and requirement engineering process   | 2        |
| CO2   | Apply design principles and UML diagrams for software modeling                          | 3        |
| CO3   | Use testing strategies and tools to validate software functionality                     | 3        |
| CO4   | Prepare project documentation including SRS, design, and test reports                   | 4        |
| CO5   | Demonstrate teamwork, communication, and project management skills in software projects | 5        |

## MAPPING

| CO      | PO1 | PO2  | PO3 | PO4 | PO5  | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------|-----|------|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1     | 3   | 2    | 3   | 2   | -    | -   | -   | -   | 3   | -    | -    | -    | 2    | 2    | -    |
| CO2     | 3   | 3    | 2   | 2   | 3    | -   | -   | -   | 2   | -    | -    | -    | 3    | 2    | 2    |
| CO3     | 2   |      | 3   | 3   | 3    | -   | -   | -   | 2   | -    | -    | -    | 2    | 2    | 3    |
| CO4     | 3   | 3    | 3   | 3   | 3    | -   | -   | -   | 2   | -    | -    | -    | 3    | -    | 3    |
| CO5     | 2   | 3    | 3   | 3   | 2    | -   | -   | -   | 3   | -    | 3    | -    | 2    | 2    | 3    |
| Average | 2.6 | 2.75 | 2.8 | 2.6 | 2.75 | -   | -   | -   | 2.4 | -    | 3.0  | -    | 2.4  | 2    | 2.75 |





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## SUBJECT: Computer Networks and Web Technologies Lab (CS506PC)

At the end of the course, the student will be able to

| S.No. | COURSE OUTCOMES                                                                 | BT Level |
|-------|---------------------------------------------------------------------------------|----------|
| CO1   | Implement and analyze basic networking protocols using simulation tools         | 1        |
| CO2   | Configure and troubleshoot network services and socket programming              | 2        |
| CO3   | Design and develop static and dynamic web pages using HTML, CSS, and JavaScript | 3        |
| CO4   | Build server-side applications using PHP and database connectivity              | 4        |
| CO5   | Demonstrate teamwork, documentation, and debugging skills in lab-based projects | 5        |

## MAPPING

| CO      | PO1 | PO2 | PO3  | PO4 | PO5 | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------|-----|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| CO1     | 3   | -   | -    | 3   | -   | -   | -   | -   | 2    | -    | -    | -    | 2    | 3    | 2    |
| CO2     | 2   | 2   | -    | 3   | 2   | -   | -   | -   | 3    | -    | -    | -    | 3    | 3    | 2    |
| CO3     | 3   | 2   | 2    | 2   | 2   | -   | -   | -   | -    | -    | -    | -    | 2    | 2    | 2    |
| CO4     | 3   | 3   | 3    | 2   | 3   | -   | -   | -   | 3    | -    | -    | -    | 2    | 2    | 2    |
| CO5     | 2   | 3   | 2    | 3   | 3   | -   | -   | -   | 3    | -    | -    | -    | -    | 2    | 3    |
| Average | 2.6 | 2.5 | 2.33 | 2.6 | 2.5 | -   | -   | -   | 2.75 | -    | -    | -    | 2.25 | 2.4  | 2.2  |





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## SUBJECT: Advanced Communication Skills Lab (EN508HS)

At the end of the course, the student will be able to

| S.No. | COURSE OUTCOMES                                                                | BT Level |
|-------|--------------------------------------------------------------------------------|----------|
| CO1   | Improve fluency and accuracy in spoken English                                 | 1        |
| CO2   | Develop effective listening and comprehension skills                           | 2        |
| CO3   | Enhance presentation and public speaking abilities                             | 3        |
| CO4   | Practice group discussions and interviews for professional settings            | 4        |
| CO5   | Demonstrate interpersonal communication and teamwork in simulated environments | 5        |

## MAPPING

| CO      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1     | -   | -   | -   | -   | -   | -   | -   | 3   | 3   | 2    | -    | 3    |      | 3    | 1    |
| CO2     | -   | -   | -   | -   | -   | -   | -   | 3   | 3   | 3    | -    | 2    | 1    | 2    | 1    |
| CO3     | -   | -   | -   | -   | -   | -   | -   | 3   | 3   | 3    | -    | 3    | 2    | 3    | 3    |
| CO4     | -   | -   | -   | -   | -   | -   | -   | 2   | 3   | 3    | -    | 3    | 1    | 3    | 1    |
| CO5     | -   | -   | -   | -   | -   | -   | -   | 2   | 3   | 3    | -    | 3    | 3    | 3    | 3    |
| Average | -   | -   | -   | -   | -   | -   | -   | 2.6 | 3   | 2.8  | -    | 2.8  | 1.8  | 2.8  | 1.8  |



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## SUBJECT: Intellectual Property Rights (MC510)

At the end of the course, the student will be able to

| S.No. | COURSE OUTCOMES                                                                          | BT Level |
|-------|------------------------------------------------------------------------------------------|----------|
| CO1   | Understand the importance of intellectual property rights in innovation and research     | 2        |
| CO2   | Identify different types of intellectual property and their legal frameworks             | 1        |
| CO3   | Analyze the process of patent filing, copyright registration, and trademark protection   | 4        |
| CO4   | Evaluate the role of IPR in business strategy, entrepreneurship, and technology transfer | 5        |
| CO5   | Demonstrate ethical awareness and responsibility in handling intellectual property       | 6        |

## MAPPING

| CO      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1     | -   | -   | -   | -   | -   | 3   | 3   | 3   | -   | -    | -    | 2    | -    | -    | -    |
| CO2     | -   | -   | -   | -   | -   | 3   | 3   | 3   | -   | -    | -    | 2    | -    | -    | -    |
| CO3     | -   | -   | -   | -   | -   | 3   | 3   | 3   | -   | -    | -    | 2    | -    | -    | -    |
| CO4     | -   | -   | -   | -   | -   | 3   | 3   | 3   | -   | -    | -    | 2    | -    | -    | -    |
| CO5     | -   | -   | -   | -   | -   | -   | -   | -   | 3   | 3    | -    | -    | -    | -    | -    |
| Average | -   | -   | -   | -   | -   | 3   | 3   | 3   | 3   | 3    | -    | 2    | -    | -    | -    |