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RGPV B.Tech CSE – 5th Semester Syllabus

📚 Core Subjects

CS-501: Theory of Computation

> This subject introduces formal models of computation. Chapters include finite automata (DFA, NFA), regular languages and expressions, Mealy and Moore machines, context-free grammars, pushdown automata, and Turing machines. It also covers decidability, the halting problem, and computational complexity.

CS-502: Database Management Systems

> DBMS covers data models, ER diagrams, relational algebra, and SQL. Chapters include normalization techniques, transaction management, concurrency control, recovery mechanisms, indexing, and an introduction to NoSQL databases. Students also learn about distributed databases and query optimization.

CS-505: Linux Lab

> Practical exposure to Linux OS, shell scripting, file system navigation, process management, user permissions, and basic networking commands. Students perform hands-on tasks using Bash and explore system-level utilities and automation scripts.

CS-506: Python Lab

> This lab focuses on Python programming fundamentals, including data types, control structures, functions, file handling, and modules. Chapters also cover object-oriented programming, exception handling, and basic data science libraries like NumPy and Pandas.

📊 Departmental Electives (Choose One)

CS-503(A): Data Analysis

> Covers data preprocessing, visualization techniques, statistical analysis, and exploratory data analysis. Students learn to use Python libraries like Matplotlib, Seaborn, and Scikit-learn for real-world datasets.

CS-503(B): Pattern Recognition

> Introduces supervised and unsupervised learning, feature extraction, classification algorithms (k-NN, SVM), clustering techniques, and performance metrics. Emphasis on mathematical foundations and practical implementation.

CS-503(C): Cyber Security

> Covers security principles, cryptography, network security, firewalls, intrusion detection systems, and ethical hacking. Chapters include threat modeling, vulnerability assessment, and secure coding practices.

🌐 Open Electives (Choose One)

CS-504(A): Internet and Web Technology

> Focuses on web architecture, HTML/CSS/JS, client-server models, HTTP protocol, and web hosting. Students learn about responsive design, AJAX, and basic backend integration.

CS-504(B): Object-Oriented Programming

> Covers OOP principles like encapsulation, inheritance, polymorphism, and abstraction. Chapters include class design, constructors, interfaces, and exception handling using Java or Python.

CS-504(C): Introduction to DBMS

> A lighter version of CS-502, this elective introduces relational databases, ER modeling, basic SQL queries, and normalization. Ideal for non-CSE students or those new to databases.

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