

**AMRITSAR GROUP OF COLLEGES**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**SYLLABUS**

**B. Tech. (CSE): 4<sup>th</sup> SEM**

4 <sup>th</sup> Semester		AGCS -21401: DISCRETE STRUCTURES			
Internal Marks:	40		L	T	P
External Marks:	60		3	1	0
Total Marks:	100		Credits		4

<b>Course Outcomes:</b> After studying the course, students will be able to:	
CO-1	Understand the concepts of sets, relations and functions.
CO-2	Understand the concept of rings and Boolean algebra.
CO-3	Understand the concept of combinatorial mathematics.
CO-4	Gain knowledge about groups.
CO-5	Understand the concept of propositional logic and calculus.
CO-6	Gain knowledge of trees and graphs for decision making

Part	Content	CO
I	<b>Sets, Relations and Functions:</b> Introduction, proofs of general identities of sets-basic operations on sets, cartesian products, disjoint union (sum and power sets), De Morgan's Law, De Morgan's law for difference of sets, types and operations on relations, properties of relations and functions, equivalence relations, different types of function, their compositions and inverse	CO-1
	<b>Rings:</b> Rings, Commutative ring, ring with unity, ring with zero divisors, ring without zero divisors, Boolean algebra and Boolean ring, units, quotient ring.	CO-2
II	<b>Combinatorial Mathematics:</b> Basic counting principles, inclusion and exclusion principle, pigeon hole principle, recurrence relations, generating function.	CO-3
III	<b>Monoids and Groups:</b> Groups Semi groups and monoids, integer modulo m, order of group, abelian group, morphisms, normal subgroups, kerf.	CO-4
	<b>Propositional Logic and Calculus:</b> Syntax and semantics, proof system, satisfiability, validity, soundness, completeness, deduction theorem, decision problems of propositional logic, introduction of first order theory, logically equivalence, Tautologies, contradiction.	CO-5
IV	<b>Graph Theory and Trees:</b> Introduction, Directed and Undirected graphs, complement, sub graph, path, Euler and Hamiltonian graph, regular, planar graph, Euler theorem, Graph Colouring, Isomorphism, Homomorphism, Trees, Spanning Tree, Kruskal Algorithm to find minimum spanning tree.	CO-6

<b>References:</b>
<ul style="list-style-type: none"> <li>Discrete Structures: C.P. Gandhi</li> <li>Discrete Structures: R.C. Joshi</li> <li>Discrete Structures: Rosen</li> <li>Discrete Mathematics: BPraba</li> </ul>

4 <sup>th</sup> Semester		AGCS-21402: RELATIONAL DATABASE MANAGEMENT SYSTEMS			
Internal Marks:	40		L	T	P
External Marks:	60		3	1	0
Total Marks:	100		Credits		4

<b>Course Outcomes:</b> After studying the course, students will be able to:	
CO-1	Understand the concept of Database Management System and its various applications in real life.
CO-2	Understand the different database languages i.e., (DDL, DML, DCL, and TCL) along with the usage of SQL and PL/SQL.
CO-3	Understand the concept of E-R diagrams for conceptual modelling.
CO-4	Understand the concept of normalizing tables for effective database design.
CO-5	Understand the concept of database security, concurrent transactions and handling deadlock.
CO-6	Understand the concept of distributed databases and its application in the real world.

Part	Content	CO
I	<b>Introduction to Database Systems:</b> DBMS and its definition, file systems versus a DBMS, components of a DBMS, advantages/disadvantages of a DBMS, describing and storing data in a DBMS, three-level architecture for a DBMS, data independence-physical and logical, mappings at various levels in three-level architecture.	CO-1
II	<p><b>Relational Query Languages: SQL- SQL as DML, DDL and DCL, DDL statements:</b> create table, create view, alter table, drop, DML statements: insert, delete and update, DCL statements: privileges-system and object privileges, Granting and revoking privileges: grant and revoke commands, roles in SQL. Basic SQL select statement, SQL data types and their usage, creating tables &amp; views, read only and read/write views, Integrity constraints in SQL: table constraints and column constraints, Various column constraints: primary key, foreign key, check, not null, unique, default, Naming constraints and data dictionaries associated with them. SQL Functions: Numeric, character, date, general and aggregate functions, sub queries and their usage- single row and multiple row sub queries.</p> <p>PL/SQL: Advantages, scripts in PL/SQL and different ways to run those, data types and their usage, anonymous block along with examples, DML in PL/SQL block: select-into statement, control statements, %type and %rowtype and their usage.</p> <p><b>Cursors and its various types:</b> implicit and explicit, parameterized cursors, cursor for loop. Exception handling- pre-defined and user defined exceptions. various pre-defined exceptions. Functions and procedures: argument modes in functions and procedures- in, out, in out, invoking functions and procedures. Packages: Package specification and package body, triggers and its types. examples based on packages and triggers. [Programs/applications in PL/SQL should primarily relate to table data.]</p>	CO-2
	<b>Data Models:</b> Record based physical models: relational model, network model, hierarchical model, Conceptual design using the ER model, ER diagrams and the various symbols for them. Relational model: entities, attributes and entity set, relationships among entities, strong and weak entities, difference between DBMS and RDBMS, CODD's rules, ER to relational model conversion, set operators and relational algebra operators, relational algebra queries, keys in relational algebra.	CO-3
III	<b>Database Design:</b> Functional dependencies, normalization and its need, normal forms, first, second and third normal forms, BCNF, multi-valued dependency, join dependency, fourth and fifth normal forms.	CO-4

IV	<b>Transaction Management and Concurrency Control:</b> Operations associated with transactions read and write, acid properties of a transaction, life cycle of a transaction, schedules-types of schedules, serializability, concurrent transactions, advantages, lock management, lost update problem, inconsistent read problem, read-write locks, 2 phase locking protocol.	CO-5
	<b>Distributed Databases:</b> Distributed database concepts–replication, fragmentation, replication & fragmentation, advantages and disadvantages, data fragmentation, replication and allocation techniques for distributed database design. Database Protection and Recovery: Database security. authorisation and authentication, threats to a database and its prevention. Backup and Recovery: Types of database recovery, recovery techniques- deferred update, immediate update, shadow paging, checkpoints, buffer management.	CO-6

#### References:

- Fundamentals of Database Systems, Elmasriv Navathe, Pearson Education, 2007.
- An Introduction to Database Systems, C.J. Date, Pearson Education
- Database Management Systems, Alexis Leon, Mathews Leon, Leon Press.
- Database Systems Concepts, Design and Applications, S. K. Singh, Pearson EDUCATION

4 <sup>th</sup> Semester	AGCS-21403: PROGRAMMING IN PYTHON				
<b>Internal Marks:</b>	<b>40</b>		<b>L</b>	<b>T</b>	<b>P</b>
<b>External Marks:</b>	<b>60</b>		<b>3</b>	<b>-</b>	<b>-</b>
<b>Total Marks:</b>	<b>100</b>		<b>Credits</b>		<b>3</b>

**Course Outcomes:** After studying the course, students will be able to:

CO-1	To interpret the python syntax and semantics of control flow statements.
CO-2	To apply list, tuple, dictionary, functions, modules and string handling in Python to solve problems.
CO-3	To analyse the concepts of object-oriented approach to solve problems.
CO-4	To implement inheritance and multithreaded programming.
CO-5	To implement operator overloading, function overloading and visualization.
CO-6	To implement exception handling, file handling, database connectivity and GUI design.

Part	Content	CO
I	<b>Basics of Python Programming:</b> Features, History, future of python, writing and executing first python program, literal constants, variables and identifiers, data types, input operation, comments, reserved words, indentation, operators and expressions, expressions, type conversion. <b>Decision control statements:</b> Introduction, selection/conditional branching statements, basic loop structures/iterative statements, nested loops, break, continue and pass statements.	CO-1
	<b>Functions and Modules:</b> Introduction, function declaration and definition, function definition, function call, variable scope and lifetime, the return statement, recursive functions, lambda functions with map, reduce & filter, modules, packages in python, import and reload module, module- random, os, math, sys.	
II	<b>Strings:</b> Concatenating, appending and multiplying strings, immutability, string formatting operator, built-in string methods and function, string slicing with step size. <b>Lists:</b> access and update values in lists, nested and cloning lists, list slicing with step size, basic list operations, list methods, using lists as stack and queues, list comprehensions, looping in lists, basic tuple operations, tuple methods. <b>Sets:</b> Creating a set and set operations, set operators, set methods, frozen sets. <b>Dictionaries:</b> Creating a dictionary, accessing values, add, modify, delete, sort items in a dictionary, looping over a dictionary. <b>Date and Time:</b> Classes in Python date time module- date, time, date time, time delta, tzinfo and time zone.	CO-2
	<b>Classes and Objects:</b> Introduction, classes and objects, class method and self-argument, init ()method, class and object variables, del() method, other special methods, public and private datamembers, private methods, calling a class method from another class method, built-in class attributes, garbage collection, class and static methods.	CO-3
	<b>Inheritance:</b> Introduction, inheriting classes in python, types of inheritance, composition/containership/complex objects, abstract classes and interfaces, meta class. <b>Mutli threading:</b> Defining a thread, Thread Control Block (thread identifier, stack pointer, program counter, thread state, thread register set, parent process pointer), threading module and thread class (methods of thread class- run, start, join, isalive, getname, setname).	CO-4

III	<b>Operator Overloading:</b> Introduction, implementing operator overloading, operator overriding, <b>Function Overloading, Assertions and Exception Handling:</b> Introduction to errors and exceptions, handling exceptions, multiple except blocks, multiple exceptions in a single block, except block without exception, the else clause, raising exceptions, built-in and user-defined exceptions, the finally block, Assertions in python.	CO-5
IV	Analysing, reading and writing a formatted file (csv or tab-separated), matplotlib module and its implementation for data visualization, regular expressions, manipulating files and directories, text files: reading/writing text and numbers from/to a file, connectivity of Python with a database: CRUD operations.	CO-6

#### References:

- Programming Python, Mark Lutz, O'Reilly.
- Introduction to Computing and Problem-Solving Using Python, E. Balagurusamy, McGraw Hill Education.
- Python Crash Course, Eric Matthews.

4 <sup>th</sup> Semester		AGCS-21404: OPERATING SYSTEMS			
Internal Marks:	40		L	T	P
External Marks:	60		3	0	0
Total Marks:	100		Credits		3

**Course Outcomes:** After studying the course, students will be able to:

CO-1	Understand the basics of operating system like kernel, shell, types and views of operating system.
CO-2	Understand the concept of process, thread, concurrency and process scheduling algorithms.
CO-3	Gain knowledge about deadlock, deadlock prevention, deadlock avoidance and deadlock recovery.
CO-4	Familiarize with the concept of memory management, fragmentation, paging, segmentation, virtual memory and page replacement algorithms.
CO-5	Understand disk management and disk scheduling algorithms, file system interface.
CO-6	Gain knowledge about protection & security of operating systems.

Part	Content	CO
I	<b>Introduction:</b> Operating system and its classification -batch, interactive, multiprogramming, time-sharing, real-time system, multiprocessor systems, system call and its types, monolithic and microkernel systems, operating system components and views, operating system functions and services.	CO-1
	<b>Processes &amp; Process Synchronization:</b> Process concept, process states, process state transition diagram, process control block (pcb), threads and its types, principle of concurrency, producer / consumer problem, critical section problem, semaphores, classical problem in concurrency: readers writers problem.	CO-2
II	<b>Process Scheduling:</b> Process scheduling concept, types of schedulers-long term scheduler, short term scheduler, medium term scheduler, scheduling criteria: CPU utilization, throughput, turnaround time, waiting time, response time (definition only), scheduling algorithms- pre-emptive and non-pre-emptive, FCFS, SJF, priority, round robin.	
	<b>Deadlocks:</b> Definition, deadlock characteristics, deadlock prevention, deadlock avoidance: banker's algorithm, deadlock detection and recovery.	CO-3
III	<b>Memory Management:</b> Concept of memory and memory hierarchy, logical and physical address map, memory allocation: contiguous and non-contiguous memory allocation, fixed and variable partition, internal and external fragmentation and compaction, paging: principle of operation, page allocation, hardware support for paging, protection and sharing, disadvantages of paging, segmentation, basics of virtual memory, locality of reference, page fault, demand paging (Concepts only), Page replacement algorithms: Optimal (OPT), First in First Out (FIFO) and Least Recently used (LRU), thrashing.	CO-4
IV	<b>Device Management &amp; File System:</b> Disk scheduling: FCFS, SCAN, C-SCAN, LOOK, C-LOOK, SSTF, file concept, file organization and access mechanism.	CO-5
	<b>Protection and Security:</b> Goals and domain of protection, access matrix, program threats: virus, worms, trojan horse, trap door, denial of service attacks.	CO-6

#### References:

- Operating System Concepts, A Silberschatz and Peter B. Galvin, Addison Wesley Publishing Company.
- Systems Programming & Operating Systems, Dhamdhare, Tata McGraw Hill.
- Operating Systems Concepts, Gary Nutt, Pearson.
- Operating Systems by Madnick Donovan, Tata McGraw Hill. Strength of Materials by Gere, Cengage Learning.

4 <sup>th</sup> Semester		AGCS-21405: WEB DEVELOPMENT			
Internal Marks:	40		L	T	P
External Marks:	60		3	0	0
Total Marks:	100		Credits		3

**Course Outcomes:** After studying the course, students will be able to:

CO-1	Introducing the fundamentals of internet & its terminology and construction of basic websites using HTML.
CO-2	Understand design principles in CSS for making web pages presentable.
CO-3	Understanding Client-side scripting language like JavaScript.
CO-4	Understanding of Document Object Modelling and the JavaScript library.
CO-5	Understanding of server-side scripting language like AJAX.
CO-6	Developing modern interactive web applications using PHP and its database connectivity.

Part	Content	CO
I	<b>Internet and World Wide Web:</b> Introduction to internet, ISP, types of internet connections, web browsers, web servers, URLs, HTTP, web applications, tools for web site creation. <b>HTML5:</b> Introduction to HTML5, basic formatting tag, html color coding, grouping using div. span, lists, adding graphics to HTML5 page, creating tables, linking documents, forms, iframes.	CO-1
II	<b>Cascading Style Sheets:</b> Introduction and types, CSS selectors, CSS box model.	CO-2
	<b>Client-Side Scripting with JavaScript:</b> Introduction, programming constructs: variables, operators and expressions, conditional checking, functions and dialog boxes, event handler.	CO-3
III	<b>DOM:</b> Document Object- finding HTML elements, changing HTML elements, adding and deleting elements, changing HTML styles, form validations, handling cookies.	CO-4
	<b>jQuery:</b> Introduction, syntax, selectors, events, effects.	
IV	<b>AJAX:</b> Introduction, HTTP request, Creation of XML Http request object, methods & properties of XML Http request, Use of Get & Post method.	CO-5
	<b>Server-Side Scripting with PHP:</b> PHP syntax, variables, data types, operators, control structure, functions, array, working with PHP and MySQL, connecting to database.	CO-6

#### References:

- HTML, CSS, JavaScript, Perl, Python and PHP, Steven M. Schafer, Wiley India Textbooks.
- An Introduction to Web Design + Programming, Paul S. Wang, G. Keller, S. Katila, Cengage Learning.
- Web Technologies: A Computer Science Perspective, Jeffery C. Jackson, Pearson Education.
- Learning PHP, MySQL, and JavaScript, Robin Nixon, Shroff/O'Reilly.
- PHP and MySQL for Dynamic Web Sites: Visual QuickPro, Larry Ullman.



4 <sup>th</sup> Semester		AGCS-21406: RELATIONAL DATABASE MANGEMENT SYSTEMS LAB			
Internal Marks:	30		L	T	P
External Marks:	20		0	0	2
Total Marks:	50		Credits		1

<b>Course Outcomes:</b> After studying the course, students will be able to:	
CO-1	Understand the concept of Database Management System and its various applications in real life.
CO-2	Understand the concept of joins and sub queries.
CO-3	Understand the concept of normalizing tables for effective database design.
CO-4	Understand the different database languages i.e., (DDL, DML, DCL, and TCL) along with the usage of SQL and PL/SQL.
CO-5	Understand the concept of concurrent transactions, database security and handling deadlocks effectively.
CO-6	Develop an application using Oracle SQL and connecting it with a front-end technology.

Part	Experiment	CO
A	Introduction to SQL and installation of SQL Server / Oracle	CO-1
	Functions: character, number, date, and general functions, aggregate functions, grouping the result of a query, set operators, nested queries, joins, sequences.	CO-2
	Designing of multiple tables using the concept of normalization.	CO-3
	DDL, DML and DCL statements Use command to compute the size of a matrix, size/length of a particular row/column, load data from a text file, store matrix data to a text file, finding out variables and their features in the current scope. Create Table, alter table, drop statements. insert, update and delete statements. Working with Null Values, matching a pattern from a table, ordering the result of a query. PL/SQL anonymous block, running scripts, select-into statement, control statements. Cursors and its various types: implicit and explicit, parameterized cursors, cursor for loop. Exception handling: pre-defined and user-defined exceptions, functions and procedures, argument modes in functions and procedures-in, out, in out. Packages: specification and body, triggers and its various types. examples based on triggers.	CO-4
	Views, database security and privileges: grant and revoke commands, commit and rollback commands.	CO5
	List of suggested applications to be designed <ul style="list-style-type: none"> <li>• E-commerce</li> <li>• Flight reservation system</li> <li>• Restaurant management system</li> <li>• Railway reservation system</li> <li>• Inventory management system</li> <li>• Book store management system</li> <li>• Cineplex management system</li> <li>• Hotel booking management system</li> <li>• Medical store management system</li> <li>• Library management system</li> <li>• Banking management system</li> </ul>	CO6

4 <sup>th</sup> Semester		AGCS-21407: PROGRAMMING IN PYTHON LAB			
Internal Marks:	30		L	T	P
External Marks:	20		0	0	2
Total Marks:	50		Credits		1

**Course Outcomes:** After studying the course, students will be able to:

CO-1	To interpret the python syntax and semantics of control flow statements.
CO-2	To apply functions, modules and string handling in Python to solve problems.
CO-3	To determine the methods to create and manipulate programs with Python data structures list, tuple and dictionary.
CO-4	To analyse the concepts of object-oriented approach to solve problems.
CO-5	To design and implement GUI application and how to handle exceptions.
CO-6	To develop an application using the concepts of file handling and database connectivity.

Part	Experiment	CO
A	Use of Data Types, Integer Arithmetic, Variables and Assignment Use of Print Function, Branching programs, Strings and Input, Iteration	CO-1
	Implementation of Functions and Recursion Modules (random, math, os, sys)	CO-2
	Implementation of Tuples, List and Dictionaries Array and Matrices	CO-3
	Object-oriented Programming	CO-4
	Exception Handling Analysing data using CSV module File I/O, Reading CSV and Excel Files, Reading Text Files, Writing and Saving to Files	CO-5
B	List of suggested applications to be designed <ul style="list-style-type: none"> <li>• E-commerce</li> <li>• Flight reservation system</li> <li>• Restaurant management system</li> <li>• Railway reservation system</li> <li>• Inventory management system</li> <li>• Book store management system</li> <li>• Cineplex management system</li> <li>• Hotel booking management system</li> <li>• Medical store management system</li> <li>• Library management system</li> <li>• Banking management system</li> </ul>	CO-6

4 <sup>th</sup> Semester		AGCS-21408: OPERATING SYSTEMS LAB			
Internal Marks:	30		L	T	P
External Marks:	20		0	0	2
Total Marks:	50		Credits		1

Course Outcomes: After studying the course, students will be able to:	
CO-1	Understand the concept of operating system and installation of operating system.
CO-2	Utilize the concept of virtualization for creating a virtual machine and installing operating system on virtual machine.
CO-3	Execute Linux commands for files and directories, creating and viewing files, File comparisons, file manipulation, program execution, and printing text.
CO-4	Understand the concept of Vi editor.
CO-5	Demonstrate shell programming by using shell variables and shell keywords for automated system tasks.
CO-6	To demonstrate the concept of CPU scheduling and page replacement algorithms used in Operating systems.

Part	Experiment	CO
A	1. Installation of operating systems	CO-1
	2. Concept of Virtualization, Installation of Virtual Machine Software and Installation of Operating System on Virtual Machine.	CO-2
	3. Introduction to UNIX/Linux: Architecture, Features. Introductory Commands: date, cal, banner, write, mesg, who, passwd etc. Files and directories: pwd, mkdir, cd, ls, rmdir, chmod, chgrp, chown, cat, cp, mv, rm, cmp. Pipes, Filters and Redirection: Pipes, filters, redirection, tees, head, tail, wc, sort, grep etc. Processes: ps, kill etc.	CO-3
	4. Vi editor: Introduction, entering text, deleting text, modifying text.	CO-4
	5. Shell Programming-I: Features of the shell, Shell as a programming language, creating and executing shell scripts, shell variables, arithmetic and logical operators, tests, decision making: if...fi, if....else....fi.	CO-5
B	To demonstrate the concept of CPU scheduling and page replacement algorithms used in Operating systems, based on the content of AGCS-21408 (OPERATING SYSTEMS LAB)	CO-6

4 <sup>th</sup> Semester	AGCS-21409: WEB DEVELOPMENT LAB				
Internal Marks:	30		L	T	P
External Marks:	20		0	0	2
Total Marks:	50		Credits		1

**Course Outcomes:** After studying the course, students will be able to:

CO-1	Develop the Web pages using HTML.
CO-2	Design principles in CSS for beautification of Web Pages.
CO-3	Design the Interactive Web Pages using Client-Side Scripting Language.
CO-4	Creation of web pages using JQuery Library.
CO-5	Development using server-side Scripting Language.
CO-6	Develop the web site with Frontend & Backend Connectivity.

Part	Experiment	CO
A	<b>1. Creation of Web pages using HTML, DHTML</b> <ul style="list-style-type: none"> <li>➤ Basic HTML tags (font, heading, bold, italic, underline etc.)</li> <li>➤ HTML Ordered List tags.</li> <li>➤ HTML Unordered List tags.</li> <li>➤ HTML Definition List tags.</li> <li>➤ HTML List tags to create nested list.</li> <li>➤ Insert images in web pages.</li> <li>➤ HTML Table tag and its attributes.</li> <li>➤ HTML form tags and its attributes.</li> <li>➤ HTML frame tags.</li> </ul>	CO-1
	<ul style="list-style-type: none"> <li>➤ Web pages with CSS (inline, internal and external).</li> </ul>	CO-2
	<b>2. Creation of Web pages using JavaScript</b> <ul style="list-style-type: none"> <li>➤ Embedding of JavaScript into a webpage (Internal and external).</li> <li>➤ Using various Dialog boxes.</li> <li>➤ Changing webpage background.</li> <li>➤ Changing text of HTML element.</li> <li>➤ Event handling.</li> <li>➤ Create a calculator utility.</li> <li>➤ Validating user input.</li> <li>➤ Using DOM objects.</li> <li>➤ Creating and destroying of Cookies.</li> </ul>	CO-3
	<b>3. Creation of Web pages using jQuery</b> <ul style="list-style-type: none"> <li>➤ Event handling.</li> <li>➤ Applying various effects to HTML elements.</li> </ul>	CO-4
	<b>4. Creation of Web pages using AJAX</b> <ul style="list-style-type: none"> <li>➤ To retrieve text from a file and update a part of webpage.</li> </ul>	CO-5
B	To make a mini project that demonstrates a concept, based on the content of <b>AGCS-21409</b> .	CO-6

4 <sup>th</sup> Semester		AGAP-21401: ENGINEERING APTITUDE-I			
Internal Marks:	50		L	T	P
External Marks:	0		0	1	0
Total Marks:	50		Credits		1

**Course Outcomes:** After studying the course, students will be able to:

CO-1	Develop a Proper Understanding of the Number system
CO-2	Understand the Concept of HCF & LCM to solve problems related to Racetracks, Traffic lights etc.
CO-3	Recognize parts and wholes both visually and numerically
CO-4	Recognize and apply Ratios, Proportions and Percentage to solve real-life problems
CO-5	Recognize company's revenues and expenditures over a specified period of time
CO-6	Understand the concept of time value of money

Part	Content	CO
I	<b>Number System:</b> Various types of numbers, Face Value & Place value of a digit in a numeral, Divisibility Tests <b>Problems on Numbers:</b> To find Unknown numbers	CO-1
II	<b>HCF &amp; LCM:</b> Factors and multiples to find Highest Common Factor and Least Common Multiple of fractions, Comparison of Fraction	CO-2
	<b>Decimal and Fractions:</b> Operations on Decimal and Fractions	CO-3
III	<b>Ratio &amp; Proportion:</b> Tricks to Find ratio and Proportions <b>Percentage:</b> Concept of Percentage, Tricks to find Percentage	CO-4
IV	<b>Profit &amp; loss:</b> Cost Price, Selling Price, Profit, Loss, Profit Percentage and Loss Percentage	CO-5
	<b>Simple Interest and Compound Interest:</b> Interest computed annually, half yearly and Quarterly	CO-6

**References:**

- Quantitative Maths: Arihant Publishers.
- Objective Mathematics : R S Aggarwal.
- Quantitative Maths : TMH Publications

4 <sup>th</sup> Semester		AGFE-21402: FUNCTIONAL ENGLISH-II			
Internal Marks:	50		L	T	P
External Marks:	0		0	1	0
Total Marks:	50		Credits		1

<b>Course Outcomes:</b> After studying the course, students will be able to:	
CO-1	Self Introduction and Body Language to prepare students to face one to one interaction.
CO-2	Spoken Activity such as Topic Presentation or extempore to hone spoken skills of students.
CO-3	Vocabulary based session to improve language proficiency of students.
CO-4	Basic Grammar to make students proficient in English correspondence.
CO-5	Book reading to improve reading skills of students.
CO-6	Formal/ Informal Letter writing to make students proficient in written correspondence.

Part	Content	CO
I	Components of Self Introduction, Exemplary Performances, Student Performances on Self Introduction along with resume.	CO-1
II	This section includes Spoken Activity such as Topic Presentation or extempore to hone spoken skills of students.	CO-2
	This section includes Root words and its usage.	CO-3
III	This section includes editing, omission, gap filling, rearranging jumbled sentences to test knowledge of passive voice, reported speech, articles and the other determiners, modals, tense, etc. Basic Grammar such as Tenses, Voice, Narration shall be done.	CO-4
IV	IKIGAI shall be prescribed for honing reading skills and comprehension in depth.	CO-5
	Formal/ Informal Letter Writing, Basic Format, Example, Practice shall be done.	CO-6

#### References:

- [www.Indiabix.com](http://www.Indiabix.com)
- English Grammar by Wren and Martin
- [www.freshersworld.com](http://www.freshersworld.com)
- [www.alison.com](http://www.alison.com)

4 <sup>th</sup> Semester	(Mandatory Course) AGMC-21401: ESSENCE OF INDIAN KNOWLEDGE TRADITION				
Internal Marks:	-		L	T	P
External Marks:	-		1	0	0
Total Marks:	-		Credits		0

Part	Content	CO
-	<p><b>INTRODUCTION TO TRADITIONAL KNOWLEDGE:</b> Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge</p> <p><b>PROTECTION OF TRADITIONAL KNOWLEDGE:</b> Protection of traditional knowledge: The need for protecting traditional knowledge Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.</p> <p><b>LEGAL FRAMEWORK AND TK:</b> The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act); The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indicators act 2003.</p> <p><b>TRADITIONAL KNOWLEDGE AND INTELLECTUAL PROPERTY</b> Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.</p> <p><b>TRADITIONAL KNOWLEDGE IN DIFFERENT SECTORS:</b> Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK. 139.</p>	-

#### References:

- Traditional Knowledge System in India, by Amit Jha, 2009.
- Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan 2012.
- Knowledge Traditions and Practices of India, Kapil Kapoor<sup>1</sup>, Michel Danino<sup>2</sup>

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**SYLLABUS**

**B. Tech. (CSE): 5<sup>th</sup> SEM**