University of Engineering & Management

Institute of Engineering & Management

IT, CSE & Allied Branches

Semester V (Third year) Curriculum									
Sl. No.	Type of course	Code	New Code	Course Title	Hours per week				Credits
					Lecture	Tutorial	Practical	Sessional	
Theory Papers									
1	Engineering Science Course	ESC501	ESC501	Signals & Systems	3	0	0	0	3
2	Professional Core Courses	PCCCS501	PCCCS501	Database Management Systems	3	0	0	0	3
3	Professional Core Courses	PCCCS502	PCCCS502	Theory of Computations	3	0	0	0	3
4	Professional Core Courses	PCCCS503	PCCCS503	Operating Systems	3	0	0	0	3
5	Professional Core Courses	PCCCS504	PCCCS504	Artificial Intelligence & Machine Learning	3	0	0	0	3
6	Humanities &Sciences including Management course	HSMC501	HSMCS501	Humanities II (Industrial Project Management)	3	0	0	0	3
7	Mandatory Course	MC501	MCC501	Constitution of India	1	-	-	-	0.5

8	Humanities &Sciences including Management course	HSMC502	ESP(CS)501	Essential Studies for Professionals – V (CS)	2	0	0	0	0.5
Total					**21**	**0**	**0**	**0**	**19**
Practical Papers									
1	Professional Core Courses	PCCCS591	PCCCS 591	Introduction to Database Systems Lab	0	0	4	0	2
2	Professional Core Courses	PCCCS593	PCCCS593	Operating Systems Lab	0	0	4	0	2
3	Professional Core Courses	PCCCS594	PCCCS594	Artificial Intelligence & Machine Learning Lab	0	0	4	0	2
Total					**0**	**0**	**12**	**0**	**6**
Sessional Papers									
1	Humanities &Sciences including Management course	HSMC582	SDP581	Skill Development for Professionals - V	0	0	0	2	0.5
2	Innovative Project	PROJ CS501	PRJCS581	Innovative Project – III	0	0	0	0	1
3	Professional Core Course (Mandatory)		PCCCS581	Quantum Computing	0	0	0	2	1
4	Mandatory Additional Requirements (MAR)	MAR581	MAR	Mandatory Additional Requirements	0	0	0	0	0

5	MOOCs (Mandatory for Honours)	MOOCs	MOOCS	Massive Open Online Courses	-	-	-	-	-
6	IFC	IFC	IFC	Industry and Foreign Certification	0	0	0	0	0
Total					**0**	**0**	**0**	**4**	**2.5**
Total					**21**	**0**	**12**	**4**	**27.5**

University of Engineering and Management

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University of Engineering & Management, Jaipur

Syllabus for B.Tech Admission Batch 2022

Subject Name: Signals & Systems **Credit: 3** **Lecture Hours: 30**

Subject Code: ESC501 **Study Material:** study material for signal & system.docx

Course Outcomes:

At the end of this course, students will demonstrate the ability to
CO1. Understand the concepts of continuous time and discrete time signals.
CO2. Evaluate the frequency spectra for different kind of signals.
CO3. Analyze different transformations for continuous and discrete signals.
CO4. Design sampling frequency and filters to recover the original signal.

Module number	Topic	Sub-topics	Mapping with Industryand International Academia	Lecture Hours	Chapter from Book	Corresponding Lab Assignment
1	**Introduction to Signals and Systems**	Signals and systems as seen in everyday life, and in various branches of engineering and science. Energy and power signals, continuous and discrete time signals, continuous and discrete amplitude signals. System properties: linearity: additivity and homogeneity, shift- invariance, causality, stability, realizability. Linear shift-invariant (LSI) systems, impulse response and step response, convolution, input- output behavior with aperiodic convergent inputs. Characterization of causality and stability of linear shift invariant systems. System representation through differential equations.	***International Academia:*** (https://ocw.mit.edu/courses/6-003-signals-and-systems-fall-2011/pages/lecture-notes/) ***AICTE-prescribed syllabus:*** (https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_EE.pdf) ***Industry Mapping:*** MATLAB,SCILAB	10	Signals and Systems,P.Ramesh Babu, R. Anandanatarajan **Chapter 1,2**	1. Simulation of different signals using MATLAB 2. Different operations on signals. 3. Introduction to programming usingMATLAB
2	**Signal operation of LTI systems**	Periodic and semi-periodic inputs to an LSI system, the notion of a frequency response and its relation to the impulse response, Fourier series representation, the Fourier Transform, convolution/multiplication and their effect in the frequency domain, magnitude and phase response, Fourier domain duality. The Discrete-Time Fourier Transform (DTFT) and the Discrete Fourier Transform (DFT). Parseval's Theorem. The idea of signal	**International Standards:** (https://ocw.mit.edu/courses/6-003-signals-and-systems-fall-2011/pages/lecture-notes/) ***AICTE prescribed syllabus:*** (https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_EE.pdf) ***Industry Mapping:*** MATLAB, OCTAVE	8	Signals and Systems,P.Ramesh Babu, R. Anandanatarajan **Chapter 3,4**	1. Different operations on continuous time signals using MATLAB , Convolution, Correlation , Auto correlation.

		space and orthogonal bases.				
3	**Fourier, Laplace and z-Transforms:**	Evolution of Transforms: Fourier Transform, Laplace Transform , Z-transform (single sided and Double sided) .The Laplace Transform, notion of eigen functions of LSI systems, a basis of eigen functions, region of convergence, poles and zeros of system, , solution to differential equations and system behavior using Laplace Transformation. The z-Transform for discrete time signals and systems- eigen functions, region of convergence, z-domain analysis.	***International Standards*** : (https://ocw.mit.edu/courses/6-003-signals-and-systems-fall-2011/pages/lecture-notes/) ***AICTE prescribed syllabus:*** (https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_EE.pdf) ***Industry Mapping:*** Hardware Chipset (DSP KIT) Software: MATLAB, OCTAVE	8	Signals and Systems,P.Ramesh Babu, R. Anandanatarajan **Chapter 5,6,7,8**	1. Transformation of signals into time and frequency domain Using MATLAB 2. DTFT, DFT transformation using MATLAB.

4	**Introduction to Sampling and Reconstruction:**	The Sampling Theorem and its implications- Spectra of sampled signals. Reconstruction: ideal interpolator, zero-order hold, first-order hold, and so on. Aliasing and its effects. Relation between continuous and discrete time systems.	***International Standards:*** (https://ocw.mit.edu/courses/6-003-signals-and-systems-fall-2011/pages/lecture-notes/) ***AICTE prescribed syllabus:*** (https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_EE.pdf) ***Industry Mapping:*** FPGA Kit Software: MATLAB, OCTAVE	Signals and Systems, P.Ramesh Babu, R. Anandanatarajan **Chapter 9**	1. Implementation of sampling using MATLAB. 2. Quantization implementation using MATLAB. 3. Reconstruction of signals using MATLAB

Suggested Learning Resources:

Text Books

1. Signals and Systems,P.Ramesh Babu, R. Anandanatarajan
2. A. V. Oppenheim, A. S. Willsky and S. H. Nawab, "Signals and systems", Prentice Hall India,1997.
3. S. Haykin and B. V. Veen, "Signals and Systems", John Wiley and Sons, 2007.

Reference Books

1. J. G. Proakis and D. G. Manolakis, "Digital Signal Processing: Principles, Algorithms, andApplications", Pearson, 2006.
2. H. P. Hsu, "Signals and systems", Schaum's series, McGraw Hill Education, 2010.
3. A. V. Oppenheim and R. W. Schafer, "Discrete-Time Signal Processing", Prentice Hall, 2009.
4. M. J. Robert "Fundamentals of Signals and Systems", McGraw Hill Education, 2007.
5. B. P. Lathi, "Linear Systems and Signals", Oxford University Press, 2009.

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Syllabus for B.Tech Admission Batch 2022

Subject Name: Introduction to database systems **Credit: 3** **Lecture Hours: 36**

Subject Code: PCCCS501

Pre-requisite: Fundamental concepts of set theory and designing.

Relevant Links:

Study material **Coursera** **NPTEL** **Linkedin Learning** **Infosys Springboard**

COURSE OBJECTIVES:

1. To introduce database systems, data models, database languages and the diagrammatic approach to design database systems.
2. To introduce the logical and mathematical formulation concept on database systems and further extend these concept towards learning database implementation languages.
3. To develop understanding on relational database design.
4. To understand the internal operations on a database systems and the storage architecture of data concepts.

COURSE OUTCOMES:

CO1: Students will have a proper understanding on database system and design.
CO2: Students will learn the concepts of database designing using logical and mathematical concepts like relational algebra and calculus which further will be extended to learning of SQL.
CO3: Students will gather the understanding of relation database design through the concept of normalization.
CO4: Students will learn the internals of DBMS through proper understanding of transaction and further the storage architecture of data for a database system.

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment	Text Book details with chapter no. mapping
1	**Introduction to database systems and Entity-Relationship Model**	Concept & Overview of DBMS, Data Models [2L] Database Languages, Database Administrator, Database Users, Three Schema architecture of DBMS [2L] E-R modelling - Basic concepts, Design Issues, Mapping Constraints[2L] Keys, Entity-Relationship Diagram [2L] Weak Entity Sets, Extended E-R features [2L]	***International Academia:*** 1. https://ocw.mit.edu/courses/6-830-database-systems-fall-2010/ 2. https://ocw.mit.edu/courses/6-5830-database-systems-fall-2023/ ***AICTE-prescribed syllabus:*** ***https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf*** ***Industry Mapping:***	10L	Designing of E-R modelling using StarUML or any other standard designing software.	**1.Database system concepts – By Abraham Silberschatz, Henry Korth, and S. Sudarshan (6^{th} ed.) Chapter - 1,2,7** **2.Fundamentals of database systems – By Ramez Elmasri, Sham Navathe. (7^{th} ed.) Chapter - 1,2,3**

			StarUML Downloading link https://staruml.io/download/ Diagram design online using Draw.io https://app.diagrams.net/			
2	**Introduction to Relational Model and SQL & Integrity Constraints**	Structure of relational Databases, Relational Algebra operations, examples and exercise [2L] Relational Calculus - operations, examples and exercise [2L] Extended Relational Algebra Operations, Views, Modifications Of the Database[2L] Concept of database languages - DDL, DML, DCL[1L] Basic Structure, Set operations, Aggregate Functions, Null Values [2L] Domain Constraints, Referential Integrity Constraints, assertions, views [2L] Joins [1L] Nested Subqueries [1L] Stored procedures and triggers, Overview of Query Optimization [1L]	***International Academia:*** 1. https://ocw.mit.edu/courses/6-830-database-systems-fall-2010/ 2. https://ocw.mit.edu/courses/6-5830-database-systems-fall-2023/ ***AICTE-prescribed syllabus:*** ***https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf*** ***Industry Mapping:*** ORACLE 10g	14L	Queries on the following – 1. Table creation. 2. Data insertion, deletion, updation in table. 3. Aggregation functions on data. 4. Concepts of keys in table. 5. Concept of Joins. 6. Subquries & Nested subqueries. 7. PL SQL programming. 8. Stored procedures and triggers – concept. Some of the sample	**1.Database system concepts – By Abraham Silberschatz, Henry Korth, and S. Sudarshan (6^{th} ed.) Chapter - 3,4,6** **2.Fundamentals of database systems – By Ramez Elmasri, Sham Navathe. (7^{th} ed.) Chapter -5,6,7,8**

			https://www.oracle.com/in/database/technologies/xe-downloads.html		queries- https://docs.google.com/document/d/1Pbg5YkwTHC11qqjjMvbNcDHxR-2TMIb1/edit?usp=drive_link&ouid=107146940537629597388&rtpof=true&sd=true	
3	**Relational Database Design**	Functional Dependency, Different anamolies in designing a Database [1L] Armstrong axioms, closure of attribute set[1L] Equivalence of functional dependency [1L] Canonical Cover [1L] Keys, types of keys, finding no. of candidate keys [2L] Normalization using funtional dependencies – 1NF, 2NF, 3NF, BCNF, multivalued dependencies - concept of 4NF, 5NF [2L] Decomposition using normal forms [1L] Losseless or Lossy decomposition [1L]	***International Academia:*** 1. https://ocw.mit.edu/courses/6-830-database-systems-fall-2010/ 2. https://ocw.mit.edu/courses/6-5830-database-systems-fall-2023/ ***AICTE-prescribed syllabus:*** ***https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf*** ***Industry Mapping:*** ORACLE 10g https://www.oracle.com/in/database/technologies/xe-downloads.html	10L		**1.Database system concepts – By Abraham Silberschatz, Henry Korth, and S. Sudarshan (6th ed.) Chapter - 8** **2.Fundamentals of database systems – By Ramez Elmasri, Sham Navathe. (7th ed.) Chapter -14, 15**

4	**Internals of RDBMS And File Organization & Index Structures**	Concept of transactions and schedules, ACID properties [2L] Transaction processing, Concurrency control – conflict and view serializability [2L] Recovery Management : transaction model properties, state serializability, lock base protocols, two phase locking [2L] File & Record Concept, Placing file records on Disk, Fixed and Variable sized Records [2L] Types of Single-Level Index (primary, secondary, clustering), Multilevel Indexes[2L] Dynamic Multilevel Indexes using B tree and B+ tree [2L]	***International Academia:*** 1. https://ocw.mit.edu/courses/6-830-database-systems-fall-2010/ 2. https://ocw.mit.edu/courses/6-5830-database-systems-fall-2023/ ***AICTE-prescribed syllabus:*** ***https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf*** ***Industry Mapping:*** ORACLE 10g https://www.oracle.com/in/database/technologies/xe-downloads.html	12L		**1.Database system concepts – By Abraham Silberschatz, Henry Korth, and S. Sudarshan (6th ed.) Chapter - 11,14,15,16** **2.Fundamentals of database systems – By Ramez Elmasri, Sham Navathe. (7th ed.) Chapter-16,17,20, 21**

TEXT BOOKS:

1. Database system concepts – By Abraham Silberschatz, Henry Korth, and S. Sudarshan (6th ed.), McGraw-Hill.
2. Fundamentals of database systems – By Ramez Elmasri, Sham Navathe. (7th ed.), Pearson.

REFERENCE BOOKS:

1. Database Management Systems, by Raghu Ramakrishnan, WCB/McGraw-Hill.
2. Database Management System (DBMS): A Practical Approach, by Chopra Rajiv, S. Chand Publishing.

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University of Engineering & Management, Jaipur

Syllabus for B.Tech Admission Batch2022

Subject Name: Theory of Computations **Credit: 3** **LectureHours:36**

Subject Code: PCCCS502

Pre-requisite: Elementary discrete mathematics includes the notion of set, function, relation, product, partial order, equivalence relation, graph & tree. They should have a thorough understanding of the principle of mathematical induction.

Relevant Links:

Study Material Coursera NPTEL LinkedIn Learning InfosysSpringboard

COURSE OBJECTIVES:

1. Understand models and abstractions: automata as a basic model of computation
2. Link between languages, automata, and decision problems.
3. Understand product, union, closure properties and algebraic formalisms of languages such as regular expressions, context-free grammar.
4. Understand algorithms and computability through the lens of Turing machines.

COURSE OUTCOMES:

CO 1: After studying Finite Automata, student will be able to define a system and recognize the behavior of a system. They will be able to minimize a system and compare different systems.
CO2: After studying regular language and grammar student will convert Finite Automata to regular expression. Students will be able to check equivalence between regular linear grammar and FA.
CO3: After studying CFG and PDA Students will be able to minimize context free grammar. Student will be able to check equivalence of CFL

and PDA. They will be able to design.
CO4: After studying turing machine Students will be able to design Turing machine.

Module number	Topic	Sub-topics	Text Book Name & Chapter Number	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	**Finite Automaton**	Introduction to concepts of alphabet, language, production rules, grammar and automaton, finite state model, concept of DFA and its problems, concept of NFA and its problems. NFA to DFA conversion, Construction of DFA & NFA for any given string and vice versa, Minimization of FA and equivalence of two FA, Mealy & moore machine and their problems. Limitations of FSM.	T1-Ch1, Ch2	***International Academia:*** (https://ocw.mit.edu/courses/18-404j-theory-of-computation-fall-2020/pages/syllabus/) ***AICTE-prescribed syllabus:*** (https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf) ***Industry Mapping:*** JFLAP, VAS, TAGS and SimStudio	9	1. Design a Finite State Machine (FSM) that accepts all strings over input symbols {0, 1} having three consecutive 1's as a substring. 2. Design a Finite State Machine (FSM) that accepts all strings over input symbols {0, 1}

						which are divisible by 3. 3. Design a Finite State Machine (FSM) that accepts all decimal string which are divisible by 3.
2	**Grammars, Regular Languages**	Introduction to the concept of Chomosky Classification of Grammar, language generation from production rules and vice- versa. Regular language and regular expressions, identity rules. Arden's theorem state and prove, Construction of NFA from regular expression, Conversion of NFA with null moves to without null moves, closure properties, pumping lemma and its applications, proof of pumping lemma.	T2- Ch2, Ch3, Ch4	**International Standards** :(https://ocw.mit.edu/courses/18-404j-theory-of-computation-fall-2020/pages/syllabus/)	9	

				AICTE prescribed syllabus: (https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf) ***Industry Mapping:*** JFLAP, VAS, TAGS and SimStudio		
3	**Context-free Languages and machine models.**	Introduction to Context Free Grammer, Derivation trees, sentential forms. Right most and leftmost derivation of strings, concepts of ambiguity. Minimization of CFG, Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages, Enumeration of properties of CFL (proofs included). Closure property of CFL, Ogden's lemma & its applications, Push Down Automata: Push down automata, definition and description, Acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence, Equivalence of CFL and PDA, interconversion, DCFL and DPDA.	T2- Ch5, Ch6, Ch7, Ch8	***International Standards***: (https://ocw.mit.edu/courses/18-404j-theory-of-computation-fall-2020/pages/syllabus/) ***AICTE prescribed syllabus:*** (https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf) ***Industry Mapping:*** JFLAP, VAS, TAGS and SimStudio	10	1. Design a Push Down Automata (PDA) that accepts all string having equal number of 0's and 1's over input symbol {0, 1} for a language 0n1n where n >= 1. 2. Design a Program to create PDA machine

						that accept the well-formed parenthesis.

4	**Turing machines and Computability**	Turing Machine : Turing Machine, definition, model, Design of TM, Computable functions, Church's hypothesis, counter machine, Types of Turing machines (proofs not required), Universal Turing Machine, Halting problem, P, NP. Recursively enumerable (r.e.) and recursive languages. Existence of non-r.e. languages. Notion of undecidable problems. Universal language and universal TM. Separation of recursive and r.e. classes. Notion of reduction. Some undecidable problems of TMs. Rice's theorem.	T1- Ch8, Ch9, Ch10	***International Standards:*** (https://ocw.mit.edu/courses/18-404j-theory-of-computation-fall-2020/pages/syllabus/) ***AICTE prescribed syllabus:*** (https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf) ***Industry Mapping:*** JFLAP, VAS, TAGS and SimStudio	8	1. Design a Turing Machine that calculate 2's complement of given binary string. 2. Design a Turing Machine which will increment the given binary number by 1.

TEXT BOOK:

T1. Introduction to Automata, Theory, Languages and Computation. Third Edition. John Hopcroft, Rajeev Motwani, Jeffrey D. Ullmann, Pearson Publications (Low-cost Indian edition available).

T2. Peter Linz, An Introduction to Formal Languages and Automata, Narosa Pub. House, 2011

T3. Introduction to the Theory of Computation, 3rd edition. Michael Sipser, Cengage Publications (Lowcost Indian edition available).

REFERENCEBOOKS:

1. Automata and Computability, Dexter C. Kozen. Part of the Undergraduate Texts in Computer Science book series (UTCS), Springer.

2. Elements of the Theory of Computation, 2nd edition. Harry Lewis, Christos Papadimitriou, Prentice

3. Dr. R.B.Patel, Theory of Computation, Khanna Publishing House

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Syllabus for B.Tech Admission Batch 2022

Subject Name: Operating Systems **Credit: 3** **Lecture Hours: 36**

Subject Code: PCCCS503

Pre-requisite: Basic knowledge of Data Structures and Computer Organization.

Relevant Links:

Study Material Coursera NPTEL Linkedin Learning Infosys Springboard

COURSE OBJECTIVES:

1. Students will learn how Operating System is Important for Computer System.
2. To make aware of different types of Operating System and their services.
3. To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
4. To know virtual memory concepts.
5. To learn secondary memory management.

COURSE OUTCOMES:

CO 1: Students will be able to understand the different services provided by Operating System and different scheduling algorithms at different level.

CO 2: Students will be able to learn synchronization techniques to avoid deadlock.

CO 3: Students will acquire a knowledge about different memory management techniques like paging, segmentation and demand paging etc.

CO 4: students will have a comprehensive understanding of I/O hardware and software principles, secondary-storage structures, file management, and disk management.

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Textbook with Chapter mapping	Lab Assignment
1	**Introduction**	Generations & Concept of Operating Systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating System. Processes: Definition, Process Relationship, Different states of a Process, Process State Transitions, Process Control Block (PCB), Context switching. Thread: Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads. Process Scheduling: Foundation and Scheduling	***International Academia:*** (https://online.stanford.edu/courses/cs111-operating-systems-principles) ***AICTE-prescribed syllabus:*** (https://www.aicte-india.org/education/model-syllabus) ***Industry Mapping:*** Linux, OSSim	**Text Book1:** **Chapters:** **1,2,3,4,5** **Text Book2:** **Chapters:** **1,2,3,4**	1. System program assignment using basic linux commands (cd, pwd, mkdir, ls, cp, mv, wc etc.), meta characters, grep commands, regular expression parameters,

		objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF, RR, Priority. Multiprocessor scheduling. (10 L)			modifying file access privileges and string manipulation. 2. WAP to implement FCFS, preemptive and non-preemptive SJF, Round Robin, preemptive and non-preemptive Priority scheduling algorithm (in programming language of your choice). 3. Simulate the above mentioned scheduling algorithms using OSSim.
2	**Inter-process Communication**	Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Producer Consumer Problem, Dinning Philosopher Problem. Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery. (10 L)	**International Standards** :(https://online.stanford.edu/courses/cs111-operating-systems-principles) ***AICTE prescribed syllabus:*** (https://www.aicte-india.org/education/model-syllabus) ***Industry Mapping:*** SimOS	**Text Book1:** **Chapters:** **6,7** **Text Book2:** **Chapters:** **5,6**	1. Create a program with two threads that increment and decrement a shared variable using semaphores to ensure proper synchronization. 2. Implement a solution to the classic producer-consumer problem using

					semaphores. 3. Simulate Banker's Algorithm using SimOS.
3	**Memory Management**	Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation– Fixed and variable partition– Internal and External fragmentation and Compaction; Paging: Principle of operation –Page allocation Disadvantages of paging. Virtual Memory: Basics of Virtual Memory –Locality of reference, Page fault, Working Set, Dirty page/Dirty bit – Demand paging, Page Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not Recently used (NRU) and Least Recently used (LRU). (10 L)	**International Standards** :(https://online.stanford.edu/courses/cs111-operating-systems-principles) ***AICTE prescribed syllabus:*** (https://www.aicte-india.org/education/model-syllabus) ***Industry Mapping:*** OSSim	**Text Book1:** **Chapters:** **8,9** **Text Book2:** **Chapters:** **7,8**	1. Compare and contrast different memory allocation algorithms such as first-fit, best-fit, and worst-fit. Implement these algorithms and evaluate their performance in terms of fragmentation, throughput, and average waiting time for allocation requests using OSSim.
4	**I/O Hardware, File and Disk Management**	I/O Hardware: I/O devices, Device controllers, Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance. Disk Management: Disk structure, Disk scheduling: FCFS, SSTF, SCAN, C SCAN, Disk reliability, Disk	**International Standards**: (https://online.stanford.edu/courses/cs111-operating-systems-principles) ***AICTE prescribed syllabus:*** (https://www.aicte-india.org/education/model-syllabus) ***Industry Mapping:*** OSSim	**Text Book1:** **Chapters:** **10,11,12** **Text Book1:** **Chapters:** **11,12**	1. Simulate the Disk scheduling algorithms using OSSim. 2. Design and implement a bootstrap loader for a simple operating system.

		formatting, Boot-block, Bad blocks (6 L)			

TEXT BOOK:

1. Operating System Concepts Essentials, 9th Edition by Abraham Silberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.

REFERENCE BOOKS:

1. Operating System Concepts, Ekta Walia, Khanna Publishing House (AICTE Recommended Textbook – 2018).
2. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing.

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श्रद्धावान लभते ज्ञानम्
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Syllabus for B.Tech Admission Batch 2022

Subject Name: Artificial Intelligence & Machine Learning **Credit:** 3 **Lecture Hours:** 40

Subject Code: **PCCCS504**

Prerequisites: Mathematics, Data structure and Algorithms

Relevant Links:

Study Material NPTEL Coursera Linkedin Learning

Course Objective:

Obj 1. The students will understand the basics concepts of Artificial Intelligence and Machine Learning.
Obj 2. They will also learn and will be able to apply different AI and ML models to various datasets.

Course Outcome:

CO 1. Understand the basic concepts and techniques of Artificial Intelligence and Machine Learning.
CO 2. Analyze various AI and ML techniques and algorithms
CO 3. Apply AI and ML algorithms for solving practical problems.
CO 4. Explain how sequential models and transformer models work

Module Number	Topic	Sub- Topic	Mapping with Industry and International Academia	Lecture Hour	Corresponding Lab Assignment
1	Introduction to AI	Introduction Artificial Intelligence and its applications, Artificial Intelligence Techniques, Level of models, criteria of success, Intelligent Agents, Nature of Agents, Learning Agents. AI Techniques, advantages, and limitations of AI, Impact and Examples of AI, Application domains of AI. The AI Ladder - The Journey for Adopting AI Successfully, Advice for a career in AI, Hotbeds of AI Innovation.	*AICTE-prescribed syllabus:* https://www.aicte-india.org/sites/default/files/UG_Emerging.pdf *International Academia:* *https://ocw.mit.edu/courses/6-034-artificial-intelligence-fall-2010/resources/lecture-1-introduction-and-scope/* *Industry Mapping:* ***Python***	4	Basic Programs using Python From https://onlinecourses.swayam2.ac.in/aic20_sp33/preview
Artificial Intelligence by Rich and Knight Chapter 1, 2					

Module Number	Topic	Sub- Topic	Mapping with Industry and International Academia	Lecture Hour	Corresponding Lab Assignment
2	Problem solving techniques	State space search, control strategies, heuristic search, problem characteristics, production system characteristics., Generate and test, Hill climbing, best first search, A* search, Constraint satisfaction problem, Mean-end analysis, Min-Max Search, Alpha-Beta Pruning, Additional refinements, Iterative Deepening.	*AICTE-prescribed syllabus:* https://www.aicte-india.org/sites/default/files/UG_Emerging.pdf *International Academia:* *https://ocw.mit.edu/courses/6-034-artificial-intelligence-fall-2010/resources/lecture-1-introduction-and-scope/* *Industry Mapping:* ***Python***	10	**1. Python programming, symbolic algebra.** **2. Implementation of Depth first search, Breadth first search** **3. Implementation of A* search** **4. Implementation of bi-directional search** **5. Implementation of Decision Tree Classifier.**
Artificial Intelligence by Rich and Knight Chapter 3, 12;					

Module Number	Topic	Sub- Topic	Mapping with Industry and International Academia	Lecture Hour	Corresponding Lab Assignment
3	Introduction to ML	What Is Machine Learning, How Do We Define Learning; what are datasets and how to handle them, Feature sets, Dataset division: test, train and validation sets, Holdout, cross validation, k Cross validation, random sampling LOOCV, Bootstrap sampling; Fitting of data; **Evaluation Measures:** SSE, MME, R2, Confusion Matrix, Precision, recall, F-Score, Kappa, ROC- Curve, Cross-Entropy Loss.	*AICTE-prescribed syllabus:* *https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf* *International Academia:* *https://ocw.mit.edu/courses/6-036-introduction-to-machine-learning-fall-2020/* *Industry Mapping:* ***Python***	6	**1. Implementation of Splitting real life data using** **a. Holdout,** **b. K Fold,** **c. Stratified K Fold,** **d. Leave-One-Out (LOO),** **e. Leave-P-Out (LPO),** **f. Shuffle Split.** **1. Compare them.** **2. Bootstrap Sampling.** **3. WAP to construct** **a. AUC-ROC curve** **b. Confusion matrix** **4. WAP Scale features in a given dataset**
Machine Learning, Tom M. Mitchell, McGraw Hill Education Chapter 1,2					

Module Number	Topic	Sub- Topic	Mapping with Industry and International Academia	Lecture Hour	Corresponding Lab Assignment
4	Supervised & Unsupervised learning techniques	Supervised: Classification and Regression: Binary, Multi-label, Multiclass, Imbalance; K-Nearest Neighbour, Linear Regression, Logistic Regression, Support Vector Machine (SVM), Decision Tree. Unsupervised: Introduction to clustering, Types of Clustering: Hierarchical, Agglomerative Clustering and Divisive clustering; Partitioned Clustering - K-means clustering, Association Analysis(Ginni)	*AICTE-prescribed syllabus:* *https://www.aicte-india.org/sites/default/files/Model_Curriculum/ AICTE%20-%20UG%20CSE.pdf* *International Academia:* *https://ocw.mit.edu/courses/6-036-introduction-to-machine-learning-fall-2020/* *Industry Mapping:* ***Python***	10	**1. Implementation on real life data** **1. Multi-class Classification** **2. Multi-label Classifications** **1. Implementation on real life data KNN** **2. Implementation on real life data Linear regression** **4. Implementation on real life data Naïve Base, Gaussian Naive Bayes** **5. Implementation on real life data SVM** **6. Implementation on real life data with** Decision **Tree** **7. Implementation on real life data Association Rule Mining** **8. Implementation on real life data with Ginni**
Machine Learning, Tom M. Mitchell, McGraw Hill Education, Chapter 3,6,8					

Module Number	Topic	Sub- Topic	Mapping with Industry and International Academia	Lecture Hour	Corresponding Lab Assignment
5	Introduction to Deep Learning	Neural Network Architecture: Biological vs artificial neuron, Definition and Evolution of ANN, Perceptron, XOR problem, non-linearity, activation functions, stochastic gradient descent, loss functions, multi-layered perceptron, Backpropagation. Convolutional Neural Networks: Filter based image processing, convolution-1D, 2D, 3D, subsampling, rectified-linear units, fully-connected layers, CNN design principles, Applications (AlexNet, VGGNet, ResNet)	*AICTE-prescribed syllabus:* *https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf* *International Academia:* *https://www.coursera.org/learn/convolutional-neural-networks* *Industry Mapping:* TensorFlow Keras, PyTorch	10	Introduction to TensorFlow Keras, PyTorch https://www.coursera.org/learn/introduction-tensorflow **1. Implementation of different activation functions to train Neural Network.** **2. Implementation of Perceptron Networks** **3. Build Artificial Neural Network model with back propagation on a real life dataset.**
"Generative Deep Learning" by David Foster, publisher Oreilly, Chapter 1 to 5.					

Module Number	Topic	Sub- Topic	Mapping with Industry and International Academia	Lecture Hour	Corresponding Lab Assignment
6	Generative AI and Large Language Models	Introduction to Generative Artificial Intelligence (GANs and VAEs), Introduction to Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU): Types of RNN Layers for Sequential Data, Introduction to Generative Adversarial Networks(GANs) and Variational Autoencoders (VAEs), Large Language Models (LLMs) and Transformer Architecture.	*AICTE-prescribed syllabus:* *https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf* *International Academia:* *https://www.coursera.org/learn/convolutional-neural-networks* *Industry Mapping:* TensorFlow Keras, PyTorch	10	Introduction to TensorFlow Keras, PyTorch https://www.coursera.org/learn/introduction-tensorflow
"Generative Deep Learning" by David Foster, publisher Oreilly, Chapter 6					

TEXT BOOK:

1. Machine Learning, Tom M. Mitchell, McGraw Hill Education, 2017.
2. Artificial Intelligence by Rich and Knight, The McGraw Hill, 2017
3. Ian Goodfellow, YoshuaBengio, Aaron Courville. Deep Learning, the MIT press, 2016

Reference book:

1. Artificial Intelligence: A modern approach by Stuart Russel, Pearson Education, 2010
2. Machine Learning for Dummies, By John Paul Mueller and Luca Massaron, For Dummies, 2016
3. "Deep Learning" Bishop, Bishop, Springer
4. Artificial Intelligence & Generative AI for Beginners, The Complete Guide, David M. Patel, Independently published 2023

Online resources:

1. https://nptel.ac.in/courses/106102220
2. https://nptel.ac.in/courses/106105077
3. https://nptel.ac.in/courses/106106139
4. https://onlinecourses.nptel.ac.in/noc20_cs81/previe
5. https://onlinecourses.nptel.ac.in/noc20_cs49/preview
6. https://www.coursera.org/learn/machine-learning-duke
7. https://www.linkedin.com/learning/artificial-intelligence-foundations-machine-learning-22345868?trk=course_title&upsellOrderOrigin=default_guest_learning
8. https://www.mooc-list.com/course/transformer-models-and-bert-model-coursera
9. https://www.coursera.org/learn/nlp-sequence-models

Mandatory Prerequisite: https://www.linkedin.com/learning/learning-python-14393370 To be completed before the starting of the class.

List of Mini Projects

#	Project Title	Project Detail
1	AI-powered Legal Documentation Assistant	https://sih.gov.in/sih2023PS#:~:text=AI%2Dpowered%20Legal%20Documentation%20Assistant
2	Use of Digital Technology to calculate water footprints for different daily use items.	https://sih.gov.in/sih2023PS#:~:text=Use%20of%20Digital%20Technology%20to%20calculate%20water%20footprints%20for%20different%20daily%20use%20items
3	Digital Assistant for Legal Awareness and Designing a KYR Know-Your-Rights framework in India	https://sih.gov.in/sih2023PS#:~:text=Digital%20Assistant%20for%20Legal%20Awareness%20and%20Designing%20a%20KYR%20Know%2DYour%2DRights%20framework%20in%20India
4	AI-powered Legal Documentation Assistant	https://sih.gov.in/sih2023PS#:~:text=AI%2Dpowered%20Legal%20Documentation%20Assistant
5	Projection of the extent of inundation corresponding to the forecasts of flood levels in a river.	https://sih.gov.in/sih2023PS#:~:text=Projection%20of%20the%20extent%20of%20inundation%20corresponding%20to%20the%20forecasts%20of%20flood%20levels%20in%20a%20river

#	Project Title	Project Detail
6	Development of AI, ML and Chat boat-powered Interactive Robot Mascot (Chacha Chaudhary) and digital avatar to strengthen the river people connect component of Namami Gange.	https://sih.gov.in/sih2023PS#:~:text=Development%20of%20AI%2C%20ML%20and%20Chat%20boat%2Dpowered%20Interactive%20Robot%20Mascot%20(Chacha%20Chaudhary)%20and%20digital%20avatar%20to%20strengthen%20the%20river%20people%20connect%20component%20of%20Namami%20Gange
7	AI-enabled water well predictor	https://sih.gov.in/sih2023PS#:~:text=AI%2Denabled%20water%20well%20predictor
8	Automatic regulation of valves for release of water based upon soil moisture availability in the root zone of the crop, using artificial intelligence, in a piped and micro irrigation network of irrigation system.	https://sih.gov.in/sih2023PS#:~:text=Automatic%20regulation%20of%20valves%20for%20release%20of%20water%20based%20upon%20soil%20moisture%20availability%20in%20the%20root%20zone%20of%20the%20crop%2C%20using%20artificial%20intelligence%2C%20in%20a%20piped%20and%20micro%20irrigation%20network%20of%20irrigation%20system
9	Al-based Generative design of Hydro power plants.	https://sih.gov.in/sih2023PS#:~:text=Al%2Dbased%20Generative%20design%20of%20Hydro%20power%20plants
10	Developing an AI-powered energy management system for industrial commercial facilities to optimize energy consumption.	https://sih.gov.in/sih2023PS#:~:text=Developing%20an%20AI%2Dpowered%20energy%20management%20system%20for%20industrial%20commercial%20facilities%20to%20optimize%20energy%20consumption

#	Project Title	Project Detail
11	Chatbot to respond to text queries pertaining to various Acts, Rules, and Regulations applicable to Mining industries	https://sih.gov.in/sih2023PS#:~:text=Chatbot%20to%20respond%20to%20text%20queries%20pertaining%20to%20various%20Acts%2C%20Rules%2C%20and%20Regulations%20applicable%20to%20Mining%20industries
12	Forecasting and scheduling of railway rakes.	https://sih.gov.in/sih2023PS#:~:text=Forecasting%20and%20scheduling%20of%20railway%20rakes
13	Air and water quality index and environment monitoring	https://sih.gov.in/sih2023PS#:~:text=Air%20and%20water%20quality%20index%20and%20environment%20monitoring
14	AI Assisted Tele-medicine KIOSK for Rural India	https://sih.gov.in/sih2023PS#:~:text=AI%20Assisted%20Tele%2Dmedicine%20KIOSK%20for%20Rural%20India
15	360-degree feedback software for the Government of India related News Stories in Regional Media using Artificial Intelligence / Machine Learning	https://sih.gov.in/sih2023PS#:~:text=360%2Ddegree%20feedback%20software%20for%20the%20Government%20of%20India%20related%20News%20Stories%20in%20Regional%20Media%20using%20Artificial%20Intelligence%20/%20Machine%20Learning

University of Engineering and Management

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Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur

Syllabus for B.Tech Admission Batch 2022

Subject Name: Industrial Project Management **Credit: 3** **Lecture Hours: 4**

Subject Code: HSMCS501

Course Outcome:

1) To impart among students the concept of the project, its characteristics, and its management subject to given constraints to successfully deliver the agreed outcomes of the project.

2) To imbibe students with the knowledge of effective project planning, project evaluating, and project scheduling with optimal resource allocation.

3) To familiarize the students with the concept of various risk management principles of a project.

4) To impart among students the legal and quality aspect of project management.

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Practical (Hands On) Questions
1	**Project Management Concepts** **Project Management Life Cycle** **Project Planning**	Concept and Characteristics of a Project, Types of Projects, Project Management (Need, Knowledge Areas, Project Manager, Project Management Triangle, Project Scope and Scope Creep, Importance of Project Management). - Chapter 24 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman Project Management Life Cycle Phases, Project Management Process (Project Process, Process Group, Process Interactions, Customization, Process Group and Knowledge Area Matrix), Project Feasibility - types and checkpoints in the Project Management, Financial Analysis (NPV, ROI, IRR); Development Productivity Index (DPI); Screening Process. - Chapter 27 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman Planning Need, Importance of Planning, Planning Process,	*International Academia:* *https://inside.tamuc.edu/academics/cvSyllabi/syllabi/201820/20507.pdf* *AICTE-prescribed syllabus:* *Industry Mapping:* *https://grow.google/intl/en_in/project-management-course/* *https://www.coursera.org/learn/project-management-foundations* *https://www.coursera.org/professional-certificates/google-project-management*	10	1. You're managing a project to upgrade a production line. During the project, the client requests additional features that weren't in the original scope. The new features will add cost and delay the schedule. How would you approach this situation? 2. A key engineer on your team gets sick and will be out for several weeks. This critical resource is needed to complete a crucial project phase. What steps would you take to mitigate the impact on the project schedule? 3. There's a potential risk of a material shortage that could delay your project. How would you identify and develop a mitigation plan for this risk? 4. Imagine a disagreement between your engineering team and the operations team about a new equipment installation process. How would you facilitate communication and find a solution that works for both parties? 5. During project execution, you realize there's a potential cost overrun due to unforeseen

		Work Breakdown Structure and Organization Breakdown Structure, Roles, Responsibility and Teamwork, Feasibility Studies. - Chapter 26 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman			circumstances. How would you manage this situation and keep the project on budget?
2	**Project Evaluation** **Project Scheduling**	Investment Analysis of Projects (Time Value of Money, Interest Rates, Compounding/Discounting, Payback Period, Average Rate of Return, Net Present Value, Profitability Index, Internal Rate of Return), Sources of Finance. - Chapter 26 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman Importance of Project Scheduling, Scheduling Techniques (Gantt Chart and Line of Balance, Network Analysis – CPM/PERT, Slack and Float). - Chapter 27 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman	International Standards *https://inside.tamuc.edu/academics/cvSyllabi/syllabi/201820/20507.pdf* *AICTE prescribed syllabus:* *Industry Mapping:* *https://grow.google/intl/en_in/project-management-course/* *https://www.coursera.org/learn/project-management-foundations* *https://www.coursera.org/professional-certificates/google-project-management*	10	6. Many industrial projects involve complex scheduling and resource allocation. Which project management software tools or techniques would you use to manage your project effectively? 7. Develop a project plan for expanding a manufacturing facility. Define the project scope, identify key stakeholders, create a Work Breakdown Structure (WBS), and estimate a project timeline and budget. 8. Simulate the launch of a new industrial product. This includes defining project goals, creating a communication plan for different stakeholders, identifying potential risks and mitigation strategies, and developing a project schedule using Gantt chart or project management software. 9. Develop a maintenance schedule for a complex industrial machine. This involves identifying

	Project Cost Control	Direct and Indirect Cost, Normal Cost and Crash Cost, Time– Cost Trade-off Analysis - Optimum Project Duration, Resource Allocation and Leveling. - Chapter 26 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman			maintenance tasks, estimating durations, allocating resources (personnel, tools), and considering dependencies between tasks. You can use Critical Path Method (CPM) techniques for scheduling. 10. Simulate the inventory management process for a production line. This could involve setting reorder points, determining safety stock levels, and analyzing the impact of lead times and supplier delays.
3	**Project Risk Management**	Project risk Management and Mitigation Strategies; Social cost-benefit analysis. Project Control. Project Management measuring, monitoring and tracking techniques; Resource allocation and scheduling and purchasing. - Chapter 28 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman	International Standards *https://inside.tamuc.edu/academics/cvSyllabi/syllabi/201820/20507.pdf* *AICTE prescribed syllabus:* *Industry Mapping* *https://grow.google/intl/en_in/project-management-course/* *https://www.coursera.org/learn/project-management-foundations* *https://www.coursera.org/professional-certificates/google-project-management*	8	11. Develop a communication plan for a complex industrial project with diverse stakeholders (e.g., engineers, production team, investors). Define communication channels, frequency, and content tailored to each stakeholder group. 12. Identify potential risks associated with a specific industrial project (e.g., equipment failure, raw material price fluctuation). Analyze the probability and impact of each risk, and propose mitigation strategies to minimize their impact on the project. 13. Select a project management software like Microsoft Project or Primavera P6. Use the software to create a project schedule and resource allocation plan for a chosen industrial project scenario. 14. Develop a cost estimation spreadsheet for an industrial project. Include categories for

					material costs, labor costs, equipment rental, and contingency reserves. Use formulas to calculate total project cost based on user input for quantities and unit prices.
4	**Legal and Quality Aspects of Project Management** **IT in Projects**	Project Contract (Types of Contract, Sub-Contracting, Tenders, Payment to Contractors), Project Audit. Chapter 30 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman Overview of types of Software for Projects, Major Features of Project Management Software like MS Project, Criterion for Software Selection. Chapter 30 - Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman	International Standards *https://inside.tamuc.edu/academics/cvSyllabi/syllabi/201820/20507.pdf* *AICTE prescribed syllabus:* *Industry Mapping* *https://grow.google/intl/en_in/project-management-course/* *https://www.coursera.org/learn/project-management-foundations* *https://www.coursera.org/professional-certificates/google-project-management*	10	**Microsoft Project:** 1. Product Development Schedule: Create a project schedule in Microsoft Project for developing a new industrial product. Include tasks like market research, design, prototyping, testing, and manufacturing. Define task dependencies, durations, and resource assignments. Estimate the project timeline and critical path. 2. Production Line Upgrade Plan: Develop a project plan in Microsoft Project for upgrading a production line. Include tasks like equipment procurement, installation, training, and testing. Utilize features like resource leveling to avoid resource conflicts and identify potential bottlenecks. 3. Budget Tracking: Simulate project budget tracking in Microsoft Project. Set up a baseline budget and track actual costs incurred for different project tasks. Use earned value management (EVM) techniques to analyze project performance and identify potential cost

					overruns. **JIRA:** 1. Bug Tracking and Issue Management: Simulate a software development project in JIRA. Create user stories, break them down into tasks (issues), and assign them to team members. Use JIRA workflows to track the progress of issues (e.g., To Do, In Progress, Done). 2. Agile Project Management: Set up an Agile board in JIRA for managing a software development project. Create user stories and epics, prioritize them in a backlog, and manage sprints using Kanban boards. Use JIRA reporting features to track sprint progress and identify roadblocks. 3. Defect Reporting and Resolution: Simulate a defect management process for a manufactured product. Create issues in JIRA to report defects identified during testing or customer feedback. Assign issues to relevant personnel for investigation and resolution. Track the progress of defect resolution and document fixes. **Combined Assignment:** 1. Integrated Project Management: Combine Microsoft Project and JIRA to manage a complex industrial project. Use Microsoft Project for overall project planning and scheduling. Create high-level tasks and link them to corresponding user stories and issues managed in JIRA for detailed development or

					execution.

Linkedin Learning Courses:

1. Project Management Foundations: https://www.linkedin.com/learning/project-management-foundations-15528659?u=229219690
2. Operations Management Foundations: https://www.linkedin.com/learning/operations-management-foundations?u=229219690
3. Project Management Simplified: https://www.linkedin.com/learning/project-management-simplified-2019?u=229219690
4. Managing JIRA Projects: https://www.linkedin.com/learning/managing-jira-projects-1-introduction?u=229219690
5. Essential New Skills in Project Management: https://www.linkedin.com/learning/paths/essential-new-skills-in-project-management?u=229219690
6. Microsoft Project Step by Step: Planning for Successful Project Management - https://www.linkedin.com/learning/microsoft-project-step-by-step-planning-for-successful-project-management?u=229219690

Coursera Courses:

1. Foundations of Project Management (Sponsored by Google): https://www.coursera.org/learn/project-management-foundations
2. Introduction to Operations Management:: https://www.coursera.org/learn/project-management-foundations

InfosysSpringBoard Courses:

1. Project Management: https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013842648856764416196 98_shared/overview
2. Ethics and Project Management: https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013501555390570496790 8/overview

Study Material: https://drive.google.com/file/d/1wv7HaGdY5gv7-3R-WbUhLPcy4RD94pEd/view?usp=sharing

Textbooks:

1. Software Engineering A PRACTITIONER ' S APPROACH by Roger S Pressman
P. Gopalkrishnan and R. M. Moorthy; Text Book of Project Management, Macmillan
2. K. Nagarajan; Project Management, New Age International Publishers; 5th Edn.
3. P. Chandra; Projects; Tata McGraw Hill; 6th Edn.
4. J. M. Nicholas; Project Management for Business and Technology – Principles and Practice; Prentice Hall India; 2nd Edn.
5. H. Maylor; Project Management; Pearson; 3rd Edn.
6. Kamaraju Ramakrishna : Essential of Project Management

Reference Books:

1) S. A. Kelkar; Software Project Management: A concise Study; Prentice Hall India; 2nd Edn.
2) F. K. Levy, J. D. Wiest; A Management Guide to PERT/CPM with GERT/PDM/DCPM and other networks; Prentice Hall India, 2nd Edn.
3) J. Mantel, J. R. Meredith, S. M. Shafer, M. M. Sutton, M. R. Gopalan; Project Management: Core Text Book, Wiley India, 1st Indian Edn.
4) L. C. Jhamb; Industrial Management-II; Everest Publishing House; 10th Edn.
5) S. N. Chary; Production and Operation Management; Tata McGraw Hill
6) Clements, Gido; Effective Project Management; Thomson Learning
7) C. F. Gray, E. W. Larson; Project Management; Tata McGraw Hill; 3rd Edn.
8) S.C. Sharma & T.R.Banga, Industrial Engineering & Management, Khanna Book Publishing Co. (P) Ltd.

University of Engineering and Management

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Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur

Syllabus for B.Tech Admission Batch 2022

Subject Name: Constitution of India **Credit: 0.5**
Lecture Hours: 10 **Subject Code: MCC501**

Pre-requisite: Some idea about professional life and society

COURSE OBJECTIVES:

CO1: Remembering and understanding the salient features of the Indian Constitution.
CO2: Analyzing the workings of Union, State and local governments.
CO3: Identifying and analyzing the function of the judiciary.
CO4: Understanding the function of local Governments and developing attitude and skills for critical analysis of social policy and development plans.

Module number	Topic	Sub topics	Mapping with Industry and International Academia	Lecture /tutorial Hours	Chapter Number of Text Book
1	Introduction to Indian Constitution	Indian Constitution: Sources and constitutional history Features: Citizenship, Preamble, Fundamental Rights and Duties Directive Principles of State Policy		2	1,2,3,4,6,7,8,9

2	Union	Union government and its administration: Structure of the Indian Union Centre- State relationship President: Role, power and position PM and Council of ministers, Cabinet and Central Secretariat Lok Sabha, Rajya Sabha State government and its administration: Governor: Role and Position, CM and Council of ministers, State Secretariat: Organisation, Structure and Functions		3	12,13,14,15,17,18,19,20,22, 31,32,33
3	Judiciary	Supreme court: Organization of supreme court, procedure of the court, independence of the court, jurisdiction and power of supreme court High court: Organization of		2	26-29, 34-37

		high court, procedure of the court, independence of the court, jurisdiction Subordinate courts: constitutional provision, structure and jurisdiction National legal services authority, Lok adalats, family courts, gram-nyayalays. Public interest litigation (PIL): meaning of PIL, features of PIL, scope of PIL, principle of PIL, guidelines for admitting PIL			
4	Local Government	Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation Pachayati raj: Introduction, PRI: Zila Pachayat,		3	38-41

		Elected officials and their roles, CEO Zila Pachayat: Position and role, Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy			

Text Book:

1. Indian polity, M, Laxmikanth, MC Graw Hill education, 5th Edition.

References:

1. DD Basu, “Introduction to the constitution of India”, 21st Edition, Lexis Nexis Books Publication ltd, India.

University of Engineering and Management

Institute of Engineering & Management, Salt Lake Campus
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur

Syllabus for B.Tech Admission Batch 2022

Subject Name: Quantum Computing **Credit: 1**

Lecture Hours: 20 **Subject Code: PCCCS581**

Pre-requisite: Linear Algebra

Syllabus

Module I (4L)
Introduction: Elementary quantum mechanics: linear algebra for quantum Mechanics, Quantum states in Hilbert space,The Bloch sphere

Module II (4L)
Quantum correlations: Bell inequalities and entanglement, teleportation.

Module III(4L)
Quantum cryptography: quantum key distribution

Module IV (4L)
Quantum gates and algorithms: Universal set of gates, quantum circuits, Deutsch-Jozsa algorithm, factoring, Shor's algorithm, Grover's Search Algorithm

Module V (4L)
Programming a quantum computer: Performing basic operations using Qiskit, coding a quantum computer using a simulator to carry out basic quantum measurement and state analysis (construction of Qubits and different types of Quantum gates).

Textbook:

1. Michael A. Nielsen and Issac L. Chuang, "Quantum Computation and Information, Cambridge (2002).

References:

2. Mikio Nakahara and Tetsuo Ohmi, "Quantum Computing", CRC Press (2008).
3. N. David Mermin, "Quantum Computer Science",Cambridge (2007)