

Eight Semester Syllabus

Sl No.	Type	Subject Code	Topic	L	T	P	S	Credit Points
THEORY								
1.	PEC	PECS801	Elective - IV	3	0	0	0	3
2.	OEC	OECS801	Open Elective - II	3	0	0	0	3
3.	OEC	OECS802	Open Elective - III	3	0	0	0	3
4.	HSSM	ESP801	Essential Studies for Professionals – VIII (CS)	2	0	0	0	0.5
SESSIONAL								
5.	HSSM	SDP881	Skill Development for Professionals - VIII	0	0	0	2	0.5
6.	PROJ	PRJCS881	Project – III	0	0	0	12	6
7.		PCCCS881	Grand Viva-Voce	0	0	0	0	2
8.		INP881	Internship – II	0	0	0	0	4
MANDATORY REQUIREMENTS								
Sl. No.	Type of course	Course Code	Course Name	Hours per week				Score/Credit/Count
9.	MAR	MAR	Mandatory Additional Requirements (Score)	0	0	0	0	0
10.	MOOCs	MOOCs	Massive Open Online Course (Credit)	0	0	0	0	0
11.	IFC	IFC	Industry and Foreign Certification (Count)	0	0	0	0	0
12.	SAR	SAR	Skills As Additional Requirement	-	-	-	-	0
TOTAL				11	0	0	14	22

Professional Elective

Type	Choice - 1 (A) Track: Network & Security	Choice – 2 (B) Track: Artificial Intelligence & Data Science	Choice -3 (C) Track: Theory & Systems	Choice-4 (D) Track: Applications
PE- IV	Data Encryption and Compression (PECS801A)	Advanced AI (PECS801B)	Real Time Operating Systems (PECS801C)	Human Computer Interaction (PECS801D)

Open Elective

Type	Option - 1	Option – 2
OE- II	Soft Skills and Interpersonal Communication (OECS801A)	History of Science and Engineering (OECS801B)
OE - III	Cyber Law and IPR (OECS802A)	Introduction to Philosophical Thoughts (OECS802B)



University of Engineering and Management, Kolkata

University of Engineering and Management, Jaipur

Institute of Engineering & Management, Kolkata

Computer Science and Engineering (Artificial Intelligence and Machine Learning)

Detailed Syllabus

Course Code- PECS801A

Course Title – Data Encryption and Compression

Credit – 3

Category – Professional Core Course

Semester – VIII

L:T:P:S – 3:0:0:0

Pre-requisite – Linear Algebra, Computer Networks, Cryptography and Network Security

Course Outcomes:

CO1	Students will understand lossless & lossy compression principles, modeling techniques, Huffman, arithmetic dictionary-based coding.
CO2	Students will learn audio compression fundamentals including psychoacoustic models, companding, MP3 st
CO3	Students will analyze image compression approaches including PCM, DPCM, JPEG, motion estimation, ME
CO4	Students will be able to understand cryptographic algorithms, message integrity techniques, authentication malware defenses, digital certificates, Kerberos and SSL.

Study Material	Coursera	NPTEL	Linkedin Learning	Infosys Springb
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Module No.	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	Lossless & Lossy Text Compression	Lossless compression, Lossy compression Measure of performance Modeling and coding Types of models Coding techniques Minimum variance Huffman encoding	International Academia: ☐ MIT OpenCourseWare – Data Compression: https://ocw.mit.edu/courses/6-241j-dynamic-programming-and-stochastic-control-spring-2011/	8	1 Implement Huffman coding and decoding. 2 Implement Adaptive Huffman coding. 3 Implement Arithmetic coding.

		Extended Huffman coding, Adaptive Huffman coding Arithmetic coding Dictionary-based coding (LZ77, LZ78, LZW) Run-Length Encoding	□ Stanford – Data Compression Resources: https://web.stanford.edu/class/ee398a/ □ IEEE Data Compression Community: https://ieeexplore.ieee.org/browse/conferences/title □ Industry Tools: MATLAB, zlib, gzip, 7-Zip algorithms		4 Implement LZ77 and LZ78 compression. 5 Compare compression ratios of RLE, LZW and Huffman.
2	Audio Coding & Psychoacoustic Modeling	Digital audio basics Frequency masking and temporal masking Lossy audio compression μ-law and A-law companding MP3 audio standard	International Academia: □ MIT OCW – Digital Signal Processing: https://ocw.mit.edu/courses/6-341-discrete-time-signal-processing-fall-2005/ □ AES (Audio Engineering Society): https://aes.org □ Industry Mapping: Audacity, FFmpeg, MP3 encoders	6	6 Implement μ-law and A-law companding. 7 Frequency masking simulation in MATLAB/Python. 8 Generate and compress audio using MP3 tools (FFmpeg).

3	Image Coding Principles	PCM, DPCM JPEG standard Intra-frame coding Motion estimation and compensation Introduction to MPEG-2 Introduction to H.264 encoder & decoder	□ MIT OpenCourseWare – Digital Image Processing: https://ocw.mit.edu/courses/6-450-principles-of-digital-communication-i-fall-2006/ □ Stanford – Image & Video Compression: https://stanford.edu/class/ee398b/ □ Industry Tools: OpenCV, MATLAB, FFmpeg, H.264 encoders	8	9. Implement JPEG DCT-based compression. 10 Implement DPCM for grayscale images. 11 Motion estimation using block matching techniques. 12 Encode & decode videos using MPEG-2 / H.264 tools.
4	Cryptography & Information Security	Security goals Cryptography: Monoalphabetic and polyalphabetic ciphers Substitution & transposition ciphers Stream vs block cipher Symmetric vs asymmetric cipher AES, DES, RSA, Diffie–Hellman Steganography Cryptanalysis Message integrity & authentication MAC, Hash functions, HMAC Digital Signature Algorithm	International Academia: □ MIT OCW – Computer Systems Security: https://ocw.mit.edu/courses/6-858-computer-systems-security-fall-2014/ □ Stanford – Applied Cryptography: https://crypto.stanford.edu/ □ Industry Mapping: Kali Linux, Wireshark, OpenSSL, Splunk, Cisco Security	14	□ Implement classical ciphers. □ Implement AES and DES algorithms. □ RSA key generation and encryption. □ Perform hashing using SHA algorithms. □ Implement HMAC. □ Build a simple firewall rule set. □ IDS simulation using Snort. □ Implement SSL communication in a client-server program.

		Malware, Intruders Intrusion Detection Systems Firewalls, Antivirus techniques Digital Immune Systems Biometric authentication Ethical hacking Kerberos Digital certificates SSL			
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Textbooks:

1. **Data Compression and Cryptography** – J. S. Katre, Pravin Goyal, TechKnowledge Publications
2. **Data Compression: The Complete Reference (3rd Ed.)** – David Salomon, Springer

Reference books:

1. **Data Compression: Methods and Theory** – James A. Storer

Course Name: Advanced Artificial Intelligence

Course Code: PECS801B

Credit – 3

Category – Professional Core Course

Semester – VIII

L:T:P:S – 3:0:0:0

Course Objectives

- To deepen understanding of symbolic logic, resolution principles, and their applications in AI.
- To explore fuzzy logic and advanced fuzzy systems for decision-making under uncertainty.
- To examine heuristic search techniques, focusing on A* search and its admissibility proof.
- To introduce generative AI models, their theoretical underpinnings, and applications in artificial intelligence.

Syllabus (Topics)	Mapping with Industry & Academia	Contact Hours	Assignment Questions	References + External Resources

Module 1: Logic and Resolution in AI Predicate & Propositional Logic, WFF, Clausal Form, Skolemization, Unification, Resolution Refutation, Linear & Input Resolution, Subsumption, and Iterative Deepening.	Industry: Automated reasoning, formal verification, logic programming. Academia: NPTEL Logic for CS, MIT OCW Logic.	9	Convert WFF to clausal form; Implement unification; Apply resolution for theorem proving.	Russell & Norvig – Artificial Intelligence: A Modern Approach. NPTEL: https://nptel.ac.in/courses/106/104/106104028/ MIT OCW Logic: https://ocw.mit.edu/courses/24-241-logic-i-fall-2005/
Module 2: Fuzzy Logic and Advanced Fuzzy Systems Fuzzy sets, membership functions, Mamdani/Sugeno systems, Defuzzification, Fuzzy clustering, Type-2 fuzzy sets, Applications in control, vision, prediction.	Industry: Control systems, robotics, medical diagnosis. Academia: NPTEL Soft Computing, MIT OCW AI research topics.	9	Design a Mamdani-type inference system; Apply defuzzification techniques; Implement fuzzy clustering.	Zadeh – Fuzzy Sets. NPTEL Soft Computing: https://nptel.ac.in/courses/106/106/106106134/ MIT AI Topics: https://ocw.mit.edu/courses/6-034-artificial-intelligence-fall-2010/

Module 3: Advanced Heuristic and A* Search Algorithms Heuristics, Evaluation functions, A*, Admissibility & Consistency proofs, Optimality, Applications in planning, robotics, game AI.	Industry: Robotics navigation, game AI, optimization . Academia: NPTEL AI Search, MIT OCW AI.	9	Implement A* algorithm; Prove admissibility of heuristics; Apply A* for pathfinding.	Russell & Norvig – AI: A Modern Approach. NPTEL AI Search: https://nptel.ac.in/courses/106/105/106105078/ MIT OCW AI: https://ocw.mit.edu/courses/6-034-artificial-intelligence-fall-2010/
Module 4: Generative AI and Applications in Artificial Intelligence Generative AI overview, GAN architecture, VAE theory, Latent space, Diffusion models, Advanced generative learning, Ethics & Bias.	Industry: Image synthesis, data augmentation, creative AI, analytics. Academia: NPTEL Deep Learning, MIT OCW Generative Models.	9	Implement a simple GAN; Train a VAE encoder-decoder; Analyse ethical issues in generative AI.	Goodfellow et al. – GANs. NPTEL Deep Learning: https://nptel.ac.in/courses/106/106/106106184/ MIT Generative Models: https://ocw.mit.edu/courses/6-819-advances-in-computer-vision-fall-2018/

Books

1. Russell, S., & Norvig, P. (2010). "Artificial Intelligence: A Modern Approach." *Pearson.*
2. Zadeh, L. A. (1965). "Fuzzy Sets." *Information and Control*.
3. Goodfellow, I., et al. (2014). "Generative Adversarial Nets." Proceedings of the 2014 Conference on Neural Information Processing Systems.

Course Code- PECS801C
Course Title – Real Time Operating Systems
Credit – 3
Category – Professional Elective Course
Semester – VIII
L:T:P:S – 3:0:0:0
Pre-requisite – Operating Systems

Course Outcomes:

CO1	Students will be able to explain the fundamental concepts and characteristics of real-time systems.
CO2	Students will be able to distinguish between various real-time task models and scheduling requirements.
CO3	Students will be able to analyze and design solutions for resource sharing and dependency issues in real-time systems using protocols such as Priority Inheritance, Priority Ceiling, and Stack Resource Policy.
CO4	Students will be able to evaluate and compare scheduling strategies and architectural considerations in multiprocessor and distributed real-time systems, and examine the features of commercial RTOS such as VxWorks, QNX, and FreeRTOS.

Study Material	Coursera	NPTEL	Linkedin Learning	Infosys Springboard
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Module No.	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Textbook Mapping
1	Fundamentals of Real-Time Systems	Introduction to Real-Time Systems: Characteristics of real-time systems, Hard vs soft real-time tasks, Real-time system models, Real-time operating system requirements.	International Academia: (MIT Open Courseware): https://web.mit.edu/16.070/www/year2001/RTOS27.pdf AICTE-prescribed syllabus: https://onlinecourses.nptel.ac.in/noc22_cs104/preview - Industry Mapping: VxWorks, QNX, FreeRTOS, ThreadX	4	Textbook-1 Chapters: 1 Textbook-2 Chapters: 1, 2
2	Real-Time Scheduling	Real-Time Task Scheduling: Clock-driven and event-driven scheduling, Aperiodic, periodic, and sporadic tasks. Performance metrics: latency, jitter, response time. Introduction to uniprocessor scheduling,	International Academia: (MIT Open Courseware):	8	Textbook-1 Chapters: 2 Textbook-2 Chapters: 3

		Rate Monotonic Scheduling (RMS), Earliest Deadline First (EDF).	https://web.mit.edu/16.070/www/year2001/RTOS27.pdf AICTE-prescribed syllabus: https://onlinecourses.nptel.ac.in/noc22_cs104/preview_ Industry Mapping: VxWorks, QNX, FreeRTOS, ThreadX3		
3	Multiprocessor RT Scheduling and Resource Management	Scheduling in Multiprocessor and Distributed Systems: Partitioned vs global scheduling, Load balancing and task migration, Real-time scheduling in distributed architectures, Fault tolerance strategies. Handling Resource Sharing and Dependencies: Resource Access Protocols (RAP), Priority Inheritance Protocol (PIP), Priority Ceiling Protocol (PCP), Stack resource policy, Dependency handling among tasks, Deadlock avoidance and detection.	International Academia: (MIT Open Courseware): https://web.mit.edu/16.070/www/year2001/RTOS27.pdf AICTE-prescribed syllabus: https://onlinecourses.nptel.ac.in/noc22_cs104/preview Industry Mapping: VxWorks, QNX, FreeRTOS, ThreadX	14	Textbook-1 Chapters: 3, 4
4	Commercial RTOS	Characteristics of commercial RTOS, Case studies: VxWorks, QNX, RTLinux, FreeRTOS, Micrium µC/OS. RTOS kernel architecture, Task management, interprocess communication (IPC)	International Academia: (MIT Open Courseware): https://web.mit.edu/16.070/www/year2001/RTOS27.pdf AICTE-prescribed syllabus:	10	Textbook-1 Chapters: 5

			https://onlinecourses.nptel.ac.in/noc22_cs104/preview_ Industry Mapping: VxWorks, QNX, FreeRTOS, ThreadX		
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Textbooks:

1. Rajib Mall, Real-Time Systems: Theory and Practice, Pearson Education, 2007.
2. C. M. Krishna, Kang G. Shin, Real-Time Systems, McGraw-Hill, 2010.

Reference books:

1. Jane W. S. Liu, Real-Time Systems, Pearson Education, 2009.
2. 4. Philip A. Laplante, Seppo J. Ovaska, Real-Time Systems Design and Analysis, Wiley, 2012.

Online Resources:

https://onlinecourses.nptel.ac.in/noc22_cs104/preview

Course Code- PECS801D

Course Title – Human Computer Interaction

Credit – 3

Category – Professional Core Course

Semester – VIII

L:T:P:S – 3:0:0:0

Pre-requisite – Basic knowledge of Software Engineering and Python

Course Outcomes:

CO1	Understand the basics of interactive system design, usability, and GUI prototyping tools.
CO2	Apply cognitive models and laws to analyze human performance in interactive systems.
CO3	Evaluate user interfaces using design guidelines, principles, and usability evaluation methods.
CO4	Develop interactive GUI applications using Python Tkinter and AI-based design tools.

<u>Study Material</u>	<u>Coursera</u>	<u>NPTEL</u>	<u>Linkedin Learning</u>	<u>Infosys Springb</u>
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Module No.	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	Introduction to interactive system design	Introduction, Historical evolution of the field, Concept of usability definition and elaboration, HCI and software engineering, GUI design and aesthetics, Prototyping techniques, GUI design Tool: Figma	International Academia: MIT OpenCourseWare: https://ocw.mit.edu/courses/6-831-user-interface-design-and-implementation-spring-2011/	8	Hands-on GUI Design with the help of Figma

			AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf Industry Mapping: Figma		
2	Cognitive architecture, and model-based Design and evaluation	Introduction to cognitive architecture and types, relevance of cognitive architecture in interactive system design, Model Human Processor (MHP) Introduction to different types of models, GOMS family of models (KLM and CMN-GOMS), Fitts' law and HickHyman's law	International Academia: MIT OpenCourseWare: https://ocw.mit.edu/courses/6-831-user-interface-design-and-implementation-spring-2011/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf Industry Mapping:	10	Case studies on model based design
3	Design guidelines and dialog design in HCI	Shneiderman's eight golden rules, Norman's seven principles, Norman's model of interaction, Nielsen's ten heuristics with example of its use, Heuristic evaluation, Contextual inquiry, Cognitive walkthrough Introduction to formalism in dialog design, design using FSM (finite state machines), State charts and (classical) Petri Nets in dialog design	International Academia: MIT OpenCourseWare: https://ocw.mit.edu/courses/6-831-user-interface-design-and-implementation-spring-2011/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf Industry Mapping:	8	Case studies on dialog design

4	GUI Design using Python & AI Tools	GUI & Event-Driven Programming, Basics of Tkinter, Creating Windows, Mainloop, Geometry Settings, Tkinter Widgets: Label, Entry, Button, Text, Frame, Radio button, Checkbox, Listbox, Combobox, Messagebox, Layout Management, Variables & Event Handling, Menus & Advanced design with AI tools.	International Academia: MIT OpenCourseWare: https://ocw.mit.edu/courses/6-831-user-interface-design-and-implementation-spring-2011/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf Industry Mapping: Python Tkinter	10	Hands-on interactive GUI development using python Tkinter library and latest available AI tools
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Textbooks:

1. Dix A., Finlay J., Abowd G. D. and Beale R. Human Computer Interaction, 3rd edition, Pearson Education, 2005.
2. Rao N. Core Python Programming, 3ed, Wiley, 2021.

Reference books:

1. Preece J., Rogers Y., Sharp H., Baniyon D., Holland S. and Carey T. Human Computer Interaction, Addison-Wesley, 1994.

Online Resources:

<https://nptel.ac.in/courses/106103115>

Course Code- OECS801A

Course Title –Soft Skills and Interpersonal Communication

Credit – 3

Category – Open Elective

Semester – VIII

L:T:P:S – 3:0:0:0

Pre-requisite – NA

Course Outcomes:

CO1	Awareness about the significance of soft skills in professional and inter-personal communications and facilitate an all-round development of personality.
CO2	Become self-confident individuals by mastering inter-personal skills, team management skills, and leadership skills.
CO3	Actively participate in group discussion / meetings / interviews and develop leadership skills.
CO4	Become more effective individual through goal/target setting, self-motivation

and practicing creative thinking facilitating an all-round development of personality.

<u>Study Material</u> https://drive.google.com/file/d/1Pm2OQiirexIHWUeaExQjTW8VLmDi2BQE/view?usp=sharing	<u>Coursera</u> https://www.coursera.org/programs/iem-uem-program-2024-2dv9/specializations/people-and-soft-skills-for-professional-success?source=search	<u>NPTEL</u> https://onlinecourses.nptel.ac.in/noc20_hs60/preview	<u>Linkedin Learning</u> https://www.linkedin.com/learning/paths/professional-soft-skills-learning-pathway?u=229219690	<u>Infosys Springboard 5G</u> -
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Module No.	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignments	Textbook Mapping
1	Soft Skills: Introduction	1. Soft Skills: An Introduction – Definition and Significance of Soft Skills; Process, Importance and Measurement of Soft Skill Development. 2. Self-Discovery: Discovering the Self; Setting Goals; Beliefs, Values, Attitude, Virtue. 3. Positivity and Motivation: Developing Positive Thinking and Attitude;	International Academia: (MIT Open Courseware): https://ocw.mit.edu/courses/21g-232-advanced-speaking-and-critical-listening-skills-els-spring-2007/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf Industry Mapping: NA	8	1. Conduct a self-assessment of your soft skills using any standard rubric and submit your score summary. 2. Prepare a one-page personal SWOT analysis and list three SMART goals based on it.	Textbook-1 Chapter: 1,2,5

		Driving out Negativity; Meaning and Theories of Motivation; Enhancing Motivation Levels.				
2	Interpersonal Communication	1. Interpersonal Communication: Interpersonal relations; communication models, process and barriers; team communication; developing interpersonal relationships through effective communication; listening skills; essential formal writing skills; corporate communication styles – assertion, persuasion, negotiation. 2. Public Speaking: Skills, Methods, Strategies and Essential tips for effective public speaking.	International Academia: (MIT Open Courseware): https://ocw.mit.edu/courses/21g-232-advanced-speaking-and-critical-listening-skills-els-spring-2007/ AICTE-prescribed syllabus: https://aicte.gov.in/index.php/education/mo-del-syllabus Industry Mapping: NA	8	1. Prepare and deliver a 2-minute speech using any one public speaking strategy discussed in class. 2. Observe a peer conversation and write one line each on how assertion, persuasion, and negotiation were used.	Textbook-1 Chapter s: 6,7

3	Team Skills	1. Group Discussion: Importance, Planning, Elements, Skills assessed; Effectively disagreeing, Initiating, Summarizing and Attaining the Objective. 2. Non-Verbal Communication: Importance and Elements; Body Language. 3. Teamwork and Leadership Skills: Concept of Teams; Building effective teams; Concept of Leadership and honing Leadership skills.	International Academia: (MIT Open Courseware): https://ocw.mit.edu/courses/21g-232-advanced-speaking-and-critical-listening-skills-els-spring-2007/ AICTE-prescribed syllabus: https://aicte.gov.in/index.php/education/model-syllabus Industry Mapping: NA	14	1. Watch a professional speaker and note two body language elements that made the delivery effective. 2. Participate in a small group task and write one line on how teamwork contributed to task completion.	Textbook-1 Chapter 8,10
4	Professional Skills	1. Interview Skills: Interviewer and Interviewee – in-depth perspectives. Before, During and After the Interview. Tips for Success. 2. Presentation Skills:	International Academia: (MIT Open Courseware): https://ocw.mit.edu/courses/21g-232-advanced-speaking-and-critical-listening-skills-els-spring-2007/ AICTE-prescribed syllabus: https://aicte.gov.in/index.php/education/model-syllabus Industry Mapping: NA	6	1. Set a one-line time management goal using any method (Pomodoro, ABC analysis, 2. Observe a formal interaction and list two etiquette mistakes or	Textbook-1 Chapter 11,12,13,14

		Types, Content, Audience Analysis, Essential Tips – Before, During and After, Overcoming Nervousness. 3. Etiquette and Manners – Social and Business. 4. Time Management – Concept, Essentials, Tips. 5. Personality Development – Meaning, Nature, Features, Stages, Models; Learning Skills; Adaptability Skills.			strengths in one line each. to-do list).	
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Textbooks:

1. Managing Soft Skills for Personality Development – edited by B.N.Ghosh, McGraw Hill India, 2012.

Reference books:

1. Effective Communication and Soft Skills, Nitin Bhatnagar, Pearson Education India, 2011
2. English and Soft Skills – S.P.Dhanavel, Orient Blackswan India, 2010.
3. Effective Business Communication, Kulbhushan Kumar, Khanna Publishing House, 2021.

Course Code- OECS801B

Course Title – History of Science and Engineering

Credit – 3

Category – Open Elective Course

Semester – VIII

L:T:P:S – 3:0:0:0

Pre-requisite – Basic understanding of science and technology

Course Outcomes:

CO1	Identify major scientific milestones from ancient to modern eras
CO2	Understand contributions of major scientists and engineers.
CO3	Analyze the evolution of engineering disciplines and technological revolutions.
CO4	Evaluate how science and engineering developments shaped modern computing.

Study Material	<u>Coursera</u>	<u>NPTEL</u>	<u>SWAYAM</u>	<u>Linkedin Learning</u>
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Module No.	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Assignments
1	Science and Engineering-Foundation	Ancient civilizations – Egypt, Mesopotamia, India, China, Greece; early mathematics, astronomy, metallurgy.	MIT Open Course Ware https://share.google/8cyM3W7Mg89VMV12B AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf	7	1. Explain contributions of Egyptian and Mesopotamian science. 2. Compare ancient Indian and Greek advancements. 3. Write short note on early metallurgy.
2	Scientific Revolution	Renaissance science; Galileo, Newton, Kepler; scientific method; impact on engineering.	MIT Open Course Ware https://share.google/8cyM3W7Mg89VMV12B AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf	7	4. Describe Galileo's experiments. 5. Explain Newton's laws in historical context. 6. Impact of scientific method on engineering.

3	Developments in Science and Technology in Colonial India	Early European Scientists in Colonial India- Surveyors, Botanists, Doctors, under the Company's Service. Indian Response to new Scientific Knowledge, Science and Technology in Modern India: Development of research organizations like CSIR and DRDO; Establishment of Atomic Energy Commission; Launching of the space satellites.	MIT Open Course Ware https://share.google/8cyM3W7Mg89VMV12B AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf	7	7.Discuss role of early surveyors 8. Write note on CSIR formation 9. Explain India's early space missions.
4	Contemporary Science & Technology	AI, IoT, nanotechnology, renewable energy, Industry 4.0; ethics in science and engineering.	MIT Open Course Ware https://share.google/8cyM3W7Mg89VMV12B AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf	7	10. Case study on AI ethics. 11. Explain IoT evolution. 12. Describe nanotechnology applications.

5	Industrial Revolution	Steam engine, electricity, telegraph, transportation; emergence of engineering disciplines.	MIT Open Course Ware https://share.google/8cyM3W7Mg89VMV12B AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf	7	13.Explain steam engine impact. 14.Compare early transport technologies. 15.Describe rise of engineering fields.

Textbooks

1. Science and Technology in World History– McClellan & Dorn, Johns Hopkins University Press.

Reference Books

1. A History of Engineering in Classical and Medieval Times – Donald Hill.
2. The Industrial Revolution: A Very Short Introduction– Robert C. Allen.
3. India's Scientific Heritage – Bal Ram Singh.

Online Resources:

E-book: <https://shorturl.at/OwkUT>

Course Code- OECS802A

Course Title – Cyber Law and IPR

Credit – 3

Category – Open Elective Course

Semester – VIII

L:T:P:S – 3:0:0:0

Pre-requisite – Fundamentals of Computer, Computer Networks

Course Outcomes:

CO1	Students will understand fundamentals of cyber laws, cyber jurisprudence, domain name issues and global cyberspace.
CO2	Students will gain knowledge of Information Technology Act 2000, cybercrime types, digital signatures, and governance.
CO3	Students will learn the concepts and importance of Intellectual Property Rights including patents, copyrights, trademarks, cybersquatting, and WIPO treaties.
CO4	Students will understand cyber ethics, ethical issues in the digital era, AI Ethics, and Blockchain ethics.

Study Material	Coursera	NPTEL	Linkedin Learning	Infosys Springboard
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Module No.	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	Evolution of Cyber Laws & Cyberspace	Evolution of computer technology Emergence of cyberspace Cyber Jurisprudence Jurisprudence and law Cyberspace vs Webspace Web hosting and Web development agreements Legal & technological significance of domain names Internet as a tool for global access	International Academia: ☐ MIT OCW – Cyber Law: https://ocw.mit.edu/search/?q=cyber+law ☐ WIPO Academy – Intellectual Property & Cyberspace: https://www.wipo.int/academy/ ☐ Industry Mapping: ICANN Guidelines, Domain Dispute Resolution (UDRP)	5	☐ Case study on domain name dispute. ☐ Report on evolution of global cyber law frameworks.
2	IT Act 2000, Cybercrimes & Electronic Governance	☐ Overview of IT Act 2000 ☐ Amendments & limitations of IT Act	International Academia: ☐ MIT OCW – Computer Systems Security:	10	☐ Case study on IT Act sections. ☐ Simulation of phishing attack &

		☐ Digital signatures ☐ Cryptographic algorithms ☐ Public-key cryptography & Private-key cryptography ☐ Electronic governance ☐ Legal recognition of electronic records ☐ Cyber offences and penalties ☐ Network service provider liability ☐ Cyber Regulations Appellate Tribunal ☐ Introduction to cybercrime ☐ Forgery, Hacking, Software Piracy ☐ Computer network intrusion ☐ Categories of cybercrime: Passive & Active attacks ☐ Cyberstalking ☐ Tools & Methods used in cybercrime: • Proxy servers • Random checking • Trojan horses & Backdoors • DoS & DDoS attacks • Phishing & identity theft	https://ocw.mit.edu/courses/6-858-computer-systems-security-fall-2014/ ☐ Stanford – Cybersecurity Courses: https://cyber.stanford.edu/ ☐ Industry Mapping: CERT-In, Cisco Cybersecurity, EC-Council (CEH)	defense techniques. ☐ Demonstration of DoS attack patterns.
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3	IPR Concepts & Digital Rights	Introduction and need for IPR Types of IPR in the digital era Patents Copyright Trademark Cyber-squatting Reverse domain hijacking Copyright in digital medium Domain name copyright disputes Electronic database protection Copyright in computer programs Copyright & WIPO treaties	☐ WIPO – Intellectual Property Rights Training: https://www.wipo.int ☐ Harvard Cyberlaw Clinic – IPR Policies: https://clinic.cyber.harvard.edu/ ☐ Industry Mapping: US Patent Office (USPTO), Digital Millennium Copyright Act (DMCA) -	10	☐ Case study on copyright infringement. ☐ Analyze a WIPO domain dispute case.
4	Ethics in Digital World	☐ Importance of cyber law ☐ Significance of cyber ethics ☐ Need for cyber regulations & ethics	International Academia: ☐ MIT – Ethics of Technology: https://ethics.mit.edu ☐ Stanford – AI Ethics Initiative:	5	☐ Essay on AI ethical dilemmas. ☐ Case study on Blockchain misuse & ethics.

		☐ Ethics in information society ☐ Introduction to Artificial Intelligence Ethics - Ethical Issues in AI - Core principles of AI ethics ☐ Introduction to Blockchain Ethics	https://hai.stanford.edu/ ☐ Industry Mapping: IEEE AI Ethics Standards, Blockchain Council		
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Textbooks:

1. *Cyber Security* – Nina Gobole & Sunit Belapune (Wiley India)
2. *Intellectual Property Rights: Protection and Management* – Nithyananda K.V., Cengage
3. *Cyber Law & Cyber Crimes* – Adv. Prashant Mali (Snow White Publications)
4. *Information Technology Law and Practice* – Vakul Sharma

Reference books:

1. Ahuja, V K. (2017). Law relating to Intellectual Property Rights. India, IN: Lexis Nexis.
2. Cell for IPR Promotion and Management (<http://cipam.gov.in/>)

Course Code- OECS802B

Course Title – Introduction to Philosophical Thoughts

Credit – 3

Category – Open Elective

Semester – VIII

L:T:P:S – 3:0:0:0

Pre-requisite – NA

Course Outcomes:

CO1	Understand the basic nature of Indian philosophy and key Vedic–Upanishadic concepts.
CO2	Explain the epistemology, metaphysics, and ethics of the Carvaka school.
CO3	Describe major Jain philosophical concepts and their views on bondage and liberation and analyse core Buddhist doctrines and distinguish between different Buddhist schools
CO4	Understand Nyaya theories of pramanas, self, liberation, and arguments for God’s existence.

Study Material	Coursera	NPTEL	Linked in Learning	Infosys Springboard 5G
-	https://www.coursera.org/programs/iem-uem-program-2024-2dvv9/learn/philosophy?source=search	https://onlinecourses.swayam2.ac.in/nou25_hs30/preview	-	-

Module No.	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignments	Textbook Mapping
1	Nature of Indian Philosophy	Nature of Indian Philosophy : Plurality as well as common concerns. 2. Basic concepts of the Vedic and Upanisadic views : Atman, Jagrata, Svapna, Susupti, Turiya, Brahman, Karma, Rta, Rna	International Academia: (MIT Open Courseware): https://mitxonline.mit.edu/courses/course-v1:MITxT+24.00x/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/AICTE%20-%20UG%20CSE.pdf Industry Mapping: NA	8	1. Write one line identifying a common concern shared across at least two Indian philosophical traditions. 2. Choose any two concepts (Atman, Jagrata, Svapna, Susupti, Turiya, Brahman, Karma, Rta, Rna) and explain each in one concise line.	Textbook-1 Chapter : 1
2	Carvaka school	Carvaka school : its epistemology, metaphysics and ethics. Mukti	International Academia: (MIT Open Courseware): https://mitxonline.mit.edu/courses/course-v1:MITxT+24.00x/ AICTE-prescribed syllabus: https://aicte.gov.in/index.php/education/model-syllabus Industry Mapping:	8	3. Write one line explaining how Cārvāka's epistemology (perception-only theory) rejects other sources of knowledge. 4. Compare Cārvāka's view of metaphysics or ethics with any other Indian school in one line and comment on its stance	Textbook-2 Chapter s: 8

					on <i>mukti</i> .	
3	Jainism & Buddhism	Jainism : Concepts of sat, dravya, guna, paryaya, jiva, ajiva, anekantavada, syadvada, and nayavada ; pramanas, ahimsa, bondage and liberation. Buddhism : theory of pramanas, theory of dependent origination, the four noble truths; doctrine of momentaryness; theory of no soul. The interpretation of these theories in schools of Buddhism : Vaibhasika, Sautrantika, Yogacara, Madhyamika.	International Academia: (MIT Open Courseware): https://mitxonline.mit.edu/courses/course-v1:MITxT+24.00x/ AICTE-prescribed syllabus: https://aicte.gov.in/index.php/education/model-syllabus Industry Mapping: Wireshark, Packet Tracer, OPNET, NS3	14	5. Explain any one Jain concept (sat, dravya, guna, paryaya, jiva, ajiva) in one line. 6. Describe anekantavada or syadvada in one line with a real-life example. 7. Compare any two Buddhist schools (Vaibhasika, Sautrantika, Yogacara, Madhyamika) in one line. 8. Write one line explaining dependent origination or the four noble truths.	Textbook-1 Chapter : 4 , 17
4	Nyaya	Nyaya : theory of Pramanas; the individual self and its liberation ; the idea of God and proofs for His existence	International Academia: (MIT Open Courseware): https://mitxonline.mit.edu/courses/course-v1:MITxT+24.00x/ AICTE-prescribed syllabus: https://aicte.gov.in/index.php/education/model-syllabus Industry Mapping: Wireshark, Packet Tracer, OPNET, NS3	6	9. Explain the four Nyāya pramāṇas (perception, inference, comparison, and verbal testimony) in detail and illustrate each with one	Textbook-1 Chapter : 12

					practical example from daily or scientific life. 10. Write a detailed note on the Nyāya concept of the individual self (ātman), explaining its characteristics, its distinction from the body and mind, and its role in knowledge and experience. 11. Describe the Nyāya view of liberation (mokṣa), explaining the nature of bondage, the means to attain liberation, and how Nyāya's theory of knowledge contributes to freedom from suffering. 12. Discuss in detail any two Nyāya arguments for the existence of God (Īśvara), explaining the	
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					reasoning behind them and evaluating their philosophical strengths or limitations.	
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Textbooks:

1. C. D. Sharma – *A Critical Survey of Indian Philosophy*
2. M. Hiriyanna : *Outlines of Indian Philosophy*

Reference books:

1. S.N.Das Gupta : *A History of Indian Philosophy Vol – I to V.* 4.
2. S.Radhakrishnan : *Indian Philosophy Vol – I & II.* 5.
3. T.R.V.Murti : *Central Philosophy of Buddhism.*
4. J.N.Mahanty : *Reason and Tradition of Indian Thought.*
5. R.D.Ranade : *A Constructive Survey of Upanisadic Philosophy.*
6. P.T.Raju : *Structural Depths of Indian Thought.*
7. K.C.Bhattacharya : *Studies in Philosophy Vol – 1.*
8. Datta and Chatterjee : *Introduction of Indian Philosophy*



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: Essential Study for Professionals -VIII Credit: 2 Lecture Hours:48

Subject Code: ESP8o1

Module number	Topic	Sub-topics	Mapping with International/National/ State Level Exams	Lecture Hours	Corresponding Assignment
1	Constitution of India	Textbook: BPSC-102 Egyankosh URL for subject matter: 1. Evolution of Indian Constitution (Unit 1 & Unit 3) (https://egyankosh.ac.in/handle/123456789/57865 & https://egyankosh.ac.in/handle/123456789/57869 IGNOU Textbook(BPSC-102Unit 3) https://egyankosh.ac.in/handle/123456789/57869 History & Civics (ICSE Class IX Textbook : Sudeshna Sengupta): (Chapter-1): https://books.google.com.na/books?id=XJL5Rk6aHYUC&printsec=copyright&hl=en&pli=1#v=onepage&q&f=false (Making of Constitution	National Exams: 1.UPSC Civil Services Exam (https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26 2. UPSC Combined Defence Services (https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21 3. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_0304_2023.pdf) pg. 20-22 4. Intelligence Bureau ACIO (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-	10	<u>Assignment:</u> - Trace the evolution of Indian constitution from 1174 to 1947 <u>Discussion:</u> - What are the potential consequences of the CAA for India's social fabric? <u>Debate:</u> Right to Privacy vs. National Security: Should governments have the right to surveil citizens in the name of national security, even if it infringes upon the right to privacy? ** All the assignments are in line of GS Paper I of UPSC CSE Mains Examination

	IGNOU Textbook(BPSC-102,Unit 1) https://egyankosh.ac.in/handle/123456789/57865 NCERT Textbook Class XI (India Constitution at Work: Chapter-1): https://ncert.nic.in/textbook.php?keps2=1-10 History & Civics (ICSE Class IX Textbook : Sudeshna Sengupta): (Chapter-1): https://books.google.com.na/books?id=XJL5Rk6aHYUC&printsec=copyright&hl=en&pli=1#v=onepage&q&f=false 2. Part I: Union and its Territories (Chapter 5 – Indian Polity – M.Laxmikanth) 3. Part II: Citizenship (Chapter 6 – Indian Polity – M.Laxmikanth) 4. Part III: Fundamental Rights. (Unit 4) IGNOU Textbook(BPSC-102) (Unit 4) https://egyankosh.ac.in/handle/123456789/57872 NCERT Textbook Class XI (India Constitution at Work: Chapter-2): https://ncert.nic.in/textbook.php?keps2=2-10	Notification-Emp-News.pdf) State Level Exams: 1.Civil Services Executive Exam (WBCS) https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement), pg 1 2. Miscellaneous Services Recruitment Examination (file:///C:/Users/UEMK/Downloads/2707970_2019.pdf) pg 1		
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		History & Civics (ICSE Class IX Textbook : Sudeshna Sengupta): (Chapter-3): https://books.google.com.na/books?id=XJL5Rk6aHYUC&printsec=copyright&hl=en&pli=1#v=onepage&q&f=false (In brief and Capsule Form)			
2	History	Textbook: IGNOU BHIC-107 History of India-IV (c. 1206-1550) 1. The Delhi Sultanate – Consolidation and Expansion (Theme- II Unit II) https://egyankosh.ac.in/handle/123456789/73298 BHIC-109 History of India-V (c.1550-1605) 2. The Rise of the Mughal (till Akbar) (Theme II- Unit 5, Unit 6) https://egyankosh.ac.in/handle/123456789/77551 (In brief and Capsule Form)	National Exams: 1.UPSC Civil Services Exam (https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26 2. UPSC Combined Defence Services (https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21) 3. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_0304_2023.pdf) pg. 20-22 4. Intelligence Bureau ACIO (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf) State Level Exams: 1.Civil Services Executive Exam (WBCS)	12	• Assignment: " Prithviraj Chauhan in Literature and Folklore: Exploring the portrayal of Prithviraj Chauhan in literature." • Discussion: "From Slave Dynasty to Tughlaq Dynasty: Analyzing Military Tactics and Strategies." • Debate: "Babur's Conquest: Was it Driven by Ambition or Necessity?" ** All the assignments are in line of GS Paper I of UPSC CSE Mains Examination.

			https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement , pg 1 2. Miscellaneous Services Recruitment Examination (file:///C:/Users/UEMK/Downloads/2707970_2019.pdf), pg 1		
3	Geography	Textbook: BGGET- 141 Egyankosh URL for subject matter: IGNOU-Block 1 1. Political Division of India (Unit 1) http://egyankosh.ac.in/handle/123456789h/80893 2. Physiographic Division of India in Brief (Unit 2) http://egyankosh.ac.in/handle/123456789/80895 (In brief and Capsule Form)	National Exams: 1. UPSC Civil Services Exam https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26 2. UPSC Combined Defence Services https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21 3. Combined Graduate Level conducted by SSC https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_0304_2023.pdf) pg. 20-22 4. Intelligence Bureau ACIO https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf) State Level Exams: 1. Civil Services Executive Exam (WBCS) https://wbpsc.gov.in/Download?param1=20230225142430	12	1. Assignment: Comparative Analysis Essay on “Comparative analysis of the political divisions in India and another country of their choice” bringing out how historical, cultural, and geographical factors have influenced the political boundaries in both nations and discuss the implications of these divisions on governance and socio-economic development. 2. Discussion: How physiographic divisions have been used (or misused) in different contexts, such as the management of river basins, the planning of infrastructure projects, or the conservation of biodiversity. ** All the assignments are in line of GS Paper I of UPSC CSE Mains Examination.

			Syllabus.pdf&param2=advertisement , pg 1 2. Miscellaneous Services Recruitment Examination (file:///C:/Users/UEMK/Downloads/2707970_2019.pdf) pg 1		
4	Economics	1. Capital and Money Market (Textbook: S.Y.B.A) https://www.icsi.edu/media/webmodules/publications/CapitalMarketandSecuritiesLaw.pdf 2. Fiscal System of India. (BECC-109, Block-3, Unit-9) http://egyankosh.ac.in/handle/123456789/76561 (In brief and Capsule Form)	National Exams: 1.UPSC Civil Services Exam (https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26 2. UPSC Combined Defence Services (https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21 3. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_0304_2023.pdf) pg. 20-22 4. Intelligence Bureau ACIO (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf) State Level Exams: 1.Civil Services Executive Exam (WBCS) (https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement), pg 1	09	1. <u>Capital and Money Market</u> Write a case study on how the RBI used monetary policy to respond to a specific economic crisis (e.g., the 2008 global financial crisis or the COVID-19 pandemic). 2. <u>Fiscal system of India</u> Analyze the relationship between fiscal policy and economic growth in India

			2. Miscellaneous Services Recruitment Examination (file:///C:/Users/UEMK/Downloads/2707970_2019.pdf) pg 1		
5	Current Affairs and Static GK:	National News, International News, MOU's and agreements, Summits and Conclaves, Obituaries, Awards and Events, Sports, Important Days, Banking and Economic Awareness	National Exams: 1. UPSC Civil Services Exam (https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26 2. UPSC Combined Defence Services (https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21 3. RBI Grade B (https://rbidocs.rbi.org.in/rdocs/Content/PDFs/DADVTGRB09052023FA65E4FB1C2CF473396B4FD7E5F69CDDE.PDF), pg 22-23 4. IBPS Probationary officer(https://www.ibps.in/wp-content/uploads/Detailed-Advt.-CRP-PO-XII.pdf) , Pg 7. 5. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_0304_2023.pdf) pg. 20-22 6. Intelligence Bureau ACIO (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-	5	1. Discussion on National and International affairs 2. Discussion on MOU's and agreements, Summits and Conclaves 3. Discussion on recent Awards and Events, Sports. 4. Discussion on Economic Awareness

			<u>Notification-Emp-News.pdf</u>) State Level Exams: 1. Civil Services Executive Exam (WBCS) <u>(https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement, pg 1</u> 2. Miscellaneous Services Recruitment Examination <u>(file:///C:/Users/UEMK/Downloads/2707970_2019.pdf)</u> , pg 1		
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Learning Resources:

Reference Books:

1. Current Affairs Magazine of IEM-UEM
2. Lucent GK

8TH SEMESTER

Subject Code : SDP881	Category: Mandatory & Industry Value Added Course
Subject Name : SKILL DEVELOPMENT FOR PROFESSIONALS - VIII	Semester : 8th
L-T-P : 2-0-0 (Total Contact Hrs. 2)	Credit: 0.5
Pre-Requisites: Basic Mathematics, General English from primary to high school.	

Course Objective:

1. To improve verbal ability skill and communicative skill of the students.
2. To enhance the analytical skill and problem solving skill of the students.
3. To make them prepare for various public and private sector exams & placement drives.

Course Outcome:

1. Remember the basic concepts of Aptitude.
2. Understand the concepts and enhance students problem-solving skill.
3. Apply the rules and solve the problems.
4. Analyze the given set of data and reach conclusion.
5. Evaluate the table and problem statement and solve the problem statements.

Course Content:

Module No.	Description	Hours	Blooms Level	PO(1..12) Mapping
1. 2.	Mock tests OF UPSC CSAT-II. Reading Comprehension Essay Writing	12	L1 (Remember) L2 (Understand) L3 (Apply) L4 (Analyze) L5 (Evaluate)	PO1, PO2, PO10

Learning Resources:

Text Books:

1. Verbal and Non-Verbal Reasoning- R.S. Agarwal
2. Quantitative Aptitude-R.S. Agarwal

	CO1	CO2	CO3	CO4	CO5
PO1	1	0	3	0	2
PO2	1	1	2	0	3
PO3	0	0	0	0	0
PO4	0	0	0	0	0
PO5	0	0	0	0	0
PO6	0	0	0	0	0
PO7	0	0	0	0	0
PO8	0	0	0	0	0
PO9	0	0	0	0	0
PO10	3	0	1	2	0
