Uka Tarsadia University

B. Tech.

Semester VI

INTELLECTUAL PROPERTY ESSENTIALS FOR COMPUTER SCIENCE

CE5038

Effective from December-2024

Syllabus version: 1.00

Subject Code	Subject Title
CE5038	Intellectual Property Essentials for Computer Science

Teaching Scheme				Examination Scheme			
Hours		Credits		Theory Marks		Practical Marks	Total Marks
Theory	Practical	Theory	Practical	Internal	External	CIE	
2	0	2	0	0	0	50	50

Objectives of the course:

- Develop a comprehensive understanding of industrial designs, patents, and copyrights their significance in technology and AI, and the foundational legal frameworks that underpin innovation and business ecosystems.
- Acquire practical skills to apply and enforce IP rights and collaborative licensing models.

Course outcomes:

Upon completion of the course, the student shall be able to

CO1: Understand various IP categories, appreciate their significance in technology and AI, and recognize IP's critical role in business and innovation ecosystems.

CO2: Apply industrial design rights, identify protectable design elements in software and hardware, and understand filing and enforcement procedures along with UI/UX design challenges.

CO3: Understand patent fundamentals for software and AI, evaluate eligibility and best practices, and determine how to secure or defensively disclose innovation.

CO4: Articulate the fundamentals of copyright law, including software protection, registration processes, exceptions, and remedies for infringement.

CO5: Apply key copyright considerations for AI-generated works, address authorship and licensing challenges, and evaluate ethical data usage in AI model training.

CO6: Understand collaboration agreements, licensing models, and technology transfer frameworks to effectively manage IP ownership and maximize innovation potential.

Sr. No.	Topics	Hours
	Unit – I	
1	**Introduction to Intellectual Property in Technology:** Overview of Intellectual Property (IP) categories, Key differences between industrial designs, patents, trademarks, and copyrights, Significance of IP in Computer Science, Software Engineering, and AI fields, Role of IP in business, research, and innovation ecosystems.	4
	Unit – II	

2	**Industrial Designs for Software and Hardware:** Definition and scope of industrial design rights, Protectable design elements (e.g., user interfaces, product packaging), Relevance of industrial design protection for tech products and devices, Procedures for filing and enforcing industrial design rights, Challenges in protecting UI/UX designs.	5
Unit – III		
3	**Patent Fundamentals:** Patent eligibility: Utility, design, and plant patents, Requirements for patentability (novelty, non-obviousness, industrial applicability), Patent lifecycle and timeline, The structure of a patent (claims, specifications, drawings), Introduction to patent searches and databases (e.g., USPTO, EPO, WIPO). **Patents in Software and AI:** The historical debate over software patent eligibility, Current legal standards and notable court cases (e.g., Alice Corp. v. CLS Bank), Patenting algorithms, data structures, and AI models, Best practices for drafting software/AI patent applications, Defensive publishing vs. patenting in open-source and AI communities.	7
Unit – IV		
4	**Copyright Foundations:** Basic principles of copyright law (originality, fixation, authorship), Scope of copyright protection for software (source code vs. object code, UI elements), Copyright registration process and duration Copyright exceptions (fair use, open-source licenses), Infringement, enforcement, and remedies.	5
Unit – V		
5	**Copyrights in the Age of AI:** Copyright issues surrounding AI-generated works (authorship challenges), Data ownership, training datasets, and licensing, Protecting AI-generated code, images, text, and music, Ethical implications of copyrighted data usage in AI model training.	4
Unit – VI		
6	**Collaborative Innovation, Licensing, and Tech Transfer:** Collaboration agreements, joint ventures, and IP ownership splits, Technology transfer from academic research to industry, Licensing models: exclusive vs. non-exclusive licensing, Royalty structures, cross-licensing, and patent pools.	5

Reference books:

1. Peter S. Menell, Mark A. Lemley, Robert P. Merges, and Shyamkrishna Balganesh, "Intellectual Property in the New Technological Age: 2023", Clauses 8 Publishing, 2023
2. Mark A. Lemley, Peter S. Menell, Robert P. Merges, and Pamela Samuelson, "Software And Internet Law, Aspen Law & Business; 3rd edition, 2006
3. David Pressman, "Patent It Yourself: Your Step-By-Step Guide to Filing at the U.S. Patent Office, Nolo Publication, 2012
4. R. Anita Rao and Bhanoji Rao– "Intellectual Property Rights – A Primer", Eastern Book Company, 2013
5. Shivani Sahai Singh – "The Law of Intellectual Property Rights", Eastern Book Company

Course objectives and Course outcomes mapping:

- Develop a comprehensive understanding of industrial designs, patents, and copyrights their significance in technology and AI, and the foundational legal frameworks that underpin innovation and business ecosystems: CO1, CO2, CO4, and CO6
- Acquire practical skills to apply and enforce IP rights and collaborative licensing models: CO3, CO4, and CO5

Course units and Course outcomes mapping:

Unit No.	Unit Name	Course Outcomes					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Introduction to Intellectual Property in Technology	✓					
2	Industrial Designs for Software and Hardware		✓				
3	Patent Fundamentals and Patents in Software and AI			✓			
4	Copyright Foundations				✓		
5	Copyrights in the Age of AI					✓	
6	Collaborative Innovation, Licensing, and Tech Transfer						✓

Programme outcomes:

PO 1: Engineering knowledge: An ability to apply knowledge of mathematics, science, and engineering.

PO 2: Problem analysis: An ability to identify, formulates, and solves engineering problems.

PO 3: Design/development of solutions: An ability to design a system, component, or process to meet desired needs within realistic constraints.

PO 4: Conduct investigations of complex problems: An ability to use the techniques, skills, and modern engineering tools necessary for solving engineering problems.

PO 5: Modern tool usage: The broad education and understanding of new engineering techniques necessary to solve engineering problems.

PO 6: The engineer and society: Achieve professional success with an understanding and appreciation of ethical behavior, social responsibility, and diversity, both as individuals and in team environments.

PO 7: Environment and sustainability: Articulate a comprehensive world view that integrates diverse approaches to sustainability.

PO 8: Ethics: Identify and demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work.

PO 9: Individual and team work: An ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give/receive clear instructions.

PO 11: Project management and finance: An ability to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: A recognition of the need for, and an ability to engage in life-long learning.

Programme outcomes and Course outcomes mapping:

Programme Outcomes	Course Outcomes					
	CO1	CO2	CO3	CO4	CO5	CO6
PO1						
PO2						
PO3						
PO4		✓	✓	✓	✓	
PO5		✓	✓	✓	✓	
PO6		✓	✓	✓	✓	
PO7						
PO8						
PO9						
PO10		✓		✓		
PO11						✓
PO12		✓		✓		✓