

**SREENIVASA INSTITUTE of TECHNOLOGY and
MANAGEMENT STUDIES (Autonomous)**

LECTURE NOTES

Subject Name

TECHNICAL PAPER WRITING & IPR

Year / Branch

III B.TECH I SEM

Regulations: *R23*



Prepared By

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SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE)

23MAC351U

III BTECH V-SEMESTER
TECHNICAL REPORT WRITING & IPR

LTPC
3003

PRE-REQUISITES : Artificial Intelligence

COURSE EDUCATIONAL OBJECTIVES:

1. To enable the student to practice the basic skills of research paper writing
2. To make the student understand the importance of IP and to educate them on the basic concepts of Intellectual Property Rights.
3. To practice the basic skills of performing quality literature review
4. To help them know the significance of real life practice and procedure of Patents.
5. To enable them learn the procedure of obtaining Patents, Copyrights, & Trademarks

UNIT-1: Principles of Technical Writing

(9)

Principles of Technical Writing: styles in technical writing; clarity, precision, coherence and logical sequence in writing-avoiding ambiguity- repetition, and vague language -highlighting your findings- discussing your limitations -hedging and criticizing -plagiarism and paraphrasing.

UNIT-2: Technical Research Paper Writing

(9)

Technical Research Paper Writing: Abstract-Objectives-Limitations-Review of Literature- Problems and Framing Research Questions- Synopsis

UNIT-3: Process of research

(9)

Process of research: publication mechanism: types of journals- indexing-seminars conferences- proof reading – plagiarism style; seminar & conference paper writing; Methodology-discussion-results-citation rules

UNIT-4: Introduction to Intellectual property

(9)

Introduction to Intellectual property: Introduction, types of intellectual property, International organizations, agencies and ties, importance of intellectual property rights Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and rating trade mark, trade mark registration processes.

UNIT-5: Law of copy rights

(9)

Law of copy rights: Fundamentals of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer. Patent law, intellectual property audits

TECHNICAL PAPER WRITING & IPR

Comprehensive Lecture Notes

L - T - P - C : 0 - 0 - 3 - 1.5

Course Outcomes (COs)

CO	Outcome	POs
CO1	Identify key secondary literature related to the proposed technical paper writing.	PO1, PO2
CO2	Explain various principles and styles in technical writing.	PO2, PO3
CO3	Use the acquired knowledge in writing a research / technical paper.	PO3, PO4
CO4	Analyse the rights and responsibilities of a holder of Patent, Copyright, Trademark, International Trademark etc.	PO5
CO5	Evaluate different forms of IPR available at national and international level.	PO4, PO5

TEXTBOOKS:

1. Deborah. E. Bouchoux, Intellectual Property Rights, Cengage Learning India, 2013
2. Meenakshi Raman, Sangeeta Sharma. Technical Communication: Principles and practices. Oxford

REFERENCEBOOKS:

3. 1. Myneni, Law of Intellectual Property, 9th Ed, Asia Law House, 2019.
4. Prabuddha Ganguli, Intellectual Property Rights Tata McGraw Hill, 2001
5. P. Naryan, Intellectual Property Law, 3rd Ed, Eastern Law House, 2007.
4. Adrian Wall work. English for Writing Research Papers Second Edition. Springer Cham Heidelberg New York, 2016
6. Dan Jones, Sam Dragga, Technical Writing Style

CO-POMAPPING:

CO/PO	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
C0.1	3	3	-	-	-	-	-	-	-	-	-	-
C0.2	3	-	3	-	-	-	-	-	-	-	-	-
C0.3	3	2	-	3	-	-	-	-	-	-	-	-
C0.4	3	3	3	2	-	-	-	-	-	-	-	-
C0.5	3	3	-	3	2	-	-	-	-	-	-	-
CO*	3	2.8	1.2	1.4	2	-	-	-	-	-	-	-

7.

UNIT I — Principles of Technical Writing

Unit Overview

Technical writing is a form of communication that presents information in a clear, accurate, and organized manner. It is widely used in engineering, science, technology, business, and research to explain concepts, describe processes, and report findings. The primary goal is to help readers understand information quickly and correctly.

OBJECTIVES OF THE UNIT

By the end of this unit, students will be able to:

1. **Understand the principles of technical writing** and their importance in academic and professional communication.
2. **Identify different styles of technical writing** and use the appropriate style for different purposes and audiences.
3. **Write with clarity, precision, coherence, and logical sequence** to communicate technical information effectively.
4. **Recognize and avoid ambiguity, repetition, and vague language** in technical documents.

Learning Objectives

- **Explain** — the purpose and defining features of technical writing as distinct from general or creative writing.
- **Apply** — the core principles — clarity, accuracy, precision, conciseness, coherence, objectivity and audience awareness — to draft technical content.
- **Identify** — different technical writing styles and select the style appropriate to a given audience and purpose.
- **Recognize** — and eliminate ambiguity, repetition and vague language in technical documents.
- **Evaluate** — a piece of technical writing for plagiarism risk, hedging, and appropriate handling of limitations.

LEARNING OUTCOMES

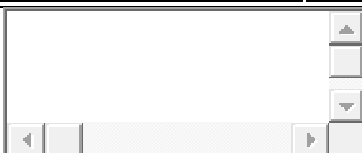
1. Produce clear, concise, and well-organized technical documents.
2. Apply ethical writing practices in academic and professional settings.
3. Communicate technical information effectively to different audiences.
4. Improve the quality, credibility, and professionalism of technical reports and research papers.

Importance of Studying This Unit

1. Enhances Communication Skills
2. Promotes Clarity and Precision
3. Develops Professional Writing Skills
4. Improves Organization of Information
5. Supports Research and Academic Writing
6. Builds Ethical Writing Practices

KEY CONCEPTS

Concept	Description
Technical Writing	Clear and accurate communication of technical information
Writing Styles	Descriptive, instructional, analytical, and persuasive
Clarity	Easy-to-understand language and presentation
Precision	Exact and specific wording
Coherence	Smooth connection between ideas
Logical Sequence	Organized presentation of information
Ambiguity	Multiple meanings that should be avoided
Repetition	Unnecessary repetition of words or ideas
Vague Language	Indefinite expressions that reduce clarity
Highlighting Findings	Clear presentation of important results
Discussing Limitations	Acknowledging the scope and constraints of the work
Hedging	Careful language for balanced claims
Constructive Criticism	Objective evaluation based on evidence
Plagiarism	Using others' work without proper credit
Paraphrasing	Rewriting ideas in your own words with proper citation



Key Outcomes

1. Understand the fundamentals of technical writing and its role in academic, scientific, and professional communication.
2. Apply appropriate technical writing styles based on the purpose, audience, and type of document.
3. Write with clarity, precision, coherence, and logical organization to communicate technical information effectively.
4. Identify and eliminate ambiguity, repetition, and vague language to improve the quality of technical documents.
5. Present research findings and technical information clearly using objective, evidence-based language.

1.1 What is Technical Writing?

Technical writing presents scientific, engineering, business and technological information in a clear and usable form. Its purpose is to deliver facts, instructions and explanations so that the intended reader understands them easily and can act on them correctly. A set of core principles — clarity, accuracy, precision, conciseness, coherence, logical sequence, objectivity and audience awareness — governs every piece of technical communication, from a one-line error message to a 200-page equipment manual.

■ *"Good technical writing is invisible — the reader should notice the content, never the writing."*

Example: A car's user manual explaining how to reset the tyre-pressure warning light in ten numbered steps is technical writing; a magazine article about the emotional experience of driving the car is not.

Why This Content Matters

Every engineer eventually has to translate technical work into a form a manager, client, operator or reviewer can understand. A brilliant design that is poorly documented can fail in the field, delay a patent filing, or be rejected by a journal. Mastering these principles decides whether your ideas are understood, trusted and acted upon.

1.2 Core Principles — Definition and Example for Each

(1) Clarity

Clarity means presenting information in simple, direct language so the reader is never confused or forced to search for the meaning.

Unclear	Clear
The performance of the device deteriorates due to multiple operational inconsistencies.	The device stops working properly because of errors.

Example: Instead of “The system exhibits suboptimal performance under certain conditions,” write “The system slows down when more than 50 users log in at once.”

(2) Accuracy

Accuracy ensures every fact, figure and statement is correct. Even a small numerical slip in technical writing can cause a wrong decision or a system failure.

Example: Recording a component's measurement as 5.5 cm instead of the actual 5.05 cm can make an entire mechanical design incorrect.

(3) Precision

Precision means giving exact, specific information rather than vague generalities.

Imprecise	Precise
Heat the solution for some time.	Heat the solution for 12 minutes at 80 °C.

Example: “The motor failed at 42.3°C after 118 hours of continuous operation” is precise; “the motor got hot and failed after a while” is not.

(4) Conciseness

Conciseness means expressing an idea in as few words as possible without losing meaning — removing filler phrases and redundant repetition.

Wordy	Concise
Due to the fact that the system is slow in nature.	The system is slow.

Example: “Due to the fact that” can simply be replaced with “because,” cutting words without losing meaning.

(5) Coherence and Logical Sequence

Coherence means ideas connect smoothly from one sentence and paragraph to the next; logical sequence means information is presented in the order the reader needs it — for example, when describing a machine: Purpose → Parts → Working → Uses.

Example: A paragraph on 'Benefits of Online Banking' should discuss the benefits one after another, not mix benefits with drawbacks midway.

(6) Objectivity

Objectivity means presenting facts without personal opinion or emotion; technical writing stays neutral and evidence-based.

Subjective (avoid)	Objective
I feel this method is the best.	This method reduces processing time by 20%.

Example: “Test results indicate a 12% failure rate” is objective; “the results were disappointingly poor” is not.

(7) Audience Awareness

Technical writing must match the reader's background — the same fact is worded differently for a specialist and a general reader.

For Engineering Students	For a General Audience
The circuit uses a 555 timer IC.	The device uses a small electronic component that controls timing.

Example: *A repair manual for technicians can say “torque the bolt to 25 Nm,” while a manual for consumers should say “tighten firmly until snug” with a picture.*

(8) Use of Visuals

Diagrams, charts, tables and graphs often communicate a process more clearly than a long paragraph — for example, a flowchart showing the steps of an algorithm is grasped far faster than the same steps written in prose.

Fig 1.1 — Eight Core Principles of Technical Writing

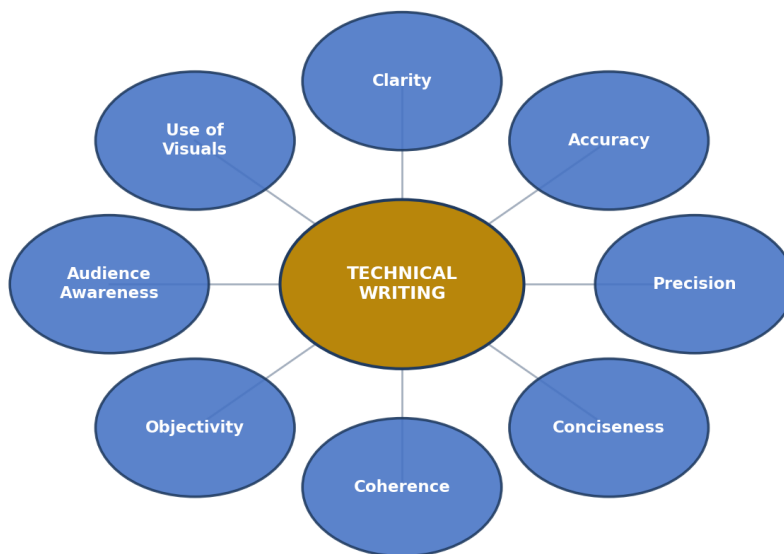


Figure 1.1: The eight core principles that govern effective technical writing.

1.3 Styles in Technical Writing

Different documents demand different registers. The table below contrasts the styles an engineer will typically encounter.

Style	Typical Document	Key Characteristic
Descriptive	Product manual, spec sheet	Objective description of a system's features and behavior

Instructional	Installation guide, SOP	Imperative mood; numbered steps; one action per step
Persuasive	Proposal, patent claim	Evidence-driven argument aimed at approval or funding
Expository	Research paper, report	Explains 'why' and 'how'; supported by data and citation
Narrative	Case study, project log	Chronological account of events or a design journey

Example: *An instruction manual uses a direct, imperative style (“Press the power button”), while a research paper uses a formal, third-person style (“The power button was pressed”).*

1.4 Avoiding Ambiguity

Ambiguity occurs when a sentence can be read in more than one way — commonly caused by vague pronouns (this, that, it, they) or words with double meanings. It is fixed by defining technical terms clearly, using specific nouns instead of pronouns, and checking that every pronoun points to exactly one noun.

Ambiguous	Clear
When the manager spoke to the engineer, he was upset. (Who was upset?)	When the manager spoke to the engineer, the manager was upset.

Example: *“Turn off the machine when it is not required” is ambiguous — does “it” mean the machine or the requirement? “Turn off the machine when production stops” is clear.*

1.5 Avoiding Repetition and Vague Language

Repetition

Repetition happens when the same idea is restated in a different way, making the writing lengthy and boring.

Repetitive	Correct
The result was very important and it played a significant role in the study.	The result was important to the study.

Example: *Writing “the results show an increase; this increase is significant; the significant increase indicates growth” repeats one idea three times where a single clear sentence would do.*

Vague Language

Vague words such as 'sort of', 'very', 'many' and 'a lot' do not give the reader exact information and should be replaced by measured facts.

Vague	Clear with Data
Many students performed well.	85% of students scored above 70%.

Vague	Clear with Data
The system works very fast.	The system processes 1,000 records per second.

1.6 Highlighting Your Findings

Findings are the key results of a study, project or experiment, and they must be surfaced so the reader grasps the main result immediately — not buried mid-paragraph.

Methods to Highlight Findings

- Start the sentence with the result: 'Notably, efficiency improved by 15% after automation.'
- Use bold or italics for the key figure: 'The error rate reduced significantly.'
- Use tables or figures with clear captions: 'Table 1 shows a 10% increase in productivity.'

1.7 Discussing Limitations

Stating limitations shows research integrity and honesty — it defines the scope of the study and explains possible weaknesses, helping future researchers build on the work.

Template: "This study is limited by [factor], which may affect [result]." — Example: "This study is limited by a small sample size, which may affect the generalization of results."

1.8 Hedging and Criticizing

Hedging

Hedging softens a strong claim and signals appropriate scientific caution, using words such as may, might, suggest and appear.

Over-claim	Appropriately Hedged
X causes Y.	The data suggest that X may influence Y.

Example: *"The data suggest that temperature may influence yield" hedges appropriately, compared with the overclaimed "temperature definitely controls yield."*

Criticizing

Criticism of prior work must be objective and constructive, targeting the method, never the author.

Example: "While Smith et al. reported high accuracy, their methodology omitted noise filtering."

1.9 Plagiarism and Paraphrasing

Plagiarism: Using someone else's ideas or words without giving credit — e.g., copying a sentence from a journal article without citation.

Paraphrasing: Restating an idea in one's own words while preserving the original meaning and citing the source.

Worked Example

Original	Good Paraphrase (cited)
Employee motivation increases productivity.	Higher employee motivation leads to improved work output (Author, Year).

Practical tip: always run plagiarism-detection tools (e.g., Turnitin) and cite sources even when paraphrasing, not only when quoting directly.

1.10 Advantages and Disadvantages of Formal Technical Style

Advantages	Disadvantages / Limitations
Removes ambiguity; supports safety-critical use	Can feel rigid or impersonal to lay readers
Enables precise reproduction of results by others	Demands more drafting/editing time
Facilitates international, cross-cultural understanding	Overuse of jargon can exclude non-specialist stakeholders
Reduces legal/contractual risk through precise wording	Excessive hedging can weaken otherwise strong claims

1.11 Applications

- Engineering design specifications and datasheets.
- Standard Operating Procedures (SOPs) and safety manuals.
- Research papers, theses and technical reports.
- Patent specifications and legal technical disclosures.
- User manuals, API documentation and software help files.

Mini Case Study: The Ariane 5 Failure (1996)

The European Ariane 5 rocket exploded 37 seconds after launch because a software conversion routine inherited from the earlier Ariane 4 was reused without re-verifying its assumptions in the new context. Post-incident review found the operating limitations of the inherited code were never explicitly re-stated for the new vehicle — a textbook example of how incomplete documentation of assumptions and limitations can have catastrophic, costly consequences.

Pedagogical Note: Classroom Activities

- Interactive lecture: show a poorly written technical paragraph and improve it collaboratively in class.
- Think–Pair–Share: students work in pairs to identify ambiguous sentences and correct them.
- Drafting workshop: students write a short technical paragraph applying clarity, precision and hedging, then exchange for peer review.

Questions — Unit I

(a) Short Questions (2 Marks)

S. No.	Question	Bloom's Level
1	Define technical writing.	L1
2	List any four principles of good technical writing.	L1
3	Differentiate between accuracy and precision with one example each.	L2
4	What is hedging? Give one example.	L2
5	Distinguish between plagiarism and paraphrasing.	L4

(b) Essay Type Questions (10 Marks)

S. No.	Question	Bloom's Level
1	Explain the principles of technical writing (clarity, accuracy, precision, conciseness, coherence, objectivity, audience awareness, use of visuals) with a suitable example for each.	L2 / L3
2	Discuss the various styles of technical writing and analyse when each style is appropriate.	L4
3	"Ambiguity is the greatest enemy of technical communication." Justify this statement with examples of ambiguous versus clear technical sentences.	L5
4	Design a set of writing guidelines (at least 8 points) that a new engineer should follow to avoid plagiarism, ambiguity and vague language in reports.	L6

Real-Time Case Study: The Challenger Disaster Memo

The night before the 1986 Challenger launch, Morton Thiokol engineer Roger Boisjoly warned in an internal memo that cold temperatures could cause the shuttle's O-rings to fail, but his technical argument was buried in dense prose and unclear charts that failed to communicate the severity of the risk to NASA decision-makers. The subsequent Rogers Commission investigation explicitly faulted the clarity of the engineering documentation and presentation, not just the underlying data, for the decision to proceed with the launch, which ended in the deaths of seven astronauts. The case is now taught worldwide as the clearest illustration of why the technical writing principles in this unit — clarity, precision and audience awareness — can carry life-or-death consequences, not merely stylistic ones.

(c) Case-Study-Based Questions

S. No.	Question	Bloom's Level
1	Analyse the Ariane 5 case study and identify at least three technical-writing failures that contributed to the incident. Suggest documentation practices that	L4 / L5

S. No.	Question	Bloom's Level
	could have prevented it.	

Additional Enrichment — Unit I

Industry Case Insight

Global technology companies such as Google and Microsoft maintain dedicated developer documentation style guides that enforce rules on voice, terminology and formatting across thousands of engineers, showing how these classroom principles scale into corporate style governance.

Emerging Trend

AI-assisted writing and grammar tools are increasingly used to enforce clarity and consistency, but publishers and universities now require authors to disclose AI assistance in manuscripts, making 'AI-usage transparency' a new principle of technical-writing ethics.

UNIT HIGHLIGHTS

1. This unit equips students with the knowledge and skills needed to produce **clear, precise, coherent, and ethical technical documents**.
2. It emphasizes effective communication, logical organization, academic integrity, and professional writing practices that are essential for success in higher education, research, and the workplace.

Prabuddha Ganguli, IntellectualPropertyRightsTataMcgrawHill,2001

UNIT II — Technical Research Paper Writing

Unit overview

This unit introduces the essential components of **technical research paper writing**. It covers how to write a clear **Abstract**, define **Objectives** and **Limitations**, conduct a **Review of Literature**, identify research **Problems** and frame effective **Research Questions**, and prepare a **Synopsis**. The unit helps students develop the skills needed to plan, organize, and present research systematically while following academic writing standards and ethical practices.

1. **Understand the structure and purpose** of a technical research paper.
2. **Write an effective abstract** that summarizes the research clearly and concisely.
3. **Formulate clear research objectives** that define the purpose and scope of the study.
4. **Identify and discuss the limitations** of a research study objectively.
5. **Conduct a review of literature** to analyze previous research and identify research gaps.
6. **Identify research problems** and frame relevant, clear, and researchable questions.
7. **Prepare a research synopsis** by organizing the title, objectives, methodology, and expected outcomes systematically.
8. **Apply academic writing and ethical practices**, including proper citation and avoidance of plagiarism.

LEARNING OUTCOMES

1. **Explain the essential components** of a technical research paper.
2. **Prepare a clear and concise abstract** that accurately summarizes a research study.
3. **Formulate specific and measurable research objectives** aligned with the study.
4. **Recognize and describe the limitations** of a research project appropriately.
5. **Conduct and organize a review of literature** to identify existing knowledge and research gaps.
6. **Identify research problems** and frame relevant, focused, and researchable questions.
7. **Develop a well-structured research synopsis** with appropriate sections and logical organization.
8. **Apply academic writing conventions** to produce clear, coherent, and professional research documents.
9. **Demonstrate ethical research practices** by avoiding plagiarism and using proper citation and referencing.

IMPORTANCE OF STUDYING THE UNIT

1. Develops Research Skills
2. Enhances Academic Writing
3. Strengthens Critical Thinking
4. Promotes Evidence-Based Learning
5. Builds Literature Review Skills
6. Improves Research Planning
7. Encourages Ethical Research Practices
8. Prepares for Higher Education and Research
9. Enhances Professional Communication
10. Supports Career Development

KEY CONCEPTS

Concept	Description
Technical Research Paper	A structured document presenting research systematically
Abstract	A concise summary of the research paper
Research Objectives	Statements defining the goals of the study
Limitations	Constraints affecting the scope or findings of the research
Review of Literature	Critical evaluation of previous studies and research gaps
Research Problem	The issue or question that motivates the research
Research Questions	Specific questions guiding the investigation
Synopsis	A brief outline of the proposed research
Research Methodology	Methods used to conduct and analyze the research
Academic Integrity	Ethical conduct in research, including proper citation and avoidance of plagiarism

Learning Objectives

- **Describe** — Describe the structure and write a complete, well-formed research abstract.
- **Frame** — SMART objectives and clearly stated limitations for a research study.
- **Organize** — a review of literature using a structured, three-part framework.
- **Formulate** — a sound research problem and distinguish it from a research question.
- **Draft** — a research synopsis containing all key elements expected by an academic committee.

2.1 Abstract

An abstract is a short, self-contained summary of an entire research paper. It tells the reader what the study is about, how it was conducted, what results were obtained, and what conclusions were drawn. Most readers decide whether to read the full paper based on the abstract alone, so it must be informative and precise. A typical abstract is 150–250 words, written as a single paragraph, after the full paper is complete.

Illustration: If a research paper is 60 pages long, the abstract compresses the entire study into one short paragraph.

The IMRaD Structure of an Abstract

Component	Answers the Question	Example Sentence
Introduction (I)	Why is this study necessary?	"MSMEs face frequent inventory problems due to inaccurate demand forecasting."
Methods (M)	How was the research carried out?	"The study uses primary data from 60 MSMEs over 12 months, applying ratio analysis."
Results (R)	What are the main results?	"Findings show a 25% increase in inventory turnover after AI-based forecasting."
Discussion (D)	What do the results mean?	"The study confirms that AI-based forecasting improves inventory efficiency in MSMEs."

Complete Worked Example of an Abstract

"This study examines the impact of AI-based demand forecasting on inventory turnover in MSMEs. The study uses primary data collected from 60 MSMEs over a period of 12 months. Ratio analysis and regression analysis are applied to analyze the data. The results show a 25% improvement in inventory turnover and a reduction in excess stock. The study concludes that AI-based demand forecasting supports better inventory decisions and improves operational efficiency in MSMEs."

Writing Tips

- Write the abstract only after completing the full paper.
- Use simple, clear language and avoid unnecessary technical jargon.
- Avoid uncommon abbreviations that a first-time reader will not recognise.
- Always include the key numerical result(s).
- Keep it to one paragraph, single-spaced.

Example simplification: instead of 'ICT-enabled SCM optimization,' write 'technology-based supply chain improvement.'

Fig 2.1 — The IMRaD Structure of a Research Paper



Abstract = one to two sentences distilled from each of the four IMRaD sections

Figure 2.1: The IMRaD structure underlying a research paper and its abstract.

2.2 Objectives of the Study

Objectives are clear statements describing what the research intends to achieve — they convert a broad research problem into measurable goals that guide the researcher throughout the study.

Example: “To evaluate the effect of remote work on employee productivity in IT firms in Bengaluru” is a clear, measurable study objective.

SMART Objectives — One Example for Each Letter

Criterion	Meaning	Example
Specific	Clearly states what is to be studied	"To study inventory turnover."
Measurable	Can be assessed using data	"To measure inventory turnover ratio before and after AI adoption."
Achievable	Realistic and completable	Studying 60 MSMEs instead of every MSME in India
Relevant	Directly tied to the research problem	Studying inventory cost when the problem is inventory efficiency
Time-bound	Specifies a time period	"Over a period of 12 months."

Complete SMART objective example: "To evaluate the impact of AI-based demand forecasting on inventory turnover in MSMEs over a period of 12 months."

2.3 Limitations of the Study

Limitations explain the boundaries of the research — what it does not cover, and why the results may not apply to every situation. They demonstrate research integrity and help readers correctly scope the conclusions.

Example: *“This survey covered only 60 MSMEs in one district and may not generalise to larger firms or other regions” is an honestly stated limitation.*

Common Types of Limitations

Type	Description
Sample Size	A small sample may not represent the whole population
Time	A short study period restricts long-term analysis
Data	Use of secondary data may affect accuracy
Geographical	Study limited to one region or organization

Example: "This study is limited to data from one bank for a period of five years. Therefore, the findings may not be generalized to all banks or longer time periods."

2.4 Review of Literature (RoL)

Review of Literature is a systematic study of existing research related to the topic. It helps the researcher understand what is already known and how the present study adds new knowledge, and it must be organised thematically or chronologically — not as an annotated list of papers.

Example: *A review of literature on “AI in inventory management” might group prior studies into demand-forecasting models, automation case studies, and adoption-barrier surveys.*

Three-Part Structure

- Thematic introduction — explains major themes/concepts (e.g., profitability, liquidity and efficiency in banking studies).
- Chronological or methodological review — shows how studies developed over time or compares research methods (e.g., earlier studies used ratio analysis; recent studies use regression/panel-data models).
- Identification of research gaps — states what previous studies have not covered (e.g., many studies focus on public-sector banks, but few analyse private insurance companies).

Sample Review-of-Literature Matrix

Author	Year	Methodology	Findings	Research Gap
Kumar	2019	Ratio Analysis	Profitability depends on NPA	No insurance sector
Rao	2021	Regression	Liquidity affects ROA	Limited sample size

2.5 Research Problem and Framing Research Questions

A research problem is a specific issue or gap observed in real-world practice or existing studies that needs systematic investigation — it explains what is wrong, why it matters, and who is affected.

Example research problem: "Many agri-food supply chains suffer from lack of transparency, leading to food safety issues and mistrust among stakeholders."

Characteristics of a Good Research Question

- Open-ended and exploratory, not answerable with a simple yes/no.
- Directly linked with the study's objectives.
- Clear, focused and genuinely researchable within the available time and data.

Example research questions: "How does blockchain technology improve transparency in agri-food supply chains?" "What are the benefits of blockchain adoption for farmers and consumers?"

Problem Statement vs. Research Question

Aspect	Problem Statement	Research Question
Nature	Broad description	Specific inquiry
Purpose	Explains context and importance	Guides investigation
Example	Lack of supply-chain transparency	How does blockchain improve transparency?

2.6 Research Synopsis

A research synopsis is a brief proposal (typically 2–3 pages) that presents the entire research plan concisely, helping supervisors or committees evaluate the direction and feasibility of the study before full-scale work begins.

Example: A synopsis for a thesis on green supply chains would summarise the problem, three objectives, the survey methodology, and expected policy implications in about two pages.

Key Elements of a Synopsis

Element	Purpose
Title	Reflects the theme and variables, e.g., 'A Study on the Role of Blockchain Technology in Improving Supply Chain Transparency in Agri-Food Sector'
Introduction	Background, problem identification and justification
Review of Literature (brief)	Summarises key studies and highlights the research gap
Objectives	States what the researcher intends to achieve
Research Questions / Hypotheses	Framed questions or testable statements guiding the research
Research Methodology	Design, sample size, data sources and tools, e.g., 'Descriptive research using

Element	Purpose
	survey method and questionnaire'
Expected Outcomes	Predicted contributions and findings
Limitations	Constraints such as time, data availability or sample size
References	Key sources used to prepare the synopsis

Writing tips: use formal, clear language; avoid vague terms and ambiguity; include a flowchart or Gantt chart to show the research timeline.

Example: *A strong synopsis title such as “Impact of AI-Based Demand Forecasting on Inventory Turnover in MSMEs” signals the variables and population in a single line.*

2.7 Advantages and Disadvantages of Structured (IMRaD) Writing

Advantages	Disadvantages / Limitations
Predictable structure speeds up reviewer evaluation	Can feel formulaic for interdisciplinary or qualitative work
Enables reproducibility through detailed methodology	Strict word/page limits can force over-compression of nuance
Facilitates indexing and searchability of literature	Novice writers may mechanically fill sections without true synthesis

2.8 Applications

- Journal and conference paper submission (IEEE, Elsevier, Springer).
- Thesis and dissertation chapters.
- Grant and project proposal synopses.
- Technical white-papers in industry R&D.

Mini Case Study: Reviewer Rejection Due to a Weak Abstract

Editorial feedback from major journals commonly cites 'abstract does not state a quantifiable contribution' as a top reason for desk rejection. Papers revised to include a specific numeric result in the abstract (e.g., 'improves accuracy by 8%' instead of 'improves accuracy significantly') show materially higher review-invitation rates — showing that the IMRaD abstract principles in this unit have direct, measurable career impact.

Classroom Activity

Students are given a problem statement and asked to frame two research questions from it, or given a completed paper and asked to identify hidden limitations such as ignored variables or an unusually short study period.

Questions — Unit II

(a) Short Questions (2 Marks)

S. No.	Question	Bloom's Level
1	List the four components of the IMRaD abstract structure.	L1
2	Define a research question with one example from engineering/management.	L2
3	What does the 'M' in SMART objectives stand for? Give an example.	L2
4	State any two purposes of a research synopsis.	L1
5	List two common types of limitations found in a research study.	L1

(b) Essay Type Questions (10 Marks)

S. No.	Question	Bloom's Level
1	Explain the IMRaD structure of a research abstract, with the purpose of each component and one illustrative sentence for each.	L2
2	Write and justify a SMART-compliant set of three objectives for a hypothetical study on 'IoT-based smart grid monitoring', explaining how each satisfies the SMART criteria.	L3 / L6
3	Critically compare thematic and chronological approaches to organising a Review of Literature, with examples.	L4
4	Evaluate why weakly framed objectives and research questions lead to unfocused research, using at least two illustrative examples.	L5

Real-Time Case Study: The STAP Stem-Cell Retraction

In January 2014, Nature published two papers by researcher Haruko Obokata claiming a simple acid-bath method could reprogram cells into a stem-cell-like state (“STAP cells”). Within weeks, outside scientists identified duplicated and manipulated images and inconsistencies in the methodology and reporting; a RIKEN institutional investigation confirmed research misconduct, and both papers were retracted by July 2014. The episode is widely cited in research-methods courses as a case where weaknesses in figure preparation, data reporting and peer review — not the underlying experiment alone — allowed a flawed abstract and manuscript to pass review, underscoring why rigorous IMRaD reporting and honest limitation-disclosure matter.

(c) Case-Study-Based Questions

S. No.	Question	Bloom's Level
1	Analyse the 'weak abstract' case study and rewrite a sample poor abstract into an effective IMRaD-structured one, justifying each change made.	L4 / L6

Additional Enrichment — Unit II

Industry Case Insight

R&D divisions of companies such as Siemens and ABB require internal 'technical memo' abstracts before any patent or paper is greenlit for external submission, mirroring the academic abstract structure to quickly triage which innovations merit further investment.

Emerging Trend

Structured and graphical abstracts, along with short video abstracts, are now requested by several journals, reflecting a shift toward multi-modal summarisation of research alongside the traditional text abstract.

Unit Highlights

- Covers the structure and components of a technical research paper, including abstract, objectives, and limitations.
- Explains the importance and process of conducting a review of literature.
- Focuses on identifying research problems and finding research gaps.
- Guides students in framing clear and effective research questions.
- Introduces the preparation and organization of a research synopsis.
 - Prabuddha Ganguli, IntellectualPropertyRightsTataMcgrawHill,2001

UNIT III — Process of Research: Publication, Methodology & Citation

"Science is built up with facts, as a house is with stones. But a collection of facts is no more a science than a heap of stones is a house." — Henri Poincaré



UNIT OVERVIEW

The unit provides an overview of the research process, publication mechanisms, and types of journals along with indexing systems. It explains the importance of seminars and conferences in sharing research findings and developing academic communication skills. The unit also covers proofreading methods, plagiarism prevention, and appropriate writing styles for research documents. It focuses on seminar and conference paper preparation, including methodology, results, and discussion sections. It also introduces citation rules and ethical practices required for successful research publication.

OBJECTIVES OF THE UNIT

After studying this unit, students will be able to:

1. Understand the various stages involved in the research process.
2. Explain the publication mechanism and the process of publishing research articles.
3. Differentiate between various types of research journals and their significance.
4. Understand journal indexing and its importance in academic research.
5. Describe the role of seminars and conferences in disseminating research findings.
6. Learn the basics of proofreading and improve the quality of research manuscripts.
7. Understand plagiarism, its consequences, and methods to avoid it using proper citation practices.

LEARNING OUTCOMES

1. **Explain** the different stages involved in the research process.
2. **Identify** various types of research journals, indexing databases, seminars, and conferences.
3. **Understand** the publication mechanism and ethical practices, including plagiarism and proofreading.
4. **Prepare** seminar papers and conference papers using the appropriate research format.
5. **Apply** suitable research methodologies for conducting research studies.
6. **Analyze** research findings and present discussions and results effectively.
7. **Use** proper citation styles and referencing techniques in academic writing.
8. **Demonstrate** ethical and professional standards in research publication and academic communication.

IMPORTANCE OF STUDYING THIS UNIT

- Develops a clear understanding of the research process from problem identification to publication.
- Enhances academic writing and research communication skills.
- Creates awareness of journals, indexing, seminars, and conferences for research dissemination.
- Promotes ethical research practices through plagiarism awareness and proper proofreading.
- Improves the ability to write quality seminar papers and conference papers.

KEY CONCEPTS

S. No.	Key Concept	Description
1	Research Process	Systematic steps involved in conducting research from problem identification to reporting.
2	Publication Mechanism	Process of submitting, reviewing, revising, and publishing research work.
3	Types of Journals	Different categories of journals such as national, international, peer-reviewed, and open-access journals.
4	Journal Indexing	Listing journals in databases like Scopus, Web of Science, Google Scholar, and UGC-CARE.
5	Seminars and Conferences	Academic events for presenting and discussing research findings.
6	Proofreading	Reviewing a manuscript to eliminate grammar, spelling, and formatting errors.
7	Plagiarism	Using another person's work without proper acknowledgment; maintaining originality in research.
8	Research Ethics	Principles of honesty, integrity, and ethical conduct in research.
9	Seminar & Conference Paper Writing	Preparing research papers in a standard academic format for presentation.
10	Research Methodology	Methods and techniques used to collect and analyze research data.
11	Discussion & Results	Interpretation and presentation of research findings.
12	Citation Rules & Referencing Styles	Proper acknowledgment of sources using APA, MLA, IEEE, Chicago, etc.

Learning Objectives

- **Sequence** — the complete research process from problem identification to dissemination.
- **Differentiate** — between types of research and research approaches used in technical studies.
- **Explain** — the mechanism of academic publication, including the roles of authors, editors and reviewers.

- **Apply** — correct methodology selection and justify it for a given research problem.
- **Use** — standard citation styles accurately and avoid citation-related misconduct.

3.1 The Research Process — Step by Step

Research follows a structured sequence of stages that carry a problem from an initial question to a published, defensible conclusion.

Step	Description	Example
1. Identify the Research Problem	Define the question or problem to be investigated	"Why do MSMEs face high inventory holding costs?"
2. Conduct Literature Review	Review existing research related to the problem	Surveying 20 prior studies on inventory management
3. Develop Objectives	Clearly define what the research will achieve	"To evaluate AI-based demand forecasting's impact on turnover."
4. Design Methodology	Choose research design, sampling and data-collection methods	Descriptive study using a structured questionnaire
5. Collect Data	Gather primary and/or secondary data	Survey of 60 MSME owners over 12 months
6. Analyze Data	Apply statistical or qualitative methods	Regression analysis in SPSS
7. Interpret Results	Draw conclusions based on findings	"AI forecasting reduced excess stock by 25%."
8. Report Results	Present findings in a paper or report	Drafting the final manuscript for submission

Example: A student researching “AI adoption in retail” first identifies the problem, reviews prior studies, frames one research question, surveys 100 retailers, analyses the data, and finally writes and submits a paper.

Types of Research and Research Approaches

Category	Type	Example
By purpose	Exploratory — investigates a problem to gain insight	Initial interviews to understand a new consumer trend
By purpose	Descriptive — describes characteristics of a population	Survey describing smartphone usage patterns among students
By purpose	Explanatory — explains relationships between variables	Testing whether advertising spend explains sales growth
By data type	Qualitative — non-numerical data (text, images)	Interview transcripts analysed thematically

Category	Type	Example
By data type	Quantitative — numerical data (statistics, surveys)	Regression analysis of sales figures

Fig 3.1 — The Research Process, Step by Step



Figure 3.1: The seven-step research process, from problem identification to dissemination.

Example: A survey measuring customer-satisfaction scores is quantitative research, while interviews exploring why customers feel dissatisfied are qualitative research.

3.2 Publication Mechanism

The publication mechanism is the process of sharing research findings and innovations with the academic community and beyond.

Example: A completed manuscript submitted to a journal such as *IEEE Access* is checked by an editor, sent to two anonymous reviewers, revised, and finally published online with a DOI.

Steps in the Publication Mechanism

- Research — conduct original research, experiments or literature reviews.
- Writing — prepare a manuscript following the target journal's guidelines.
- Submission — submit the manuscript to a journal or conference.
- Peer Review — receive reviewer feedback and revise the manuscript.
- Acceptance — the paper is accepted for publication or presentation.

- Publication — the article, paper or book is published.

Example: After a “minor revision” verdict, an author might need to add a limitations paragraph and re-run one statistical test before resubmitting.

Key Players in the Publication Mechanism

Player	Role
Authors	Researchers/scholars who create the content
Editors	Oversee the peer-review process and make publication decisions
Reviewers	Provide feedback to improve manuscript quality
Publishers	Produce and distribute the publication

Benefits of the Publication Mechanism

- Knowledge sharing — disseminates research findings and innovations.
- Career advancement — supports academic promotions and progression.
- Credibility — demonstrates expertise and enhances professional reputation.
- Collaboration — fosters networking among researchers.

Example: Post-publication peer scrutiny was what first flagged the data problems in the 2014 STAP stem-cell papers, showing the mechanism's quality-control value.

3.3 Types of Journals

Type	Description
Academic Journals	Focus on original research, peer-reviewed, published by universities/societies
Review Journals	Publish review articles summarising recent research on a topic
Professional Journals	Target practitioners; focus on practical applications and industry trends
Open Access Journals	Freely available online, often with an article-processing charge
Predatory Journals	Fake or low-quality journals that charge fees without proper peer review
Indexed Journals	Listed in databases such as Scopus, Web of Science or PubMed
UGC-CARE Journals	Recognised by India's University Grants Commission for quality and relevance

Journal Categories by Field (Illustrative)

- Science and Technology — Nature, Science, PLOS ONE
- Social Sciences — Harvard Business Review, Journal of Business Research
- Humanities — Journal of Philosophy, Journal of History
- Medicine — New England Journal of Medicine, JAMA

3.4 Seminars and Conferences

Event Type	Description
Conferences	Formal gatherings for presenting research, often with keynote speakers and proceedings
Seminars	Smaller, focused events for in-depth discussion and learning
Workshops	Hands-on sessions for skill development
Symposia	Expert-led discussions on a specific topic
Webinars	Online seminars or conferences

Preparing for a Conference

- Submit and refine the abstract for the presentation.
- Prepare an engaging talk or poster.
- Research likely attendees and prepare questions in advance.
- Follow up with contacts and speakers after the event.

Example: *A student presenting at a national conference prepares a ten-minute slide deck, a one-page abstract, and rehearses answers to likely questions from the audience.*

Types of Presentations

- Oral presentations — short talks, typically 10–20 minutes.
- Poster presentations — visual displays of research.
- Keynote speeches — invited talks by domain experts.

Example: *A poster presentation suits early-stage results at a large conference, while an oral presentation suits a completed study with strong findings.*

3.5 Proofreading

Proofreading is the final review of written content for errors in grammar, punctuation, spelling and formatting before submission.

Type	Focus
Copy Editing	Grammar, punctuation and spelling
Line Editing	Sentence structure and clarity
Content Editing	Accuracy and relevance of the content

Example: *Reading a draft aloud often reveals an accidentally repeated word, such as “the the system,” that silent reading misses.*

Tips for Effective Proofreading

- Take a break and return to the work with fresh eyes.
- Read the text aloud to catch awkward phrasing and missed errors.

- Use grammar/spell-check tools, but never rely on them solely.
- Get a second opinion — ask a peer to review the work.

Example: *Checking a reference list against in-text citations often reveals a source like “Kumar (2020)” cited in the text but missing from the bibliography.*

3.6 Plagiarism Styles

Style	Description	Example
Verbatim	Copying text word-for-word without quotes or citation	Pasting a paragraph directly from a website
Paraphrasing Plagiarism	Rewording someone's work without proper citation	Changing a few words in a sentence but not citing the source
Mosaic	Combining your own words with someone else's without citation	Blending copied phrases into an otherwise original paragraph
Self-Plagiarism	Reusing one's own previously published work without citation	Resubmitting an earlier paper's results as new
Accidental	Unintentional plagiarism from carelessness or lack of knowledge	Forgetting to cite a source paraphrased from memory

Consequences of Plagiarism

- Academic penalties — failing a course, suspension or expulsion.
- Professional consequences — loss of credibility, job loss, or legal action.
- Reputation damage — long-term damage to personal and professional standing.

Example: *In a widely reported 2012 case, a German government minister's doctorate was revoked after reviewers found large unattributed passages copied from other theses.*

3.7 Seminar & Conference Paper Writing

A seminar/conference paper is a compact version of a full paper, structured to be presented and discussed within a fixed time slot.

Example: *A six-page IEEE conference paper compresses the same IMRaD content as a twenty-page journal article into a tighter, more selective format.*

Key Components

- Title — clear, concise and relevant.
- Abstract — 150–250 word brief summary.
- Introduction — topic, context and research question.
- Literature Review — overview of relevant prior research.
- Methodology — the research approach and methods used.

- Results — findings and analysis.
- Discussion — interpretation and implications.
- Conclusion — summary of key findings and contributions.

Example: *A conference paper's “related work” section might cite five recent papers to show precisely how the current work differs from each.*

Common Formats

Format	Typical Length
Full paper	5–10 pages, published in proceedings
Extended abstract	2–4 pages, summarising the research
Poster presentation	Visual display with a short verbal pitch

3.8 Methodology

The methodology section explains how the research was conducted — the approach, methods and procedures used — in enough detail for another researcher to reproduce the study.

- Research Design — the overall approach (qualitative, quantitative or mixed-methods).
- Data Collection — how data was gathered (surveys, interviews, observations).
- Sampling Strategy — how the sample and population were selected.
- Data Analysis — the methods used to analyse the data.
- Ethical Considerations — how ethical issues were identified and addressed.

Example: *A study testing whether training improves productivity might use a pre-test/post-test design with a control group of untrained employees.*

3.9 Results and Discussion

Section	Purpose	Rule of Thumb
Results	Presents findings objectively, without interpretation	Use tables/figures; report only relevant data
Discussion	Interprets results, compares with literature, states implications	Relate every point back to the research question; avoid speculation beyond the data

3.10 Citation Rules

Citations acknowledge the work of others and give credibility to research. All sources — books, articles, websites and data — must be cited consistently in one chosen style throughout a document.

Example: *APA style cites a source in text as (Kumar, 2020), while IEEE style cites the same source numerically as [3].*

Common Citation Styles — In-Text Format

Style	Field	In-Text Example
APA	Social sciences, education, business	(Smith, 2020, p. 12)
MLA	Humanities and literature	(Smith 12)
Chicago/Turabian	History, philosophy, fine arts	Footnote: 1. Smith, Title, 12.
IEEE	Engineering, computer science	Numbered: [1]

Reference-List Format Examples

Style	Book Reference	Article Reference
APA	Author, A. A. (Year). Title. Publisher.	Author, A. A. (Year). Title. Journal Name, Volume (Issue), Page–Page.
MLA	Author's Last Name, First Name. Title. Publisher, Year.	Author's Last Name, First Name. "Title." Journal Name, vol. Volume, no. Issue, Year, pp. Page–Page.

3.11 Advantages and Disadvantages

Advantages of Rigorous Publication Process	Disadvantages / Limitations
Ensures quality control through peer review	Long review cycles can delay dissemination of urgent findings
Indexing provides discoverability and a credibility signal	Open-access fees can be a barrier for under-funded researchers
Standard citation rules prevent plagiarism disputes	Predatory journals exploit publish-or-perish pressure

3.12 Applications

- Selecting appropriate, UGC-CARE/Scopus-indexed venues for publishing student and faculty research.
- Preparing conference presentations and extended journal versions of the same study.
- Building a correctly formatted reference list using tools like Mendeley, Zotero or EndNote.
- Institutional research-quality audits based on indexing and citation metrics.

Mini Case Study: The Rise and Fall of a Predatory Publisher

Investigative reports have documented how certain fee-charging open-access publishers accepted nonsensical or plagiarised manuscripts within days, without genuine peer review. In response, universities introduced 'approved journal list' policies, and funding agencies began rejecting reports that cited papers published in blacklisted venues — a direct, career-relevant consequence of skipping the due diligence taught in this unit.

Questions — Unit III

(a) Short Questions (2 Marks)

S. No.	Question	Bloom's Level
1	List the eight steps of the research process.	L1
2	What is a predatory journal?	L2
3	Differentiate between mosaic plagiarism and self-plagiarism.	L2
4	Name any two citation styles and one field where each is commonly used.	L1
5	Why is proofreading essential before submission?	L4

(b) Essay Type Questions (10 Marks)

S. No.	Question	Bloom's Level
1	Describe the complete publication mechanism from manuscript preparation to publication, identifying the key players at each stage.	L2
2	Compare journal publication and conference publication as two dissemination routes, and recommend which a student should choose for a time-sensitive result.	L4 / L5
3	Explain citation rules across APA, MLA and IEEE styles with worked in-text and reference-list examples, and discuss the risks of inconsistent citation.	L3
4	Design a checklist (at least 10 items) a research scholar should use before submitting a paper to a journal.	L6

Real-Time Case Study: The Sokal Affair

In 1996, physicist Alan Sokal submitted a deliberately nonsensical paper, filled with fashionable jargon but no real argument, to the cultural-studies journal *Social Text*. The paper was accepted and published without substantive peer review, after which Sokal revealed the hoax to expose weaknesses in the journal's editorial and review process. The affair triggered lasting debate about peer-review rigour and is still cited in research-methodology courses as a caution about the publication mechanism: prestige of a venue is not a guarantee of the review quality behind a given paper, which is why researchers are taught to evaluate journals, reviewers and methodology critically before trusting or citing a publication.

(c) Case-Study-Based Questions

S. No.	Question	Bloom's Level
1	Analyse the predatory-publisher case study and propose three institutional safeguards that could prevent students from publishing in such venues.	L4 / L5

Additional Enrichment — Unit III

Industry Case Insight

Corporate R&D labs often publish in a hybrid mode — filing a patent first, then publishing a related paper once the priority date is secured — to protect IP while still gaining academic visibility, illustrating how Units II–V of this course interact in real practice.

Emerging Trend

Open peer review, where reviewer identities and comments are published alongside the paper, and post-publication review platforms are growing in adoption, adding transparency to the traditional closed peer-review process.

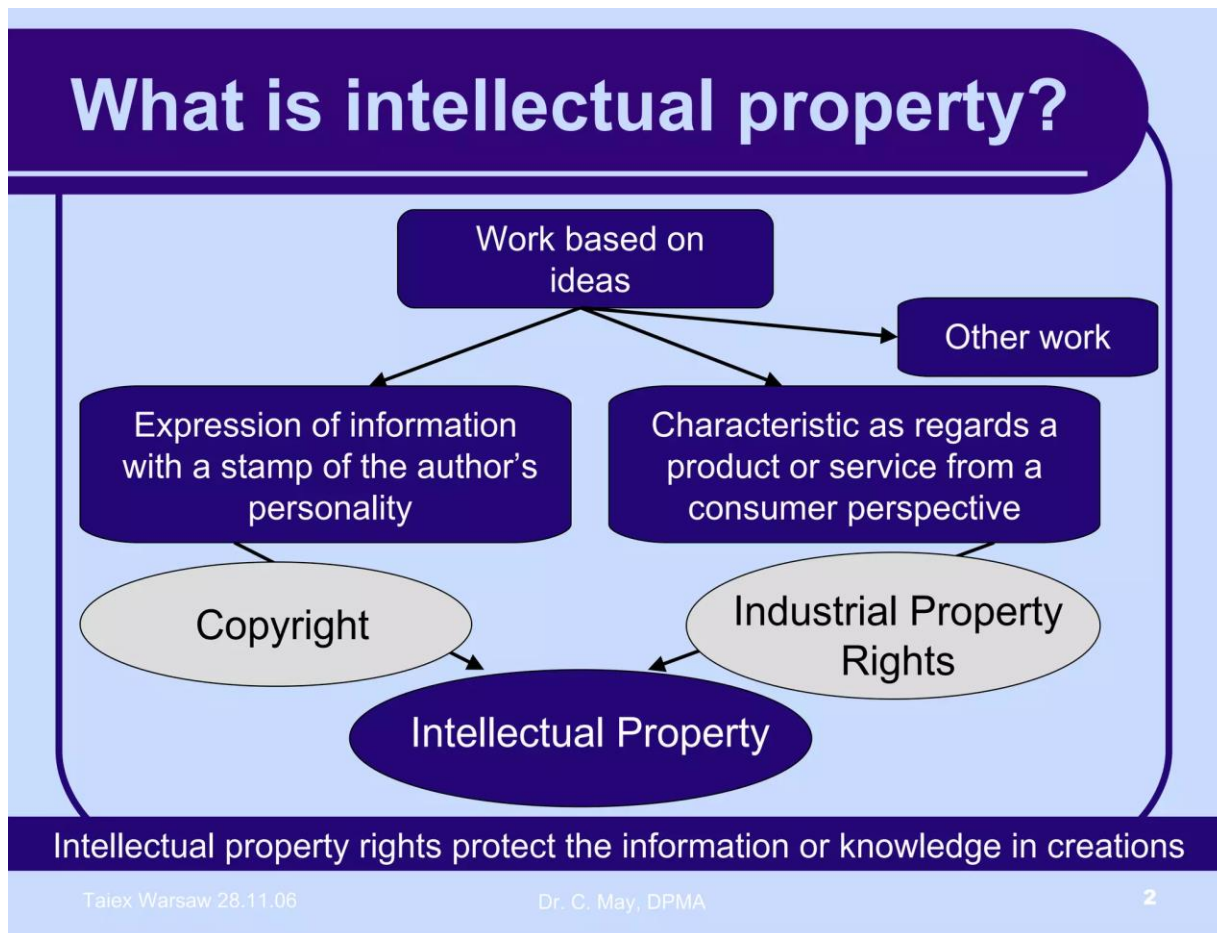
UNIT HIGHLIGHTS

1. Understand the complete **research process** from problem identification to report writing.
2. Learn the **publication mechanism** for research papers.
3. Explore different **types of research journals** and their significance.
4. Understand the concept and importance of **journal indexing**.
5. Gain knowledge about **seminars and conferences** as platforms for research dissemination.
6. Develop **proofreading and editing** skills for high-quality manuscripts.
7. Understand **plagiarism** and the importance of maintaining **research ethics**.

1. **DanJones, SamDragga, TechnicalWritingStyle**

UNIT IV — Introduction to Intellectual Property & Trade Marks

"The patent system added the fuel of interest to the fire of genius." — Abraham Lincoln



UNIT OVERVIEW

This unit introduces the fundamentals of **Intellectual Property Rights (IPR)**, including their types, importance, and the role of international organizations and treaties in protecting intellectual property. It also covers **trademarks**, their purpose, acquisition of rights, protectable subject matter, selection, and the trademark registration process, highlighting their significance in protecting brands and promoting innovation.

Objectives of the Unit

After studying this unit, students will be able to:

1. **Understand** the concept and importance of Intellectual Property Rights (IPR).
2. **Identify** the different types of Intellectual Property and their applications.

3. **Explain** the role of international organizations, agencies, and treaties in protecting intellectual property.
4. **Describe** the purpose and functions of trademarks.
5. **Understand** the acquisition and protection of trademark rights.
6. **Learn** the criteria for selecting and evaluating trademarks.
7. **Explain** the trademark registration process and its legal significance.
8. **Recognize** the importance of IPR in promoting innovation, business growth, and economic development.

LEARNING OUTCOMES

1. **Define** Intellectual Property (IP) and Intellectual Property Rights (IPR).
2. **Classify** the different types of Intellectual Property.
3. **Explain** the role of international organizations, agencies, and treaties related to IPR.
4. **Describe** the importance of Intellectual Property Rights in protecting innovation and creativity.
5. **Understand** the purpose and functions of trademarks.
6. **Identify** protectable subject matter and the process of acquiring trademark rights.
7. **Apply** the criteria for selecting and evaluating trademarks.

IMPORTANCE OF STUDYING THIS UNIT

1. Understand the significance of **Intellectual Property Rights (IPR)** in protecting innovation and creativity.
2. Gain knowledge of the **different types of Intellectual Property** and their applications.
3. Learn the role of **international organizations, agencies, and treaties** in safeguarding IP rights.
4. Understand the **importance of trademarks** in building and protecting brand identity.
5. Develop awareness of the **legal rights and protection** available for trademarks.
6. Learn the **trademark selection and registration process**.

Key Concepts

S. No.	Key Concept	Description
1	Intellectual Property (IP)	Legal protection for creations of the human mind.

S. No.	Key Concept	Description
2	Intellectual Property Rights (IPR)	Rights granted to creators over their intellectual creations.
3	Types of Intellectual Property	Patents, Copyrights, Trademarks, Industrial Designs, Geographical Indications, Trade Secrets, etc.
4	International Organizations	Organizations such as WIPO that promote and protect IPR globally.
5	International Treaties	Agreements that facilitate international protection of intellectual property.
6	Importance of IPR	Encourages innovation, creativity, investment, and economic growth.
7	Trade Marks	Symbols, names, logos, or signs used to identify goods or services.
8	Purpose and Functions of Trade Marks	Differentiate products, protect brand identity, and build consumer trust.
9	Acquisition of Trade Mark Rights	Methods of obtaining legal ownership and protection of trademarks.
10	Protectable Matter	Words, logos, symbols, slogans, shapes, colors, and other distinctive marks eligible for protection.
11	Selecting and Rating a Trade Mark	Criteria for choosing a distinctive and legally protectable trademark.
12	Trade Mark Registration Process	Steps involved in applying for and obtaining trademark registration.

Learning Objectives

- **Define** — intellectual property and describe its major characteristics and rationale.
- **Distinguish** — between patents, trademarks, copyrights and related IP categories.
- **Explain** — the criteria and process for registering a trademark under the Trade Marks Act, 1999.
- **Analyse** — real business scenarios to identify trademark infringement or dilution.
- **Assess** — the strategic value of IP protection for individuals, start-ups and organisations.

4.1 Meaning and Characteristics of Intellectual Property

Intellectual Property (IP) refers to creations of the human mind — inventions, literary and artistic works, designs, symbols, names and images used in commerce. Unlike physical property, IP is intangible but has real commercial value. Intellectual Property Rights (IPR) are the legal rights granted to creators and inventors to protect these creations for a specified period.

Example: The secret formula for Coca-Cola (a trade secret), the Nike swoosh (a trademark), and a Pfizer drug patent are all forms of intellectual property, each protecting a different kind of intangible asset.

Characteristics of Intellectual Property

- Intangible asset — cannot be touched, yet holds economic value.
- Result of intellectual effort — creativity, research or investment.
- Exclusive rights granted by law — owner alone may authorise use.
- Territorial in nature — generally valid only in the country where registered.
- Time-bound protection — most forms expire after a defined term.

Example: A patented drug formula can be licensed to multiple manufacturers worldwide while the original inventor still retains ownership — illustrating how IP rights are separable from any physical object.

4.2 Types of Intellectual Property — With an Example for Each

IP is broadly classified into (A) Industrial Property and (B) Copyright and Related Rights.

Type	Definition	Protection Period	Example
Patent	Exclusive right for an invention that is new, involves an inventive step, and is industrially applicable	20 years	A new pharmaceutical drug formula (e.g., Pfizer); a technological invention by Apple Inc.
Trademark	A sign distinguishing the goods/services of one enterprise from another (word, logo, symbol, colour or sound)	10 years, renewable indefinitely	The Nike swoosh logo; the brand name Tata
Copyright	Protection for original literary, artistic, musical and dramatic works	Life of author + 60 years (India)	A novel by J.K. Rowling; films produced by Walt Disney Company
Industrial Design	Protects the aesthetic aspect of an article — shape, pattern, configuration	10–15 years typically	The unique smartphone design of Samsung
Geographical Indication (GI)	Identifies goods from a specific geographical origin with special qualities	10 years, renewable	Darjeeling Tea; Kanchipuram Silk Sarees
Trade Secret	Confidential business information providing a competitive advantage, protected by secrecy rather than registration	Indefinite, while kept secret	The secret formula of Coca-Cola

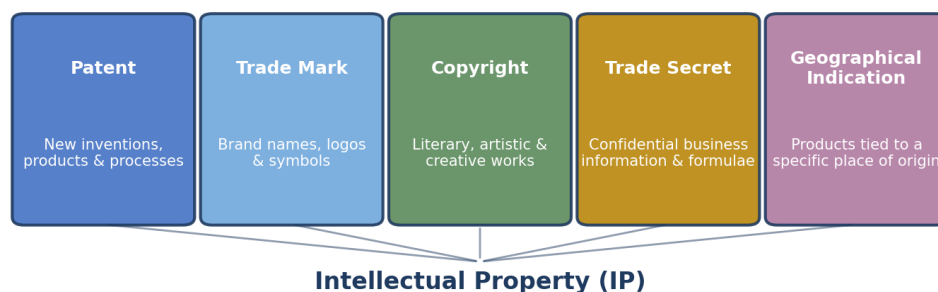
Fig 4.1 — Major Categories of Intellectual Property

Figure 4.1: The major categories of intellectual property and what each protects.

4.3 International Organizations, Agencies and Treaties

Organization / Treaty	Role
World Intellectual Property Organization (WIPO)	A specialised UN agency (established 1967, headquartered in Geneva) that promotes global IP protection
World Trade Organization (WTO)	Administers international trade rules and oversees the TRIPS Agreement
Paris Convention	Protects industrial property and establishes the 'national treatment' principle
Berne Convention	Protects literary and artistic works with automatic copyright protection
TRIPS Agreement	Sets minimum IP protection standards for WTO member countries
Patent Cooperation Treaty (PCT)	Simplifies international patent filing through a single application

4.4 Importance of Intellectual Property Rights

Importance	Explanation and Example
Encourages Innovation	Protects inventors and promotes R&D — e.g., pharmaceutical innovation is driven by patent protection

Importance	Explanation and Example
Economic Growth	Attracts foreign direct investment, boosts industrial development and start-ups
Competitive Advantage	Brand protection through trademarks prevents copying and unfair competition
Revenue Generation	Licensing and royalties, e.g., Microsoft's technology licensing to other firms
Consumer Protection	Ensures quality/authenticity and prevents counterfeit goods
Global Trade Facilitation	Harmonised IP systems under the WTO ease international business

4.5 Trade Marks

Meaning of a Trade Mark

A trademark is a distinctive sign used by a business to identify its goods or services and distinguish them from competitors. It acts as a badge of origin, a symbol of quality, a marketing tool and a legal protection mechanism. A trademark may consist of words, logos, symbols, letters, numbers, shapes, colours, sounds, or a combination of these.

Example: *The golden arches of McDonald's function as a trademark because customers instantly associate that symbol with one specific restaurant chain.*

Purpose and Functions of Trade Marks — With Examples

Function	Explanation	Example
Source Function	Identifies the manufacturer/source of the goods	The Nike swoosh identifies its sports products; 'Amul' identifies dairy products
Distinguishing Function	Differentiates one company's products from others	PepsiCo vs. Coca-Cola on a store shelf
Quality Function	Builds consumer trust in consistent quality	Consumers associate Samsung with reliable electronics
Advertising Function	Builds brand recognition and goodwill	The Apple Inc. logo carries enormous brand value
Legal Protection Function	Prevents unauthorised use of the mark	Right to sue for infringement or passing off

Acquisition of Trade Mark Rights

Basis	By Use (Common Law)	By Registration (Statutory)
Nature	Rights arise from actual, continuous use in commerce ('passing off' protection); priority to the first user	Rights granted after registration under the Trade Marks Act, 1999 (India)
Protection	Limited — must prove prior use	Strong — registration certificate itself is

Basis	By Use (Common Law)	By Registration (Statutory)
Strength		sufficient proof; nationwide protection

Example: If a local business uses a mark continuously for years without registering it, it may still claim limited rights on the strength of that use.

Protectable and Non-Protectable Matter

A trademark must be distinctive, capable of graphical representation, not deceptive, and not identical/confusingly similar to an existing mark.

Type of Protectable Mark	Example
Word Mark	Google
Logo/Device Mark	The Mercedes-Benz three-pointed star
Shape Mark	The unique Coca-Cola bottle shape
Sound Mark	The Intel startup chime
Colour Mark	A specific colour combination uniquely associated with a brand

Not protectable: generic terms (e.g., 'Milk' for dairy), purely descriptive marks (unless they acquire distinctiveness), offensive/deceptive marks, and national emblems or flags.

Selecting and Evaluating a Trade Mark — Hierarchy of Distinctiveness

Category (Strongest → Weakest)	Description	Example	Protectability
Fanciful	An entirely invented word with no prior meaning	Kodak	Strongest
Arbitrary	A common word used in a completely unrelated context	Apple (for computers)	Very strong
Suggestive	Hints at a quality but requires imagination to connect it	—	Strong
Descriptive	Directly describes a feature; needs acquired distinctiveness	—	Weak unless distinctive
Generic	The common name for the product itself	'Milk' for dairy	Not protectable

A good trademark should also be distinctive, easy to pronounce, memorable, not descriptive, legally available, and adaptable for future business expansion.

Example: “Apple” is a fanciful/arbitrary mark for computers (very strong) but would be merely descriptive — and hard to register — for a business that actually sells apples.

Trade Mark Registration Process (India)

Registration is carried out through the Office of the Controller General of Patents, Designs and Trade Marks.

- Step 1 — Trademark search: check availability in the public trademark database.
- Step 2 — Filing application: file Form TM-A, mention the class under NICE classification, and attach the logo if applicable.
- Step 3 — Examination: the examiner reviews distinctiveness and checks for conflicts with existing marks; an Examination Report is issued.
- Step 4 — Reply to objections: the applicant must respond within the prescribed time.
- Step 5 — Publication in the Trade Marks Journal: if accepted, the mark is published; the opposition period is 4 months.
- Step 6 — Registration certificate: if there is no opposition (or it is resolved), the certificate is issued, valid for 10 years and renewable indefinitely.

Worked Example — 'Golden Mango' Trademark Registration

An entrepreneur starting a mango-pulp business under the brand 'Golden Mango' would: (1) conduct a trademark search; (2) confirm the name is distinctive; (3) file the application under Class 29 (processed fruits); (4) respond to any examination objections; (5) wait through the publication/opposition window; and (6) obtain the registration certificate — a concrete illustration of the six-step process above.

Rights Conferred by Registration

- Exclusive right to use the ® symbol.
- Right to sue for infringement.
- Right to license or assign the mark.
- Nationwide protection across the country of registration.

Example: Once “Golden Mango” is registered, its owner can stop a competitor from selling snacks under a confusingly similar name without having to prove actual confusion in court.

Infringement vs. Passing Off

Concept	Meaning	Example
Infringement	Unauthorised use of an identical or deceptively similar registered mark	A company copies the Adidas logo on its own footwear
Passing Off	Misrepresentation causing confusion, relying on goodwill even without registration; requires proof of goodwill, misrepresentation and damage	A new café uses packaging strikingly similar to an established, unregistered local brand

4.6 Advantages and Disadvantages of Trademark Protection

Advantages	Disadvantages / Limitations
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Advantages	Disadvantages / Limitations
Builds long-term, renewable brand value	Registration and enforcement can be costly, especially internationally
Deters counterfeiting and consumer confusion	Protection is territorial — separate filing needed per country
Can be licensed or franchised for revenue	A mark can be lost through 'genericide' if not properly policed

4.7 Applications and Limitations

Applications: brand protection for start-ups, franchise licensing, anti-counterfeiting enforcement, and domain-name/trademark disputes in e-commerce. Limitations: trademarks protect only the identifying mark, not the underlying product's function (which needs a patent) or its written/artistic content (which needs copyright) — IP protection is therefore usually a combined strategy, not a single right.

Mini Case Study: Starbucks — Trademark Dilution and Look-Alike Branding

Starbucks Corporation has pursued trademark opposition and infringement actions in multiple countries — including a widely reported dispute over the use of a similar green circular logo and name by a smaller coffee chain — illustrating how even small similarities in colour, shape and font can trigger 'likelihood of confusion' claims, and how aggressively global brands defend mark distinctiveness.

Questions — Unit IV

(a) Short Questions (2 Marks)

S. No.	Question	Bloom's Level
1	Define Intellectual Property and list any two characteristics.	L1
2	Give one example each for Patent, Trademark and Copyright.	L1
3	What is the role of WIPO?	L2
4	Differentiate between a fanciful and a descriptive trademark, with examples.	L2
5	Distinguish between infringement and passing off.	L4

(b) Essay Type Questions (10 Marks)

S. No.	Question	Bloom's Level
1	Explain the different types of Intellectual Property with a suitable example for each type.	L2
2	Describe the trademark registration process in India step by step, using the 'Golden Mango' example to illustrate each step.	L2 / L3

S. No.	Question	Bloom's Level
3	Analyse the hierarchy of trademark distinctiveness (fanciful to generic) with examples, and evaluate which category offers the strongest legal protection and why.	L4 / L5
4	Design a trademark selection and protection strategy (at least 6 steps) for a new electric-vehicle charging start-up, justifying each step.	L6

Real-Time Case Study: Christian Louboutin's Red-Sole Trademark

Shoe designer Christian Louboutin registered the red colour on the sole of his shoes as a trademark, and in *Christian Louboutin S.A. v. Yves Saint Laurent* (2012), a U.S. appeals court upheld protection for that red sole when used against a contrasting upper, while narrowing it so it would not block all-red shoe designs. The case is a frequently taught example of a single-colour trademark and the limits of trademark scope — showing how even a distinctive, non-traditional mark (a colour, rather than a word or logo) can acquire strong legal protection once it becomes distinctive of a brand in the minds of consumers, while also illustrating how courts balance protection against fair competition.

(c) Case-Study-Based Questions

S. No.	Question	Bloom's Level
1	Analyse the Starbucks trademark-dilution case study and evaluate the factors a court would consider in assessing 'likelihood of confusion'.	L4 / L5

Additional Enrichment — Unit IV

Industry Case Insight

Technology companies routinely build large trademark portfolios — protecting product-family names, UI icon designs, and even distinctive start-up sounds — as part of a brand-defence strategy well before product launch, treating trademark filing as a standard pre-launch checklist item alongside patent filing.

Emerging Trend

Non-traditional trademarks — including motion marks, hologram marks and AI-generated brand assets — are an emerging area, along with rising disputes over the use of established brand names in NFTs and the metaverse.

Unit Highlights

1. Introduces the fundamentals of **Intellectual Property (IP)** and **Intellectual Property Rights (IPR)**.
2. Explains the **types of Intellectual Property** and their legal protection.

3. Highlights the role of **international organizations, agencies, and treaties** in IPR.
4. Emphasizes the **importance of Intellectual Property Rights** in promoting innovation and creativity.
5. Explains the **purpose and functions of trademarks** in protecting brand identity.
6. Describes the **acquisition of trademark rights** and protectable subject matter.

Deborah. E. Bouchoux, Intellectual Property Rights, Cengage LearningIndia,2013

UNIT V — Law of Copyright & Law of Patents

"He who receives an idea from me, receives instruction himself without lessening mine, as he who lights his taper at mine, receives light without darkening me." — Thomas Jefferson

Unit Overview

This unit introduces the fundamentals of **Copyright and Patent Laws** under Intellectual Property Rights (IPR). It covers copyright protection, ownership, registration, international copyright law, patent law, patent searching, ownership and transfer of patent rights, and the role of intellectual property audits in protecting innovations and intellectual assets.

Objectives of the Unit

1. **Understand** the fundamentals of copyright and patent laws.
2. **Explain** the concept of originality and copyright protection.
3. **Describe** the rights associated with copyright, including reproduction and public performance.
4. **Understand** copyright ownership, registration, and international copyright laws.
5. **Explain** the principles and legal framework of patent law.

Learning Outcomes

After completing this unit, students will be able to:

1. **Define** the concepts of copyright and patent laws under Intellectual Property Rights (IPR).
2. **Explain** the principles of originality, copyright ownership, and copyright protection.
3. **Identify** the rights of reproduction, public performance, and copyright registration procedures.
4. **Describe** the significance of international copyright laws.
5. **Understand** the fundamentals of patent law and the patent searching process.
6. **Explain** patent ownership rights and the transfer of patent rights.

Learning Objectives

- **Explain** — the scope, ownership and duration of copyright protection under Indian law.
- **Describe** — the rights of a patent holder and the criteria for patentability.
- **Differentiate** — between copyright and patent protection and identify which applies to a given creation.
- **Evaluate** — landmark copyright and patent disputes and their implications for innovators.
- **Apply** — licensing and compulsory-licensing concepts to real-world technology and pharmaceutical scenarios.

KEY CONCEPTS

1. **Copyright** – Legal protection provided to original creative works.
2. **Originality** – A work must be original to qualify for copyright protection.
3. **Rights of Reproduction** – The exclusive right to copy or reproduce a copyrighted work.
4. **Public Performance Rights** – The right to perform or communicate a work publicly.
5. **Copyright Ownership** – Legal ownership of a copyrighted work and its transfer.
6. **Copyright Registration** – The process of obtaining legal recognition for copyright.
7. **Copyright Notice** – A statement or symbol indicating copyright ownership.
8. **International Copyright Law** – International agreements that protect copyrights across different countries.
9. **Patent** – Legal protection granted for a new and useful invention.
10. **Patent Law** – Laws governing the protection and enforcement of patent rights.

Part A: Law of Copyright

5.1 What is Copyright?

Copyright is a legal right given to the creator of an original work, giving the creator exclusive control over how the work is used, copied or distributed, so the author can benefit from their creativity and effort. It protects works such as books, music, paintings, films and computer programs. In India, copyright is governed by the Copyright Act, 1957 (amended in 2012 to cover digital works, online distribution and performers' rights).

Example: When an author writes a book, the author automatically becomes the copyright owner of that book — no formality is needed.

Subject Matter of Copyright

Copyright protects literary works (books, articles), musical works (songs, compositions), artistic works (paintings, photographs), films, sound recordings and computer software — provided the work is expressed in a fixed, tangible form such as written text, recorded audio or a digital file.

Example: A software program written by a programmer is protected under copyright as a 'literary work'.

Basic Principle: Automatic Protection

Copyright protection arises automatically the moment a work is created and fixed in a tangible form — the creator does not need to apply for it. The instant a poem is written down or a song is recorded, copyright protection begins.

Example: A student who writes an original research article automatically owns the copyright of that article.

5.2 Originality of Material

Originality is the basic requirement for copyright protection: the work must originate from the author and involve some skill, effort and judgement — it need not be entirely novel, but it must not be copied from another source.

Example: A teacher preparing unique study notes for students can claim copyright over those notes, even though the underlying subject matter is not new.

Idea–Expression Dichotomy

Copyright protects only the expression of an idea, not the idea itself. Ideas, procedures, systems and methods cannot be copyrighted — only the specific words, structure or arrangement used to express them.

Example: The idea of a detective solving a crime is not protected, but the specific way an author writes the story — characters, dialogue, plot structure — is protected.

Landmark Case: R.G. Anand v. Delux Films (1978)

In this well-known Indian case, playwright R.G. Anand claimed a film producer had copied the story of his play for a movie. The Supreme Court held that copyright protects the original expression of an idea, not the general idea or theme itself — if the expression, sequence or structure is copied, it may amount to infringement, but similarity of theme alone is not enough. The case remains the leading Indian precedent on originality and the idea–expression dichotomy.

5.3 Rights of Reproduction

The right of reproduction allows the copyright owner to make copies of the original work and control how many copies are produced and distributed, letting the creator earn financial benefit from the work.

Example: A publisher must obtain the author's permission before printing copies of a book.

Scope of the Reproduction Right

The scope is broad — it covers photocopying, scanning, printing, recording and digital storage, and extends to adaptations such as translations or new editions.

Example: Translating an English novel into Telugu or Hindi requires the copyright owner's permission because it is an adaptation of the original work.

Fair Dealing Exception

Copyright law permits certain limited uses without permission under 'fair dealing' — for research, private study, criticism, review, news reporting and limited educational use.

Example: A student quoting a few lines from a book in a research paper is fair dealing, but copying the entire book is not.

5.4 Right to Perform the Work Publicly

Public performance means presenting a copyrighted work in front of an audience — singing at a concert, staging a play, screening a film, or broadcasting via TV/radio/streaming. The copyright owner controls these performances and may charge for permission.

Example: A theatre group must obtain permission before performing a copyrighted drama on stage; showing a film in a college auditorium for students is a public performance requiring authorisation.

5.5 Copyright Ownership Issues

Category	Rule	Example
Author	The creator is normally the first owner of copyright	A poet who writes an original poem owns the copyright to it
Employer Ownership	Under Section 17 of the Copyright Act, an employer owns the copyright of a work created by an employee as part of their job duties	A software developer at an IT company usually does not personally own the copyright of software written during employment
Joint Works	When two or more authors create a work together, all authors share ownership unless otherwise agreed	Two researchers who co-write a paper jointly own its copyright
Moral Rights	Non-transferable personal rights of attribution and integrity that survive even after economic rights are sold	An artist can object if a buyer alters their painting in a way that damages the artist's reputation

5.6 Copyright Registration

In India, copyright registration is voluntary — protection exists automatically upon creation. However, registration provides strong legal evidence of ownership in case of disputes.

Example: *A filmmaker registers a movie's copyright to obtain a certificate that serves as strong evidence of ownership if the film is later pirated.*

Registration Process (Form XIV)

- The applicant submits Form XIV along with the prescribed fee.
- The Copyright Office examines the application and checks for objections.
- If no objection arises, the work is entered into the Register of Copyrights, maintained by the Registrar of Copyrights.
- A certificate of registration is issued, serving as official proof of ownership.

Example: A filmmaker may register a movie script to establish strong legal proof of ownership before entering into production contracts.

5.7 Notice of Copyright

A copyright notice conventionally contains three elements — the symbol ©, the year of publication, and the owner's name — e.g., '© 2026 K. Suresh'. While not always legally mandatory, it warns against

unauthorised copying and prevents an infringer from claiming 'innocent infringement' (that they were unaware of the copyright).

5.8 International Copyright Law

Instrument	Key Contribution
Berne Convention (1886)	Automatic protection across member states, following the 'national treatment' principle — a book written in India is protected in other member countries
Universal Copyright Convention (UCC)	Provided international copyright protection for countries outside the Berne Convention, though with weaker standards
TRIPS Agreement	Sets minimum copyright standards for all WTO members, ensuring fair competition in international trade
WIPO Copyright Treaty (WCT, 1996)	Extends protection to digital and internet-based works, e.g., songs uploaded to streaming platforms

Part B: Law of Patents

5.9 Foundations of Patent Law

A patent is a legal right granted by the government to an inventor for a new invention, giving the exclusive right to make, use, sell or distribute the invention for a fixed period. In India, patents are governed by the Patents Act, 1970 (amended 2005 to comply with TRIPS, introducing product patents in fields like pharmaceuticals and chemicals).

Example: A scientist who invents a new water-purifying machine can obtain a patent to prevent others from copying it.

Objectives of Patent Law

Patent law aims to encourage innovation by rewarding inventors with exclusivity, and to promote disclosure of knowledge — when a patent is granted, the invention's details are published so others can learn from and build on it.

Example: *By granting a company twenty years of exclusive rights to a newly invented drug, patent law rewards its R&D investment while requiring the formula to be publicly disclosed for future innovation.*

Types of Patents

Type	Protects	Example
Utility Patent	A new product or process with a useful function	A new machine or manufacturing method
Design Patent	The ornamental/decorative appearance of a product	The unique shape of a bottle
Plant Variety	New plant species developed through	Protected in India under the

Type	Protects	Example
Protection	breeding/biotechnology	PPVFR Act, 2001

5.10 Patent Searching Process

A patent search is conducted before filing to confirm the invention's novelty, avoid infringing existing patents, and understand the 'prior art' — the existing body of knowledge in the field.

- Step 1 — Define search keywords: identify technical terms and synonyms, e.g., for a 'solar-powered water pump', also search 'solar pump', 'solar irrigation', 'renewable energy pump'.
- Step 2 — Choose the database: national (Indian Patent Office) or international (WIPO PATENTSCOPE, USPTO, EPO Espacenet).
- Step 3 — Search fields: examine the title, abstract, description and claims, and use IPC/CPC classification codes.
- Step 4 — Analyze results: compare prior patents against the new invention to check whether it is genuinely novel or offers a meaningful improvement.
- Step 5 — Document the search report: record databases used, keywords applied, and a conclusion on patentability.

Classroom activity: search the Indian Patent Office database for a simple everyday invention (e.g., a paper clip) to see how inventions are classified and described.

5.11 Patent Ownership Rights and Transfer

Concept	Explanation	Example
Inventor vs. Applicant	The inventor creates the invention; the applicant files the application — they may differ	An employee invents something at work; the employer becomes the applicant/owner
Assignment	Complete transfer of patent ownership via a written agreement recorded with the Patent Office	An inventor sells patent rights to a company with manufacturing capacity
Licensing	Permission to use the invention without transferring ownership; may be exclusive or non-exclusive	A pharma company licenses its patented drug formula to other manufacturers
Compulsory Licensing	Government-granted permission for a third party to use a patent without the owner's consent, under Section 84 of the Patents Act, typically for public-welfare reasons	The government allows another firm to produce a life-saving medicine if the patent holder does not supply it adequately or affordably

5.12 Patent Law — Key Provisions (Patentability Criteria)

Criterion	Meaning	Example
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Criterion	Meaning	Example
Novelty	The invention must be completely new and not disclosed anywhere before filing	A machine design already published online loses its novelty and cannot be patented
Inventive Step	Must not be obvious to a person skilled in the field	Changing only a machine's colour is not an inventive step; significantly improving its efficiency may qualify
Industrial Applicability	Must have a practical, commercial use	A packaging machine used in factories satisfies this requirement

Patent term: generally 20 years from the date of filing, after which the invention enters the public domain — for example, once a pharmaceutical patent expires, other companies can produce generic versions of the medicine.

Patentability Exceptions

Certain categories cannot be patented, including inventions against public order or morality, discoveries of naturally occurring substances, and abstract concepts such as mathematical formulas. In India, business methods and certain software inventions also face restrictions.

Example: A naturally occurring mineral cannot be patented merely because it was discovered — it already exists in nature.

5.13 Practical Walkthroughs

5.13.1 Copyright Registration Walkthrough

- Fill Form XIV online or physically, with the author's name, title, category and ownership details.
- Attach the Statement of Particulars and an Oath/Declaration confirming the information is correct and the work is original.
- Pay the prescribed fee, which varies by work type (literary, artistic, music, film, software).
- The Copyright Office examines the application; if there are no objections, the work is entered into the Register of Copyrights and a Registration Certificate is issued as legal proof of ownership.

5.13.2 Patent Filing Walkthrough

- File a Provisional Specification to secure an early priority date while the invention is still being developed.
- Submit the Complete Specification within 12 months, detailing structure, working and claims.
- File Form 1 (Application for Grant of Patent) and Form 2 (Specification) online via the Indian Patent Office (IPO) portal.
- Pay the filing fee; the application is typically published 18 months after filing.
- Submit a Request for Examination (RFE); the examiner issues a First Examination Report (FER) with objections or suggestions.

- Respond to the FER within the specified time; if satisfied, the Patent Office grants the patent, giving exclusive rights for 20 years from the filing date.

5.14 Intellectual Property Audits

An IP audit is a systematic review of an organisation's IP assets — patents, trademarks, copyrights, designs and trade secrets — to verify their legal protection status and commercial value.

- Step 1 — Planning: define the scope (e.g., a product line or R&D output) and form an audit team of legal, managerial and technical experts.
- Step 2 — Data Collection: gather registration certificates, agreements and licensing contracts for every IP asset.
- Step 3 — Analysis: assess legal protection status, competitive advantage, commercial value and risk (e.g., a Freedom-to-Operate analysis).
- Step 4 — Reporting: document gaps, risks and recommendations such as filing new patents or renewing trademarks.
- Step 5 — Monitoring and Review: conduct periodic audits to keep records current and maintain a strong IP strategy.

IP Strategy: Protect, Leverage, Defend, Monitor

Element	Description	Example
Protect	File patents, trademarks and copyrights to legally secure innovations	A company files a patent application to secure exclusive rights over a new technology
Leverage	Generate value through licensing, technology transfer or joint ventures	A software company licenses its patented technology to expand market reach
Defend	Ensure products do not infringe others' IP, e.g., via Freedom-to-Operate (FTO) analysis	An FTO check before launching a new product avoids costly legal disputes
Monitor	Track competitors' patent filings, trademarks and technology developments	A company analyses competitor patents to adjust its own R&D strategy

Fig 5.1 — Copyright vs. Patent: A Quick Comparison

	COPYRIGHT	PATENT
Protects	Expression of an idea (text, art, music, software)	The idea itself (invention, process)
Arises	Automatically on creation	Only after formal examination & grant
Typical Term	Author's life + 60 years (India)	20 years from filing
Registration	Optional (evidentiary)	Mandatory

Figure 5.1: Key differences between copyright and patent protection.

Example: A start-up might patent its core technology (protect), license it to a manufacturer (leverage), sue an infringer (defend), and track competitor filings every quarter (monitor).

5.15 Comparative Overview — Copyright vs. Patent

Aspect	Copyright	Patent
Subject Matter	Original creative works (books, music, art, software); protects expression, not ideas	New inventions (product/process); must be novel, inventive and industrially applicable
Protection Term	Life of author + 60 years (India)	20 years from date of filing
Registration	Voluntary — protection is automatic on creation	Mandatory — protection begins only after grant
Key Rights	Reproduce, perform publicly, distribute, create adaptations	Make, use, sell, license or import the invention; exclude others
Key International Treaty	Berne Convention	Paris Convention; Patent Cooperation Treaty (PCT)

5.16 Advantages and Disadvantages

Advantages	Disadvantages / Limitations
Patents grant a time-limited monopoly, incentivising R&D investment	Filing, prosecution and international protection are expensive

Advantages	Disadvantages / Limitations
Copyright protects creative/software work automatically, at no cost	Patent specifications become public, potentially aiding competitors after expiry
Licensing and cross-licensing generate revenue and reduce litigation risk	Enforcement across jurisdictions is complex and costly
IP audits reduce legal risk in M&A and funding transactions	Patent term (20 years) may lag behind fast-moving technology cycles

5.17 Applications and Limitations

Applications: protecting new hardware/software inventions, safeguarding creative and technical documentation, structuring technology-licensing agreements, and conducting IP due diligence for start-ups seeking investment. Limitations: patents do not protect abstract ideas, laws of nature or pure business methods; copyright does not protect facts or short phrases/titles; trade secrets offer no protection once independently discovered or reverse-engineered.

Mini Case Study: Novartis vs. Union of India (2013)

The Supreme Court of India denied a patent to Novartis for a modified crystalline form (Glivec/imatinib mesylate) of a previously known cancer-drug molecule, holding that the new form did not demonstrate significantly enhanced therapeutic efficacy over the known substance as required by Section 3(d) of the Patents Act — a provision aimed at preventing 'evergreening' (seeking new patents on minor variations of existing drugs to extend market exclusivity). The case remains a landmark reference point for balancing patent incentives against public access to affordable medicines.

Questions — Unit V

(a) Short Questions (2 Marks)

S. No.	Question	Bloom's Level
1	Define originality in the context of copyright law, with one example.	L1
2	State the idea-expression dichotomy with an example.	L2
3	List the three patentability criteria under the Patents Act.	L1
4	Differentiate between assignment and licensing of a patent.	L2
5	What is compulsory licensing? Give an example.	L2

(b) Essay Type Questions (10 Marks)

S. No.	Question	Bloom's Level
1	Explain the fundamentals of copyright law — originality, the idea-expression	L2

S. No.	Question	Bloom's Level
	dichotomy, exclusive rights, and ownership issues (including Section 17) — with suitable examples for each.	
2	Describe the complete patent filing and grant process in India, from provisional specification to grant, referencing the relevant forms and time limits.	L2 / L3
3	Analyse the significance of novelty, inventive step and industrial applicability in patent law using a hypothetical invention example.	L4
4	Design an IP audit and IP strategy (Protect–Leverage–Defend–Monitor) plan for a technology start-up preparing for a funding round, justifying each element.	L6

Real-Time Case Study: Oracle v. Google — Copyright in Software APIs

Oracle sued Google for using the structure of 37 Java API packages in the Android operating system without a license, arguing this was copyright infringement. After a decade of litigation, the U.S. Supreme Court ruled in 2021 that Google's use of the Java API declarations was a fair use, emphasizing that Google had copied only what was needed for interoperability and had transformed the material by building a new platform. The judgment is one of the most significant modern copyright rulings for the software industry and is regularly discussed alongside patent and copyright law in this unit as an example of how fair-use and interoperability arguments shape the boundaries of copyright protection for functional, technical works such as code.

(c) Case-Study-Based Questions

S. No.	Question	Bloom's Level
1	Analyse the R.G. Anand v. Delux Films case and explain how it illustrates the idea–expression dichotomy in Indian copyright law.	L4
2	Analyse the Novartis vs. Union of India case and evaluate the policy rationale behind Section 3(d), balancing innovation incentives against public health access.	L4 / L5

Additional Enrichment — Unit V

Industry Case Insight

Smartphone manufacturers (as seen in the long-running Apple vs. Samsung patent litigation) illustrate how design patents, utility patents and trade-dress claims can be litigated simultaneously across multiple countries over a single product line, showing the real commercial stakes of the IP concepts in this unit.

Emerging Trend

Patent offices worldwide, including the Indian Patent Office, are actively developing guidance on the patentability of AI-generated inventions and whether an AI system can be named as an 'inventor' — a live, unresolved legal question following cases such as the 'DABUS' AI-inventor filings.

Unit Highlights

- Introduces the **fundamentals of Copyright Law** and its role in protecting original creative works.
- Explains the concept of **originality** and the scope of copyright protection.
- Covers **copyright ownership**, reproduction rights, and public performance rights.
- Describes the **copyright registration process** and the importance of copyright notices.
- Highlights the role of **international copyright laws** in protecting works across countries.
- Introduces the **fundamentals of Patent Law** and patent protection.

Bouchoux, Deborah E. Intellectual Property Rights. Cengage Learning India, 2013

Consolidated References

(a) Standard Reference Books

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- Bouchoux, Deborah E. Intellectual Property Rights. Cengage Learning India, 2013.
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- Naryan, P. Intellectual Property Law. 3rd ed., Eastern Law House, 2007.
- Wallwork, Adrian. English for Writing Research Papers. 2nd ed., Springer Cham Heidelberg, New York, 2016.
- Jones, Dan, and Sam Dragga. Technical Writing Style.

(a2) Key Statutes and Case Law Referenced in this Course

- The Copyright Act, 1957 (India), as amended in 2012.
- The Patents Act, 1970 (India), as amended in 2005.
- The Trade Marks Act, 1999 (India).
- The Protection of Plant Varieties and Farmers' Rights (PPVFR) Act, 2001 (India).
- R.G. Anand v. Delux Films, AIR 1978 SC 1613 (Supreme Court of India).
- Novartis AG v. Union of India, (2013) 6 SCC 1 (Supreme Court of India).

(b) Web Resources

- Principles of Technical Writing — <https://theconceptwriters.com.pk/principles-of-technical-writing/>
- IEEE EMC Society Newsletter — Technical Paper Writing — <https://www.ewh.ieee.org/soc/emcs/acstrial/newsletters/summer10/TechPaperWriting.html>
- Process of Publishing a Research Paper in a Journal — <https://www.manuscriptedit.com/scholar-hangout/process-publishing-research-paper-journal/>
- ICSI — Intellectual Property Right: Laws & Practice — <https://www.icsi.edu/media/website/IntellectualPropertyRightLaws&Practice.pdf>
- Intellectual Property Rights Notes — <https://lawbhoomi.com/intellectual-property-rights-notes/>
- Purdue Extension — Intellectual Property Rights — <https://www.extension.purdue.edu/extmedia/ec/ec-723.pdf>

Recommended NPTEL / SWAYAM Courses (for further self-study)

- NPTEL — "Research Writing" (various offerings, IIT faculty) — <https://nptel.ac.in> — search "Research Writing" and "Technical Writing" for the current active run.
- NPTEL — "Intellectual Property" — <https://nptel.ac.in> — search "Intellectual Property" for the current active run.
- SWAYAM Portal — <https://swayam.gov.in> — search for current MOOCs on Research Methodology and IPR offered each semester.
- WIPO Academy — Free online IP courses (e.g., DL-101 'General Course on Intellectual Property') — <https://www.wipo.int/academy/en/>
- ---END---