Unit VI: Patent Rights and New Developments in IPR

Dr. Ayush Kumar Agrawal

SoCS, UPES

Scope of Patent Rights and Ownership

Understanding Patent Rights

- Patent rights allow the inventor to control how the invention is used commercially.
- Rights are territorial, limited to jurisdictions where the patent is granted.
- A patent transforms an idea into a legally protectable economic asset.
- Core purpose: encourage innovation by granting temporary monopoly.

Exclusive Rights Granted to Patentee

- Right to make the product covered by the patent.
- Right to sell, license, or transfer the patented invention.
- Right to prevent others from manufacturing or distributing without permission.
- Control extends to commercial, industrial, and technological use.
- Rights exist for 20 years from filing of the complete specification.

Economic vs. Moral Rights

- **Economic Rights:** Exploitation of invention for revenue—manufacturing, licensing, sale, assignment.
- **Moral Rights:** Recognition of inventor; protection of integrity of invention.
- Moral rights cannot be transferred; economic rights can be sold or licensed.

Rights Before and After Grant

- **Before Grant:** Only limited protection after publication (right to receive royalties later).
- **After Grant:** Full enforceable legal rights to stop infringement.
- Public disclosure after 18 months builds global knowledge.
- Rights apply retrospectively from publication date once granted.

Patent Ownership Rules

- Owner can be: inventor, company, institution, or assignee.
- Universities often own faculty and student-generated IP under institutional policy.
- Employment contracts may include clauses on IP ownership.
- Joint ownership occurs when multiple inventors contribute significantly.

Co-Ownership of Patents

- All co-owners have equal undivided share unless otherwise agreed.
- Licensing requires consent of all co-owners (varies by jurisdiction).
- Each co-owner can use the invention without paying others unless a contract says otherwise.
- Research collaborations must define ownership early.

Patent Infringement

- Unauthorized making, selling, or importing of patented invention.
- Includes inducing someone else to infringe.
- Infringement may be direct or indirect (contributory).
- Remedies: injunction, damages, account of profits, seizure of goods.

Types of Patent Infringement

- **Literal Infringement:** Direct copying of patented claims.
- **Doctrine of Equivalents:** Same function–way–result test.
- **Contributory Infringement:** Supplying essential components.
- **Willful Infringement:** Intentional violation; leads to higher penalties.

Limitations of Patent Rights

- Rights are valid only in countries where patents are granted.
- Time-limited duration: 20 years from filing.
- No protection for ideas; only specific technical implementation.
- Public use or disclosure before filing may destroy novelty.
- Not all inventions are patentable (e.g., software per se in India).

Patent vs. Freedom to Operate (FTO)

- Holding a patent does not guarantee freedom to commercialize.
- FTO ensures no one else holds blocking patents on components.
- Example: A patented AI model may rely on a patented algorithm owned by someone else.
- FTO analysis is essential before launching products.

Real Case Example: India

- **Ericsson vs. Xiaomi (2014):** Infringement claim over standard-essential patents in mobile communication.
- Court ordered Xiaomi to deposit royalties and restricted import.
- Shows how patent rights can block market access.

Mini Task: Patent Claim Interpretation

- Read one patent claim related to your project topic.
- Identify: – What technical feature is protected? – What is not covered?
- Purpose: understand scope and boundaries of patent protection.

Summary

- Patent rights provide exclusive control over commercial use of invention.
- Ownership may belong to individuals, institutes, or companies.
- Infringement occurs when others use the invention without permission.
- FTO and patent scope are crucial for commercialization decisions.

Licensing and Technology Transfer

Introduction to Technology Transfer

- Technology transfer (TT) enables movement of knowledge, inventions, and innovations from creators to industries, startups, and society.
- It bridges the gap between research outcomes and real-world products.
- Universities, R&D labs, and industries use TT to commercialize new technologies.
- TT transforms ideas into market-ready solutions through legal agreements and structured processes.

Why Licensing is Needed

- Inventors may not have the resources to manufacture or market their inventions.
- Licensing allows companies to use patented technologies legally.
- Reduces risk for both inventor and industry through shared benefit models.
- Promotes innovation diffusion, especially in software, IoT, AI, robotics, and pharmaceuticals.

Types of Licensing

- **Exclusive License:** Only one licensee gets full commercial rights.
- **Non-Exclusive License:** Multiple companies can simultaneously use the technology.
- **Compulsory License:** Government-mandated licensing for public interest.
- **Cross-Licensing:** Two parties exchange rights to their patented technologies.
- **Sub-Licensing:** Licensee transfers rights further with permission.

Exclusive License

- Licensee gains sole rights to manufacture, sell, or distribute the invention.
- Attractive to industries needing competitive advantage.
- Inventor usually receives higher royalties.
- Suitable for technologies requiring high investment (e.g., robotics hardware, medical devices).

Non-Exclusive License

- Inventor can license the same technology to multiple organizations.
- Ideal for software, algorithms, or digital innovations.
- More accessible for startups and educational applications.
- Promotes wider adoption and higher scalability.

Compulsory Licensing

- Issued by government when technology is vital for public health or national interest.
- Common in pharmaceuticals and essential technologies.
- Ensures affordability and accessibility.
- Example: Natco Pharma vs. Bayer in India for cancer drug Nexavar.

What is Technology Transfer (TT)?

- TT includes disclosure, protection, evaluation, marketing, negotiation, and commercialization.
- TT offices (TTOs) or IPR Cells manage this process in universities.
- Facilitates research collaboration, licensing, and startup formation.
- Converts academic research into industrial innovation.

Technology Transfer Workflow

- **Disclosure:** Inventor submits invention disclosure to institution.
- **IP Assessment:** Patentability and market evaluation.
- **IP Protection:** Patent filing or design/copyright registration.
- **Marketing:** Identifying industries, partners, or startups.
- **Licensing:** Negotiating legal and financial terms.
- **Commercialization:** Industry produces and markets technology.

Licensing Agreement Structure

- Rights granted and territorial scope.
- Royalty structure and milestone payments.
- Duration of license and renewal terms.
- Confidentiality and non-disclosure obligations.
- Performance obligations from licensee.
- Termination conditions and dispute resolution.

Royalty Types in Licensing

- **Upfront Payment:** Paid when license is signed.
- **Running Royalty:** Percentage of sales revenue.
- **Milestone Payments:** Triggered by achievements such as prototype completion.
- **Equity Share:** Licensee gives stake in startup/company.
- Choosing royalty model depends on technology maturity, market, and risk factors.

Licensing in Educational Institutions

- Universities promote innovation through IPR Cells / Technology Transfer Offices.
- Faculty, researchers, and students disclose inventions formally.
- Revenue-sharing policies encourage more innovation.
- Many institutes support incubated startups with exclusive or non-exclusive licenses.
- KTs (Knowledge Transfers) strengthen academia–industry relevance.

Example: IIT Bombay Licensing Model

- 70–30 revenue-sharing between inventor and institute.
- Strong incubation ecosystem via SINE.
- High-output patent culture enables large-scale licensing.
- Model for new HEI innovation frameworks in India.

Summary

- Licensing enables legal transfer of patent rights to industries.
- Types: exclusive, non-exclusive, compulsory, cross-licensing.
- Technology transfer bridges research with commercialization.
- Licensing agreements ensure structured, legal innovation exchange.
- Educational institutes play a leading role through IP cells and TT offices.

Patent Databases, Information Systems & Patent Analytics

Why Patent Information Matters

- Patents contain technical disclosures not available in journals or textbooks.
- 70–80% of technical knowledge is available only in patent documents.
- Patent information helps identify novelty, trends, competitors, and technology gaps.
- Essential for research planning, commercialization, and avoiding infringement risks.

What is Patent Information?

- Structured documentation covering title, abstract, claims, description, figures, citations.
- Helps trace evolution of an idea through multiple versions or families.
- Includes legal status data: filed, published, granted, abandoned, expired.
- Enables forecasting of research direction based on filing patterns.

Patent Classification Systems

- **IPC (International Patent Classification):** Categorizes inventions into 8 broad sections and 70,000+ subgroups.
- **CPC (Cooperative Patent Classification):** Joint system by USPTO and EPO with higher granularity.
- Classifications help locate patents in specific domains systematically.
- Example: AI classification under CPC – G06N.

Major Patent Databases

- **InPASS (India):** Search Indian patents; legal status; full-text PDFs.
- **Google Patents:** Global coverage with easy search interface.
- **WIPO PATENTSCOPE:** Access PCT applications; international search.
- **Espacenet (Europe):** Over 120 million documents; citation maps.
- **USPTO Database:** US-specific filings; machine-readable claims.

InPASS: Indian Patent Advanced Search System

- Provides two search modes: Quick Search and Advanced Boolean Search.
- Allows search by title, abstract, claims, applicant name, IPC class.
- Shows legal status such as FER issued, grant, hearing, renewal status.
- Useful for Indian researchers assessing local novelty.
- Supports PDF download of full specifications.

WIPO PATENTSCOPE

- Covers all international PCT filings since 1978.
- Offers machine translation for non-English patents.
- Provides sequence listings and chemical structure search.
- Includes advanced filters such as applicant, country, and publication stage.

Google Patents

- Simple search interface suitable for beginners.
- Integrates with Google Scholar for non-patent literature.
- Shows patent family data, forward citations, and legal events.
- Machine-learning powered relevance ranking.
- Useful for broad, exploratory patent searches.

Patent Families

- A patent family includes all filings for the same invention in different countries.
- Helps track geographical coverage and commercialization strategy.
- Identifies where competitors are targeting markets.
- Simple family vs extended family structures.

Citation Analysis

- Patents cite earlier patents (backward citations) and are cited by new ones (forward citations).
- Forward citations indicate technological impact and relevance.
- Backward citations show existing prior art influencing the invention.
- Citation networks help identify emerging clusters in research fields.

Patent Analytics

- Combines large-scale patent data to understand trends and competitive landscapes.
- Includes heatmaps, filing trend charts, assignee comparisons.
- Useful in identifying saturated vs emerging technologies.
- Helps researchers align work with future industrial needs.
- Plays a key role in strategy formulation for R&D labs.

Example: Analytics in AI Patents

- Rapid rise in filings from 2016 onwards globally.
- Major assignees: Google, IBM, Microsoft, Baidu.
- Focus areas: autonomous systems, AI governance, NLP, ML hardware accelerators.
- Analytics helps forecast areas ripe for innovation (e.g., responsible AI).

Hands-on Activity

- Search your chosen project topic using:
  - Google Patents
  - InPASS or WIPO
- Identify IPC/CPC categories relevant to your idea.
- Note top 3 patents: publication number, applicant, and claims.
- Prepare notes for comparison in next lecture.

Summary

- Patent information provides deep technical and legal insights.
- Databases like InPASS, WIPO, Espacenet, USPTO are essential research tools.
- Patent families, citations, and analytics reveal technological direction.
- Proper database usage can significantly enhance research novelty.

New Developments in IPR & Software Patents

Evolving Nature of Intellectual Property

- IP systems globally are changing due to emergence of AI, biotech, cloud systems, IoT, and immersive technologies.
- Increasing emphasis on digital innovation and data-based inventions.
- New forms of creative outputs (AI-generated art/code) demand updated legal frameworks.
- Patents today are intertwined with cybersecurity, privacy, platform economics, and automation.

Global Trends in IPR

- Rapid growth in AI and ML-related patent filings.
- Blockchain-based IP verification systems emerging.
- Rise of patent analytics for forecasting and competitive intelligence.
- Cross-border licensing and global innovation networks.
- Increasing disputes related to standard-essential patents (SEPs).

IPR in the Age of AI

- AI tools generate designs, code, and creative output—raising authorship questions.
- Major debate: Should AI be recognized as an inventor?
- Many offices (USPTO, EPO, IPO India) restrict inventor status to humans.
- AI-assisted inventions allowed; AI-generated inventions are debated.
- Copyright concerns over AI training datasets.

Open Source and IP Challenges

- Open-source software encourages collaboration but creates licensing conflicts.
- Licenses like MIT, GPL, Apache define terms for reuse and modification.
- Commercial products must ensure no violation of open-source obligations.
- Dual licensing emerging as popular model for AI frameworks.

Emergence of Data Rights

- Data has become a valuable economic asset requiring protection.
- IP systems are adapting to ensure rights for curated datasets.
- Data protection laws (GDPR, India's DPDP Act) influence innovation models.
- Patent claims now often include data processing frameworks.

Software Patentability in India

- Section 3(k) of the Indian Patent Act excludes: "mathematical methods, business methods, computer programs per se."
- Pure software cannot be patented in India.
- But software with a technical effect or technical contribution may qualify.
- Example: software controlling robotic movement or sensor integration.
- Focus is on hardware–software integration rather than pure code.

Software Patents in the USA

- US allows software patents if they provide a "significantly meaningful improvement."
- **Alice v. CLS Bank (2014)** imposed restrictions on abstract software claims.
- USPTO now requires technical implementation beyond abstract idea.
- AI/ML algorithms often patented when tied to a specific application.

Software Patents in Europe

- EU law: software is not patentable unless it has a "technical effect."
- Examples: encryption methods, industrial control systems, image processing.
- EPO is strict but consistent in evaluating software-based inventions.

Standard Essential Patents (SEPs)

- SEPs are patents essential for implementing technical standards (5G, Wi-Fi).
- Owners must license them on FRAND (Fair, Reasonable and Non-Discriminatory) terms.
- Licensing disputes in India and China increasing rapidly.
- SEPs define global competitiveness in telecom, IoT, robotics.

Case Study: Ericsson vs Xiaomi

- Ericsson accused Xiaomi of infringing its telecom SEPs.
- Delhi High Court ordered Xiaomi to deposit royalties.
- Case highlights importance of FRAND commitments.
- Shows how SEPs influence global smartphone markets.

IPR Challenges in Computer Software

- Identifying ownership of collaborative code contributions.
- Overlap between copyright and patent protection.
- Reverse engineering and interoperability issues.
- Software piracy and unauthorized replication.
- Cloud-based software complicates enforcement.

Modern Developments in Patent Administration

- AI-based patent examination tools being deployed globally.
- Automated prior-art search systems increasing efficiency.
- Blockchain-enabled timestamping for IP protection.
- Faster patent prosecution through expedited routes.

Summary

- IPR is evolving rapidly due to AI, software, and global digital ecosystems.
- Software patents vary globally—India restricts pure software, US/EU allow technical-effect software.
- SEPs now shape telecom and smart device industries.
- New developments include AI-assisted inventions, data rights, and blockchain IP tools.

IPR in Educational Institutes & Case Studies

Role of Educational Institutes in IPR

- Universities are primary generators of new knowledge through research.
- They convert research outcomes into patents, designs, copyrights, and industrial solutions.
- HEIs strengthen national innovation ecosystems through startups, incubations, and collaborations.
- IPR policies encourage students and faculty to innovate with legal protection.

Institutional IPR Policy

- Defines ownership rules for inventions created within the institution.
- Ensures fair distribution of revenue among inventor and institute.
- Covers confidentiality, disclosures, filing responsibilities, and licensing.
- Encourages ethical, responsible, and high-quality research practices.

IP Cells and Technology Transfer Offices (TTOs)

- Many universities have dedicated IPR Cells or TTOs to manage innovation.
- These handle invention disclosure, patent filing, licensing, and commercialization.
- They connect researchers with industries, government bodies, and incubators.
- Provide training and workshops on patent drafting, searching, and IP awareness.

Ownership of Academic IP

- IP ownership depends on funding source, institutional policy, and inventor contribution.
- If research is funded by an institute, institution typically owns the IP.
- Sponsored projects may have shared ownership with funding agency.
- Student IP ownership depends on use of institutional resources.

Revenue Sharing Models

- Common model: 50–70
- Incentivizes research output and boosts patent filing culture.
- Some institutes have equity-based revenue from startups.
- Revenue includes royalties, license fees, milestone payments, and commercialization gains.

Startups and Incubation Support

- Many HEIs run incubation centers that help convert student ideas into ventures.
- Patents filed by students may be licensed back to their own startups.
- Institutes provide IP, seed funding, mentorship, labs, and legal support.
- Helps academic research reach societal and commercial applications.

Case Study: IIT Bombay

- Strong IP culture through SINE incubation center.
- Balanced revenue-sharing policy: inventor receives up to 70
- High number of patents filed annually due to active research-driven ecosystem.
- Multiple startups licensed institute-owned patents for product development.

Case Study: MIT Technology Licensing Office (TLO)

- One of the world's most successful tech-transfer programs.
- Manages 800+ invention disclosures annually.
- MIT's TLO has supported the birth of more than 30,000 active companies.
- Focus on bridging academic discovery with industrial innovation.

Case Study: NITs and IITs (India)

- Many NITs/IITs encourage early-stage patents from student B.Tech/M.Tech/Ph.D. work.
- Strong collaboration with DRDO, ISRO, MeitY, and private R&D labs.
- National IPR policy encourages HEIs to integrate IP education in curriculum.
- Several patents licensed to MSMEs and national startups under Make in India.

Challenges Faced by HEIs in Managing IPR

- Lack of awareness about patentability among students.
- Poor documentation and record-keeping practices.
- Limited funding for international patent filings.
- Need for industry linkages and professional patent drafting.
- Delay in commercialization despite patent grant.

IPR and Academic Ethics

- Institutes must ensure ethical handling of student and faculty-generated research.
- Misappropriation of student theses or project ideas violates IP ethics.
- Academic environments should promote transparency in collaboration.
- Institutions must safeguard confidentiality during research reviews.

Mini Activity

- Draft a 1-page IP policy for a hypothetical research lab.
- Include: ownership, disclosure, revenue sharing, and licensing guidelines.
- Aim: understand practical design of institutional IP frameworks.

Summary

- Educational institutes play a key role in national innovation ecosystems.
- IP policies define ownership, revenue sharing, and responsibilities.
- Strong TTO/IPR Cells improve patent filing and commercialization.
- Case studies reveal successful innovation-to-market pathways.