

## **Engineering Tripos Part IIB, 4E1: Innovation & Strategic Management of Intellectual Property, 2021-22**

### **Leader**

[Dr Frank Tietze](#) [1]

### **Lecturer**

Dr Frank Tietze

### **Guest lecturer**

[Dr Pratheeba Vimalnath](#) [2]

### **Guest speakers**

Speakers from different industries (e.g. senior IP managers) and governmental organisations (e.g. European Patent Office) will complement the academic lectures

### **Timing and Structure**

Michaelmas term (Monday 14:00 - 16:00). All teaching for this module will take place according to governmental guidance, preferably in-person, but potentially hybrid or online (for details see Moodle page). Assessment: 100% coursework

### **Prerequisites**

Students attending this module are provided pre-reading material covering what the different IP rights are, the key concepts and limitations which students are expected to study before the second lecture of this module. Students are expected to have a basic understanding of the different IP rights, such as patents, trademarks, design rights, copyright and trade secrets.

### **Aims**

The aims of the course are to:

- acknowledge the relevance of intellectual property (IP) in today's technology and innovation systems and collaborative innovation processes.
- understand how to strategically manage IP to achieve and maintain competitive advantage.
- understand ways and tools for developing IP strategies that support long term business success.
- know how to use IP data and analytics to support business related decision making.

### **Objectives**

As specific objectives, by the end of the course students should be able to:

- appreciate the interdisciplinary nature of IP management.

- understand and apply relevant concepts, frameworks, tools and theories introduced during the module.
- be enabled to interact with professionals (managers, R&D engineers, lawyers) in IP related business conversations.
- understand the opportunities strategic IP management can create to develop and maintain competitive advantage.

## **Content**

**Lectures will be delivered in person, but streamed via ZOOM at the same time (also recorded and made available via Panopto).**

The module builds on the state of the art in strategic IP management thinking for maximizing value appropriation from predominately technological innovations. By definition, IP is an interdisciplinary concept. In the module we emphasise an engineering management perspective on IP, the module also touches on related concepts from law and economics. During the module we will run exercises, discuss examples, and a more indepth case study. The Dolby story is a facinating case of how IP strategies evolve along the development of one of the most successful licensing businesses, particularly with Dolby's strong link to Cambridge as a Pembroke alumni. Emphasis will be, where possible on IP strategies for sustainable / green technologies and innovations.

IP strategies differ across industries. While pharmaceutical companies typically rely on relatively small patent portfolios, firms in the electronics and ICT sectors typically have larger and more divers IP portfolios and employ different IP strategies. For students to gain an understanding of the different IP approaches in different sectors, we bring in guest speakers with strong practical experience in different sectors. In addition, guest speakers from governmental organisations, such as the European Patent Office (EPO) and the World Intellectual Property Organisation (WIPO) enhance students' learning experience by providing insights into the functioning of IP systems.

### **1. Innovation and the need for strategic IP management (Guest speaker from European Patent Office - EPO tbc)**

This session will introduce the module structure, the assessment exercise and set the scene by explaining why strategic IP management has become increasingly relevant for many industries over the last decades.

- Introduction to the patent system
- Digital economy, multi-technology products and the IP complexity challenge
- The rise of open / cumulative innovation and open source and the need for collaborative and open innovation
- Incentives to innovate, motives to patent, and the patenting paradox
- Intellectual assets, intellectual capital and intellectual property

### **2. IP systems, prosecution and litigation & searching and analysing patent data**

While it is expected that students have read the pre-course reading material, this session revisits some of the IP basics and covers some of the legal and IP system issues, e.g. by introducing relevant legal frameworks.

- Formal and informal IP rights (appropriability regimes)
- Patenting procedures and renewals

- Ownership and reassignments
- Counterfeits, patent quality, infringement and litigation
- Patent databases, search strategies and indicators for analysing patent data (patent landscaping and mining)
- Technology foresight, intelligence, understanding competitors and identifying weak signals (emerging and disruptive technologies)
- AI, machine and deep learning approaches for IP analytics

### **3. Technology, strategic and economic value as fundamental concept for effective IP management (Guest speaker from World Intellectual Property Organisation - WIPO tbc)**

This session introduces students to the concept of value with its various dimensions, established as well as emerging approaches for valuing intangible assets. Being able to put a "price tag" on an intellectual assets is as fundamental to firms' making decision than knowing what tangible assets are worth, but just a tiny little bit more challenging.

- The concept of value and value dimensions (strategic, economic, technological)
- The value of data in the AI age
- Established and emerging valuation approaches for intangible assets

### **4. Mastering markets for technology and licensing**

This session introduces to the relevant concepts around technology markets, particularly in the context of open innovation, the different actors on the supply and demand side (in the innovation ecosystem) as well as intermediaries and relevant managerial issues regarding licensing.

- Supply and demand sides of markets for technologies, innovations and data
- Technology market intermediaries, NPEs and patent trolls
- The micro and macro IP ecosystem
- Licensing models, contracts, royalty rates, negotiations
- IP based business models
- Standard essential patents and FRAND

### **5. Managing IP in collaborative innovation processes & IP risk management (Guest speaker: Pharmaceutical industry tbc)**

The session introduces considerations in collaborative innovation and IP associated risks.

- Managing IP in open, collaborative and distributed innovation processes
- Contracts and ownership considerations
- Reputational, operational and strategic IP associated risks

- IP risk assessment and mitigation strategies
- IP management in R&D collaborations (open innovation paradox)

## **6. Developing effective IP strategies (Guest speaker: Medical device industry tbc)**

This session focuses on different IP strategies as well as tools and toolkits that can be deployed to developed IP strategies.

- IP strategies for maximizing value creation and capture
- IP strategy typologies
- Strategies for accelerating technology diffusion (patent pledges)
- IP acquisition and exploitation / commercialization strategies for inbound and outbound innovation
- Tools and toolkits for developing IP strategies

## **7. Dolby case study & the future of IP management (Guest speaker: Global engineering tbc)**

In this session students will discuss the Dolby case study and hear some concepts and ideas that will change the way how IP will be used to gain and maintain competitive advantage. Students will hear from a guest speaker how a global engineering company develop and deployed a sophisticated IP management system across multinational divisions.

- Challenges for organizations IP cultures when firms move towards more effective, value driven IP management
- Organizational principles and processes (incentive systems, invention disclosure) for effective IP management
- IP challenges in mergers and acquisitions (due diligence, disassembly problem)
- Effectively managing actors in the IP ecosystem

## **8. Strategic IP management and innovation – the full picture (Guest speaker: Electronics / ICT / IoT industry tbc)**

This session will bring together the content, frameworks, concepts and tools of all lecture in a guest lecture and wrap-up session.

## **Further notes**

Additional readings and resources for this module will be available on the respective Moodle page. Details will be given at the start of the module.

## **Coursework**

Coursework assignment 100%.

Student will have to apply their knowledge gained in this module by developing an IP strategy for a selected case company. An IP analysis of the company's own portfolio, those of relevant current and future competitors is a key element of the assignment. During the module the students will be introduced to relevant frameworks and tools, which they will be expected to use for the coursework. The coursework will comprise an individual report.

Coursework	Format	Due date & marks
To develop an IP strategy for a selected case company, which includes an analysis of the company's IP portfolio and relevant actors in the IP ecosystem, drawing upon the knowledge from the different sessions in the module.  Further details will be available on the module's Moodle page.	Individual report, anonymously marked	Towards the end of the module (specific details will be available at the beginning of the module)

## Booklists

### Recommended books for this module:

- Chesbrough, H. W. (2006). Open Innovation: The New Imperative for Creating and Profiting from Technology, Harvard Business Press.
- Granstrand, O. (1999). The Economics and Management of Intellectual Property: Towards Intellectual Capitalism. Cheltenham, UK and Northampton, MA, USA, Edward Elgar Publishing.
- Phelps, M. and D. Kline (2009). Burning the Ships: Intellectual Property and the Transformation of Microsoft, Wiley Hoboken.
- O'Connell, D. (2011). Harvesting External Innovation, Gower Publishing.
- Teece, D. J. (2000). Managing Intellectual Capital: Organizational, Strategic, and Policy Dimensions, OUP Oxford.

## Examination Guidelines

Please refer to [Form & conduct of the examinations](#) [3].

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