

## **Engineering Tripos Part IIB, 4E1: Innovation & Strategic Management of Intellectual Property, 2019-20**

### **Leader**

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### **Lecturer**

Dr Frank Tietze

### **Guest lecturer**

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### **Timing and Structure**

Michaelmas term (Monday 16:00-18:00; Lecture Room 4). 100% coursework

### **Prerequisites**

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

### **Aims**

The aims of the course are to:

- the relevance of intellectual property (IP) in today's technology and business context.
- how to strategically manage IP for technology related business problems.
- the portfolio approach to IP, challenges in IP transactions and open innovation.
- how to use patent data and analytics to support business related decision making.
- how to effectively organize IP management.

### **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.
- 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**

**The module builds on the state of the art in strategic IP management thinking for maximizing value appropriation value from technological innovations. While the modules emphasis an management perspective on IP, it also include concepts from engineering, law and economics. During the module we will run different exercises, discuss various examples, and one larger case study in particular. Guest lecturers, such as from different industry sectors and patent offices will enrich the academic elements of the module.**

### **1. Innovation and the need for strategic IP management**

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 collaboration
- IP fragmentation, assembly problem and hold-up
- Patent races and patent wars
- Incentives to innovate, motives to patent, and the patenting paradox
- Path dependency, trajectories and technology transition (to sustainability), dynamic capabilities
- Intellectual assets, intellectual capital and intellectual property

### **2. IP systems, prosecution and IP risk management**

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 some legal frameworks.

- Appropriability regimes
- Formal and informal IP rights
- Patenting procedures and renewals
- Ownership and reassignments
- Counterfeits, patent quality, infringement and litigation
- IP threats and risk management

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

This session introduces students to the relevant concepts around technology markets in the context of open innovation, the different actors on the supply and demand side as well as intermediaries and relevant managerial

issues regarding licensing.

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

#### **4. IP strategies for appropriating value from technological innovation**

The session introduces how IP management can help to maximize value appropriation from R&D investments to gain and maintain competitive advantage.

- The need for strategic alignment of IP and business / corporate strategies
- IP strategies for maximizing value creation and capture
- IP strategy typologies
- Strategies for accelerating technology diffusion (patent pledges)
- Tools and toolkits for developing IP strategies

#### **5. Open innovation and IP portfolio management**

This session focuses on the dynamic nature of IP portfolios in open innovation processes and strategies to update and exploit portfolio assets and its associated challenges.

- Strategically building, maintaining (and "evergreening") IP portfolios
- IP acquisition and exploitation / commercialization strategies for inbound and outbound innovation
- IP management in R&D collaborations (open innovation paradox)

#### **6. Analytics for strategic IP and innovation management**

The session introduces students to IP analytics and how it can help with strategic IP and innovation management in particular, but also with decision making in innovation processes and for technology development.

- Technology foresight, intelligence and IP analytics
- Disruptive technologies and weak signals
- Databases, search strategies and patent mining
- Tools, indicators and analytical techniques
- AI, machine and deep learning for IP analytics

## 7. Enabling effective IP management

To enable strategic IP management, organizations need to have operational processes, structures and routines in place, such as IP due diligence processes for acquisitions. Organizational change towards effective IP management often also faces cultural barriers, which will be discussed in this session together with ways to use IP for financing and IP based business models.

- Challenges for organizations IP cultures when firms move from closed to open innovation
- Organizational principles and processes (incentive systems, invention disclosure) for effective IP management
- IP challenges in mergers and acquisitions (due diligence, disassembly problem)
- A note on IP financing models (securities, collaterals)
- IP based business models

## 8. Strategic IP management and innovation – the full picture

This session will bring together the content 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. 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 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 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 using patent analytics software.  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 given at the beginning of the module)

### Booklists

### **Recommended books for this module:**

- 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.
- Chesbrough, H. W. (2006). Open Innovation: The New Imperative for Creating and Profiting from Technology, Harvard Business Press.
- 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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