

Course guide

230639 - TAM - Technology Asset Management

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Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications.

Degree: MASTER'S DEGREE IN ELECTRONIC ENGINEERING (Syllabus 2013). (Optional subject).
MASTER'S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Optional subject).
MASTER'S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Optional subject).
MASTER'S DEGREE IN ELECTRONIC ENGINEERING (Syllabus 2022). (Optional subject).

Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: CARLES PUENTE BALIARDA

Others: Primer quadrimestre:
CARLES PUENTE BALIARDA - 10

TEACHING METHODOLOGY

See 'Regulations for carrying out activities'.

LEARNING OBJECTIVES OF THE SUBJECT

Course Objectives:

- 1.- To train engineers and scientists in the management of technology assets, research and engineering teams.
- 2.- To understand the rules of the international patent system and to learn how to develop a patent portfolio and a patenting strategy to secure and monetize the technology value of a corporation.
- 3.- To learn the basic technology and patent licensing models and the related business trade-offs.
- 4.- To develop the basic skills to plan and manage a technology and product roadmap, understanding the role of a technology department in a small or large corporation and its fit and interaction with other departments and government bodies within the organization.
- 5.- To review several strategies on how to introduce an innovation into the market, from the traditional product development cycle to a pure intellectual property licensing model.

Pedagogic targets:

- 1.- To make engineers and scientists conscious on the potential value of a technology asset beyond its use in a traditional product development program.
- 2.- To provide engineers and scientists with some basic tools and insights in the art of technology management.
- 3.- To get engineers and scientists confident and familiar in managing patent information.
- 4.- To get engineers and scientists understand the purpose of patenting and to provide them an insight on how to make an effective use of patents in a business context.
- 5.- To get engineers and scientist familiar in the reading and wording of patent documents and interpreting its basic scope of protection.
- 6.- To help engineers and scientists in protecting through patents broad technology concepts rather than narrow product lines.
- 7.- To provide engineers and scientists with the tools to budget and monitor a patent portfolio and help in making a strategic plan for a patent asset development.
- 8.- To provide engineers and scientists with the basic concepts on technology and patent licensing.
- 9.- To provide engineers and scientists with a perspective on how to set up a technology and IP group inside a company whether a start-up or a large corporation.
- 10.- To train engineers and scientists in the reading of technical documents (patents) in different fields where the student is not necessarily an expert.

Who should attend:

This course is directed to train engineers and scientist aiming to develop a technology management career in a high-tech company, whether a start-up or a large corporation.

Course Description:

Background: Technology and talent are the main assets for a technology based company; however, a disruptive technology alone does not guarantee a business success. Properly managing such two key assets, a proprietary technology and the talented team behind it, becomes a key success factor when addressing a highly competitive market environment. This course aims to provide the basic tools and skills to future technology managers to develop a mid and long-term technology development and innovation strategy which is aligned with the business goals of a corporation.

STUDY LOAD

Type	Hours	Percentage
Hours large group	39,0	31.20
Self study	86,0	68.80

Total learning time: 125 h

CONTENTS

Part I - Background, Basic Knowledge and Skills

Description:

Technology Based Companies and a Knowledge Based Economy - What is a technology based company? The technology and the team as key assets of the corporation. Structure and organization of a technology based company. Examples of technology companies in the telecommunications/electronics space (Qualcomm, ARM, Intel, Thomson, Rambus, Tesser, InterDigital, IBM, Immersion, WiLAN). Overview of Intellectual Property (IP) protection. The patent system worldwide: why patenting?

Project Oriented Management - The project as a business and engineering management tool. The project steering committee. The project leader and the project team. Project management tools: project definition, project planning, budget and resources planning and tracking, tracking tools (action item list, meeting minutes, reporting), closing meetings. Project planning examples with Microsoft Project.

Introduction to Patent Prosecution - What is a patent? The patent as a technical document. The patent as a legal document. The patent as a negative right. Data structure of a patent and patent application document. Searches in patent databases. General requirements for patentability. The US patent system vs. the European patent system. Novelty, Non-obviousness/Inventive-step in US/Europe. Patent prosecution in the US and EPO. Patent prosecution in other offices world-wide.

Introduction to Patent Engineering - The invention report as the link between the engineering and legal teams. Technical content and structure of a patent document: background, specification, drawings and claims. Independent and dependent claims. Specification support according to EPC and USPTO practices. Claim look-up tables. Claim charts. Basic patent drafting for engineers. Technology and patent review examples.

Part II - Technology and Patent Strategies and Organization

Description:

Technology and Product Innovation -The technology roadmap. The product roadmap. The project funnel. Product development cycle and product development pipeline. Intellectual property considerations in product development: intellectual property surveillance and product marking.

Patent Prosecution Strategies - Cost analysis of patent prosecution. Filing international patent (PCT) applications. Filing provisional applications. Divisional applications in the EPO and USPTO. Continuation and Continuation in Part applications. What to file, where and when. The patent as an intellectual property (IP) product. The IP product pipeline. Patent portfolio management. Monitoring your patent portfolio. Budgeting a corporate patent portfolio investment. Budgeting examples with Microsoft Project.

The Knowledge Management System (KMS) - The KMS as a productivity tool for technology based companies. The KMS as knowledge storage tool: internal projects and reports. The KMS as prior-art and state of the art surveillance tool. The KMS as a patent docketing and document management tool. The 'duty of candor' in the US and the Information Disclosure Statement procedure in front of the USPTO. Examples of software tools for implementing a KMS. Information and document workflows and quality system related procedures.

Part III - Technology and Patent Based Business Models

Description:

Technology and Patent Licensing Models - Product, design, technology and patent licensing. Enabling technologies and the 'carrot' patent license model. Examples of 'carrot' licensing. Infringed technologies and the 'stick' license model. Examples of 'stick' licensing. Choosing the right licensee in the value chain. Pricing models and technology and patent value. The Entire Market Value Rule in the US. Patents as defensive business tools for large corporations. Cross-licensing. Patents as a key business tool for high-tech companies.

The 'carrot' licensing model - Product and design licensing vs. patent licensing. Engineering services and the non-recurring expenses (NRE) model. Enabling technology and patent pricing and licensing. Bundling an IP product pack. Partnership programs. The pilot program. Confidentiality and Non Disclosure Agreements (NDA). The Memorandum of Understanding (MoU). Client-attorney privileged information and the Common Interest Agreement (CIA) in the US.

The 'stick' licensing model - Patent enforcement in the US and Europe. Choosing a venue for patent enforcement. The Federal Circuit and the International Trade Commission in the US. Injunctive relief. Lost profits and past damages. Patent marking of products. Royalty awards. Timings and stages of litigation. Litigation as a defensive tool: declaratory judgements in the US.

Licensing agreements - Dimensions of a licensing agreement: defining your IP product. Exclusivity. Rights to Sublicensing. Reservation of Rights. Term and termination. Royalties and other considerations. Prosecution and maintenance. Infringement. Indemnification. Representation and warranties. Disclaimers.

GRADING SYSTEM

30% Patent Drafting & Innovation (paper airplane project)

Winners (teams with exclusion rights) get 4 extra bonus points in final exam.

Best airplane builders get 2 extra bonus points in final exam.

Delivering all assignments and projects and obtaining at least 4/10 points in the final exam is a condition for the bonus to accrue.

20% Weekly Assignments.

20% Final Exam.

15% Patent Business/ Patent Portfolio Management project.

15% Project Planning project.

EXAMINATION RULES.

Weekly Assignments (3h/week) - At the end of the week (7-8 out of 13 weeks), students will have to work on an assignment for the following week. Completing and delivering the exercises will be mandatory. Completion of work will be checked, and a few randomly selected assignments will be graded each week. Weekly assignments will be based on:

- Read and comment 'the patent of the week'.
- Read selected material from reference books and papers.
- Quest on the content of the week sessions and material.
- Exercises based on the week sessions.

Course Project #1 (15h in 2 weeks) - Project Planning - Students will organize in teams of 2-3 people to prepare a detailed project plan and related project management tools. A project leader will be elected within each group and the team will organize to find information about the target product design, manufacturing and marketing. (Teamwork)

Course Project #2 (30h in 4 weeks) - Patent Drafting & Innovation: The paper airplane competition - Every student is invited to prepare a paper airplane in class and compete for the longest flight-time airplane. Then students are arranged in teams of two/three, and a time period for improving the plane and 'filing' a patent on the invention is proposed. Entire prior-art will be defined by the professor. 'First to file' system is proposed. The winner is who owns an exclusion right on the longest flight-time airplane. The winning team gets 4 extra points in the final exam. (Teamwork)

Course Project #3 (15h in 2 weeks) - Teams will have a choice between a "Patent Portfolio Management" project and a project related to a topic around the "Patent Business":

- "Patent Portfolio Management" - Students will collect the dates of a set of PCT patent applications filed by a tech company in the previous year and will prepare a 20 year budget. Cost analysis and comparison based on several national filing strategies will be carried out. (Teamwork)
- "Patent Business" - Students will research on a selected topic around the patent and licensing business and will prepare a report and a presentation. (Teamwork)

BIBLIOGRAPHY

Basic:

- Dematteis, B.; Gibbs, A.; Neustel, M. The patent writer: how to write successful patent applications. Garden City Park, NY: Square One Publishers, 2006. ISBN 0757001769.
- Ulrich, K.T.; Eppinger, S.D.; Yang, M.C. Product design and development. 7th ed. New York: McGraw-Hill Irwin, 2019. ISBN 9781260566437.
- Lowery, G.; Stover, T. Managing projects with Microsoft Project 2000: for Windows. New York: John Wiley and Sons, 2001. ISBN 0471397407.
- Mock, D. The qualcomm equation: how a fledgling telecom company forged a new path to big profits and market dominance. New York: American Management Association, 2005. ISBN 0814409970.
- Holmes, M.S. Patent licensing: strategy, negotiation, forms. New York: Practising Law Institute, 2000. ISBN 0872241378.
- McGrath, M.E. Product strategy for high-technology companies : accelerating your business to web speed. 2nd ed. New York: McGrawHill, 2001. ISBN 0071362460.

RESOURCES

Hyperlink:

- USPTO
- EPO