Opti 539A: From Photonics Innovation to the Marketplace

Professor:
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Lectures: Tuesday and Thursday, 8:00-9:15 in Meinel 305

Office Hours: By appointment.

Course Description: This course covers the process of technology development in the photonics industry, both from the perspective of formal processes and case studies. Key aspects of the commercialization process including intellectual property, new product development processes, technical marketing and team building are treated in an interactive program informed by the instructor’s 15 years of industry experience in both large corporate R&D organizations and entrepreneurial startups.

Course Objectives:
- Provide practical, working knowledge of all aspects of intellectual property, including patents, trademarks and trade secrets. Students will learn how to draft invention disclosures and patent claims.
- Comprehensively treat technology commercialization processes such as stage-gate systems, with an emphasis on systems that have proven successful in technology driven industries. Students will work in groups to develop stage-gate presentations.
- The fundamentals of technical marketing will be stressed and students will be capable of composing a company profiles for both customers and competitors.
- A strong understanding of team dynamics and how successful teams are built will be acquired.
- The key course concepts will be applied to several intriguing case studies from the optical fiber industry.

Grading
- Invention disclosure project - 10%
- Midterm exam – 25%
- Group Gate 1 presentation – 25%
- Company profiles project – 15%
- Final exam – 25%

The grade will be determined according to the cumulative percentage earned such that 90-100% = A, 80-89% = B, 70-79% = C, 60-69% = D, below 60% = E.

Required Text
None. Readings will be provided from a variety of sources.
Course Outline

Module 1: Introduction
- Technology ≠ Science & Engineering
- Essentials of Innovation
- Marketplace and Marketing

Module 2: Case Study I: Uniphase – Growth by Technology Acquisition
- From Sleepy Laser Company to Market Leader
- The Visionary
- The Technologist
- An Explosive Market

Module 3: Protecting Innovation
- What is an Invention?
- Patent Basics
- Drafting a Disclosure
- The Value of Trade Secrets
- Trademarks and Brand Protection

Module 4: New Product Development Overview
- Marketplace Warfare
- The Low Odds of Success
- Learning from Failure
- The Actual New Product Process
- Keys to New Product Victory
- Execution is Essential

Module 5: New Product Process
- Stage-gate Systems
- Managing Risk
- Ideas and Better Ideas
- Building a Business Case
- Project Evaluation
- Economic Models
- Gate Reviews
- Development
- The Value Proposition
- Timing
- Markets, Segments and Niches

Module 6: Ciena – Capturing the Value
- Right Technology, Wrong Market
- A Key Component
- A Desperate Industry
• Execution and Payoff

Module 7: Technical Marketing and Sales
• Sales is not Marketing and Vise Versa
• Marketing 101
• Crafting the Value Proposition – the Customer as the Resource
• Closing the Deal
• The Innovator’s Dilemma

Module 8: Building the Team
• The Importance of Preferences
• Complementary Skills – Seeing the Blind Spots
• The Soft Stuff
• Situational Leadership
• Success

Module 9: Case Study 3: Infinera – Dream Team
• Success Breeds Frustration
• Integrated Vision
• A Deep Hole
• Ascendance and Leadership

Module 10: Photonics Future
• What’s Next?
• Structured Brainstorming

Academic Integrity (http://web.arizona.edu/~studpubs/policies/cacaint.htm)
According to the Arizona Code of Academic Integrity “Integrity is expected of every student in all academic work. The guiding principle of academic integrity is that a student’s submitted work must be the student’s own.” Unless otherwise noted by the instructor, work for all assignments in this course must be conducted independently by each student. Co-authored work of any kind is unacceptable. Misappropriation of exams before or after they are given will be considered academics misconduct.

Misconduct of any kind will be prosecuted and may result in any or all of the following:
• Reduction of grade
• Failing grade
• Referral to the Dean of Students for consideration of additional penalty, i.e. notation on a student’s transcript re. academic integrity violation, etc.

Students with a Learning Disability
If a student is registered with the Disability Resource Center, he/she must submit appropriate documentation to the instructor if he/she is requesting reasonable accommodations. (http://drc.arizona.edu/instructor/syllabus-statement.shtml).

The information contained in this syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.