

## **COURSE OUTLINE**

### **BSN3701/TR3008 Technological Innovation**

### **Academic Year 2021/22, Semester 2**

*Note: This course outline is subject to changes*

#### **LECTURER**

Su-Ann Nair  
Office Hours: By appointment

#### **COURSE OVERVIEW**

This course aims to equip students with a strong conceptual foundation for understanding the dynamic process of technological innovation. Students will be introduced to the importance of technological innovation as a driver for value creation and economic growth. The dynamics of technological change will be analysed through concepts such as technology life-cycles, dominant design, network externalities, and first-mover advantage.

This course has its foundations in theory and research but is practice-oriented. This means that students will be exposed to the challenges in technological innovation through case studies of real world companies that seek to build strong market positions for their innovations; firms with successful (and unsuccessful) technology strategies; companies that must formulate strategy in rapidly changing and highly uncertain market contexts; and enterprises whose market positions are severely challenged by external technological developments.

The course develops frameworks for understanding strategic issues confronted by firms in technology-intensive industries. The focus in the course will always be on strategic issues rather than on descriptions of complex technologies. Students are not required to have a technical background to take this course. However, given the emphasis on the case method, students need to prepare to discuss and debate in class.

#### ***Who should take this course?***

This course is designed for undergraduate students, to be taken as part of the Minor in Technopreneurship program offered by the NUS Business School. There are no formal prerequisites for this course.

#### **COURSE MATERIALS**

The course requires a fair amount of reading and reflection in between classes. You can find the reading materials assigned to each lesson in the schedule below. There is no required textbook for the course.

I expect you to read the assigned materials before each class. During class time, we will focus on discussions, analysis, and exercises. If you have any questions about the

readings, you may bring them up in class.

## ASSESSMENT

Attendance: 10%

Class participation: 30%

Final Case Analysis: 20%

Group Project: 40%

- Mid-term presentation: 5%
- Final presentation: 15%
- Group report: 20%

### **Attendance (10%):**

Missing class will affect your grade and more importantly your own and your classmates' experience in the class. Attendance will be recorded every week after the first class. Absences will only be excused for valid reasons such as being certified medically unfit by a doctor, experiencing a death in the immediate family, involved in a serious accident. If you are absent for a valid reason, please email me and provide documentary evidence in the subsequent class.

*Failure to attend class will result in a negative class participation score for that class.*

### **Class Participation (30%):**

This is a case-based course. To be prepared for class, you must read and think about assignments in advance of class. Evaluation of your participation will be based on your ability to contribute comments that are insightful, relevant and progressive (i.e., comments that add on to what is being said and move the discussion forward, rather than restate what has already been said). Comments should be thoughtful and constructive. I will be looking for quality in your participation and you will not need significant "airtime" to earn a high participation grade (if you put forth a single, key insight and that is all you contribute to a session, you will receive the maximum class participation grade for that session). To aid you in preparing for class discussion, I will distribute key questions for each case that will foreshadow the direction of the in-class discussions. Please come to every class prepared to discuss the case at hand. **Expect to be cold called.**

### **Final - Individual Written Case Analysis (20%):**

Each person is responsible for writing up a case analysis (*10 pages maximum, 1 inch margins, double spaced and 12 point font*). This write-up will be based on a case that I will distribute in the last week of class, and will be due one week after. You are free to discuss and work with groups of any size, however all final submissions should be prepared independently. If you choose to work in groups, acknowledge all group members involved in the case discussion.

Some guidelines and expectations:

- This is NOT a case summary. Beyond a brief introduction of the company, you should avoid simply describing the case. Be analytical.
- The purpose of the case is to provide information for you to illustrate your statements and defend your points.

- Focus. Aim for depth rather than breadth.
- Write in *prose*; I expect an essay. Articulate the main points clearly using topic sentences and make sure the writing and argumentation flows logically.

### **Group Work - Company Assessment (40%):**

In a group with 4 members (minimum), you will perform an in-depth analysis of a company's technology strategy and the positioning of its products or services. The paper may be up to 20 pages in length (*1 inch margins, double spaced and 12 point font*) not including figures, financials, and other exhibits. I highly recommended that you establish a contact at the company and spend some time interviewing company personnel, although field interviews are not strictly required to complete the assignment. All groups are expected to present interim findings prior to the mid-term recess and the results of their research to the class on the final day of the quarter.

Your paper should describe the firm's technology strategy and the important strategic issues that confront the organisation. Although not all of the following issues will be relevant to the situation you choose to analyse, you should identify and evaluate: the competitors of your firm, the stage of development of its industry, potential changes in the industry created by technological or market changes, sources of innovation for the industry and firm you are analysing, your target's intellectual property position, its key competencies, the stage of development of its products, the appropriability regime it faces, its financial situation (access to capital, capital structure), the technical and managerial staffing issues that it faces, and the characteristics and strengths of its alliance portfolio. Through your analysis, you draw conclusions about the attractiveness and sustainability of your company's position and the industry segment that it occupies. If it helps, you can assume that you are either crafting a report to submit to potential investors in the firm, or submitting an external review of its current technology strategy to the firm's board.

The project should offer critical evaluation and it should draw heavily on the theoretical readings and frameworks that are covered in the class.

*There will be a mid-term presentation which will also serve as a checkpoint to make sure you are on the right path. All groups will present their interim findings in a 10-15 minute presentation, followed by ~10 minutes of Q&A, to the class in week 6. You will receive feedback on the interim presentation, which should help you structure and sharpen your final presentations and report. The final project report is due by 5pm, 5 May 2022.*

## **CLASS ADMINISTRATION**

### **Ground Rules**

- Please display your name card in the front of your desk. If you forget your name card, please make a temporary name card for that session
- Please silence your cell-phone before each course session
- We have a **no personal device screen policy** for the class (i.e., no phones or laptops). As the class is mostly case-based, we ask that you be respectful to your fellow students during case discussions

## Missed Class Sessions

As noted above, attendance will be recorded every week after the first class. Absences will only be excused for valid reasons such as being certified medically unfit by a doctor, experiencing a death in the immediate family, involved in a serious accident (note that this does not include sports training, cultural events, etc.). If you are absent for a valid reason, please email me in advance of the course meeting and provide documentary evidence in the subsequent class.

Please note that if you miss a course session for which your group is presenting, you will receive no points for the in-class portion.

## Assignments

Please note that LATE SUBMISSIONS WILL NOT BE GRADED and that SEVERE PENALTIES EXIST FOR PLAGIARISM. If you have any questions regarding these policies please ask me in advance of potential issues. I will be available during the course, appointments, and via email.

## Academic Honesty & Plagiarism

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule – You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. In case of any doubts, you should consult your instructor.

Additional guidance is available at:

<http://www.nus.edu.sg/registrar/adminpolicy/acceptance.html#NUSCodeofStudentConduct>

Online Module on Plagiarism: <http://emodule.nus.edu.sg/ac/>

**COURSE SCHEDULE** (subject to change)

<b>Week 1: 13 Jan 2022</b>	<b>Course Overview and Introduction</b>
<i>Case</i>	EMI and the CT Scanner (A) + (B), Bartlett C. A., <i>HBS Case Series</i>
<i>Suggested Readings</i>	Staw B.M., "Why No One Really Wants Creativity", <i>Creative Action in Organizations</i> <a href="http://haas.berkeley.edu/faculty/papers/stawnoonecreativity.pdf">http://haas.berkeley.edu/faculty/papers/stawnoonecreativity.pdf</a> Abernathy & Utterback, "Patterns of Industrial Innovation," <i>Technology Review</i>
<i>Case Questions</i>	<ol style="list-style-type: none"> <li>1. After reading the (A) case, stop and think about these questions: (1) Should EMI enter the CT scanner business? Why or why not? (2) How attractive is this business? And, (3) Who will make the money in CT scanners and why?</li> <li>2. How was EMI doing in the CT business in 1976? How do you assess the company's performance to date? What should Powell do at the conclusion of the case?</li> </ol>
<b>Week 2: 20 Jan 2022</b>	<b>Innovation Strategy</b>
<i>Case</i>	Theranos Inc.: Pivoting Consumer Health Care, K. Antia, R. Chandy, R. Chandrasekhar, <i>Ivey Case Series</i>
<i>Suggested Readings</i>	Alice Park, "Blood Will Tell", <i>Time</i> , July 27 2015 John Carreyrou, "Hot Startup Theranos Dials Back Lab Tests at FDA's Behest", <i>Wall Street Journal</i> , 16 October 2015 David Crow, "Theranos exemplifies clash of new versus old in-vitro test models", <i>Financial Times</i> , 15 December 2015 James B. Stewart, "The Narrative Frays for Theranos and Elizabeth Holmes", <i>New York Times</i> , 29 October 2015
<i>Case Questions</i>	<p>A lot has happened since the time of the case, but our learning will come from setting yourself in the time of the case, not today. With that in mind, consider the following questions:</p> <ol style="list-style-type: none"> <li>1. Does the blood-testing system represent a disruptive innovation? Why or why not?</li> <li>2. Discuss the relevance of the technology adoption life cycle to Theranos.</li> <li>3. How should Theranos navigate the chasm between early adopters (the pharmaceutical companies) and mainstream consumers?</li> <li>4. How should Theranos navigate the cost-benefit trade-off in order to diffuse innovation and promote product adoption?</li> </ol>
<b>Week 3: 27 Jan 2022</b>	<b>Profiting from Innovation</b>
<b><i>Due</i></b>	<b><i>Submit your project teams - Min groups of 4</i></b>
<i>Case</i>	Netflix in 2011, Willy Shih; Stephen P. Kaufman, <i>HBS Case Series</i>
<i>Readings</i>	Watch: "Netflix Distribution Mix Video"

	<a href="https://www.youtube.com/watch?v=GOXqGEWW2d8">https://www.youtube.com/watch?v=GOXqGEWW2d8</a>
<i>Case Questions</i>	<p>A lot has happened since the time of the case, but our learning will come from setting yourself in the time of the case, not today. With that in mind, consider the following questions:</p> <ol style="list-style-type: none"> <li>1. How would you characterise the differences between Blockbuster’s and Netflix’s business models?</li> <li>2. Was Netflix disruptive? How? How would you evaluate Blockbuster’s response?</li> <li>3. Did Reed Hastings make the right move in trying to separate the DVD-by-mail business from the streaming business? How do you think he should proceed now?</li> </ol>
<b>Week 4: 3 Feb 2022</b>	<b>Building Technological Competencies</b>
<i>Case</i>	Amazon Go: Venturing into Traditional Retail, Wiboon Kittilaksanawong, Aurelia Karp, <i>Ivey Case Series</i>
<i>Suggested Readings</i>	<p>Melissa A. Schilling, “Chapter 5: Timing of Entry” in <i>Strategic Management of Technological Innovation, 5th ed.</i>  Cohen and Levinthal, Absorptive Capacity, A New Perspective, <i>Administrative Science Quarterly</i></p>
<i>Case Questions</i>	<ol style="list-style-type: none"> <li>1. Were Amazon’s diversifications through Amazon Go and Amazon Elements appropriate, given the company’s resources and capabilities? Were such diversifications risky strategic moves?</li> <li>2. Can Amazon reproduce its online retail success in offline retail segments? Will it be able to become one of the biggest offline retail players?</li> <li>3. As the first mover in its shopping technology, will Amazon Go be able to succeed in the long term?</li> </ol>
<b>Week 5: 10 Feb 2022</b>	<b>Standards and Design Dominance</b>
<i>Case</i>	“DropBox, It Just Works”, Eisenmann, Pao and Barley, <i>HBS Case Series</i>
<i>Suggested Readings</i>	<p>Schilling, M. A., “Technological Leapfrogging: Lessons from the U.S. Video Game Industry”, <i>California Management Review</i>  Schilling, M. A., “Standards Battles and Design Dominance,” <i>Chapter 4 in Strategic Management of Technological Innovation</i></p>
<i>Case Questions</i>	<ol style="list-style-type: none"> <li>1. Dropbox is a late mover in a crowded space. What opportunity did Houston see?</li> <li>2. What are the key elements of Dropbox’s current business model?</li> <li>3. Is Dropbox profitable as of June 2010? Are you optimistic about its prospects? How does your estimate of Dropbox’s current profitability influence your evaluation of the venture’s prospects?</li> </ol>
<b>Week 6: 17 Feb 2022</b>	<b>Midterm Presentations</b>
<b><i>Recess Week</i></b>	

<b>Week 7: 3 Mar 2022</b>	<b>Adoption of Technology and Innovation</b>
<i>Case</i>	Google Glass, Eisenmann, Barley and Kind, <i>HBS Case Series</i>
<i>Case Questions</i>	<ol style="list-style-type: none"> <li>1. What are Google's goals in developing Glass?</li> <li>2. What is your view of the likelihood that Glass will eventually achieve commercial success</li> <li>3. If, at Glass's inception, you had been tasked as a product manager with validating demand and refining Glass' features to maximise success odds, would you have structured the Explorer Program differently (e.g., with respect to the profile of early testers; number of Explorers; product price; etc.)? What metrics would you use to assess demand?</li> <li>4. Which of the three distribution options listed in the case would you pursue, i.e., a) direct distribution; b) open platform; c) partnership with a leading eyewear manufacturer?</li> </ol>
<b>Week 8: 10 Mar 2022</b>	<b>Platforms: Introduction and Network Effects</b>
<i>Case</i>	Amazon, Apple, Facebook and Google 2018, Deighton and Kornfeld, <i>HBS Case Series</i>
<i>Suggested Readings</i>	Hariharan, A., "All about Network Effects," Andreessen-Horowitz Blog, accessed at <a href="https://a16z.com/2016/03/07/all-about-network-effects/">https://a16z.com/2016/03/07/all-about-network-effects/</a> Hagiwara and Wright, "Do You Really Want to be an Ebay?," Harvard Business Review, accessed at <a href="https://hbr.org/2013/03/do-you-really-want-to-be-an-ebay">https://hbr.org/2013/03/do-you-really-want-to-be-an-ebay</a>
<i>Case Questions</i>	<ol style="list-style-type: none"> <li>1. Define the contested boundaries among all four of the companies.</li> <li>2. For each contested boundary that you have identified, how is the contest likely to play out among the giants? How many contests give rise to winner-take-all markets? How many to always-a-share markets? How will the complex ecosystems, in which online businesses are built on top of other online businesses, and third-party sellers that rely on platforms, evolve?</li> <li>3. Consider Facebook and Apple as platforms. Can they be viewed as of the same kind?</li> </ol>
<b>Week 9: 17 Mar 2022</b>	<b>Sustaining Long-term Competitive Advantage</b>
<i>Case</i>	Walmart Inc. takes on Amazon.com, David J. Collis; Andy Wu; Rembrandt Koning; Huaiyi CiCi Sun, <i>HBS Case Series</i>
<i>Case Questions</i>	<ol style="list-style-type: none"> <li>1. Is Walmart or Amazon in the stronger position at the time of the case? In ten years? Why?</li> <li>2. Why did Walmart struggle in the online business for so long?</li> <li>3. What should Walmart do going forward?</li> </ol>
<b>Week 10: 24 Mar 2022</b>	<b>Reinvention in the face of Technology</b>
<i>Case</i>	The Reinvention of Kodak, Ryan L. Raffaelli; Christine Snively, <i>HBS Case Series</i>

<p><i>Case Questions</i></p>	<p>On 3 September 2021, Kodak announced it had emerged from Chapter 11 bankruptcy. Six months later, Kodak’s board announced that former Silicon Valley executive Jeff Clarke would become the company’s next CEO and charged him with leading one of the most complex corporate turnarounds in recent history. Consider the following questions as you review the case:</p> <ol style="list-style-type: none"> <li>1. How did Kodak go from being a giant in the film industry to facing bankruptcy?</li> <li>2. What are the leadership challenges facing Clarke as he attempts to bring Kodak out of bankruptcy?</li> <li>3. What trade-offs does Clarke face? Be specific.</li> <li>4. What is the biggest mistake he could make as Kodak’s newly appointed CEO?</li> </ol>
<p><b>Week 11: 31 Mar 2022</b></p>	<p><b>Course Wrap-Up and Review</b></p>
<p><b>Week 12: 7 Apr 2022</b></p>	<p><b>Final Project Presentations</b></p>
<p><b>Week 13: 14 Apr 2022</b></p>	<p><b>No Class</b></p>
<p><b>Weeks 14-16</b></p>	<p><b>Final Individual Written Case Analysis due on <u>22 April 2022</u></b>  <b>Final Project Report due on <u>5 May 2022</u></b></p>