

## **COURSE OUTLINE**

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| <b>Course Coordinator :</b>  | <b>Tat-How Teh</b>                                  |
| <b>Course Code / Title :</b> | HE3035 Platform Economics                           |
| <b>Pre-requisites :</b>      | HE1001 or HE5091 or AB0901 (with at least B+ Grade) |
| <b>No. of AUs. :</b>         | 3                                                   |
| <b>Contact Hours :</b>       | 39                                                  |

### **Course Aims**

Multi-sided platforms (MSPs)—exemplified by global leaders such as Apple, Amazon, and Google; and regional leaders such as Shopee and Grab—constitute the backbone of the contemporary digital economy. This course aims to equip you with the analytical and theoretical tools to navigate the complex world of MSPs. You will explore: (i) what distinguishes these platforms from traditional linear firms; (ii) mechanisms through which platforms influence participants' behaviour (iii) unique strategic challenges and economic implications that arise for these platforms. By integrating microeconomic concepts, mathematical modelling, and real-world case studies, the curriculum provides a comprehensive framework for understanding the platform ecosystem, whether you are an aspiring economist, business analyst, or policymaker.

Theme 1: What are platform businesses: (i) identifying platforms and their stakeholders; (ii) network effects; (iii) strategic advantages and trade-offs; (iv) platformization strategies.

Theme 2: Key strategic issues faced by a platform: (i) the launch/cold-start problem; (ii) pricing analysis; (iii) platform leakage; (iv) feedback and recommendation systems.

Theme 3: Platform competition and regulation: (i) competition analysis; (ii) network defensibility analysis; (iii) regulatory and antitrust issues.

### **Intended Learning Outcomes (ILO)**

1. Understand what makes digital multi-sided platforms different from other businesses.
2. Analyze the implications of pricing and non-pricing platform strategies in business and regulatory settings.
3. Understand business strategy and regulatory policy issues related to multi-sided platforms, and apply the knowledge as an industry practitioner in multi-sided platform businesses.

4. Understand current academic research in the economics/marketing literature on multi-sided platforms, and apply the knowledge in formulating potential further research.

### **Course Content**

Theme 1: What are platform businesses: Topics include (i) the definition of a platform and identifying them; (ii) users sides and network effects; (iii) advantages and disadvantages of a platform business model versus traditional pipeline businesses.

Theme 2: Key strategic issues faced by a platform. Topics include: (i) launching problem; (ii) turning a traditional pipeline business into a platform; (iii) pricing across multiple sides of markets; (iv) platform leakage; (v) platform feedback systems;(vi) platform recommendation systems.

Theme 3: Platform competition and regulations. Topics include: (i) competition between platforms; (ii) assessing the network defensibility of a platform business; (iii) interoperability and multihoming across platforms; (iv) regulatory issues in general.

### **Course Assessment (Continuous Assessment):**

|                                                                       |             |
|-----------------------------------------------------------------------|-------------|
| Class Participation                                                   | : 15%       |
| Group project on a platform topic                                     | : 20%       |
| Presentation (Individual presentation on the platform topic selected) | : 15%       |
| Test/Quiz (In-person quiz 1 on Week 7)                                | : 20%       |
| Test/Quiz (In-person quiz 2 on Week 13)                               | : 30%       |
|                                                                       | -----       |
| <b>Total</b>                                                          | <b>100%</b> |

### **Reading and References**

- 1) Armstrong, M. (2006). Competition in two-sided markets. The RAND journal of economics, 37(3),668-691.
- 2) Armstrong, M., & Wright, J. (2007). Two-sided markets, competitive bottlenecks and exclusive contracts. EconomicTheory, 32, 353-380.
- 3) Crémer, J., De Montjoye, Y. A., & Schweitzer, H. (2019). Competition policy for the digital era. Report for the EuropeanCommission.

- 4) Hagiu, A., & Spulber, D. (2013). First-party content and coordination in two-sided markets. *Management Science*, 59(4), 933-949.
- 5) Hagiu, A., & Wright, J. (2015). Multi-sided platforms. *International Journal of Industrial Organization*, 43, 162-174.
- 6) Hagiu, A., & Wright, J. (2015). Marketplace or reseller? *Management Science*, 61(1), 184-203.
- 7) Hagiu, A., Jullien, B., & Wright, J. (2020). Creating platforms by hosting rivals. *Management Science*, 66(7), 3234-3248.
- 8) Rochet, J. C., & Tirole, J. (2006). Two-sided markets: a progress report. *The RAND journal of economics*, 37(3), 645-667.
- 9) Rysman, M. (2009). The economics of two-sided markets. *Journal of Economic Perspectives*, 23(3), 125-143.
- 10) Tadelis, S. (2016). Reputation and feedback systems in online platform markets. *Annual Review of Economics*, 8, 321-340.
- 11) Teh, T.-H. (2022). Platform governance. *American Economic Journal: Microeconomics*, 14(3), 213-254.
- 12) Teh, T. H., Liu, C., Wright, J., & Zhou, J. (forthcoming) Multihoming and oligopolistic platform competition. *American Economic Journal: Microeconomics*.
- 13) Wang, C., & Wright, J. (2020). Search platforms: Showrooming and price parity clauses. *the RAND Journal of Economics*, 51(1), 32-58.

Note: The above listing comprises the foundational readings for the course, and additional, more up-to-date and relevant readings will be provided as they become available.

### Course Instructors

| Instructor  | Office Location | Email                 |
|-------------|-----------------|-----------------------|
| Tat-How Teh | SHHK-04-46      | tathow.teh@ntu.edu.sg |

## Planned Weekly Schedule

| Week   | Topic                                                   | Course LO  | Readings/ Activities                                                                                                                                                                                                                                           |
|--------|---------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1 | Introduction to multi-sided platforms and preliminaries | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture and in-class discussion on the definition of platform businesses.</li> <li>- Case study</li> <li>- Exercises on the microeconomics preliminaries</li> </ul>                             |
| Week 2 | Platform launching problem                              | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture and in-class discussion on launching problem faced by platforms and how to solve them.</li> <li>- Case study</li> <li>- Exercises on the economic model analyzed.</li> </ul>            |
| Week 3 | Pricing by multi-sided platforms                        | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture and in-class discussion on pricing problem faced by platforms</li> <li>- Analysis of two formal economic models and exercises.</li> <li>- Case study on payment card markets</li> </ul> |
| Week 4 | Choosing marketplace or reseller                        | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture on the trade-offs of adopting a</li> </ul>                                                                                                                                              |

|        |                                          |            |                                                                                                                                                                                                                                                               |
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|        |                                          |            | <p>platform business models.</p> <ul style="list-style-type: none"> <li>- In-class discussion and case study on each trade-off.</li> </ul>                                                                                                                    |
| Week 5 | Products-to-platforms                    | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- In-class discussion on three broad strategies of becoming a platform.</li> <li>- Demonstration of case studies</li> <li>- Applications in case studies</li> </ul>                              |
| Week 6 | Platform governance I<br>- Leakage       | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture and in-class discussion on the platform leakage problem</li> <li>- Analyze a formal economic model of leakage</li> <li>- Case studies</li> <li>- Application case studies</li> </ul>   |
| Week 7 | Platform governance II - feedback system | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture on the economics of information asymmetry and the role of feedback systems.</li> <li>- In-class discussions on the various feedback system design by platforms in practice.</li> </ul> |

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|                    |                                                           |            | <ul style="list-style-type: none"> <li>- Lecture on the trade-offs associated with each design.</li> <li>- Case studies</li> </ul>                                                                                                                                                                                                                                                 |
| <b>Recess Week</b> |                                                           |            |                                                                                                                                                                                                                                                                                                                                                                                    |
| Week 8             | Platform governance III - recommendation systems          | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture on the economic considerations in recommendation system design.</li> <li>- In-class discussions on the various recommendation system design by platforms in practice.</li> <li>- Lecture on the trade-offs associated with each design.</li> <li>- Case studies</li> <li>- Student presentations</li> </ul> |
| Week 9             | Platform competition I                                    | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture on analyzing a model of platform competition.</li> <li>- In-class discussion on the competing platforms in practice.</li> <li>- Analyze the implications of platform competition.</li> </ul>                                                                                                                |
| Week 10            | Platform competition II - assessing network defensibility | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- In-class discussion on the strength of network effects in practice.</li> </ul>                                                                                                                                                                                                                                      |

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|         |                                                                   |            | <ul style="list-style-type: none"> <li>- In-class discussion on potential ways to mitigate dominance of incumbent platforms.</li> <li>- Student presentations</li> </ul>                                                                                                                                                        |
| Week 11 | Platform competition III: multihoming and competitive bottlenecks | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture on analyzing platform competition when users can multihome.</li> <li>- In-class discussion on the practices of multihoming in real life.</li> <li>- Exercise on analyzing the models of platform competition</li> <li>- Student presentations</li> </ul> |
| Week 12 | Regulatory issues I                                               | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Lecture on regulatory issues involving platform companies.</li> <li>- In-class discussion on the implications of various anti-competitive practices.</li> <li>- Student presentations.</li> </ul>                                                                |
| Week 13 | Regulatory issues II                                              | 1, 2, 3, 4 | <p>Lecture notes.</p> <ul style="list-style-type: none"> <li>- Case studies</li> <li>- Recap on the class materials and final Test/Quiz preparation.</li> </ul>                                                                                                                                                                 |