



INDIAN INSTITUTE OF TECHNOLOGY KANPUR

INDUSTRIAL AND MANAGEMENT ENGINEERING DEPARTMENT

DMSXXX: INTERACTIVE DECISIONS AND BUSINESS STRATEGIES

Game theory on the other hand is study of quantitative models based on which individuals or organizations interact as rational agents. Finally, management science is an umbrella of different concepts based on which problem solving is undertaken for decision making in different spheres of an organization. This course aims to utilize the body of knowledge from these different domains to help the students make better decisions. Both theoretical as well as practical concepts (with real life examples) will be dealt with, which will ensure a good balance as well as rationale development among students to appreciate the relevance of this field in an ever-changing business environment.

Key learning take away

- Will help students master the tools and techniques necessary for making detailed scientifically/rationally strategic decisions for business organization.
- Will help students learn both the basic and advanced theoretical background in strategic decision making for businesses working in a variety of economic and political environment.
- Will equip learners with the requisite skills in utilizing different game theoretic and strategic techniques through examples, case studies related to war, politics and games and thus appreciate their applications in business organization and entities.
- Will help students value how concepts from game theory, politics and war strategy can help improve decision-making in myriad of business organizations with a rapidly changing environment.

Plan of lectures (considering the course is for one semester)

S No.	Coverage of Topics	No. of lectures
Part A		
01	Elements of a game (Players, Rules, Outcomes and Payoffs); The concepts of Dominance and Pure Strategy Nash Equilibrium	02
02	Simultaneous move games; (Prisoner’s dilemma, Matching Penny, Battel of Sexes, Tragedy of Commons; the Cournot and Bertrand Models,)	03
03	Sequential Move games (Game Tree, Subgame Perfect Nash Equilibrium; Backward induction). Centipede game, Stackelberg Game, Ultimatum Game, Rubinstein Bargaining Game)	04



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04	Incomplete information games (Bayesian games)	02
05	Auctions, Game of Trust	02
06	Mixed Strategy Nash Equilibrium	01
Part B		
07	Business & Industry Structure Analysis, Management and Analysis of competitive forces in Industries	02
08	Corporate Strategy, Strategy for Growth and Diversification, Business Growth and Diversification	02
09	Turnaround Strategies, Technology Transfer, Trans-national Investments	02
10	SWOT analysis, Experience curve, Competitive advantage, Value Chain, Core competence	02
11	Strategic Thinking, Strategic Planning (Environmental Analysis, Scenario Planning, Strategic Operations Management	03
12	Military Strategy, etc.	03

Books

Textbooks

- 01) An Introduction to Game Theory. Martin J. Osborne. Oxford University Press, 2003, ISBN (13): ISBN (13): 978-0195128956.
- 02) Strategy, Joel Watson, W. W. Norton & Co., 2007, ISBN (13): 978-0393929348.
- 03) The Art of Strategy – A Game Theorist’s Guide to Success in Business and Life, Avinash K. Dixit, Barry J. Nalebuff, W. W. Norton & Company, 2010, ISBN (13): 978-0393337174.

Reference Books

- 01) The Strategy of Conflict, T. Schelling, Harvard University Press, 1990, ISBN (13): 978-0674840317.
- 02) Economics of Strategy, David Besanko, David Dranove, Mark Shanley, Scott Schaefer, Wiley, 2013, ISBN (13): 978-1-118-55570-5.
- 03) Co-Opetition Paperback, Adam M Brandenburger, Barry J Nalebuff, Profile Books Ltd., 1997, ISBN (13): 978-1861975072.



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- 04) The Competitive Strategy: Techniques for Analyzing Industries and Competitors, Michael E. Porter, Simon & Schuster, 2004, ISBN (13): 978-0743260886.
- 05) Strategy and the Business Landscape, Pankaj Ghemawat, Createspace Independent Publication, 2017, ISBN (13): 978-1542852920.
- 06) War of Attrition: Fighting the First World War, William Philpott, Harry N. Abrams, 2015, ISBN (13): 978-1468310993.
- 07) Arms and Influence, T. Schelling, Yale University Press, 2008, ISBN (13): 978-0300143379.
- 08) Game Theory, Michael Maschler, Eilon Solan and Shmuel Zamir, Cambridge University Press, 2013, ISBN (13): 978-1107005488.
- 09) Game Theory: Analysis of Conflict, Roger Myerson, Harvard University Press, 1997, ISBN (13): 978-0674341166.

Note: Relevant academic journal papers, cases and caselets will be referred to and discussed in class.

- 01) Hold or Fold?: The War of Attrition, Adam Brandenburger, HBS, 1994, Strategy, 794092-PDF-ENG.
- 02) Cooperation Based on Trust: An Experimental Investigation - W. Guth, P. Ockenfels and M. Wendel, Journal of Experimental Psychology, 1997, 18, 1, 15-43.

Other books of interest

- 01) On War, Carl von Clausewitz, Wordsworth Classic, 1997, ISB (13): 978-1-85326-482-5.
- 02) The Foundations of the Science of War, John Frederick Charles Fuller, Books Express Publishing, 2012, ISBN (13): 978-1780396743.
- 03) Strategy, Basil Henry Liddell Hart, Penguin, 1991, ISBN (13): 978-0452010710.
- 04) The Arthashastra, Kautilya, Penguin Books, 1992, ISBN (13): 97801140446036.
- 05) The War And The Second International, Vladimir Ilich Lenin, Little Lenin Library, 2011, ISBN (13): 9781258155728.
- 06) The Art of War, Niccolò Machiavelli, Dover Publications Inc., 2006, ISBN (13): 978-0486445090.
- 07) The Prince, Niccolò Machiavelli, Fingerprint Publishing, 2015, ISBN (13): 978-9391464592.
- 08) The Living Thoughts of Machiavelli, Count Carlo Sforza, Rupa & Co., 2002, ISBN (13): 81-7167-977-3.



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09) The Art of War, Sun Tzu, Wilco Publishing House, 2008, ISBN (10): 81-8252-171-8.

Evaluation Methodology (Tentative)

S No.	Evaluation Methods	Evaluation Criteria
01	Quizzes	20%
02	Project/Assignments	20%
03	Mid-semester examination	20%
04	End Semester examination	35%
05	Attendance	05%
Total		100%

Other IME faculty members who can contribute to this course: S. V. Vanamalla, Vinay Ramani, Subhankar Mukherjee

Name of Proposer: Raghu Nandan Sengupta

Signature:

Date: 18-August-2025