

MSSE Leadership Bootcamp (Chem 282) Syllabus

Spring 2023 (May 1, 2023 – May 12, 2023)

Lecture & Discussion: MTWThFSS 9:00 – 5:00

775B Tan Hall

Instructor: Mike Cheng mkcheng@berkeley.edu

Graduate Student Instructor: N/A

Guest Lecturers: Tony Drummond, Capstone Project Faculty
Terry Rosen, PhD, CEO, Arcus BioScience
Juan Jaen, PhD, President, Arcus BioScience
Ted Hou, PhD, General Partner, Berkeley Catalyst Funds
Peter Foller, PhD

Textbooks :

Required readings from:

A reader will be assembled that contains selected readings from business and industry journals such as Harvard Business Review, Sloan Management Review, California Management Review, and other chemical industry publications. A detail reading list by lecture topics is included at the end of this syllabus.

Recommended readings (subject to changes and additions):

Jones, G.R., & George, J.M., *Contemporary Management, 8th Ed.*, McGraw Hill, ISBN: 978-0-07-802953-0 (tentative and subject to change)

The above books are recommended as supplementary reading materials only. The material covered in the course will be drawn from different sources and will be made available to the students throughout the semester.

Course Description:

This boot camp for the Master of Molecular Science and Software Engineering program is a two-week intensive course that introduces program participants to the leadership, management and entrepreneurial skills necessary in today's professional environment. Using the capstone project as a baseline, this course aims to provide program participants an understanding of the key aspects of management and leadership disciplines; team and organization dynamics; leading and participating in cross functional teams; engineering economic, finance and accounting concepts; effective communication skills and project management.

Prerequisites:

Co-requisites: MSSE Capstone Project Course (Chem 283)

Course Objectives:

By the end of this course, students will have learned:

- The fundamentals of management
- Leadership theory and the different leadership styles
- Organizational dynamics
- Effective communication, negotiation and presentation skills in a professional setting
- The basic techniques of project management

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- Leading and participating in a cross-functional team
- The use of engineering economics for decision making
- Basic financial analysis concepts
- Project risk assessment and technical proposal preparation techniques

Course Outcomes:

At the end of this course, students will be able to:

- Apply the various leadership and management techniques to enhance a technology professional's ability to achieve desirable performance objectives
- Effectively communicate, negotiate with and present to stakeholders of all disciplines
- Apply the basic MSSE concept of cross-functional teams to enhance the ability of a technology professional's contribution to a cross-functional team
- Use engineering economic principles to help assess the effectiveness of a business investment, such as research project or product development initiatives
- Analyze project risks and prepare technical proposals
- Establish a project plan, manage/participate in a project and assess project performance
- Identify the key cost elements of a business operation and the effects of a technology professional on these cost elements
- Use the various financial statements to assess the health of a business

Grading:

Assignments: 30%

Students will submit (3) written assignments as detailed at the end of this syllabus. Each assignment is weighted at 10% of the course grade. Assignments are due on the due dates *before* class meetings and no late assignments will be accepted unless prior permission is given by the instructor. You will apply the materials and concepts discussed in class to support your analysis, arguments and conclusions/recommendations. In evaluating the assignments, the following three criteria will be considered:

1. Analysis: Have you identified the key issues in response to the assignment topics? Is your argument logical? Is your recommendation/conclusion practical and implementable?
2. Clarity: Is the writing clear and concise? Is there a statement of recommendations at the start and a summary of your justifications at the end? Is there a logical flow to the argument?
3. Presentation: Are there errors in spelling, typing, grammar, or punctuation? Is the memo professional in appearance?

Class Participation: 40%

Class participation is evaluated based on the student's performance in class discussions, case analyses and in-class activities. A significant amount of class time is devoted to an exploration of course materials and cases through class discussion, exercises and presentations. The value of this class is dependent on the participation of the entire class. You are expected to attend each class and actively participate in all class activities. Effective participation will require that you arrive at every class period having read the assigned materials and case(s), and be prepared to offer and defend your recommendations. Your self-evaluation will be considered in assigning your class participation grade. Class participation for each session is weighted at approximately 4% of the total course grade. The following five criteria will be used to evaluate your class participation:

1. Frequency: How often and willing do you voluntarily participate in class discussions?

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2. Professionalism: How professional is your demeanor in defending your arguments? How well do you respond to constructive criticism? How do you handle conflicts? How well do you deliver constructive criticism to your peers?
3. Quality: How relevant is your responses to the issues being discussed? How well do you support your arguments using the materials discussed in class?
4. Clarity and Presentation: Do you clearly and succinctly communicate your ideas and defend your arguments? Do you adhere to the time limit of your presentation? Are your presentations well-organized and follow a logical flow? Are you able to communicate technical ideas to a not-so-technically knowledgeable audience?
5. Team work: How well do you work in team assignments? How well do you lead a team in an assignment?

Final Project: 30%

Students will present the final capstone project to program faculty members as well as invited guests. For this course, final project grades will *not* be assigned based on the technical merits of the project, but how well students present and defend the results of their projects. Students will also be expected to reflect upon the lessons learned in this course and provide self-assessments of their final capstone project performance from the boot camp content perspective.

Assignments and final project will be challenging and extensive preparation is expected in order to perform well. All assignments will be written and consist of memos, short answer, multiple choice, and/or true/false questions. Students are also expected to actively participate in all discussion sessions held both in class and during discussion sessions. Use of a cell phone or texting during an exam or project presentation will lead to an automatic F.

In compliance with Education code, Section 92640(a), it is the official policy of the University of California at Berkeley to permit any student to submit an assignment and undergo a test or examination, without penalty, at a time when that activity would not violate the student's religious creed, illness or family crisis unless administering the examination at an alternate time would impose an undue hardship which could not reasonably have been avoided. Approximately twelve to fifteen homework sets will be assigned regularly throughout the semester, and are due three days from the date of assignment. Homework is due at the *beginning of class* on the due date, and will not be accepted late unless requests for permission to submit late assignments due to the above-mentioned reasons are submitted to and granted by either the faculty member or the Graduate Student Instructors before the assignments are due.

Requests to accommodate a student's religious creed, illness or family crisis by scheduling tests or examinations at alternative times should be submitted directly to the faculty member responsible for administering the examination. Reasonable common sense, judgment and the pursuit of mutual goodwill should result in the positive resolution of scheduling conflicts. The regular campus appeals process applies if a mutually satisfactory arrangement cannot be achieved.

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For questions about the manner in which an assignment was graded, the student is required to write a note describing the discrepancy, attach the note to the assignment and discuss the issue with the GSI so that the entire assignment may be reviewed for any other discrepancies (positive or negative). Discussions with the instructor to resolve a disagreement with the GSI regarding the re-grade can be done by arranging a visit during the instructor's office hours. This procedure must be followed within three weekdays of the time the assignments are initially returned to the class; after that period the assignment will not be regraded. Please keep in mind that no regrades will be granted for assignments done in pencil or erasable pen. If the instructor adds the total points incorrectly, it is not considered a regrade but should be handled similarly; assignments done in pencil will be recalculated upon request.

A detail list of assignments by lecture topics and a final team project are listed at the end of the syllabus.

Tentative Boot Camp Format and Lecture Schedule: *(Subject to change and modification)*

This boot camp aims to provide students with an active (12-day) learning experience comprise of lectures, team exercises, interactions with peers and program faculty member to discuss and analyze relevant cases, touring of local companies and meetings with local industry professionals. Class will be held every day (including weekend). Students are expected to complete their reading assignments before coming to class.

	Topic	Readings and Assignments
May 1, 2023	Introduction, Critical Thinking, Projects & Contracts, Leadership Theory	Readings: <i>Leadership That Gets Results.</i> , D. Goleman., Harvard Business Review, March-April, 2000 <i>What Great Managers Do.</i> , M. Buckingham., Harvard Business Review, March 2005 (Recommended) <i>Managers and Leaders: Are They Different?</i> , A. Zaleznik., Harvard Business Review, 1977 (Recommended) Activity: <i>Prepare</i> a five-minute introduction to describe your background, your experience in this program, what you expect from the completion of this program and how you intend to apply what you learn to your future career.

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		<p>Critique your presentations. What do you think you did well and what areas do you feel you need improvement?</p>
May 2, 2023	Communication, Strategic Thinking, Management Theory	<p>Readings: <i>Effective Business Presentations.</i>, T.M. Hofmann, D.F. Womack & J.J. Shubert., Harvard Business School, 9-391-011, July 1990.</p> <p><i>Change the Way Your Persuade.</i>, G.A. Williams & R.B. Miller., Harvard Business Review</p> <p><i>How to Pitch a Brilliant Idea.</i>, K.D. Elsbach., Harvard Business Review (Recommended)</p> <p><i>Good Writing: It Begins with Principles.</i>, Harvard Business School Press (Recommended)</p> <p><i>How to Give a Killer Presentation.</i>, C. Anderson., Harvard Business Review, June 2013 (Recommended)</p> <p>Activity: Each team member of the capstone project will present their respective capstone presentations for initial evaluation. Critique your presentations. What do you think you did well and what areas do you feel you need improvement?</p>
May 3, 2023	Contract/Project Initiation Process, Organizational Dynamics, Cross Functional Teams	<p>Readings: <i>Developing A Request for Proposal.</i>, S. Sunderman., Research Brief, National Association of Counties (Recommended)</p> <p><i>The Emergence and Evolution of the Multidimensional Organization.</i>, J. Strikwerda & J.W. Stoelhorst., California Management Review, Summer 2009, Vol. 51, No. 4</p> <p><i>Creating Value from Organization Alignment.</i>, R.S. Kaplan & D.P. Norton.,</p>

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		<p>Balanced Scorecard Report, November – December, 2005 (Recommended)</p> <p><i>The Discipline of Teams.</i>, J.R. Katzenbach & D.K. Smith., Harvard Business Review, July – August 2005</p> <p><i>What Makes High-Performance Teams Excel?</i>, L.J. Daniel & C.R. Davis., Research-Technology Management, Vol. 52, Issue 4 (Recommended)</p> <p><i>Hot Groups.</i>, H.J. Leavitt & J.L. Blumen., Harvard Business Review, July-August 1995 (Recommended)</p> <p>Activity: Each team member of the capstone project will rotate and perform the function of a team leader. At the end of the exercise, critique the performance of each participant in the roles as a team leader and a team member. Discuss the effectiveness of the different styles and techniques used in leading and performing in a cross-functional team.</p> <p>Arcus BioSciences Visit Preparation - students are expected to perform a brief research of the company and prepare a list of discussion topics to explore the company’s business practices, management culture and organizational dynamics. Students are also expected to explore the company’s cross-functional team culture and their effectiveness.</p>
<p>May 4, 2023</p>	<p>Entrepreneurship – Guest Lecture by Dr. Terry Rosen and visit to Arcus BioSciences</p>	<p>Activity: Visit Arcus BioSciences</p> <p>Assignment 1: (Due 5/6/2023) Submit a one-page memo in which you will discuss your site visit experience and reflect upon your performance in front of your industry contacts. Suggest what areas you would improve and what you have</p>

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		learned from the experience that will help with your professional career.
May 5, 2023	Accounting and finance for Engineers <ul style="list-style-type: none"> • Basic accounting concept • Financial statement fundamentals • Accounting system for manufacturing industries 	<p>Readings: <i>Guide to Finance Basics for Managers.</i>, Harvard Business Review</p> <p>Activity: After the company visit, students are expected to present to class about their findings and give recommendations on how this company can improve its effectiveness in the topics discussed.</p>
May 6, 2023	Engineering Economy, Proposal Preparation	<p>Readings: Selected Chapters from <i>Manual of Engineering Economy.</i>, Nanda Shakya</p> <p><i>Guidelines for Project Proposals.</i>, Adapted from Guidelines at the Penn State Learning Factory</p> <p>Activities: Case Discussion – Kent Chemical: <i>Organizing for International Growth.</i>, C.A. Bartlett & L. Wing., Harvard Business School, February 23, 2012</p>
May 7, 2023	Assessing Project Risk	<p>Readings: <i>Project Risk Analysis and Management.</i>, C. Norris., J. Perry., & P. Smith., The Association for Project Management</p> <p>Activities: Using your capstone project, analyze the different project risks and develop a mitigation plan. Reflect upon how your capstone project aligns with the elements of the technical proposal as discussed in this session.</p>
May 8, 2023	Proposal Evaluation, Project Planning & Implementation, Idea Screening Advising Technology Start-Up, Peter Foller, PhD (Guest Speaker)	<p>Readings: <i>The Project Life Cycle: Planning.</i>, IESE Business School, University of Navarra, PN-461-E, December 2010.</p> <p>Activity: You are asked to make a (20 minute) presentation of your capstone project proposal to a group of sponsors who may</p>

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		not be technically knowledgeable about the content. The outcome of your presentation will result in the sponsorship or rejection of your project proposal. You will have to decide on the structure and the content of the presentation.
May 9, 2023	Project management, Transition from Development to Commercialization	<p>Readings: <i>What Successful Project Managers Do?</i>, A. Laufer, E.J. Hoffman, J.S. Russell & W.S. Cameron., MIT Sloan Management Review, Spring 2015</p> <p>Activity: <i>Using the Capstone project</i>, analyze and assess the effectiveness of the capstone project experience based on the concept as discussed in the last two sessions. Present an implementation plan for successful execution of the project to achieve the desired result.</p>
May 10, 2023	Performance management <ul style="list-style-type: none"> • Performance culture • Using advanced information technology to increase performance • Performance tracking – key performance metrics 	<p>Readings: <i>Strategy Execution Module 3: Using Information for Performance Measurement and Control.</i>, Simons, R., Harvard Business School Press</p> <p>Assignment 2: (Due 5/11/2023) Submit a one-page memo in which you will develop a set of performance metrics to track the projected performance of the capstone project.</p> <p>Final Project Presentation: Each project team will make a 20-minute Capstone project presentation followed by a 10-minute Q&A from the audience. Presentation slide deck, together with your poster will be submitted as part of the final grade evaluation.</p>
May 11, 2023	Change management <ul style="list-style-type: none"> • Responding to and creating external environment change • “Innovator’s dilemma” • Leading change 	<p>Readings: <i>The Ambidextrous Organization.</i>, C.A. O’Reilly III & M.L. Tushman., Harvard Business Review, April 2004</p>

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	Financing Technology Start-Up – Ted Hou, PhD (Guest Speaker)	
May 12, 2023	Wrap-Up <ul style="list-style-type: none">• Technologists in business• Career paths for technologists	<p>Readings: <i>Extreme Productivity.</i>, R.C. Pozen., Harvard Business Review, May 2011</p> <p><i>Managing Oneself.</i>, P.F. Drucker., Harvard Business Review, January 2005</p> <p>Activity: Discuss how you view yourself as a technology professional in business and what career paths you envision for yourself throughout your career. In your presentation, you will want to address the following:</p> <ul style="list-style-type: none">• How do you think you can effectively perform your assigned duties?• How do you assess your own performance and what actions would you take to solicit input to align your self-assessment with the expectations you're your organization?• What do you see as your strengths and areas for improvement and how do you plan to address those areas of improvement?• What career opportunities do you foresee and what is your plan for achieving your career goals? <p>Assignment 3: (Due 5/12/2023) Submit a one-page memo that summarizes your (MSSE) program experience and how you intend to use the skills and knowledge acquired in this program to build/pursue your career goals.</p>