





http://cheme.columbia.edu/master-science-chemical-engineering

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Master of Science

in Chemical Engineering Program

Department of Chemical Engineering

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... in the Eu Foundation School of Engineering and Applied Science

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Columbia University...



... in the City of New York

... "An ever heightening sky for human thought, an ever widening horizon for human knowledge, and absolute truthfulness in the expression of the light within, these are the distinguishing marks of a great university." Seth Low, Columbia University President, 1890

(2016 Holiday Card from Columbia University President Lee C. Bollinger)

Outline

How long does it take to complete the degree?

What courses must I take?

What elective courses may I take?

What colloquium course must I attend?

How does advising work?

How do I apply for the degree?

- Introduction
- Background and History
- The Chemical Engineering Profession
- Academic Integrity
 - Master of Science in Chemical Engineering
 - Goal
 - Time to complete
 - Core Courses
 - Program for Student with BS in ChemE
 - Program for Student without a BS in ChemE- Scientist to Engineer (S2E)
 - **Technical Electives**
 - MS Colloquium
 - Advising
 - Applying for the degree
 - Applying for Ph.D.
 - Faculty and Staff
 - Research
 - Columbia ChemE Grad Student Life and NYC
 - Career Placement & Employers
- Housing
- Questions

Background- "What exactly does a chemical engineer do?" AChE

"... they use science and mathematics, especially chemistry, biochemistry, applied mathematics and engineering principles, to take laboratory or conceptual ideas and turn them into value added products in a cost effective, safe (including environmental) and cutting edge process. From the development of smaller, faster computer chips to innovations in recycling, treating disease, cleaning water, and generating energy, the processes and products that chemical engineers have helped create touch every aspect of our lives."

<u>https://www.aiche.org/resources/careers/career-faqs#cheme</u> accessed 3 Mar 2019)

Background- chemical engineers...

"Design chemical plant equipment and devise processes for manufacturing chemicals and products, such as gasoline, synthetic rubber, plastics, detergents, cement, paper, and pulp, by applying principles and technology of chemistry, physics, and engineering."

Sample of reported job titles: Process Engineer,

Chemical Engineer, Engineer, Scientist, Project Engineer, Development Engineer, Engineering Scientist, Process Control Engineer, Process Development Engineer, Refinery Process Engineer (<u>http://www.onetonline.org/</u> accessed 3 Mar 2019 Occupational Information Network (O*NET), U.S. Dept of Labor/Employment and Training Administration) https://www.careeronestop.org/ accessed 3 Mar 2019

Background- Engineering and the Columbia Engineering School



McCaughey, Robert A Lever Long Enough: A History of Columbia's School of Engineering and Applied Science Since 1864, Columbia University Press, New York, June, 2014, ISBN: 978-0-231-16688-1

Accreditation Board for Engineering and Technology (ABET) definition of engineering

"Engineering is the profession in which a knowledge of the mathematical and natural sciences, gained by study, experience, and practice, is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the benefit of mankind."

"Give me lever long enough and somewhere to stand and I will move the world." Archimedes (287-212 B.C.)

Columbia Engineering Mission Statement

"Columbia Engineering, The Fu Foundation School of Engineering and Applied Science at Columbia University in the City of New York, prepares talented students to become innovative, socially responsible leaders in industry, government, and academia. Our education is grounded in the fundamental principles and creative approaches of engineering, while being critically informed by the broader perspective of a distinguished liberal arts education. This interdisciplinary education mission is enriched by a research endeavor focused on expanding the knowledge base of engineering and creating technological solutions that serve society. Columbia students, faculty, and alumni strive to improve the human condition locally, nationally, and globally with their enthusiasm to learn, to question, and to solve some of the world's most pressing current and future challenges."

(https://engineering.columbia.edu/about/mission-vision accessed 14 Feb 2019)

Engineers "...discover, invent, innovate, create..."

(http://seas150.columbia.edu/multimedia accessed 3 Mar 2019~5:11 min)

(http://discovery-press.com/discovery-press/studyengr/chapter24E.pdf accessed 2 Oct 2014)

History The School of Engineering and Applied Science founded in 1864 as the School of Mines (150th celebration in 2014)



Named in 1997 in recognition of Z.Y. Fu, a major benefactor.

In the forefront of collaborative research and teaching Columbia engineers invented the FM radio, long distance telephony, mass production of antibiotics and the first robots and changed transportation with steam engines, railroads, the Panama Canal, and NYC subways.

History

The Department of Chemical Engineering founded in 1905 (110th anniversary in 2015) largely due to Professor Charles Frederick Chandler



Unit Operations Lab ~1929

Professor Charles Frederick Chandler (1836 - 1925)

"The Mission of the Department of Chemical Engineering at Columbia University is to provide an outstanding academic and research experience to students to prepare them to meet the needs and challenges of the 21st century."

(https://cheme.columbia.edu/undergraduate-program-4 accessed 3 Mar 2019)

"....Electrochemistry, Polymers, Bioengineering... Materials, Energy, Environment, Data Sciences..."



Professor Elmer Gaden

"Father of Biochemical Engineering"

(http://pubs.acs.org/doi/abs/10.1021/cen-v049n022.p027 accessed 19 Feb 2016) (Gryte, Carl C. Chemical Engineering at Columbia, Chem Eng Education, ASEE 2006)

(Kumar, Sanat, Dept of Chemical Engineering Alumni Newsletter 2011-2012)



Prof Carl Gryte and polymer research team circa 1971

Previous Heat Transfer Research Facility 10

(http://c250.columbia.edu/c250_celebrates/remarkable_columbians/charles_frederick_chandler.html accessed 28 Sep 2014)

Consider being a part of the Chemical Engineering Profession and your Professional Reputation



(http://www.aiche.org/ accessed 3 Mar 2019)



Consider joining the professional organizations listed on this slide. http://www.aiche.org/co mmunity/sites/committe es/young-professionals accessed 1 Mar 2019

Metro New York Section, AIChE

http://aiche-metrony.org/Join/Network.html accessed 3

accessed 3 Mar 2019

COLUMBIA ENGINEERING The Fu Foundation School of Engineering and Applied Science

Be a part of the Chemical Engineering Profession and your professional reputation

Members of AIChE are expected to uphold the AIChE code of ethics.

THE AICHE CODE OF ETHICS

Members of the American Institute of Chemical Engineers shall uphold and advance the integrity, honor and dignity of the engineering profession by:

 Being honest and impartial and serving with fidelity their employers, their clients, and the public;

 Striving to increase the competence and prestige of the engineering profession;

 Using their knowledge and skill for the enhancement of human welfare.

To achieve these goals, Members shall:

 Hold paramount the safety, health and welfare of the public and protect the environment in performance of their professional duties.

 Formally advise their employers or clients (and consider further disclosure, if warranted) if they perceive that a consequence of their duties will adversely affect the present or future health or safety of their colleagues or the public.

"R.S.V.P."

 Accept responsibility for their actions, seek and heed critical review of their work and offer objective criticism of the work of others.

 Issue statements or present information only in an objective and truthful manner.

 Act in professional matters for each employer or client as faithful agents or trustees, avoiding conflicts of interest and never breaching confidentiality.

 Treat fairly and respectfully all colleagues and co-workers, recognizing their unique contributions and capabilities.

 Perform professional services only in areas of their competence.

 Build their professional reputations on the merits of their services.

 Continue their professional development throughout their careers, and provide opportunities for the professional development of those under their supervision.

Never tolerate harassment.

Conduct themselves in a fair, honorable and respectful manner.

Source: www.aiche.org/about/code-ethics

Better to cancel than to be a "no show".

Background-Historical Vignette Quebec Bridge Disaster 11 September 1916

"The Quebec Bridge collapsed on 11 September 1916 a second time due to poor design work and materials. The bridge, which was conceived to be one of the most advanced in the world, had already collapsed under similar circumstances in 1907. Eighty-five workers perished in that tragedy prompting a Dominion Royal Commission to investigate the catastrophic failure. The findings of the Commission placed the failure solely on the engineer design and management of the project. To this day, all graduating engineers from Canadian universities receive iron rings to remind them of this event and the social responsibility they have in the proper design and execution of projects." ("The West Point Link of the Order of the Engineer" Slide Show, Tuesday 28 April 2009 Arnold Auditorium, Mahan Hall, West Point, NY.) (http://www.ameriquefrancaise.org/en/article-381/Ouebec City%E2%80%99s Cantilever Bridge,html accessed 16 Dec 2014)

The Engineering Profession and Academic Integrity Sources

- National Society of Professional Engineers' (NSPE) Creed, Adopted Jun 1954
- NSPE provided rights to U.S. Army Engineers to use NSPE Creed, 9 Oct 2013
- Order of the Engineer "Upholding Devotion to the Standards and Dignity of the Engineering Profession"

since Jun 1970

Columbia Engineering Graduate Student Affairs

The Engineering Profession Engineers' Creed

"As a Professional Engineer, I dedicate my professional knowledge and skill to the advancement and betterment of human welfare. I pledge: To give the utmost of performance; To participate in none but honest enterprise; To live and work according to the laws of man and the highest standards of professional conduct; To place service before profit, the honor and standing of the profession before personal advantage, and the public welfare above all other considerations. In humility and with need for Divine Guidance, I make this pledge."

The Engineering Profession

Order of the Engineer Obligation: "I am an Engineer. In my profession I take deep pride. To it, I owe solemn obligations.

Since the Stone Age, human progress has been spurred by the engineering genius. Engineers have made usable nature's vast resources of material and energy for Humanity's [Mankind's] benefit. Engineers have vitalized and turned to practical use the principles of science and the means of technology. Were it not for this heritage of accumulated experience, my efforts would be feeble.

As an Engineer, I pledge to practice integrity and fair dealing, <u>tolerance and respect</u>, and to uphold devotion to the standards and the dignity of my profession, conscious always that my skill carries with it the obligation to serve humanity by making the best use of Earth's precious wealth.

As an Engineer, [in humility and with the need for Divine guidance,] I shall participate in none but honest enterprises. When needed, my skill and knowledge shall be given without reservation for the public good. In the performance of duty and in fidelity to my profession, I shall give the utmost."

Student Conduct

"The continuance of each student upon the rolls of the University, the receipt of academic credits, graduation, and the conferring of the degree are strictly subject to the disciplinary powers of the University.

Although ultimate authority on matters of student discipline is vested in the Trustees of the University, the Dean of the School and his staff are given responsibility for establishing certain standards of behavior for Columbia Engineering students beyond the regulations included in the Statutes of the University and for defining procedures by which discipline will be administered.

We expect that in and out of the classroom, on and off campus, each student in the School will act in an honest way and will respect the rights of others."

"<u>Academic integrity defines a university and is essential to the</u> <u>mission of education. At Columbia, students are expected to</u> <u>participate in an academic community that honors intellectual work</u> <u>and respects its origins.</u> In particular, the abilities to synthesize information and produce original work are key components in the learning process. As such, a violation of academic integrity is one of the most serious offenses a student can commit at Columbia and can result in dismissal.

Students rarely set out with the intent of engaging in violations of academic integrity. But classes are challenging at Columbia, and students will often find themselves pressed for time, unprepared for an assignment or exam, or feeling that the risk of earning a poor grade outweighs the need to be thorough.

Such circumstances lead some students to behave in a manner that compromises the integrity of the academic community, disrespects their instructors and classmates, and deprives them of an opportunity to learn.

In short, they cheat. Students who find themselves in such circumstances should immediately contact their instructor and adviser for advice."

What constitutes a breach in academic integrity?

- The following are the most common breaches of academic integrity. When in doubt, ask a professor if you're unsure if you are breaching academic integrity:
- Cheating (of any kind)
- Representing someone else's work as your own
- Not giving appropriate credit (citations) of someone else's work
- Collaborating on work when permission was not granted
- Utilizing library or internet sources without giving credit
- Using a previous assignment or paper from another class or course
- Selling notes, exam answers or papers
- Using some else's papers or assignments as your own

(https://gradengineering.columbia.edu/academics/academic-integrity 3 Mar 2019, (http://bulletin.engineering.columbia.edu/policy-conduct-and-discipline accessed 3 Mar 2019, https://www.apastyle.org/learn/quick-guide-on-references accessed 3 Mar 2019, https://odoc.princeton.edu/curriculum/academic-integrity/ accessed 3 Mar 2019, https://library.columbia.edu/subject-guides/social-sciences/plagiarism.html accessed 3 Mar 2019, <a href="https://library.columbia.edu/subject-guides/social-sciences/social-sciences/social-sciences/social-sciences/social-sciences/social-sciences

"Plagiarism and Acknowledgment of Sources

Columbia has always believed that writing effectively is one of the most important goals a college student can achieve. Students will be asked to do a great deal of written work while at Columbia: term papers, seminar and laboratory reports, and analytic essays of different lengths. These papers play a major role in course performance, but more important, they play a major role in intellectual development. Plagiarism, the use of words, phrases, or ideas belonging to another, without properly citing or acknowledging the source, is considered one of the most serious violations of academic integrity and is a growing problem on university campuses."

- "Plagiarism and Acknowledgment of Sources (continued)
- One of the most prevalent forms of plagiarism involves students using information from the Internet without proper citation. While the Internet can provide a wealth of information, sources obtained from the web must be properly cited just like any other source. If you are uncertain how to properly cite a source of information that is not your own, whether from the Internet or elsewhere, it is critical that you do not hand in your work until you have learned the proper way to use in-text references, footnotes, and bibliographies. Faculty members are available to help as questions arise about proper citations, references, and the appropriateness of group work on assignments. You can also check with the Undergraduate Writing Program. Ignorance of proper citation methods does not exonerate one from responsibility."

- "Plagiarism and Acknowledgment of Sources (continued)
- Intentional
- Use others' intellectual work without quotation or reference to the source:
- Type I: Direct Copy & Paste
- Type II: Small Modification by Word Switch
- Type III: Use Others' Reasoning Style
- Type IV: Use Others' Metaphor
- Type V: Use Others' Idea
- Barnbaum, C. "Plagiarism: A Student's Guide to Recognizing

It and Avoiding It." Valdosta State University.

(http://vsutv.valdosta.edu/personal/teaching_MISC/plagiarism.htm accessed 3 Mar 2019)

• Examples may be found at the link below:

(<u>https://odoc.princeton.edu/curriculum/academic-integrity</u> accessed 3 Mar 2019.)

https://library.columbia.edu/subject-guides/social-sciences/plagiarism.html accessed 3 Mar 2019)

- "Plagiarism and Acknowledgment of Sources (continued)
- Unintentional
- Unintentional plagiarism is plagiarism that results from the disregard for proper scholarly procedures. Examples of Unintentional Plagiarism:
- Failure to cite a source that is not common knowledge.
- Failure to "quote" or block quote author's exact words, even if documented.
- Failure to put a paraphrase in your own words, even if documented.
- Failure to put a summary in your own words, even if documented.
- Failure to be loyal to a source."
- *"Plagiarism Tutorial."* Duke University.
- (<u>https://plagiarism.duke.edu/unintent/</u> accessed 3 Mar 2019)

Common Knowledge and Facts

- "Common knowledge" does not need to provide citation if:
- An average educated person knows it;
- It is easy to look up;
- It can be found from multiple sources.
- **Example:** HIV is the human immunodeficiency virus that causes AIDS.
- "Facts" that do not open to contention do not need to provide citation.
- **Example:** United States of America has 50 states and 1 district.
- Note: "Common Knowledge" in one academic area might not be "common" for outsiders, so when you are not sure, cite to be safe or ask your professor for help.

Academic Integrity "What are the ramifications of a breach in academic integrity?

Students who violate codes of academic integrity can face academic consequences in the course at the faculty level, department level, and at the school's level. The following are some common ramifications:

- "F" grade for the paper/exam/assignment in question
- "F" grade for the course
- Documentation at the Department Level
- Academic File Documentation
- Warning
- Probation
- Dismissal
- Academic Probation for Term(s)
- Academic Dismissal from Columbia University"

Documentation: "EndNote" is a helpful resource available to Columbia Students

REFERENCE & CITATION MANAGEMENT

Citation management software makes mining and using information resources easier and more effective, helping you to:

- Capture bibliographic and full-text information as you explore
- Organize, evaluate, annotate, and search within your collection
- Cite and list resources in a wide range of bibliographic styles as needed
- Access the information on your desktop or online
- Synchronize your data across multiple machines
- Share your research with others

Additional Citation Management Tools

Mendeley: Mendeley is another free standalone application, which performs largely the same functions as Zotero but behaves a little bit differently. For example, while both Zotero and Mendeley allow you to extract metadata (such as title, authors, etc.) from PDFs, Mendeley automates this process while providing the option of organizing your files directly in your hard drive in a customizable manner. Mendeley also allows for highlighting and annotations directly on the article PDF.

Download Mendeley here. Here is a list of Mendeley Help Guides to get you started, or to expand your knowledge.

EndNote:

NOTE TO WINDOWS USERS

The license.dat file needs to be in the same location as the installation file in order for the registration to work (e.g. if you downloaded the installation file to your Downloads folder, the license.dat file needs to be there as well).

Download EndNote for Windows.

Click here to download the License.dat file.



Columbia University Libraries

535 West 114th St. New York, NY 10027

Phone: (212) 854-7309 Map: Libraries Map »

Ask a Librarian Course Reserves Digital Scholarship Research Data Services Study Spaces Library Information Office Preservation & Digital Conversion Division Request It Other Library Catalogs Frequently Asked Questions (FAQ)

(https://library.columbia.edu/services/citation-management.html accessed 25 Feb 2020)



Columbia Chemical Engineering MS Program



27

Fall	Spring	Summer	Fall	
Sep- Dec	Jan- May	Sep- Dec		
CHEN E4001 Essentials A CHEN E4002 Essentials B MS Colloquium S2E Elective Elective	Core MS Course Core MS Course Elective Elective	Time for Summer Internships Time for Research	Core MS Course Core MS Course Elective Elective	

Note: Scientist to Engineer, "S2E", students must select 1 course with substantial design content

Fall	Spring	Summer	Fall		
Sep- Dec	Jan- May	Jun- Aug	Sep- Dec		
Core MS Course Core MS Course MS Colloquium Elective Elective	Core MS Course Core MS Course Elective Elective	Time for Summer Internships Time for Research	Elective Elective		



MS Degree Requirements: 30 credits beyond BS in chemical engineering 12 credits: graduate core, 18 credits: technical electives Thesis not required, but Master's Research may be included in the electives. (Columbia Directory of Classes- http://www.columbia.edu/cu/bulletin/uwb/)

MS in Chemical Engineering Graduate Degree Application and Conferral

All MS Students must apply for their degree based on the deadline requirements listed at the Columbia University Office Of the Registrar Degree Application Web Site: <u>https://registrar.columbia.edu/content/graduation-and-diplomas</u> accessed 19 Mar 2020.

Example: In order to complete your studies in <u>Dec 2021</u> and have the degree conferred in <u>Feb 2022</u>, an MS in Chemical Engineering Student must apply at the before mentioned web site not later than <u>1 November 2021</u>. See the web site for a specific deadline. If you do not apply for the degree, you will not be approved to graduate.

You must apply for the degree. You will be notified by the department if something is <u>wrong</u> with your status. Degree Audit Reports (DARs) can be <u>inaccurate</u>. Go with the word from the Chemical Engineering Department and be on your way to degree success.

Refer all other matters about graduation to GSA, see http://gradengineering.columbia.edu/graduation-1 and https://www.cc-seas.columbia.edu/gradzone



Note: x indicates Fall, y indicates Spring

Typical Program (Students with a BS in ChE)

Fall, Year 1Spring, Year 1CHAP E4120x (Stat Mech)CHEN E4112y (Transport)CHEN E4010x (Math Methods)CHEN E4330y (Adv Kinetics)technical electivetechnical electivetechnical electivetechnical electiveCHEN E9001 MS ColloquiumKinetical elective

Fall, Year 2 technical elective technical elective

Possible Program (Students with a BS in ChE)

FallSpringCHAP E4120x (Stat Mech)CHEN E412CHEN E4010x (Math Methods)CHEN E432technical electivetechnical elective

Spring CHEN E4112y (Transport) CHEN E4330y (Adv Kinetics) technical elective technical elective technical elective

Students without a BS in Chemical Engineering Scientist to Engineer (S2E) Program

An intensive, accelerated consideration of the essential chemical engineering principles from the undergraduate program

CHEN E4001x Essentials of Chem Eng – A

- 1. Introduction to Chemical Engineering
- Chemical Engineering Control 2.
- Transport Phenomena I 3.
- Transport Phenomena II 4.

CHEN E4002x Essentials of Chem Eng – B

- 1. Thermodynamics I
- Thermodynamics II 2.
- **Reaction Kinetics & Reactor Design** 3.
- 4. Chemical & Biochemical Separations

A graduate-level course with substantial design content (also counts) as a technical elective)

Essentials of Chemical Engineering A & B

 Arranged to be 6 credits to minimize costs for students, but content/workload far exceed 6 credits: 6 credits cannot count toward MS degree, so

S2E students need 36 credits total to graduate

- Each course consists of 4 modules, each taught by different faculty member and covering essentials of an undergraduate course in intensive, accelerated way
- Each module will last ~3 weeks and include 6 lectures,2 recitation classes, 2 homeworks, and an exam

S2E Design Requirement

- S2E students must select one of these courses to meet the design course requirement: Fall
- -CHEN E4400x Chemical Process Development Spring
- -CHEN E4501y Chemical Engineering Process Safety
 - <u>Take one of these courses after</u> <u>completing</u>

<u>CHEN E4001 and CHEN E4002</u>

Typical Program (Students in S2E Program)

Fall, Year 1 CHEN E4001x (Essen ChE-A) CHEN E4002x (Essen ChE-B) technical elective technical elective CHEN E9001 MS Colloquium

Spring, Year 1 CHAP E4130y (Adv Kinetics) CHEN E4010y (Math Methods) CHEN E4501y (design elective) technical elective

Fall, Year 2 CHEN E4330x (Adv Thermo) CHEN E4110x (Transport) technical elective technical elective

Technical <u>Electives</u>

- Courses at 4000 or 6000 level
- With advisor approval MS students may select up to 6 points of the required 30 from outside the Department.
- May include up to 6 credits of MS Research (CHEN E9400), with written approval of research advisor. (Maximum of 3 points per academic term)
- Should not be equivalent to courses already taken as an undergraduate
- Approved in writing by a graduate program advisor
- Check Alphabetic listing of class times, locations, instructor and course descriptions: http://www.columbia.edu/cu/bulletin/uwb/

								FALL 2020								
	UNDE	CRGRADUA	TE	1				GRADUA	TE CORE				GF	ADUATE E	LECTIVE	
		MONDAY							VEDNESDAY			_	THURSDAY.	-	FRI	DAV
8:40am - 9:55am	CHEN E4670 Chemical Engineering Data Analysis Bishop (45)				CHEN E3010 Thermo I Moment (60)	CHEN E4201 Eng Application Echem West (45)		CHEN E4670 Chemical Engineering Data Analysis Bishop (45)				CHEN E301. Thermo I Moment (60)	CHEN E4201 Eng Application Echem West			
10:10a m - 11:25a m	CHEN E3110 Transport I Boyce (60)	CHEN E4231 Solar Fuels Esposito (45)	CHEN E4660 Biochem. Eng. Obermeyer (45)		CHEN E2100 MEB Banta (60)	CHEN E4235 Surface Rxn and Kinetics Chen (30)		CHEN E3110 Transport I Boyce (60)	CHEN E4231 Solar Fuels Esposito (45)	CHEN E4660 Biochem. Eng. Obermeyer (45)		CHEN E2100 MEB Banta (60)	CHEN E4235 Surface Rxn and Kinetics Chen (30)			CHEN E4001 & E4002 Essential s A & B 10:00am
11:40 m - 12:55 m	CHEN E4010 Math Methods Bozic (45)				CHEN E4110 Transport III Durning (45)			CHEN E4010 Math Methods Bozic (45)				CHEN E4110 Transport III Durning (45)				- 11:15am (A) 11:30am - 12:45pm (B) Banta
1:10pm - 2:25pm	CHEN E4920 Pharma Industry for Engineers Moment (45)	CHEN E6543 Res. Meth. Bishop (20)	CHEN E4500 Design I Borio (60)	CHEN E4580 Artificial Intelligence in ChemE Venkat (45)	CHEN E4001 Essentials A Banta (45)	APCH E4080 Soft Materials	CHEN E4300 Controls A	CHEN E6543 Research Methods Bishop (20)	CHEN E4920 Pharma Industry for Engineers Moment (45)	CHEN E4500 Design I Bozic (60) 1:10pm- 2:00pm	CHEN E4580 Artificial Intelligence in ChemE Venkat (45)	CHEN E4001 Essentials A Banta (45)	CHEN E4300 Controls A		CHEN E6543 Research Methods Bishop (20)	
2:40pm - 3:55pm	CHEN E302 Analysis Urban (60)	CHEN E4130 Advanced Thermo Kumar (60	1:00pm - 4:00pm		CHEN E4002 Essential B Banta (45)	641g (43) 1:10pm - 3:40pm	4:00pm McNeill (60)	CHEN E3020 Analysis Urban (60)		CHEN E4130 Advanced Thermo Kumar (60)		CHEN E4002 Essential B Banta (45)	4:00pm McNeill (60)			
4:10pm - 5:25pm	CHEN E4140 Separations Durning (60)				CHEN E9000 Colloquiu m 4:00pm - 5:00pm Boyce	CHEN E9001 MS Colloquium 4:10pm - 5:00pm Bozic (75)		CHEN E4140 Separations Durning (60)				CHEN E4850 Contaminate Site Clean Up				
5:40pm - 6:55pm	CHEN E4860 NMR of Bio, Soft, and Energy Materials Marbella (45)							CHEN E4860 NMR of Bio, Soft, and Energy Materials Marbella (45)				(35) 4:10pm - 6:40pm Tsiamis				
7:00pm - 8:00nm	CHEN E4020 Protection of	CHEN E4700 Principles			CHAP E4120 Stat								CHEN E4400 Chemical			-
8:00pm - 9:30pm	Industrial and Intellectual Property Spall (45)	of Genomic Technologi es Ju (30)			Mech O'Shaughn essy (45)								Process Developmen t Mattas (45)			

Sample Schedule, Fall 2020

					_			FALL 2020								
	UNDE	CRGRADUA	TE					GRADUA	TE CORE	1			GF	ADUATE E	LECTIVE	
															EDU	N A X7
	CHEN E4670	MONDAY			CHEN	TUESDAY		CHEN E4670	VEDNESDA Y				CHEN		FRI	JAY
8.10am	CHEN E40/0				E2010	CHEN E4201		Chemical				CHEN E2010	E4201 Eng			
0:40am	Engineering				LS010 Thormo I	Application		Engineering				Thormo I	Application			
- 0.55am	Data Analysis				Moment	Echom West		Data Analysis				Moment (60)	Echom West			
2.55am	Bishon (45)				(60)	(45)		Bishon (45)				Woment (00)	(45)			
	Distop (10)		CHEN		(00)	(10)		Dishop (10)		<u>₽-₽-₽-₽</u>			(10)			CHEN
10:10a		CHEN	E4660		CHEN	CHEN E4235				CHEN E4660			CHEN			E4001 &
m -	CHEN E3110	E4231	Biochem.		E2100	Surface Rxn		CHEN E3110	CHEN E4231	Biochem.		CHEN E2100	E4235			E4002
11:25a	Transport I	Solar Fuels	Eng.		MEB	and Kinetics		Transport I	Solar Fuels	Eng.		MEB Banta	Surface Rxn			Essential
m	Boyce (00)	LSPOSILO	Obermeyer		Banta (60)	Chen (30)		Doyce (00)	Esposito (45)	(45)		(00)	Chop (30)			s A & B
		(43)	(45)							(43)			Chen (30)			10:00am
										F						
11 40					CHEN											11:15am
11:40a	CHEN E4010				E4110			CHEN E4010				CHEN E4110				(A)
III - 12:55n	Math Methods				Transport			Math Methods				Transport III				11:50am
12.33p	Bozic (45)				Durning			Bozic (45)				Durning (45)				- 12·45nm
					(45)											(B)
					()											Banta
	CHEN E4020			CHEN E459	CHEN				CHEN E4020		CHEN E459				CHEN	
1.10nn	Pharma	CHEN		Artificial	E4001			CHEN E6543	CHEN E4920 Pharma	Design I	Artificial	CHEN F400			E6543	
1.10pm -	Industry for	26543 Res.	CHEN	Intelligence i	Essential	APCH F4080	CHEN	Research	Industry for	Bozic (60)	Intelligence i	Essentials A	CHEN		Research	
2:25pm	Engineers	Meth.	E4500	ChemE	A Banta	Soft	E4300	Methods	Engineers	1:10pm-	ChemE	Banta (45)	E4300		Methods	
F	Moment (45)	Pishop (20)	Design I	Venkat (45)	(45)	Materials	Controls A	Bishop (20)	Moment (45)	2:00pm	Venkat (45)		Controls A		Bishop	
		CHEN	Bozic (60)			Gang (45)	1:10pm -						1:10pm -		(20)	
2.40nm	CHEN E3020	CHEN E4130	1:00pm -		CHEN	1:10pm -	4:00pm	CHEN E3020		CHEN E4130		CHEN E400	4:00pm			
2.40pm -	Analysis	Advanced	4:00pm		E4002	3:40pm	McNeill (60)	Analysis		Advanced		Essential B	McNeill (60)			
3:55pm	Urban (60)	Thermo			Essential I			Urban (60)		Thermo		Banta (45)				
· · · · F · ·		Kumar (60)			Banta (45					Kumar (60)						
					CHEN	CHEN E900							1			
4.10nm	CHEN F4140				E9000	MS		CHEN F4140								
4.10pm -	Separations				Colloquiu	Colloquium		Separations								
5:25pm	Durning (60)				m 4:00pn	4:10pm -		Durning (60)				CHEN E4850				
F					- 5:00pm	5:00pm Bozi		g ()				Contaminate				
	CHEN E4860				Воусе	(75)		CHEN E4860				Site Clean Up				
	NMR of Ric							NMR of Rio				(33) 4:10pm				
5:40pm	Soft. and							Soft, and				Tsiamis				
	Energy							Energy								
6:55pm	Materials							Materials								
	Marbella (45)							Marbella (45)								
7:00pm	CHEN F4020	CHEN											CHEN			
-	Protection of	E4700			CHAP								E4400			_
8:00pm	Industrial and	Principles			E4120 Stat								Chemical			
8:00pm	Intellectual	of Genomic			Mech								Process			
-	Property Spall	recnnologi			O Snaughn								t Mottos			
9:30pm	(45)	(30)			cssy (45)								(45)			

S2E Sample Schedule, Fall 2020

DRAFT Example Fall Courses in the Department of Chemical Engineering (3 pts each)

	Chemical Engineering Gr	aduate (Courses <u>Fall 2020</u>		
Course #	Course title	Day	Start Time	End Time	Professor
CHAP E4120#	STAT MECH	Т	7:00 PM	9:30 PM	O'Shaughnessy
CHEN E4001	ESSENTIALS OF CHEM ENG A	TR	1:10 PM	2:25 PM	Banta
CHEN E4001	ESSENTIALS OF CHEM ENG A R01	F	10:00 AM	11:15 AM	Banta
CHEN E4002	ESSENTIALS OF CHEM ENG B	TR	2:40 PM	3:55 PM	Banta
CHEN E4002	ESSENTIALS OF CHEM ENG B R01	F	11:30 AM	12:45 PM	Banta
CHEN E4010	MATH METHODS	MW	11:40 AM	12:55 PM	Bozic
CHEN E4020#	PROTECT INTEL PROP	М	7:00 PM	9:30 PM	Spall
CHEN E4110	TRANSPORT III	TR	11:40 AM	12:55 PM	Durning
CHEN E4130	ADV CHEM ENG THERMO	MW	2:40 PM	3:55 PM	Kumar
CHEN E4201#	ENG'G APPL of ELECTROCHEM	TR	8:40 A M	9:55 AM	West
CHEN E4231#	SOLAR FUELS	MW	10:10 AM	11:25am	Esposito
CHEN E4235	SURFACE REACTIONS AND KINETEICS	TR	10:10 AM	11:25 AM	Chen
CHEN E4400	CHEMICAL PROCESS DEVELOPMENT	R	7:00 PM	9:30 PM	Mattas
CHEN E4580	ARTIFICAL INTELLIGENCE FOR CHEME	MW	1:10 PM	2:25 PM	Venkat
CHEN E4660#	BIOCHEMICAL ENGINEERING	MW	10:10 AM	11:25AM	Obermeyer
CHEN E4670#	CHEMICAL ENGINEERING DATA ANALYSIS	MW	8:40 AM	9:55 AM	Bishop
CHEN E4700#	PRINCIPLE OF GENOMIC TECHNOLOGIES	М	7:00 PM	9:30 PM	Ju
CHEN E4850	CONTAMINTED SITE CLEAN UP	R	4:10 PM	6:40 PM	Tsiamis
CHEN E4860#	NMR OF BIO, SOFT, & ENERGY MATERIALS	MW	5:50 PM	6:40 PM	Marbella
CHEN E4920#	PHARMA INDUSTRY FOR ENGINEERS	MW	1:10 PM	2:25 PM	Moment
CHEN E9001	MASTERS COLLOQUIUM	Т	4:10 PM	5:00 PM	Bozic

S2E Recitation periods are highlighted in yellow. S2E Students must attend recitation periods, but do not need to register for the CHEN E4001 and CHEN E4002 recitation periods. CHEN E4001 and CHEN E4002 are for S2E students only.

** MECE E4320 will count as in the department.

*Courses in red count toward the S2E Student design requirement. S2E students must fulfill the design requirement after successful completion of CHEN E4001 and CHEN E4002.

#S2E students are eligible to take this elective during the first semester and count the course as within the department of chemical engineering.

These are Co	ommon Elective Courses Outside of the Dep	bartmen	t of Chemical Engir	neering (With	n advisor approval			
	MS students may select up t	o 6 poin	ts of the required 3	30.)				
	Other Electives of Interest to Cher	<mark>nical En</mark> ยู	gineering Graduate	Students				
	Mechanica	l Engine	ering					
MECE E4211	ENERGY SOURCES AND CONVERSION	М	4:10 PM	6:40 PM	Modi			
MECE E4320**	INTRO TO COMBUSTION	R	4:10 PM	6:40 PM	Burke			
	Earth/Environm	ental En	gineering					
EAEE E4003	INTRO TO AQUATIC CHEMISTRY	MW	10:10 AM	11:25 AM	Ngai			
EAEE E4163	SUSTAINABLE WATER TREATMENT	М	4:10 PM	6:40 PM	Becker			
EAEE E4550	CATALYSIS OF EMISSIONS CONTROL MW 2:40 PM 3:55 PM Farrauto							
EAEE E6212#	CARBON SEQUESTRATION	W	4:10 PM	6:00 PM	Park			
Biomedical Engineering								
BMEN E4001	QUANTITATIVE PHYSIOLOGY I	MW	8:40 AM	9:55 AM	Kam			
BMEN E4501	TISSUE ENGINEERING I	MW	11:40 AM	12:55 PM	Hess			
	Applied Physics and	Applied	l Mathematics					
APAM E4260	Electrochemical Materials and Devices	TBD	TBD	TBD	TBD			
S2E Recitation pe register for the C only.	eriods are highlighted in yellow. S2E Students must a CHEN E4001 and CHEN E4002 recitation periods. CHEN	attend rec I E4001 an	itation periods, but do d CHEN E4002 are for S	o not need to 2E students				
** MECE E4320 w	ill count as in the department.							
*Courses in red or requirement after	count toward the S2E Student design requirement. S er successful completion of CHEN E4001 and CHEN E4	52E studer 1002.	nts must fulfill the des	ign				
#S2E students are department of cl	e eligible to take this elective during the first semes nemical engineering.	ter and co	ount the course as with	nin the	40			

Spring 2020

		UNDERGRADUAT	ſE			GRADUATE ELECTIVE				
	MO	NDAY	TUESDAY		WED	NESDAY		THURSDAY		FRIDA Y
8:40am - 9:55am	CHEN E3120 Transport II Bishop (60)		CHEN E3210 Thermo II Momen (45)	CHEN E4330 Advanced Kinetics Esposito (45)	CHEN E3120 Transport II Bishop (60)		CHEN E3210 Thermo II Moment (45)	CHEN E4330 Advanced Kinetics Esposite (45)		
0:10am - 11:25am	CHEN E4620 Intro to Polymers Durning (45)	CHEN E4600 Atmospheric Aerosols McNeill (45)	CHEN E4230 Reaction Kinetics and Reactor Design Marbella (45)	CHEN E401 Math Methods Venkat (45)	CHEN E4620 Intro to Polymer Durning (45)	CHEN E4600 Atmospheric Aerosols McNeill (45)	CHEN E4230 Reaction Kinetics and Reactor Design Marbella (45)	CHEN E4010 Math Methods Venkat (45)		
1:40am - 12:55pm	CHEN E4112 Transport in Fluid Mixtures Durning (45)		CHEN E4650 Polymer Physics Kumar (45)	CHEN E4501 Safety Bozic (50)	CHEN E4112 Transport in Fluid Mixtures Durning (45)		CHEN E4650 Polymer Physics Kumar (45)	CHEN E4501 Safety Bozic (50)		
1:10pm - 2:25pm	CHEN E6201 Topics in Electrochem 1:10 - 3:40pm West	CHEN E3810 Lab	CHEN E4880 Atomistic Simulations for Science and Engineering Urban (45)	CHEN 4930 Pharma Lab 1:10pm to 3:40pm		CHEN E3810 Lab 1:00pm - 5:00pm - Ju	CHEN E4880 Atomistic Simulations for Science and Engineering Urban (45)	APCH E4080 Soft Materials 1:10 - 3:40pm Gang (45)	CHEN E4325 Bioseparations 1:10pm - 3:40pm	
2:40pm - 3:55pm	(25)	Ju (60)		Moment (45)		(60)			artouman (35	
4:10pm - 5:25pm			CHEN E9000 C 4:00pm - 5:00pm O	Colloquium Dermeyer (90)				CHEN E8100 Topics Bio	CHEN E4890 Biopharma.	
5:40pm - 6:55pm	CHEN E4150 Computational Fluid Dynamics Boyce (45)				CHEN E4150 Computational Fluid Dynamics Boyce (45)			4:10pm - 6:40pm O'Shaughnessy (20)	4:10pm - 6:40pm Hartounian (50)	
6:10pm - 7:25pm										
7:40pm - 8:55pm										
9:00pm - 9:30pm										

Sample, CHEN Dept Course, Offerings, Spring 2020

Example Spring 2020 Electives in the Department of Chemical Engineering (3 pts each)

	Chemical Engineering Gr	aduate (Courses Spring <mark>202</mark>	<u>0</u>	
Course #	Course title	Day(s)	Start Time	End Time	Professor
CHEN E4010	Math Methods in Chemical Engineering	TR	10:10 AM	11:25 AM	Venkatsubramanian
CHEN E4112	Transport in Fluid Mixtures	MW	11:40 AM	12:55 PM	Durning
CHEN E4150	Computational Fluid Dynamics	MW	5:40 PM	6:55 PM	Воусе
CHEN E4325	Bioseparations	R	1:10 PM	3:40 PM	Hartounian
CHEN E4330	Adv Chemical Kinetics	TR	8:40 AM	9:55 AM	Esposito
CHEN E4501	Chemical Engineering Process Safety	TR	11:40 AM	12:55 PM	Bozic
CHEN E4600	Atmospheric Aerosols	MW	10:10 AM	11:25 AM	McNeill
CHEN E4620	Intro to Polymers	MW	10:10 AM	11:25 AM	Durning
CHEN E4780	Engineering the Human Embryo	TBD	TBD	TBD	Simunovic
	Atomistic Simulations for Science and				
CHEN E4880	Engineering	TR	1:10 PM	2:25 PM	Urban
	Biopharmaceutical Product				
CHEN E4890	Development and Chemical Engineering	R	4:10 PM	6:40 PM	Hartounian
CHEN E4930	Biopharmaceutical Process Laboratory	Т	1:10 PM	3:40 PM	Moment
CHEN E8100	Topics in Biology	R	4:10 PM	6:40 PM	O'Shaughnessy
APCH E4080	APCH E4080 Soft Materials	R	1:10 PM	3:40 PM	Gang

Courses in red counts toward elective requirement for S2E students

Example Spring <u>2020</u> Electives in the Department of Chemical Engineering (3 pts each)

Inese are Co	These are common Elective Courses Outside of the Department of Chemical Engineering (with advisor approval									
	MS students may select up to 6 points of the required 30.)									
	Other Electives of Interest to Chemical Engineering Graduate Students									
	Mechanical Engineering									
MECE E4210	Energy and Infrastructure Planning	ergy and Infrastructure Planning M 7:00 PM 9:30 PM Waite								
MECE E4302	Advanced ThermodynamicsR4:10 PM6:40 PMBurke									
	Earth/Environr	mental Er	ngineering							
EAEE E4150	AIR POLLUTION PREVENTION/CONTR	М	4:10 PM	6:40 PM	Fthenakis					
EAEE E4160	SOLID & HAZARDOUS WASTE MGMT	TR	4:10 PM	5:25 PM	Somasundaran					
EAEE E6150	INDUSTRIAL CATALYSIS	MW	2:40 PM	3:55 PM	Farrauto					
*Coursos in r	ad count toward the SDE Student design re	a uiro mo	nt COE students	muct fulfill +	he decign					

*Courses in red count toward the S2E Student design requirement. S2E students must fulfill the design requirement after successful completion of CHEN E4001 and CHEN E4002

MS Student Course Registration/Advising

Graduate student must register during the designated registration period or risk loss of student status. Registration for classes is done through student services on line: <u>https://ssol.columbia.edu/</u> Graduate student course registration dates are dictated by the CU Registrar Office and posted at the Columbia Academic Calendar site. <u>http://registrar.columbia.edu/event/academic-calendar</u>

"Advising of MS students is currently the responsibility of the Masters Committee. Each incoming MS student will be assigned an advisor who will approve courses." (2015-2016 Columbia Chemical Engineering Graduate Student Handbook)

MS student advising takes place close to the registration period. Typical advising weeks are the week prior to classes starting for entering students and the week prior to the academic calendar registration dates for each subsequent Spring or Fall semester. Students will be informed of advising dates via Columbia email. Students are required to meet with their academic advisor during that time. Students are informed at orientation of core and suggested elective courses. All course selections must be approved by an academic advisor. Student will be informed of course options via email or other means for subsequent semesters.

MS Student Course Registration/Advising

Prior to meeting with an academic advisor, an MS student must record all current and requested courses and grades on the academic advising sheet in order to inform the advisor of the current program structure. This is done to save the student time as evaluation of student progress in the program is needed prior to making changes. See example advising sheet below:

•	CHEMICAL·E	NGIN	EERING	•MS•PROGRAM* →	→	→ <u>F</u>	<u>all·2018</u> ·Admission¶			Name and UNI
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	Course¤	Pts¤	Grade¤	Course¤	Pts¤	Grade¤	Course¤	Pts¤	Grade¤¤	
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 Kinetics-Core¶ CHEN-E4330^o 	¤	¤	¤	CHEN·E4330¤	3¤	00000	00000 <u>0</u>	۵¤	¤ ¤ ° ° ° ° ° °	courses, points,
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■Tech·Elect·5+	° ° ° ° ° ° ¶	۵¤	00000	° ° ° ° ° ¶	۵¤	00000	CHEN-E4850-	3¤	ααοοοοα	any time you
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degree requirement	tsFinal·approvals·are·made·	by∙the∙	MS∙adviso	or.¶						classes.
**All·first·year·MS·S	tudents must register for and	l·attend	d-CHEN-E9	0001·MS·Chemical·Engineering	g·Colle	oquium.¶				
Technical electiv	es-must-be-approved-by-advi	sor and	a∙course∙n	umbers·must·be·4000·level·or	∙abov	eNo·moi	re-tnan-2-courses-may-be-tec	nnical•	electives	
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An-courses-with	ini a statient s ris Degree Fro	Stant,	cacept-140	oonoquium, must be taken of	anet	ici grade.	¶			
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							······Advisor/Date¶			

This form my be obtained at: http://cheme.columbia.edu/ms-advising

MS Student Course Registration/Advising Frequently Asked Question (FAQ)

"What should I do when I register in SSOL and the course that I have chosen is listed as "full" in SSOL?

If you find that the course you have chosen is full when you try to register, you may enter your name on the wait list (See Kathy Marte in the Department of Chemical Engineering for "Wait Lists") for that course and then wait and see if a slot opens up. It is suggested that you attend the first few lessons of the course so that if you come off the wait list, you will not be behind on the material. You may choose to contact the professor about availability in the course. You must have a backup plan as if the course is full you may not be able to take it at the semester of offering and thus you must take another course. Your academic plan must be agreed upon between you and your academic advisor. Any changes made to your academic plan must be approved in writing by your academic advisor. Any back up courses need to be approved by your academic advisor so that you meet all graduation requirements. You must manage this request for change carefully. " https://cheme.columbia.edu/advising accessed 14 Feb 2019 46

MS Colloquia

<u>CHEN E9001</u> Masters Colloquium

(Fall Semester Only):

- Tuesdays 4:10PM-5:00PM
- Guest lecturers from Industry, including alumni, adjunct faculty, etc
- All first year MS students must register for CHEN E9001.
- Attendance Requirement: All first year MS Students must attend MS Colloquium.

"Colloquia definition, a conference at which scholars or other experts present papers on, analyze, and discuss a specific topic." dictionary.com accessed 1 Mar 2018) Learn about careers in industries that require technical expertise in chemical engineering. (Obj 1)

Understand more about the impact of engineering solutions in a global, economic, environmental, and societal context. (Outcome 8)

American Institute of Chemical Engineers Young Professionals Develop an understanding of professional and ethical responsibility (Outcome 6)

Historical Perspective of Chemical Engineering

CU MS Colloquia

Program Welcome! Life as a Graduate Student Pursuing a PhD Internships, Resumes and Corporate Recruiting

<u>Your Academic</u>

Seminar

Enhance knowledge of contemporary issues. (Outcome 10)

Chemical Engineering in the Pharmaceutical Industry

Strengthen your foundation to pursue alternative career paths, especially careers in business, management, finance, law, medicine or education. (Obj 4)

> Learn about and recognize the need for, and ability to engage in life-long learning. (Outcome 9)

> > The Engineer in the Catalyst Industry

Applying to the Ph.D. Program

- Must formally apply if you are interested
- No guarantees; in competition with all other applicants
- Opportunity to impress faculty with grades and/or performance in a research group
- You will also be well prepared for doctoral programs in other universities

Columbia Chemical Engineering Faculty



Alan West Electrochemical Engineering



Lauren Marbella **McNeil** Materials for Atmospheric Energy Storage and Chemistry, Conversion, Aerosols Magnetic Resonance



Alex Urban Energy Materials Theory



Jingguang Chen Catalysis and Sustainable Energy



Colloidal Machines



Chris Boyce Fluid Mechanics, Magnetic Resonance Imaging, Clean Energy

Christopher

Durning

Polymer

Physical

Chemistry



Daniel **Esposito** Solar Fuels and Sustainable Energy

Oleg Gang

Soft

Matter.

Programma

ble self-

assembly



Ah-Hyung Alissa Park Sustainable Energy, Carbon Capture and Storage, Particle Technology



Mijo Simunovic Quantitative human embryology, human stem cell tissue engineering



Dan Steingart Electrochemical **Energy Storage**



Robert Bozic Process Safety EC Sensors and Fuel Cells



Michael P. Burke Combustion, Multi-Scale Uncertainty Qualification, Non-Equilibrium Kinetics



Sanat Kumar Synthetic and Natural Polymers, Nanomaterials



Kyle Bishop Materials and



Venkat Risk Management, Complexity, Self-



Pharmaceutical

Engineering

Allie Obermeyer Protein-based materials and immunoengine ering



Jingyue Ju Genomics



Ben **O'Shaughnessy** Cellular Mechanisms, Quantitative Biology



Edward Leonard Artificial Organs, Transport Phenomena



Scott Banta Protein and Metabolic Engineering





Adjunct Faculty

Experienced industry professionals who teach focused courses



A. A. Bedrossian-Omer

G. Hounsell

TBP

	ТВР
(C. Tsiamis



E. Mattas



K. Spall



H. Hartounian

Masters Committee



Robert G. Bozic



Aaron Moment



Scott A. Banta

Responsible for approving programs

Chemical Engineering Staff



Rezarta Binaj Business Manager



Kathy Marte Director of Finance and Administration



Ariel Sanchez IT Manager



Raina M. Ranaghan Career Placement Officer



To Be Announced Operations Manager



Emely Aquino Administrative Assistant

Faculty Research Themes

- Catalysis
- Molecular Dynamics
- Polymers/Materials
- Electrochemical Engineering
- Biological & Medical Engineering
- Informatics & Large Data Systems
- Sustainable Energy & the Environment

Non-Research Themes

- Chemical Product Design
- Chemical Process Engineering

Joining a Research Group

- Not required of MS Students
- Maximum of 3 points per semester.
- Maximum of 6 points towards the degree.
- Research course may be selected for the second and/or the third semester
- Take advantage of Chem Eng Poster sessions
- Approach faculty and express interest in the research
- Understand that if you are selected, you must dedicate appropriate time and effort
- Limited number of opportunities, and you will be in competition with other students, so sell yourself!

Chemical Engineering Graduate Organization (CheGO)

ChEGO WHAT WE DO



1. Act as a liaison between the graduate student population and the department on issues of concern to the student body

- 2. Organize and run activities which enrich the academic and social experience of graduate students within the department
- 3. Assist in the management of the chemical engineering community outreach program
- 4. Aide in the planning and running of miscellaneous departmental activities (e.g., open house, orientation, graduate student breakfasts, etc.)

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Chemical Engineering Graduate Organization (CheGO)

Chego COMMUNITY OUTREACH

- Fredrick Douglas Academy II located Harlem, NY
- In class experiments and lectures with middle school and high school students
- Mentoring and judging a science fair





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(Mayank Jhalaria Vice President, ChEGO, MS Colloquium, September 7, 2018)

Chemical Engineering Graduate Organization (CheGO) EVENTS

- Monthly breakfasts for graduate students, faculty and staff
- Social events with other departments
- Game nights
- Happy hour for the department



Some Student Organizations of Campus

- Engineering Graduate Student Council (EGSC)
- American Institute of Chemical Engineers (AIChE)
- Association for Computing Machinery (ACM)
- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME)
- Columbia Science Review (CSR)
- American Institute of Aeronautics and Astronautics (cuAIAA)
- Engineers Without Borders (EWB)
- Entrepreneurship, Leadership and Consulting Club
- Institute of Electrical and Electronics Engineers (IEEE)
- Society of Automotive Engineers (SAE)
- Scientists & Engineers for a Better Society (SEBS)
- Society of Women Engineers (SWE)



Career Placement



Direct all questions regarding career placement requirements to the Career Placement Officer, Raina Ranaghan, rmr2185@columbia.edu, (work phone) 212-854-9158.

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New York City Advantage



- Campus in the Morningside Heights neighborhood of Manhattan
- NYC: major player in high-tech research & development, financial and other industries
- Vibrant Columbia alumni network

- Long tradition of collaboration with private industry and public sector
- internships, networking, job search

Employers

- Accenture
- Amex
- Apple
- Bain Capital
- Bain & Company
- Bank of America
- Barclays Capital
- Bloomberg
- BNP Paribas
- Boeing
- Boston Consulting Group
- Booz Allen
- *BP*
- Chevron
- Credit Suisse
- Dell

- Deutsche Bank
- *EMC*
- Exxon
- Fedex
- General Electric
- Goldman Sachs
- Google
- HSBC
- *HP*
- IBM
- ITT Corp
- Johnson & Johnson
- JP Morgan
- Louis Vuitton
- Mars
- Mayo Clinic

- McKinsey & Co.
- Microsoft
- Morgan Stanley
- Murex
- NASA
- Pfizer
- Proctor & Gamble
- RBS
- SocGen
- Texas Instruments
- UBS
- United Nations
- United Technologies
- Walmart
- Yahoo
- and many more....

*Data from Graduation Exit Survey for School of Engineering

Housing

- University Apartment Housing (UAH)
- http://facilities.columbia.edu/hou sing/
- International House <u>http://www.ihouse-nyc.org</u>
- The Off-Campus Housing Assistance Office (OCHA)-
- http://www.columbia.edu/cu/ire/ ocha/
- Alternative Housing List:
- Contact The Office of Graduate Student Services



"NOCELAC!"



"No One Can Engineer Like A Columbian"

THE CAMP COLUMBIA SUNDIAL DEDICATED HERE TO THE MEMORY OF

DEAN WESLEY J.HENNESS

EN HIS MANY ERLENDS AND FELLOW SUPPORTERS OF

GAMP COLUMBIA









Columbia Chemical Engineering

Questions?



https://cheme.columbia.edu/frequently-asked-questions-1 accessed 3 Mar 2019 https://gradengineering.columbia.edu/admissions/faq accessed 3 Mar 2019

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Chemical Engineering Department Colloquia

<u>CHEN 9000x/y</u> Chemical Engineering Colloquium

- Tuesdays 4PM <u>(check the website for the</u> schedule before attending) cheme.columbia.edu/colloquia
- Attendance is <u>optional</u> for MS students and must be approved for absence from the MS Colloquium.