

CHEMICAL ENGINEERING

FIRST YEAR



MATH 125: Calculus I

GEC

MATH 126 or MATH 129: Calculus II MATH 226 or MATH 229: Calculus III MATH 245: Mathematics of Phys. and Engr.

CHE 446 MATH 245

PHYS 151L: Mechanics and Thermodynamics PHYS 152L: Electricity and Magnetism

CHEM 105AL: General Chemistry CHEM 105BL: General Chemistry CHEM 300L: Analytical Chemistry CHEM 322AL: Organic Chemistry CHEM 430: Physical Chemistry: Thermodynamics & Kinetics

CHEMISTRY ELECTIVE: CHEM 322bL or 431

GE A The Arts (1 Course)

GE B Humanistic Inquiry (2 Courses)

GE C Social Analysis (2 Courses)

GE D Life Sciences (1 Course)

GE E Physical Sciences (1 Course)

GE F Quantitative Reasoning (1 Course)

GE G,H Global Perspectives (2 Courses)* GESM General Education Seminar (1 Course)*

CHE 460L

WRIT 150: Writing and Critical Reasoning WRIT 340: Advanced Writing

CHE 480

CHE 120: Intro. to Chemical Engineering CHE 205: Numerical Methods in Chemical Engineering

CHE 330: Chemical Engr. Thermodynamics CHE 350: Intro. to Separation Processes CHE 405: Probability and Statistics for CHE CHE 442: Chemical Reactor Analysis

CHE 443: Viscous Flow

CHE 444AL: Chemical Engineering Lab CHE 444BL: Chemical Engineering Lab CHE 445: Heat Transfer in ChE Processes CHE 446: Mass Transfer in ChE Processes CHE 460L: Chem. Proc. Dynamics & Control CHE 476: Chemical Engineering Materials CHE 480: Chem. Process and Plant Design CHE 485: Computer Aided Process Design ENGR 102: Engineering Freshman Academy

TECHNICAL ELECTIVE APPROVED ELECTIVES

* SPECIAL NOTES

CHEMISTRY ELECTIVE



Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.

OPTIONAL ELECTIVE

GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

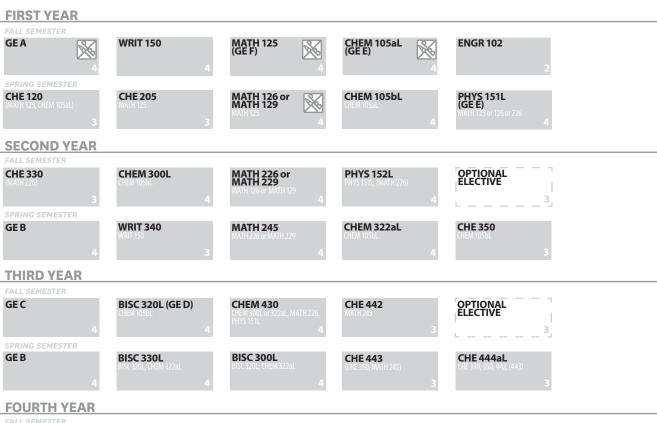
OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.

TECHNICAL ELECTIVE: Any upper-division CHE course that is not already required.

APPROVED ELECTIVES: 8-9 units of approved electives including CE 205 (2), EE 438L (3), and ISE 460 (3) or BUAD 301 (3) or other courses with department approval.



CHEMICAL (BIOCHEMICAL)







MATH 125: Calculus I MATH 126 or MATH 129: Calculus II MATH 226 or MATH 229: Calculus III MATH 245: Mathematics of Phys. and Engr.

PHYS 151L: Mechanics and Thermodynamics PHYS 152L: Electricity and Magnetism

CHEM 105AL: General Chemistry CHEM 105BL: General Chemistry CHEM 300L: Analytical Chemistry CHEM 322AL: Organic Chemistry CHEM 430: Physical Chemistry: Thermodynamics & Kinetics

BISC 300L: Intro. to Microbiology BISC 320L: Molecular Biology BISC 330L: Biochemistry

GE A The Arts (1 Course) GE B Humanistic Inquiry (2 Courses) GE C Social Analysis (2 Courses) GE D Life Sciences (1 Course) GE E Physical Sciences (1 Course)

GE F Quantitative Reasoning (1 Course) GE G,H Global Perspectives (2 Courses)*

GESM General Education Seminar (1 Course)*

WRIT 150: Writing and Critical Reasoning WRIT 340: Advanced Writing

BME 410: Intro. to Biomaterials CHE 120: Intro. to Chemical Engineering CHE 205: Numerical Methods in Chemical Engineering CHE 330: Chemical Engr. Thermodynamics CHE 350: Intro. to Separation Processes

CHE 405: Applications of Probability & Statistics

for Chemical Engineers or ISE 460: Engineering Economy CHE 442: Chemical Reactor Analysis

CHE 443: Viscous Flow

CHE 444ABL: Chem. Engineering Laboratory CHE 445: Heat Transfer in ChE Processes CHE 446: Mass Transfer in ChE Processes CHE 460L: Chemical Process Dynamics CHE 480: Chem. Process and Plant Design CHE 485: Computer-Aided Plant Design CHE 489: Biochemical Engineering ENGR 102: Engineering Freshman Academy BIOELECTIVE

* SPECIAL NOTES



Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.

GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.

BIOELECTIVE: Approved Bioengineering course or BISC 403

BISC 403: Must have 48 engineering units in order to register for this class

CHEMICAL (ENVIRONMENTAL)

FIRST YEAR



















SECOND YEAR



CHEM 300L

CHEM 322aL

MATH 226 or MATH 229

MATH 245

PHYS 152L

WRIT 340



THIRD YEAR

GEB













GEB







CHE 444aL



FOURTH YEAR

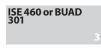












GEC







CHE 486 CHE 476

MATH 125: Calculus I

MATH 126 or MATH 129: Calculus II MATH 226 or MATH 229: Calculus III MATH 245: Mathematics of Phys. and Engr.

PHYS 151L: Mechanics and Thermodynamics PHYS 152L: Electricity and Magnetism

CHEM 105AL: General Chemistry CHEM 105BL: General Chemistry CHEM 300L: Analytical Chemistry CHEM 322AL: Organic Chemistry CHEM 430: Physical Chemistry: Thermodynamics & Kinetics

GE A The Arts (1 Course)

GE B Humanistic Inquiry (2 Courses)

GE C Social Analysis (2 Courses)

GE D Life Sciences (1 Course)

GE E Physical Sciences (1 Course)

GE F Quantitative Reasoning (1 Course)

GE G,H Global Perspectives (2 Courses)* GESM General Education Seminar (1 Course)*

CE 453: Water Quality Control CE 463L: Water Chemistry and Analysis

CHE 120: Intro. to Chemical Engineering CHE 205: Numerical Methods in Chemical Engineering

WRIT 150: Writing and Critical Reasoning

WRIT 340: Advanced Writing

CHE 330: Chemical Engr. Thermodynamics CHE 350: Intro. to Separation Processes CHE 405: Prob. and Stats. for Chem. Engr. CHE 442: Chemical Reactor Analysis

CHE 443: Viscous Flow

CHE 444AL: Chem. Engineering Laboratory CHE 444BL: Chem. Engineering Laboratory CHE 445: Heat Transfer in ChE Processes CHE 446: Mass Transfer in ChE Processes CHE 460L: Chemical Process Dynamics

CHE 476: Chemical Engineering Materials CHE 480: Chem. Process and Plant Design CHE 485: Computer Aided Process Design CHE 486: Design of Environ. Benign Plants

ENE 428L: Air Pollution Fundamentals

or ENE 429: Air Pollution Control ENGR 102: Engineering Freshman Academy

ISE 460: Engineering Economy

or BUAD 301: Technical Entrepreneurship PTE 463L: Trans Processes in Porous Media

* SPECIAL NOTES



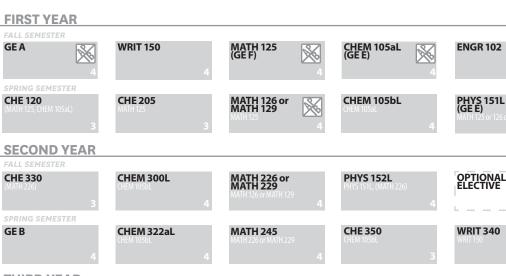
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GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.



CHEMICAL (NANOTECHNOLOGY)



THIRD YEAR











CHE 391





CHEM 453







FOURTH YEAR















GEC









MATH 125: Calculus I

MATH 126 or MATH 129: Calculus II MATH 226 or MATH 229: Calculus III MATH 245: Mathematics of Phys. and Engr.

PHYS 151L: Mechanics and Thermodynamics PHYS 152L: Electricity and Magnetism

CHEM 105AL: General Chemistry CHEM 105BL: General Chemistry CHEM 300L: Analytical Chemistry CHEM 322AL: Organic Chemistry CHEM 430: Physical Chemistry: Thermodynamics & Kinetics CHEM 453: Advanced Inorganic Chemistry

GE A The Arts (1 Course)

GE B Humanistic Inquiry (2 Courses)

GE C Social Analysis (2 Courses)

GE D Life Sciences (1 Course)

GE E Physical Sciences (1 Course)

GE F Quantitative Reasoning (1 Course)

GE G,H Global Perspectives (2 Courses)* GESM General Education Seminar (1 Course)*

WRIT 150: Writing and Critical Reasoning WRIT 340: Advanced Writing

CHE 120: Intro. to Chemical Engineering CHE 205: Numerical Methods in Chemical Engineering

CHE 330: Chemical Engr. Thermodynamics CHE 350: Intro. to Separation Processes CHE 391: Intro. to Nanotechnology Research CHE 405: Applications of Prob. & Stats. for ChE or ISE 460: Engineering Economy

or BUAD 301: Technical Entrepreneurship CHE 442: Chemical Reactor Analysis

CHE 443: Viscous Flows

CHE 444ABL: Chemical Engineering Lab CHE 445: Heat Transfer in ChE Processes CHE 446: Mass Transfer in ChE Processes CHE 460L: Chemical Process Dynamics & Control

CHE 480: Chem. Process and Plant Design CHE 485: Comp.-Aided Chemical Process Design CHE 487: Nanotech and Nanoscale Engineering CHE 491: Nanotech Research for Undergrads ENGR 102: Engineering Freshman Academy

MASC 350L: Design, Synthesis and Processing of **Engineering Materials**

NANOTECH. ELECTIVE

* SPECIAL NOTES



Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.

GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.

NANOTECH. ELECTIVE: EE/MASC 438L, CHE 489, or CHE/PTE 463L.

CHE 391, 491: Technical electives may be taken in place of these courses. Contact the department for approved courses.

CHEMICAL (PETROLEUM)

FIRST YEAR

GE A











CHE 120

CHE 205

MATH 126 or MATH 129

CHEM 105bL

PHYS 151L (GE E)

SECOND YEAR



CHEM 322aL

MATH 226 or MATH 229

PHYS 152L

WRIT 340



CHEM 300L

MATH 245

CHE 350

CHE 476

THIRD YEAR



CHE 405









GEB

CHE 444aL

PTE 464L

CHE 443

GEC



FOURTH YEAR



CHE 444bL















Engineering







MATH 125: Calculus I

MATH 126 or MATH 129: Calculus II MATH 226 or MATH 229: Calculus III MATH 245: Mathematics of Phys. and Engr.

PHYS 151L: Mechanics and Thermodynamics PHYS 152L: Electricity and Magnetism

CHEM 105AL: General Chemistry CHEM 105BL: General Chemistry CHEM 300L: Analytical Chemistry CHEM 322AL: Organic Chemistry CHEM 430: Physical Chemistry: Thermodynamics & Kinetics

CHEMISTRY ELECTIVE: CHEM 322bL or 431

GE A The Arts (1 Course)

GE B Humanistic Inquiry (2 Courses)

GE C Social Analysis (2 Courses)

GE D Life Sciences (1 Course)

GE E Physical Sciences (1 Course)

GEF Quantitative Reasoning (1 Course) GE G,H Global Perspectives (2 Courses)*

GESM General Education Seminar (1 Course)*

CHE 350: Intro. to Separation Processes CHE 405: Probability and Statistics for CHE CHE 442: Chemical Reactor Analysis CHE 443: Viscous Flow CHE 444AL: Chemical Engineering Lab CHE 444BL: Chemical Engineering Lab CHE 445: Heat Transfer in ChE Processes CHE 446: Mass Transfer in ChE Processes CHE 460L: Chemical Process Dynamics CHE 476: Chemical Engineering Materials

WRIT 150: Writing and Critical Reasoning

CHE 120: Intro. to Chemical Engineering

CHE 205: Numerical Methods in Chemical

CHE 330: Chemical Engr. Thermodynamics

WRIT 340: Advanced Writing

CHE 480: Chem. Process and Plant Design CHE 485: Computer Aided Process Design ENGR 102: Engineering Freshman Academy

ISE 460: Engineering Economy

or BUAD 301: Technical Entrepreneurship PTE 461: Formation Evaluation

PTE 463L: Trans. Processes in Porous Media PTE 464L: Petroleum Reservoir Engineering PTE 465L: Drill. Tech. & Subsurface Meth.

* SPECTAL NOTES



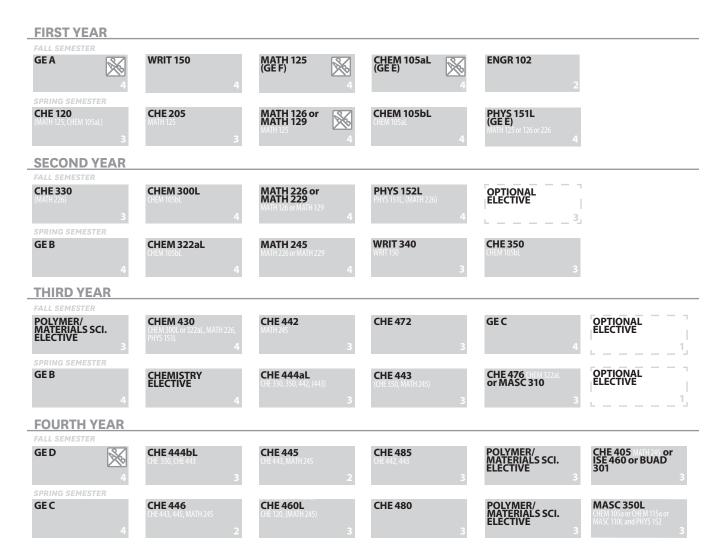
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GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.



CHEMICAL (POLYMERS/MATERIALS)



MATH 125: Calculus I

MATH 126 or MATH 129: Calculus II MATH 226 or MATH 229: Calculus III MATH 245: Mathematics of Phys. and Engr.

PHYS 151L: Mechanics and Thermodynamics PHYS 152L: Electricity and Magnetism

CHEM 105AL: General Chemistry CHEM 105BL: General Chemistry CHEM 300L: Analytical Chemistry CHEM 322AL: Organic Chemistry CHEM 430: Physical Chemistry: Thermodynamics & Kinetics

CHEMISTRY ELECTIVE: CHEM 322bL or 431

GE A The Arts (1 Course)

GE B Humanistic Inquiry (2 Courses)

GE C Social Analysis (2 Courses)

GE D Life Sciences (1 Course)

GE E Physical Sciences (1 Course)

GESM General Education Seminar (1 Course)*

GE F Quantitative Reasoning (1 Course) GE G,H Global Perspectives (2 Courses)*

WRIT 150: Writing and Critical Reasoning WRIT 340: Advanced Writing

CHE 120: Intro. to Chemical Engineering CHE 205: Numerical Methods in Chemical Engineering

CHE 330: Chemical Engr. Thermodynamics CHE 350: Intro. to Separation Processes CHE 405: Probability and Statistics for CHE or ISE 460: Engineering Economy or BUAD 301: Technical Entrepreneurship

CHE 442: Chemical Reactor Analysis

CHE 443: Viscous Flow

CHE 444ABL: Chemical Engineering Lab CHE 445: Heat Transfer in ChE Processes CHE 446: Mass Transfer in ChE Processes CHE 460L: Chemical Process Dynamics CHE 472: Polymer Science & Engineering

CHE 476: Chemical Engineering Materials or MASC 310: Materials Behavior and Processing

CHE 485: Computer Aided Process Design ENGR 102: Engineering Freshman Academy MASC 350L: Nanostructured Materials: Design, Synthesis, and Processing

CHE 480: Chem. Process and Plant Design

POLYMER / MATERIALS ELECTIVES

* SPECIAL NOTES



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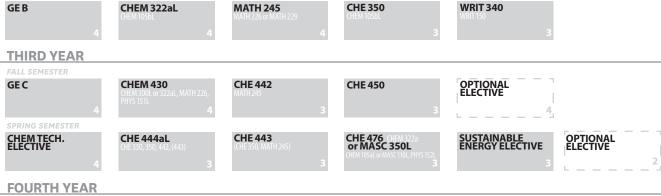
GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.

POLYMER/MAT ELECTIVES: Select 9 units from BME 410. CHE 474L, 475, 477, 487, EE 438L, or MASC 440.

CHEMICAL (SUSTAINABLE ENERGY)

FIRST YEAR WRIT 150 CHEM 105aL (GE E) **GE A ENGR 102** MATH 125 (GEF) × **CHE 205** CHEM 105bL PHYS 151L (GEE) CHE 120 MATH 126 or MATH 129 SECOND YEAR OPTIONAL ELECTIVE **CHE 330** CHEM 300L **PHYS 152L** MATH 226 or MATH 229





MATH 125: Calculus I MATH 126 or MATH 129: Calculus II MATH 226 or MATH 229: Calculus III

MATH 245: Mathematics of Phys. and Engr.

PHYS 151L: Mechanics and Thermodynamics PHYS 152L: Electricity and Magnetism

CHEM 105AL: General Chemistry CHEM 105BL: General Chemistry CHEM 300L: Analytical Chemistry CHEM 322AL: Organic Chemistry CHEM 430: Physical Chemistry: Thermodynamics & Kinetics

Chemistry Technical Electives: CHEM 322BL: Organic Chemistry

or CHEM 431: Physical Chemistry: Quantum **Mechanics**

or CHEM 453: Advance Inorganic Chemistry

GE A The Arts (1 Course)

GE C Social Analysis (2 Courses)

GE D Life Sciences (1 Course) GE E Physical Sciences (1 Course)

GE B Humanistic Inquiry (2 Courses)



GE F Quantitative Reasoning (1 Course) GE G,H Global Perspectives (2 Courses)* GESM General Education Seminar (1 Course)*

WRIT 150: Writing and Critical Reasoning WRIT 340: Advanced Writing

CHE 120: Intro. to Chemical Engineering CHE 205: Numerical Methods in Chemical Engineering

CHE 330: Chemical Engr. Thermodynamics CHE 350: Intro. to Separation Processes CHE 405: Applications of Prob. & Stats. for ChE

or ISE 460: Engineering Economy

or BUAD 301: Technical Entrepreneurship CHE 442: Chemical Reactor Analysis

CHE 443: Viscous Flows

CHE 444ABL: Chemical Engineering Lab CHE 445: Heat Transfer in ChE Processes

CHE 446: Mass Transfer in ChE Processes

CHE 450: Sustainable Energy

CHE 460L: Chemical Process Dynamics &

CHE 476: Chem. Engineering Materials or MASC 350L: Nanostructured Materials: Design, Synthesis and Processing CHE 480: Chem. Process and Plant Design CHE 485: Comp.-Aided Chemical Process Design ENGR 102: Engineering Freshman Academy

* SPECIAL NOTES



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GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.

SUSTAINABLE ENERGY ELECTIVE (3):

Biofuel (CHE 301 or CHEM 488 or CHE 489); Solar (CHE 487 or EE 513); Geothermal (PTE 463L)

*Must have 49 engineering units to be able to take BUAD 301.