

OPERATIONS RESEARCH CONCENTRATION

Mathematics, Bachelor of Arts with a Concentration in Operations Research Requirements

Code	Title	Credits
GENERAL EDUCATION REQUIREMENTS - 46 Hours Required		
Minimum of "C-" required		
Fundamental Academic Skills		15
ENGL 1150	ENGLISH COMPOSITION I	
ENGL 1160	ENGLISH COMPOSITION II	
Writing in the Discipline Course		
CMST 1110 or CMST 2120	PUBLIC SPEAKING FUNDS ARGUMENTATION AND DEBATE	
MATH 1120 or MATH 1100 or MATH 1130 or MATH 1140 or MATH 1300 or STAT 1100 or STAT 1530	INTRODUCTION TO MATHEMATICAL AND COMPUTATIONAL THINKING DATA LITERACY AND VISUALIZATION QUANTITATIVE LITERACY QUANTITATIVE REASONING FOR HEALTHCARE PROFESSIONALS COLLEGE ALGEBRA WITH SUPPORT DATA LITERACY AND VISUALIZATION ELEMENTARY STATISTICS	
Distribution Requirements		31
Natural Science - From two disciplines and at least one lab - 7 hrs		
Social Science - From two disciplines - 9 hrs		
Humanities and Fine Arts - From two disciplines- 9 hrs		
Global Diversity - 3 hrs		
US Diversity - 3 hrs		
MAJOR REQUIREMENTS		
**Course will satisfy UNO's General Education requirement		
^Course requires pre-requisite(s)		
Mathematics Major with a Concentration in Operations Research - 46 Hours Required		
Required Coursework		25
MATH 1950	CALCULUS I (^)	
MATH 1960	CALCULUS II	
MATH 1970	CALCULUS III	
MATH 2050	APPLIED LINEAR ALGEBRA	
MATH 2230	INTRODUCTION TO ABSTRACT MATH	
MATH 2350	DIFFERENTIAL EQUATIONS	
MATH 3230	INTRODUCTION TO ANALYSIS	
Select one of the following		3
CIST 1400	INTRODUCTION TO COMPUTER SCIENCE I	
MATH 2200	MATHEMATICAL COMPUTING I	
MATH 3250	INTRODUCTION TO NUMERICAL METHODS	
Select all of the following Operations Research Concentration courses		15

MATH 3200 or CSCI 1620	MATHEMATICAL COMPUTING II (^) INTRODUCTION TO COMPUTER SCIENCE II	
MATH/CSCI 4300	DETERMINISTIC OPERATIONS RESEARCH MODELS	
MATH/CSCI 4310	PROBABILISTIC OPERATIONS RESEARCH MODELS	
MATH 4320	COMPUTATIONAL OPERATIONS RESEARCH	
MATH 4740 or STAT 3800	INTRODUCTION TO PROBABILITY AND STATISTICS I APPLIED ENGINEERING PROBABILITY AND STATISTICS	
Select one the following Operations Research Concentration courses		3
MATH/CSCI 4150	GRAPH THEORY & APPLICATIONS	
MATH/STAT 4450	INTRODUCTION TO MACHINE LEARNING AND DATA MINING	
MATH 4750	INTRODUCTION TO PROBABILITY AND STATISTICS II	
MATH 4900	INDEPENDENT STUDIES	
STAT 4410	INTRODUCTION TO DATA SCIENCE	
STAT 4420	EXPLORATORY DATA VISUALIZATION AND QUANTIFICATION	
STAT 4430	LINEAR MODELS	
STAT 4440	TIME SERIES ANALYSIS	
College Breadth (choose one option)		15-30+
Option 1: Complete any UNO minor or undergraduate certificate - 15 + hours		
Option 2: Additional General Education Requirements - 19+ hours		
Additional quantitative literacy - 3 hours		
Additional Social Science Gen. Ed. from 3rd Discipline - 3 hours		
Additional Humanities Gen. Ed. from 3rd Discipline - 3 hours		
HIST 1000 and HIST 1010 - 6 hours		
Additional Nat. and Physical Science w/ Lab - 4-5 hours		
Option 3: CAS comprehensive major (50+ hours) OR any second UNO major (30+ hours)		
Bachelor of Arts Language Requirement		16
FREN, GERM, Or SPAN, 1110**, 1120, 2110, 2120		
ELECTIVES		
Elective hours as required to reach a total of 120 hours		
Mathematics, Bachelor of Arts with a Concentration in Operations Research Four Year Plan		
Freshman		
Fall		Credits
CMST 1110	PUBLIC SPEAKING FUNDS	3
ENGL 1150	ENGLISH COMPOSITION I (*)	3
MATH 1950	CALCULUS I (**)	5
Foreign Language Course 1110***		5
*ENGL 1150: Requires placement exam.		
**MATH 1950: Requires Math Placement Exam or ACT or SAT scores.		

***Level 1110 foreign language courses count as a Humanity/Fine Arts course, Global Diversity, and toward the student's BA requirement. If student is fulfilling the BA requirement via alternative methods, then 16 additional credits including a HFA and Global Diversity will need to be factored in to this degree plan.

		Credits	16
Spring			
ENGL 1160	ENGLISH COMPOSITION II	3	
MATH 1960	CALCULUS II	4	
Foreign Language Course	1120	5	
Social Science		3	
		Credits	15
Sophomore			
Fall			
MATH 1970	CALCULUS III	4	
MATH 2230	INTRODUCTION TO ABSTRACT MATH (*)	3	
Natural/Physical Science with Lab		4	
Foreign Language Course	2110	3	
		*MATH 2230: Requires MATH 1960	
		Credits	14
Spring			
MATH 2050	APPLIED LINEAR ALGEBRA (*)	3	
MATH 3230	INTRODUCTION TO ANALYSIS (**)	3	
Social Science		3	
Foreign Language Course	2110	3	
Humanities/Fine Arts Course with US Diversity		3	
		*MATH 2050: Requires MATH 1960	
		**MATH 3230: Requires MATH 2230	
		Credits	15
Junior			
Fall			
MATH 4300 or CSCI 4300	DETERMINISTIC OPERATIONS RESEARCH MODELS (*) or DETERMINISTIC OPERATIONS RESEARCH MODELS	3	
MATH 4740	INTRODUCTION TO PROBABILITY AND STATISTICS I (**)	3	
Humanities and Fine Arts		3	
Coding Course***		3	
Social Science^		3	
		*MATH/CSCI 4300: Requires MATH 2050	
		**MATH 4740: Requires MATH 2230	
		***See Academic Catalog for list of Coding Course Options.	
		^Social Science must be from 2nd discipline	
		Credits	15
Spring			
HIST 1000 or Minor/2nd Major Course*		3	
MATH 3200 or CSCI 1620	MATHEMATICAL COMPUTING II (**) or INTRODUCTION TO COMPUTER SCIENCE II	3	
MATH 4310 or CSCI 4310	PROBABILISTIC OPERATIONS RESEARCH MODELS (***) or PROBABILISTIC OPERATIONS RESEARCH MODELS	3	
Natural/Physical Science^		3	
Social Science#		3	
		*A&S College Requirement Options	

		Credits	15
Senior			
Fall			
MATH 2350	DIFFERENTIAL EQUATIONS (*)	3	
Operations Research Elective or Elective at 3000-4000 Level**		3	
Additional Humanities & Fine Arts Course for A&S or Minor/2nd Major Course***		3	
Additional Social Science Course for A&S or Minor/2nd Major Course^		3	
Elective		3	
		*MATH 2350: Requires MATH 1960. MATH 2050 Recommended but not required.	
		**Must take one Operations Research Elective. Fall options: MATH 4750 Probability & Statistics II, MATH 4900 Independent Studies, STAT 4410 Intro to Data Science, STAT 4430 Linear Models	
		***A&S College Requirement Options. Additional HFA must be in a 3rd discipline.	
		^A&S College Requirement Options. Additional SS must be in a 3rd discipline	
		Credits	15
Spring			
HIST 1010 or Minor/2nd Major Course*		3	
MATH 4320	COMPUTATIONAL OPERATIONS RESEARCH (**)	3	
Advanced Writing Requirement***		3	
Operations Research Elective or Elective at 3000-4000 Level^		3	
Elective at 3000-4000 Level#		3	
		*A&S College Requirement Options	
		**MATH 4320: Requires MATH 3200 (or instructor permission) and MATH 4300.	
		***Advanced Writing Requirement can be: CIST 3000 Advanced Composition for IS&T, ENGL 3050 Writing for the Workplace, ENGL 3980 Technical Writing Across the Discipline, or PHIL 3000 Philosophy Writing Seminar.	
		^Must take one Operations Research Elective. Fall options: MATH 4750 Probability & Statistics II, MATH 4900 Independent Studies, STAT 4420 Data Visualization, STAT 4440 Time Series Analysis, STAT 4450 Machine Learning & Data Mining.	
		#Students need at least 120 credits and a minimum of 27 upper level credits throughout the entire degree, with at least 18 credits of upper level coursework taken within the major/concentration. May need to select 3000/4000 level free electives to reach the 27 credit minimum.	
		Credits	15
		Total Credits	120

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

This plan is not a contract and curriculum is subject to change

Additional Information About this Plan:

University Degree Requirements: The minimum number of hours for a UNO undergraduate degree is 120 credit hours. Please review the requirements for your specific program to determine all requirements for the program. In order to graduate on-time (four years for an undergraduate degree), you need to take 30 hours each year.

Placement Exams: For Math, English, Foreign Language, a placement exam may be required. More information on these exams can be found at <https://www.unomaha.edu/enrollment-management/testing-center/placement-exams/information.php>

**Transfer credit or placement exam scores may change suggested plan of study