PROGRESSIVE DEGREE PROGRAM
COURSE PLAN TEMPLATE

USC SCHOOL	Viterbi School of Engineering
ACADEMIC DEPARTMENT	Daniel J. Epstein Department of Industrial & Systems Engineering
GRADUATE PROGRAM	MS NLTX (Analytics)
POST CODE	1570
TERM EFFECTIVE DATE	Fall 2023

PROGRAM DESCRIPTION
A brief description of the graduate program.

The Master of Science in Analytics is designed to satisfy the growing demand for professionals equipped with significant technical and quantitative training in the fundamentals of analytics for solving engineering and management problems in today's data-extensive digital world.

Analytics is a multidisciplinary field that relates the application of engineering approaches and methods to the analysis and management of engineering and enterprise processes based on data. Learning objectives of this program involve data collection, cleansing, fusing and curating, for the purpose of analyzing trends, discovering patterns and building decision models for well-reasoned decision support. Rigorous mathematical modeling and computational methods tools are at the heart of the program.

COMMON BACHELOR DEGREE PROGRAM PATHWAYS
A list of common bachelor's degrees that undergraduate students pursue in advance of pursuing a progressive degree option with this graduate program. Some programs are restricted to certain majors while others are open to all students.

Analytics	Mechanical Engineering
Financial Engineering	
Data Science	
Industrial & Systems Engineering	

PREPARATORY UNDERGRADUATE COURSES
A list of courses at the undergraduate level that prepare students for the graduate program. Required coursework is listed first, followed by recommended courses. If not applicable, this section will be blank.

Dept. Prefix - Course #	Course Title	Required or Recommended	Units
ISE 150	Computer Programming	Required	
ISE-220	Foundations of Probability Modeling	Required	
ISE-225	Calc Based Statistics	Required	
MATH 229	Calculus, I, II, III for Engineers and Scientists	Required	
MATH 225	Linear Algebra and linear differential Equations	Required	

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UNDERGRADUATE COURSES USED TO REDUCE GRADUATE LEVEL UNITS

A list of undergraduate level courses that may be used to reduce the number of graduate level units required for the graduate program. If there are none, that is specified instead.

Dept. Prefix - Course #	Course Title	Units
	NONE	

CORE GRADUATE PROGRAM REQUIREMENTS (# units required)

A list of all required graduate courses for the graduate program. None of these courses may be used toward satisfying undergraduate degree requirements.

If special exceptions for any of these courses are made by the academic department, the course # is marked with an asterisk (*) and the exception is explained in the "Department Notes" section at the end of this course plan template.

Dept. Prefix - Course #	Course Title	Units
Core Courses (required)		**12**
ISE-529	**Predictive Analytics**	**4**
ISE-530	**Optimization Methods for Analytics**	**4**
ISE-558	**Data Management for Analytics**	**4**
Group A (choose one)		**4**
ISE-533	**Integrative Analytics**	**4**
ISE-534	**Data Analytics Consulting**	**4**
ISE-580	**Performance Analysis with Simulation**	**4**
Group B (choose one)		**4**
ISE-525	**Design of Experiments**	**4**
ISE-535	**Data Mining**	**4**
ISE-537	**Financial Analytics**	**4**
ISE-538	**Performance Analysis Using Markov Models**	**4**
ISE-540	**Text Analytics**	**4**
ISE-543	**Enterprise Business Intelligence & Systems Analytics**	**4**
ISE-562	**Decision Analysis**	**4**
ISE-580	**Performance Analysis with Simulation**	**4**
	Total Units	**20**

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PRE-APPROVED ELECTIVE COURSEWORK

Elective coursework is approved at the discretion of the academic department. Note the following details about the total number and units required of elective coursework.

8	**TOTAL ELECTIVE UNITS REQUIRED FOR THE TRADITIONAL GRADUATE DEGREE**
0	**TOTAL ELECTIVE UNITS REQUIRED FOR THE PROGRESSIVE GRADUATE DEGREE**

TOTAL UNIT COUNTS AND REQUIRED GRADUATE UNITS

28	**TOTAL UNITS REQUIRED FOR THE TRADITIONAL GRADUATE DEGREE**
8	**TOTAL GRADUATE UNITS THAT MAY BE WAIVED (IF ANY)**
20	**MINIMUM NUMBER OF GRADUATE UNITS THAT MUST BE AT THE 500 LEVEL OR ABOVE**

NOTES FROM THE DEPARTMENT

This section highlights any unique considerations, exceptions, or requirements for the graduate program. If a program has specific restrictions (courses, majors, etc.), they are detailed below.

Project courses (Group A) and Methodology courses (Group B) cannot be double counted.

Kelly Goulis	8/29/2023 | 8:19:47 PM PDT
Authorizing Dean's Name	**Date Approved**

Senior Associate Dean, Viterbi School of Engineering

Authorizing Dean's Title

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Master's Degree – Analytics
Progressive Degree Option

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Analytics is a multidisciplinary field that relates the application of engineering approaches and methods to the analysis and management of engineering and enterprise processes based on data. Learning objectives of this program involve data collection, cleansing, fusing and curating, for the purpose of analyzing trends, discovering patterns and building decision models for well-reasoned decision support. Rigorous mathematical modeling and computational methods tools are at the heart of the program.

Graduates of this program will be prepared to convert data into meaningful information, embedded in decision support systems that can help organizations make important operational decisions and help set strategic direction and policy.

Required Courses (12 units)

ISE 529 Predictive Analytics Units: 4
ISE 530 Optimization Methods for Analytics Units: 4
ISE 558 Data Management for Analytics Units: 4

Group A (4 units) Select one course.

ISE 533 Integrative Analytics Units: 4
ISE 534 Data Analytics Consulting Units: 4
ISE 580 Performance Analysis with Simulation Units: 4

Group B (4 units) Select one course.

ISE 525 Design of Experiments Units: 4
ISE 535 Data Mining Units: 4
ISE 537 Financial Analytics Units: 4
ISE 538 Performance Analysis Using Markov Models Units: 4
ISE 540 Text Analytics Units: 4
ISE 543 Enterprise Business Intelligence & Systems Analytics Units: 4
ISE 562 Decision Analysis Units: 4
ISE 580 Performance Analysis with Simulation Units: 4

*Total Units Required for the PDP degree: 20

Last Revised 6/6/2023