

# MACHINE LEARNING/ ARTIFICIAL INTELLIGENCE MAJOR

The **Machine Learning/Artificial Intelligence** major is designed to provide an opportunity to all business majors. They will gain an understanding of the applied use of data mining, data visualization, and machine learning and artificial intelligence.

The International Data Corporation (<https://www.idc.com/>) predicts that data will grow from 33 zettabytes to 175 zettabytes by 2025. A zettabyte is approximately the size of a trillion gigabytes. This is a 61% compounded annual growth rate. Around half of this data will likely live in the cloud. The numbers are staggering and the implications are huge.

MLBA give analysts the ability to process and find meaning in these extremely large data sets. MLBA are not only prized skills, but will likely become the most demanded skill for job applicants in the coming years.

Further, the SAS Institute asserts that "...it's possible to quickly and automatically produce models that can analyze bigger, more complex data and deliver faster, more accurate results – even on a very large scale." This helps organizations to be increasingly capable in a highly competitive world, while minimizing unknown risks ([https://www.sas.com/en\\_us/insights/analytics/machine-learning.html](https://www.sas.com/en_us/insights/analytics/machine-learning.html)).

## Learning Goals and Outcomes

**Goal 1:** Students will be able to demonstrate a conceptual and intuitive understanding of the common machine learning algorithms (inc. Supervised and Unsupervised Learning) and when each kind of technique may be appropriate.

**Goal 2:** Students will be able to define the structure and components of a Python program (using loops, decision statements, functions, and libraries). Additionally, they will be able to work with Python libraries for data processing, and data visualization.

**Goal 3:** Students will be able to design and implement various machine learning algorithms in a range of business applications.

**Goal 4:** Students will demonstrate the use of data mining models that can identify hidden patterns and rules.

**Goal 5:** Students will be able to communicate clearly and effectively in composing and delivering oral presentations to the target audience.

## Requirements

The traditional undergraduate programs includes a minimum of 120 credits distributed across three components: A General Education component divided into Signature Courses, Variable Courses, and an Integrative Learning requirement; a Major and Divisional component; and Free Electives. In addition to course requirements as specified in each area, students must complete one certified course in each of the following overlay areas<sup>1</sup>:

1. Diversity, Globalization or Non-western Area Studies,
2. Ethics Intensive
3. Writing Intensive, and
4. Diversity

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Overlay requirements are part of the 120 credit requirements

## General Education Signature Courses

See this page about Signature courses (<https://academiccatalog.sju.edu/curricula/#signature>).

## General Education Variable Courses

See this page about Variable courses (<https://academiccatalog.sju.edu/curricula/#variable>). Six to Nine courses

## General Education Overlays

See this page about Overlays (<https://academiccatalog.sju.edu/curricula/#overlay>).

## General Education Integrative Learning Component

See this page about Integrative Learning Component (<https://academiccatalog.sju.edu/curricula/#integrative-learning>). Three courses:

Code	Title	Hours
<b>ILC 1: Economics</b>		<b>3</b>
ECN 102	Introductory Economics Macro	
<b>ILC 2: Mathematics</b>		<b>3</b>
MAT 123	Differential Calculus	
MAT 155	Fundamentals of Calculus	
MAT 161	Calculus I	
<b>ILC 3: Non Department ILC: Select one from the following courses:</b>		<b>3</b>
<b>Accounting</b>		
ACC 205	Fin Acc Info Sys I	
ACC 212	Management Acc Info Systems	
<b>Business</b>		
BUS 495	Business Strategy	
<b>Computer Science</b>		
CSC 120	Computer Science I	
CSC 125	CSC I: Programming Fundamentals	
<b>English</b>		
ENG 263	Writing for Organizations	
ENG 264	Scientific Writing	
<b>Finance</b>		
FIN 201	Markets and Institutions	
FIN 225	Fund of Quantitative Finance	
<b>Mathematics</b>		
MAT 132	Math of Games & Politics	
<b>Psychology</b>		
PSY 190	Intro Research Method Soc Sci	
PSY 210	Research Methods	
<b>Theology</b>		
THE 372	Technology Ethics	
<b>Total Hours</b>		<b>9</b>

## Business Foundation

Ten courses, including:

Code	Title	Hours
ACC 101	Concepts of Financial Acct	3
ACC 102	Managerial Accounting	3
DSS 100	Excel Competency	1
DSS 200	Intro to Information Systems	3
DSS 210	Business Statistics	3
DSS 220	Business Analytics	3
FIN 200	Intro to Finance	3
or FIN 225	Fund of Quantitative Finance	
MGT 110	Essent'ls of Organzational Beh	3
or MGT 120	Essentials of Management	
MGT 360	Legal Environment of Business	3
MKT 201	Principles of Marketing	3
BUS 495	Business Strategy <sup>1</sup>	3
or ACC 423	Accounting Control Systems	
<b>Total Hours</b>		<b>31</b>

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Accounting Majors can choose between ACC 423 and BUS BUS 495

## Major Requirements

Code	Title	Hours
DSS 325	Open Source Program Lang	3
DSS 415	Data Wrangling & Visualization	3
or DSS 416	Data Wrangling: Ethics Int.	
DSS 420	Introduction to Data Mining	3
DSS 451	Machine Learning for Bus I	3
DSS 455	Machine Learning for Bus II	3
<b>DSS Elective (select one of the following):</b>		<b>3</b>
DSS 330	Database Management	
DSS 425	Analytics Cup	
DSS 435	Advanced Business Analytics	
DSS 445	Statistical Programming Lang	
DSS 465	Supply Chain Analytics	
DSS 470	DSS Special Topics I	
DSS 471	DSS Special Topics II	
DSS 493	Independent Study I	
DSS 494	Independent Study II	
<b>Total Hours</b>		<b>18</b>