B.S. IN DATA ANALYTICS AND INTELLIGENCE FOR SOCIAL IMPACT

Overview

The **Bachelor of Science in Data Analytics and Intelligence for Social Impact** (DAISI) is designed to produce decision-makers who can collect, analyze, and use data to generate insight that increases social impact. It is a *collaborative, interdisciplinary, and customizable* program that will equip UM graduates with the technical capabilities of data intelligence and analytics, critical thinking skills, and a strong theoretical foundation in education and social sciences such as sociology, psychology, geology, communication. As communities require solutions that address the complexities of the challenges they encounter, and organizations, especially non-profits, drive to be more impactful, this integrated approach will offer students the knowledge and skill sets to not only learn how to collect, measure, and report data, but more importantly, they will be able to contextualize the data, detect potential areas for bias, and derive insights that result in more responsible data-driven information and decision-making.

In a collaboration with various departments at UM, students will learn key analytic skills (i.e., data collection, data cleaning, data management, and data analysis) and tools (i.e., Excel, Tableau, R/SAS/Python programming, and machine learning) that are required for collecting, managing, and analyzing data and persuasively communicating insights that address real-world challenges.   In addition to the required courses, students will have the flexibility to customize their studies with a selection of courses drawn from various disciplines. This integrated approach provides students with an opportunity to apply substantive knowledge and skills to a discipline based on their areas of interest and professional goals. The experience culminates in field experiences and practicums which allow students to collaborate with community partners, and critically apply theories, methodologies, and knowledge relevant for more responsible data-driven information and decision-making. This program is ideal for students, who would like to make a definitive, long-lasting social impact that is equally beneficial for all individuals and communities based on more representative and unbiased data as it is applied in various fields such as health services, education, and community development, and public affairs.

Curriculum Requirements

Code	Title	Credit Hours
MAJOR REQUIREMENTS (21 courses)		
Foundation: Core Courses (9 courses)		
EPS 291	Community and Character Development	3
EPS 361	Community Psychology and Development	3
EPS 371	Applied Social Research Methods	3
EPS 251	(Excel/Tableau (or equivalencies))	3
EPS 351	Introduction to Statistics and Research Design	3
CIM 203	Intro to Creative Coding	3
CSC 115	Python Programming for Everyone	3
JMM 331	Introduction to Infographics and Data Visualization	3
COS 211	Public Speaking	3
Diversity (Choose minimum 1 course)		**3**
EPS 412	Migration, Well Being, and Human Development	
EPS 430	Creating Belonging Through Dialogue	
TAL 205	Contemporary Issues in Disability and Society	
Practicum (2 courses)		
EPS 578	Community and Applied Psychological Studies Practicum	3
EPS 579	Community and Applied Psychological Studies Practicum Seminar	3
Advanced Courses (9 courses)		
EPS 462	Community Consultation and Leadership	3
EPS 401	Advanced statistics: Using regression for predictive modeling	3
EPS 372	Survey Methodology for the Social and Behavioral Sciences (Survey research)	3
EPS 402	Statistical Programing in R and SAS	3
EPS 403	Introduction to Machine Learning using Python	3
EPS 452	Community Program Development and Evaluation	3
EPS 405	Text Mining for the Social and Behavioral Sciences (Text/Sentiment Analysis)	3
GEG 310	Geographic Information Systems I	3
GEG 305	Spatial Data Analysis I	3

ELECTIVES (7 courses) Consultation with Academic Advisor		**21**
SPECIAL ELECTIVES (Choose minimum 3 courses) Consultation with Academic Advisor		**9**
GENERAL EDUCATION REQUIREMENTS		
Written Communication Skills		
WRS 105	First-Year Writing I	3
WRS 106	First-Year Writing II	3
or ENG 106	Writing About Literature and Culture	
or WRS 107	First-Year Writing II: STEM	
Quantitative Skills:		
MTH 108	Precalculus Mathematics II	3
Areas of Knowledge:		
Arts & Humanities Cognate (3 courses)		9
People and Society Cognate (3 courses)		9
STEM Cognate (fulfilled through the major)		
Total Credit Hours		**120**

** Every student majoring in Data Analytics and Intelligence for Social Impact will complete the Advanced Writing and Communication Requirement upon fulfillment of their major courses. These courses have a prerequisite requirement of WRS105 and WRS106/WRS107/ENG106 and will be identified as either writing intensive or as an oral/verbal communication proficiency course or both. Competency in both written and oral communication will also be assessed. Writing intensive courses require a minimum of 2500 written words; assignments will be assessed for analytical ability, synthesis of information, grammar, content, and style. Courses designated as oral/verbal proficiency classes will provide students an opportunity to demonstrate their presentation skills using accurate, standard English structure and syntax, non-verbal cues and gestures, as well as audience-appropriate language. Courses in Data Analytics and Intelligence for Social Impact, which meet the Advanced Writing and Communication Requirements are EPS351, EPS401, and EPS579.

Students in EPS351 are required to demonstrate their competency in both written and oral communication skills by completing a research-intensive paper that summarizes 1) research problems, the population of interests, and the goals/objectives of the project; 2) a literature review of theoretical and empirical backgrounds relevant to the context and research design; and 3) detailed description of the research design, data collection, and data analysis plan. Students in EPS401 are required to demonstrate their competency in both written and oral communication skills by completing a research-intensive paper that (1) describes data collection and analysis procedures, (2) summarizes findings from the data both numerically and visually, and (3) provides the implication of their findings relevant to all potential stakeholders.

Students' research papers in those oral/verbal proficiency classes should be in a format for **publication** (**must follow the style and formatting guidance [e.g., APA, MLA]**). Also, peer-, self-, and faculty evaluations of the oral paper presentations will be used to assess students' verbal and non-verbal communication skills.

Sample special electives 1 – Data Analytics and Intelligence for Social Impacts

EPS 311 Group Processes and Development: Fall & Spring

EPS 365 Psychological Study of Children, Families, and the Law, Fall

GSS 315 Gender, Race, and Class, Fall

SOC 487 Race, Ethnicity, and Criminal Justice, Fall & Spring

BPH 305 Issues in Health Disparities Spring

MSC 220 Climate and Global Change Fall & Spring

CIM 563 Design with Al

GEG 410 Geographic Information Systems II

Sample special electives 2 – Data Intelligence and Analytics for Environmental Justice

ECS 113 Introduction to Environmental Policy, Fall & Spring

ECS 302 Perspectives on Environmental Decision Making, Fall & Spring

ECS 371 Readings in Ecosystem Science and Policy, Fall, Spring & Summer

ECS 204 Environmental Statistics, Fall & Spring

MSC 342 Decision Making and the Environment, Spring

MSC 220 Climate and Global Change, Fall & Spring

CIM 563 Design with AI

GEG 410 Geographic Information Systems II

Sample special electives 3 - Data Intelligence and Analytics for Public Health

GHS 201 Introduction to Global Health

SOC 321 Applied Health Policy

INS 201 Globalization and Change in World Politics

INS 572

GHS 330 Topics in Global Health Studies: Humanities

COS 324 Health Communication Fall & Spring

BPH 305 Issues in Health Disparities Spring

HCS 465 Public Health Statistics and Data Management, Fall

CIM 563 Design with AI

GEG 410 Geographic Information Systems II

Sample special electives 4 - Data Intelligence and Analytics for Criminal Justice

SOC 101 Introduction to Sociology, Fall, Spring, & Summer

SOC 271 Criminal Justice, Fall, Spring, & Summer

SOC 371 Criminology, Fall & Spring

SOC 487 Race, Ethnicity, and Criminal Justice Fall & Spring

GSS 315 Gender, Race, and Class, Fall

EPS 365 Psychological Study of Children, Families, and the Law, Fall

CIM 563 Design with AI

GEG 410 Geographic Information Systems II

Suggested Plan of Study
B.S. Data Analytics and Intelligence for Social Impacts

Freshman Year		
Fall		**Credit Hours**
WRS 105	First-Year Writing I	3
MTH 108	Precalculus Mathematics II	3
EPS 291	Community and Character Development	3
EPS 251	Excel	3
Arts & Humanities Cognate		3
	Credit Hours	**15**
Spring		
WRS 106	First-Year Writing II	3
EPS 351	Introduction to Statistics and Research Design	3
EPS 371	Applied Social Research Methods	3
Diversity Requirement (1)		3

(Special Elective)		3
	Credit Hours	**15**
Sophomore Year		
Fall		
EPS 371	Applied Social Research Methods	3
CSC 115	Python Programming for Everyone	3
People & Society Cognate OR Elective		3
Elective		3
(Special Elective)		3
	Credit Hours	**15**
Spring		
EPS 361	Community Psychology and Development	3
CIM 203	Intro to Creative Coding	3
JMM 331	Introduction to Infographics and Data Visualization	3
COS 211	Public Speaking	3
(Special Elective)		3
	Credit Hours	**15**
Junior Year		
Fall		
EPS 402	Statistical Programing in R and SAS	3
EPS 401	Advanced statistics: Using regression for predictive modeling	3
EPS 452	Community Program Development and Evaluation	3
(Special Elective)		3
Arts & Humanities Cognate		3
	Credit Hours	**15**
Spring		
EPS 462	Community Consultation and Leadership	3
EPS 405	Text Mining for the Social and Behavioral Sciences (Text/Sentiment)	3
EPS 372	Survey Methodology for the Social and Behavioral Sciences (Survey research)	3
GEG 305	Spatial Data Analysis I	3
People & Society Cognate OR Elective		3
	Credit Hours	**15**
Senior Year		
Fall		
EPS 403	Introduction to Machine Learning using Python	3
GEG 310	Geographic Information Systems I	3
People & Society Cognate OR Elective		3
(Special Elective)		3
Elective		3
Senior Credit Check		
	Credit Hours	**15**
Spring		
EPS 578	Community and Applied Psychological Studies Practicum	3
EPS 579	Community and Applied Psychological Studies Practicum Seminar	3
Arts & Humanities Cognate		3
(Special Elective)		3
Elective		3
	Credit Hours	**15**
	Total Credit Hours	**120**

Program Mission

It is the mission of the Data Analytics and Intelligence for Social Impact (DAISI) program to generate socially responsible change agents, who are empowered with the knowledge, skills, and attitudes to draw unbiassed and equitable data-driven information for policies and practices that promote social, cultural, economic, structural, political, and environmental justice. We strive to produce undergraduates who generate, collect, assess, and analyze trustworthy and reliable data, and can persuasively communicate data-driven insights that increase social impact. With a strong theoretical and methodological foundation for understanding and catalyzing social change; mastering analytic skills and tools required for data intelligence and data analytics in each stage of the data lifecycle, the training in visualization and communication, UM undergraduates will be able to critically assess and understand the deep-rooted complexities of real-world social challenges, systematically tackle the social, cultural, economic, and structural disparities, and contribute to increasing social impact.

Program Goals

The BS in Data Intelligence and Analytics for Social Impact (DAISI) will create an interdisciplinary and collaborative learning environment that teaches students how to critically apply theories, knowledge, skills, and attitudes that will draw data-driven decisions for unbiased, representative, inclusive, and equitable practices and policies based on trustworthy and reliable data and its use. The program promotes an understanding of the social, cultural, economic, political, and structural issues, the value of data-driven decision-making processes and community engagements, and the importance of social responsibility and active participation in civic life.

Student Learning Outcomes

1. Students will be able to recognize and analyze issues around social, cultural, economic, political, and structural biases and inequities.
2. Students will be able to understand the application of theories, methodologies, and knowledge relevant to social change and their use in practice.
3. Students will be able to combine multiple perspectives including social, computational, statistical, and
4. Students will be able to understand the application of data analytic skills and apply tools required in each stage of the data lifecycle to handle real-life social challenges.
5. Students will be able to critically evaluate tools and apply appropriate techniques to the solution of real-world complex problems, communicate findings, and effectively present results using data visualization techniques.
6. Students will be able to recognize and analyze ethical dilemmas related to data collection, data security, integrity, and privacy and apply ethical practices and make well-reasoned ethical decisions.
7. Students will be able to demonstrate the use of teamwork, collaboration, leadership skills, decision-making, and communication.
8. Students will be able to engage in socially responsible and ethical decision-making processes based on trustworthy and reliable data for policies and practices.
9. Students will be able to collaborate with community partners and stakeholders to identify and address social, cultural, economic, political, and structural biases and inequities in the field of student's interests and professional goals.