

Criminal Justice Data Analytics (CJDA)

Program Director: Darren Wheelock, Ph.D.

Criminal Justice and Data Analytics website (<https://www.marquette.edu/grad/programs-criminal-justice-data-analytics.php>)

Degree Offered

Master of Science, Plan B only

Program Description

The master of science in criminal justice data analytics (CJDA) is designed to develop graduates with the skills and knowledge to harness data and employ analytical tools effectively to inform ethical planning, decision making, and problem solving in provider, payer and government organizations in criminal justice. The program also offers an accelerated 5-year bachelor's and master's degree option.

Learning Outcomes

Students completing the master of science in criminal justice data analytics will be able to:

1. Identify crime analysis opportunities that can be ethically addressed through an understanding of crime, criminal offending, the operations of criminal justice organizations, and the US criminal justice system.
2. Design and implement strategies for analyzing crime data using appropriate methods, tools, and datasets.
3. Analyze crime data to create actionable information, and use it to establish priorities, make decisions, and solve problems aligning with the ethics, needs, and values of individuals, communities, and stakeholders.
4. Display and explain the results of criminal justice data analytics projects using effective written, graphic, and verbal tools and techniques.
5. Use advanced data processing tools incorporating regulatory, data governance, master data management, data profiling, parallel and distributed processing best practices.

Prerequisites for Admission

Applicants should have:

- A baccalaureate degree from an accredited university in criminal justice, a related social science, data science, or other relevant educational experience with a cumulative GPA of at least 3.200.
- A grade of B or above in a computer coding and programming course (e.g., COSC 1010 Introduction to Software Development or COSC 6500 Foundations of Computing).
- A grade of B or above in an undergraduate statistics course (e.g., SOCI 2060 Social Statistics or PSYC 2001 Psychological Measurements and Statistics, or equivalent).
- A GPA of 3.200 or higher in undergraduate upper-division course work.

Application Deadlines

Admission to the program is made on a rolling basis, but priority consideration is given to applicants who apply by February 15th. The deadlines for financial aid consideration are February 15 for the following fall term and November 15 for the following spring term.

Application requirements

Applicants must submit, directly to the Graduate School:

1. A completed application form and fee online (<https://www.marquette.edu/grad/future-apply.php>).
2. Copies of all college/university transcripts except Marquette.¹
3. Official GRE scores. Waived if cumulative GPA is 3.200 or higher.
4. A statement of purpose describing reasons for pursuing an advanced degree and career goals.
5. Two recommendation letters from professors familiar with student's academic achievements and qualifications.
6. (For international applicants only) a TOEFL score or other acceptable proof of English proficiency.

¹ Upon admission, final official transcripts from all previously attended colleges/universities, with certified English translations if original language is not English, must be submitted to the Graduate School within the first five weeks of the term of admission or a hold preventing registration for future terms will be placed on the student's record.

Criminal Justice Data Analytics Master's Requirements

The master of science in criminal justice data analytics (CJDA) is interdisciplinary program designed to utilize the existing data science program and expertise in the criminology and law studies program. Computer science (COSC) courses compose the program's data analytics core and provide instruction and training in computer science, data science and managing/manipulating large data sets. Criminology and law studies (CRLS) courses provide the context for applying the skills developed in the data analytics core to criminal justice related fields. The CRLS course work also includes a practicum, which provides students with an opportunity to analyze criminal justice data in collaboration with local agencies and organizations to examine evidence-based decisions and their ethical implications.

Program Requirements

Students must complete a total of 30 credit hours of course work for the master of science degree in criminal justice data analytics. This interdisciplinary program is composed of 15 credit hours in data analytics courses and 15 credit hours in criminology and law studies courses, including the practicum. The practicum's culminating experience provides the student an opportunity to work independently with a local non-profit or government agency through a community-engaged learning experience.

Required Course work

CRLS 5700	Ethics in Criminal Justice	3
CRLS 6100	Advanced Social Statistics	3
CRLS 6200	Introduction to Geographic Information Systems (GIS)	3
CRLS Elective - choose one of the following:		3
CRLS 5000	Criminological Theory	
CRLS 5350	Neighborhoods and Crime	
CRLS 5360	Crime Mapping	
COSC 5500	Advanced Data Science	3
COSC 5820	Ethical and Social Implications of Data	3
COSC 6510	Business Intelligence	3
COSC 6520	Business Analytics ¹	3
or COSC 6540	Data Analytics	
COSC 6570	Data at Scale ²	3
or COSC 6060	Parallel and Distributed Systems	
or COSC 6380	Advanced Database Systems	
CRLS 6975	Criminal Justice Data Analytics Practicum	3
Total Credit Hours		30

¹ COSC 6540 Data Analytics recommended for students with a programming background

² COSC 6060 Parallel and Distributed Systems or COSC 6380 Advanced Database Systems recommended for students with a computer science background

MASTER'S DEGREE WITH THE DATA SCIENCE CERTIFICATE

The Department of Computer Science offers a data science certificate. If a criminal justice data analytics master's student chooses to also earn the certificate, admission to both programs may be concurrent. The same courses may be used to satisfy the requirements of the master's program and certificate, as outlined in the university bulletin for each program. Students are expected to be admitted into all programs they intend to complete, although course work completed prior to admission may be allowed to apply toward program requirements. Certificates must be approved individually via the curriculum approval process as Title IV aid eligible in order for students in any of these programs to be eligible to apply for federal financial aid.

Details on the data science certificate can be found in this bulletin.

ACCELERATED DEGREE PROGRAM

The accelerated degree program (ADP) is designed to give Marquette University undergraduate students a more efficient means to obtain a master of science degree in criminal justice data analytics. Interested Marquette students in their junior year (or equivalent) must meet the following criteria in order to apply for the ADP:

- Students must have a minimum cumulative undergraduate GPA of 3.200.
- Students must have completed at least 18 credits of CRLS course work (6 courses) by the end of their junior year.

Undergraduates participating in this program are granted early admission to the Graduate School and are allowed to take specific graduate-level courses during their senior year. Candidates for admission should submit transcripts and two letters of recommendation, but need not submit GRE scores. Candidates for admission to this program should notify the department director of graduate studies of their intentions.

Anthropology Courses

ANTH 5144. The Rise of Agriculture. 3 cr. hrs.

Process and variation in the development of farming and herding societies. Archaeological record pertaining to domestication of plants and animals in North and South America, Near East, Africa, and East Asia.

ANTH 5245. Archaeology of Complex Societies. 3 cr. hrs.

Patterns of processes involved in the development of complex social systems. Archaeological records of state formation and urbanization in Egypt, Mesopotamia, and Mesoamerica.

ANTH 5247. Bioarchaeology: Linking Bones and Behavior. 3 cr. hrs.

Reconstructs patterns of human behavior from integrated biological data sets. Archaeological evidence is drawn from human skeletal, plant, and faunal remains. Addresses questions of nutrition, pathology, occupation, and mortuary ritual.

ANTH 5251. Human Osteology and Odontology. 3 cr. hrs.

The anatomy of the skeleton and teeth. Methods of analysis of biological dynamics of past populations including reconstruction of population structure and patterns of disease.

ANTH 5252. Origins of the Human Species. 3 cr. hrs.

The biological past of the species sapiens. The biological legacy of the non-human primate past and the fossils which exemplify the evolutionary trends of our species.

ANTH 5253. Forensic Anthropology. 3 cr. hrs.

Survey of the applications of human biology in criminalistics, including forensic applications of skeletal analysis, dermatoglyphics, DNA and hair. Studies methods of handling and analyzing these evidentiary materials, as well as the probative value each has in the criminal justice system. Special emphasis on the methods of personal identification. Reviews case studies of mass disasters, human rights abuses and homicides to demonstrate the utility of techniques taught in the course.

ANTH 5255. Sex and Evolution. 3 cr. hrs.

The evolutionary significance of sex. Mechanisms of reproduction and sexual reproduction as a source of variation. Reproductive anatomy, sexual strategies and adaptation as well as sexual selection in the order Primates.

ANTH 5316. Culture Change and Development. 3 cr. hrs.

Societal changes analyzed from holistic anthropological perspective. Recognizing factors of long-term cultural change; modernization of the West and Third World countries; ecological and social problems related to development in the contemporary world.

ANTH 5320. Culture, Law and Violence. 3 cr. hrs.

Explores domestic violence, sexual assault and the death penalty in different legal cultures across the globe. Focuses on how different cultures define and respond to violent crime as it relates to family, intimate partner violence and sexual assault. Includes discussion of cultural variations in the death penalty.

ANTH 5931. Topics in Anthropology. 3 cr. hrs.

Various topics are designated in the Schedule of Classes. May be taken a maximum of two times.

ANTH 5964. Archaeological Fieldwork. 3 cr. hrs.

An introduction to methods used in the excavation and analysis of prehistoric sites. Surveying techniques, stratigraphy, analyses of soils and landforms, analytical fundamentals of prehistoric material remains.

Criminology Law Studies Courses

CRLS 5000. Criminological Theory. 3 cr. hrs.

Analysis of the nature and consequences of delinquency and crime. Classical and contemporary examinations of criminal behavior. The effects of social interaction, social class, social organization, small groups, and other variables on crime patterns and efforts to cope with crime. Relationship of criminological theory to social policy issues.

CRLS 5100. Ultimate Penalties in the Criminal Justice System. 3 cr. hrs.

A critical look at the rationales and history of corporal punishment, capital punishment, and life imprisonment without possibility of parole in order to understand the endurance of these types of sanctions in modern society. The focus will be on the philosophical, legal, social, and political aspects of the punishments. Research on ultimate punishments, such as frequency of use, characteristics of offenses and offenders, will also be presented. In addition, the course will examine the experience of sentenced offenders and their families, and correctional staff in implementing the punishments.

CRLS 5110. Media Perspectives on Urban Crime. 3 cr. hrs.

Historical overview of how urban crime has been portrayed in the media. Analysis of contemporary media presentations of urban crime, criminals, and the criminal justice system (including police, courts, and the correctional system). Social scientific theory and analysis regarding media portrayals of crime, criminals, and the criminal justice system.

CRLS 5120. Comparative Justice Systems. 3 cr. hrs.

The nature and character of police, prosecutorial, court, and correctional activity and operations in world legal systems. An examination of common law, civil law, socialist, and Islamic systems of law and social control.

CRLS 5130. Women, Crime, and Criminal Justice. 3 cr. hrs.

Examination of the roles of women in the criminal justice system. Critical analysis of the relationship of women as offenders, as victims, and as agents of social control. Review of relevant theories and practices and both historical and contemporary issues.

CRLS 5170. Organized Crime. 3 cr. hrs.

Examination of the political, social, and economic conditions involved in the appearance and expansion of organized crime in the United States. Descriptions of structures as well as internal and external dynamics, including incentives and penalties employed by criminal groups. Explanation of investigative techniques and impact of police, courts, and correctional agencies.

CRLS 5180. Empathy, Crime and Justice. 3 cr. hrs.

Social justice approach to the study of empathy as it relates to crime and justice; explore and cultivate various modes of empathic knowing, specifically as these relate to criminal defendants, victims of crime, and various actors in the criminal justice system.

CRLS 5250. Clinical Criminology. 3 cr. hrs.

The theory, research and practice dimensions of clinical criminology, with a focus on sociological, psychiatric, biological, biosocial learning, cognitive, psychoanalytic theory. Examination of deviant and/or criminal interactions and their consequences. Topics for possible inclusion: substance abusers, psychopathic and violent offenders, spouse and child abusers, sex offenders, juvenile offenders, female offenders. Orientation to clinical techniques and therapy as they apply to intervention, decision-making, incarceration and sentencing, and modifications of behavior.

CRLS 5340. Financial Crime Investigation. 3 cr. hrs.

Introduces current perspectives and procedures used by the financial investigator in detecting and resolving financial crimes. Includes specific study of: methods of tracing funds, financial record keeping, accounting, interviewing techniques and law and evidence as they relate to financial investigations.

CRLS 5350. Neighborhoods and Crime. 3 cr. hrs.

Surveys theoretical and empirical literature on the role that neighborhood characteristics play in crime, and to examine the utility of crime prevention strategies for reducing neighborhood crime rates. An additional objective is to develop the skills necessary to investigate Milwaukee neighborhood crime patterns and to create and deliver professional presentations and technical reports.

CRLS 5360. Crime Mapping. 3 cr. hrs.

A technological introduction to the basic functionality of ESRI's ArcGIS for mapping and analyzing crime data. Students learn skills to create crime maps and analyze crime patterns and develop a solid base upon which to build further expertise in geographic information system (GIS) software and spatial analysis.

CRLS 5400. Criminal Law and Procedure. 3 cr. hrs.

Studies criminal substantive law; constitutional limits and principles of criminal law and liability; defenses to criminal liability; definitions and classification; criminal procedure of crimes; constitutional limits and protections of criminal procedure.

CRLS 5550. Crime Control. 3 cr. hrs.

Contemporary issues in criminal justice and social control. Evaluates the effectiveness of various crime control strategies and explore their social utility and implications for social stratification. Discusses crucial socio-legal questions and philosophical debates concerning crime control policies.

CRLS 5600. Evidence. 3 cr. hrs.

Basic principles of the law of evidence. Presentation of oral and demonstrative evidence in the trial process. The quantum of proof in criminal proceedings.

CRLS 5640. Family Violence and Public Intervention. 3 cr. hrs.

Analysis of maltreatment of children, youth, spouses, and seniors within the family. Examination of causes and intervention methods emphasizing the response of actors and government agencies.

CRLS 5660. Criminal Violence in America. 3 cr. hrs.

Analysis of violent crime in American society and ways in which the criminal justice system responds to it. Examination of the causes of violent crime, its prevention, treatment and public policy ramifications. Historical and contemporary understanding of the significance of violence in American culture. Critical evaluation of methods utilized to deal with violent offenders.

CRLS 5700. Ethics in Criminal Justice. 3 cr. hrs.

An overview of prevailing ethical controversies confronting the process and agencies of contemporary criminal justice. Special attention given to concrete ethical issues and dilemmas, which are encountered regularly by participants in the major components of the criminal justice system. Attention is given to another emerging trend in the field: evidence-based criminal justice policy that relies heavily on criminal justice analytics, algorithms and predictive statistical modelling.

CRLS 5931. Topics in Criminology and Law. 3 cr. hrs.

Lectures and discussions in a broad area which, because of its topicality, is not the subject of a regular course. The special topics will be designated in the Schedule of Classes. May be taken a maximum of two times.

CRLS 6100. Advanced Social Statistics. 3 cr. hrs.

An advanced statistics course examining multivariate regression models for the social sciences and common statistical software packages including STATA. Builds upon basic mathematical functions for advanced-level statistics. Develops advanced skills in multivariate linear OLS, GLS and nonlinear models with categorical dependent variables. Examines techniques in regression diagnostics and tests of robustness. Concludes with model specification of two-way interaction effects. Prereq: SOCI 2060 or equiv.

CRLS 6200. Introduction to Geographic Information Systems (GIS). 3 cr. hrs.

An introduction to Geographic Information Systems (GIS). Designed to provide students with a working knowledge of GIS. Gives instruction on how to use GIS analytical tools to expand and enhance the understanding of spatially referenced phenomena. Examines foundational concepts behind Geographic Information Science (GIScience) to properly use GIS analytical tools. Incorporates diverse learning activities including lectures, PowerPoint presentations, instructor-led skills training and student practice sessions.

CRLS 6975. Criminal Justice Data Analytics Practicum. 3 cr. hrs.

Serves as the CJDA capstone experience. Practical application of knowledge and skills in a crime and intelligence/crime analysis unit of a criminal justice agency. Topic determined by the instructor in conjunction with a community partner from a criminal justice-related institution, agency or organization within the Milwaukee community. Designed to afford graduate students the opportunity to use their skills to solve to an organizational problem and to cultivate relationships with community partners. Prereq: CRLS 6100 and admitted to the CJDA program.

Social Welfare and Justice Courses**SOWJ 5300. Advanced Practice in Social Welfare and Justice. 3 cr. hrs.**

Students strengthen their skills in interviewing, data collection, problem appraisal, and the development of contracts for planned change. Competence is developed in carrying out contract plans, evaluating results, renegotiating contracts and terminating contracts. Working with families and groups is further examined.

SOWJ 5500. Ethics in Social Welfare and Justice. 3 cr. hrs.

An in-depth examination of ethical issues and special challenges that characterize the fields of social work, social welfare and social justice. Explores value dilemmas, stresses and frustrations that may confront professionals in these fields.

SOWJ 5600. Faith-based Activism. 3 cr. hrs.

Analyzes sociologically a range of historic and contemporary faith-based movements through the lens of social movement theory. Examines variations in goals, framing, strategies, mobilization, engagement of symbols and movement cultures as they are recorded in movement literature, oral histories, archives, films and scholarly studies. Prereq: SOWJ 1001 or cons. of instr.

SOWJ 5700. Global Aid and Humanitarianism. 3 cr. hrs.

Introduction to governmental, nongovernmental and volunteer efforts in global aid and humanitarianism. Explores ethical and practical dilemmas in solving internationally identified social problems, such as child soldiers, sex trafficking and global hunger. Examines how aid and humanitarian systems can be part of the problem rather than the solution. Additional areas of debate may include global health as a right and achievable goal, tensions between cultural relativism and human rights and "voluntourism."

SOWJ 5931. Topics in Social Welfare and Justice. 3 cr. hrs.

Special areas and themes. Specific topics will be designated in the Schedule of Classes.

Sociology Courses**SOCI 5050. Urban Ethnography: The City as Laboratory. 3 cr. hrs.**

Explores urban processes and institutions "from the inside." Initially focuses on the study of various ethnographies. Next, requires "hands-on" research, involving: observing human interaction, preparing field notes, conducting focused interviews, analyzing the collected data, and preparing a data-based research paper.

SOCI 5100. Urban Life. 3 cr. hrs.

Social psychological aspects of urban life and experience. Implications of urbanization for individuals and groups. Ecological, cultural, and institutional influences. Interpersonal and intergroup relations in urban settings. Topics may include conflict, alienation, diversity.

SOCI 5130. Sociology of Human Values. 3 cr. hrs.

Definitions of values in economics, linguistics, communication and sociology. The value system of selected sociologists. Values and sociocultural pluralism.

SOCI 5200. Personal Troubles and Public Issues. 3 cr. hrs.

Deals with the social realities of troubles, which range from circumstances that we treat as irksome to major traumas in our lives that become social problems. Focuses on the commonalities shared by these various social constructions. Draws from a variety of disciplines, notably sociology, social work, anthropology, history, psychology, linguistics and rhetorical studies. SOCI 1001 recommended.

SOCI 5250. African-American Social Thought. 3 cr. hrs.

Examination of historical and contemporary writings of Black social theorists. The impact of historical, social, economic, and cultural factors on Blacks in the United States and alternative strategies for change.

SOCI 5270. Urban Sociology. 3 cr. hrs.

Urban society with special consideration of the problems of dealing with the structures, institutions, agencies and decision-making units in a metropolitan area.

SOCI 5300. Sociology of Aging. 3 cr. hrs.

The place of the aged in contemporary society. Disengagement and the social integration of older persons. Roles linking older persons to society and roles in hospitals, nursing homes and homes for the aged.

SOCI 5400. Social Inequality. 3 cr. hrs.

Theories and systems of social class in modern society. Societal structures and processes resulting from stratification phenomena.

SOCI 5420. Sociology of Religion. 3 cr. hrs.

The sociological study of religious groups, institutions and behavior, including relationships between religion and other areas of social life.

SOCI 5430. Christianity and Sexuality in the U.S.. 3 cr. hrs.

Explores the very recent historical development of sexuality and its intersections with U.S. Christianity. Engages readings from multiple disciplines, emphasizing intersectional perspectives on religion, gender, sexuality, race and social class through U.S. history.

SOCI 5440. Sociology of Education. 3 cr. hrs.

Sociological analysis of educational institutions with primary emphasis on contemporary U.S. urban education, student subcultures, school-community relations and innovations.

SOCI 5450. Sociology of Sex and Gender. 3 cr. hrs.

Biological and cultural bases of sex and gender patterns. Impact of major social institutions and processes on maintenance of gender patterns, with questions of power and dominance central to discussion. Benefits and costs of stereotypic gender patterns. Mechanisms and alternative directions for change. Includes historical and cross-cultural research.

SOCI 5460. Sociology of Work and Occupations. 3 cr. hrs.

The diverse ways in which human beings make their livings in both industrialized and nonindustrialized societies. Career patterns and work problems. Theories about work and workers. Proposals for improving the quality of modern work.

SOCI 5480. Complex Organizations. 3 cr. hrs.

Theories and research on the sociology of organization. The social functions, structures and processes of formal and informal organizational systems in modern society and their relationships to social behavior. The nature and place of bureaucracies in complex societies.

SOCI 5600. The Social Reality of Crime and Justice. 3 cr. hrs.

A critical examination of the ways in which crime is defined, how crime control policies are established, and how the criminal justice system responds to the problem of crime. Specific attention given to the social and political context in which crime is talked about and responded to. Examines alternative approaches to crime control, such as peacemaking criminology and restorative justice.

SOCI 5660. Law and Society. 3 cr. hrs.

The social components of legal organizations and procedural systems. The role of law as an instrument of social control and social change.

SOCI 5680. Sociology of Mental Illness. 3 cr. hrs.

Review of major sociological and social psychological models of madness. Analysis of definitions and responses to mental illness. Study of the social processing involved in the production, recognition and treatment of mental illness.

SOCI 5700. Political Sociology. 3 cr. hrs.

The interrelationship of politics and society. Special consideration of leadership analysis, party systems, public opinion, electoral behavior and conflict situations.

SOCI 5720. Sociology of Community. 3 cr. hrs.

Discussion of contemporary problems of rural, urban and suburban communities including ecological and communication patterns, problems of identity, organization and motivation.

SOCI 5730. Capitalism and Society. 3 cr. hrs.

Explores the relationship between capitalism and society. Examines the ways in which capitalism is an engine for freedom, prosperity and efficiency and a source of exploitation and inequality. Topics may include the role of capitalism in the environment, the health care system, economic inequality, and government.

SOCI 5740. Social Change. 3 cr. hrs.

Selected topics dealing with models and theories of innovation, diffusion, resistance to change and associated conflict in and between social systems. Contents vary; subtitles indicate precise contents.

SOCI 5931. Topics in Sociology. 3 cr. hrs.

Lectures and discussions in an area which, because of its topicality, is not the subject of a regular course. Specific topics will be designated in the Schedule of Classes.