Bachelor of Science (BS) in Information Technology with a minor in Data Management

Effective January 8, 2018
The Data Management minor is designed to provide learners with the knowledge, skills, and abilities necessary to support an effective data management program in a variety of settings. The curriculum addresses the range of process and workflow concepts and activities specific to effective management of organizational data assets. Specific topics include data governance, architecture, design and integration, database administration, data modeling and standards, and strategies and techniques in traditional, distributed, and virtual environments. Learners integrate recognized concepts in business process, data architecture and design, and database development with best practices used in real-world situations, in order to excel as practitioners in their chosen careers. Upon successful completion of this minor, learners are prepared to effectively solve business challenges using a variety of data management processes. This minor provides foundational information for learners with an interest in pursuing Certified Data Management Professional (CDMP) certification offered by Data Management Association (DAMA).

A University on Top of IT Industry Trends

With the emergence of globalization and outsourcing, the field of information technology poses new challenges to IT professionals who want to advance in their careers. Previously it was enough simply to stay focused on “hard” skills through IT certifications and training. Today, organizations are looking for IT professionals who also understand the business needs of the enterprise, the creative possibilities of technology, and how to integrate that technology into complex enterprise-wide systems. Capella is aware of these trends and continues to adjust its curricula to keep up with the needs of this rapidly, changing, dynamic field.
# Career Information

## RELATED EMPLOYMENT SETTINGS TO EXPLORE

- Corporation
- Nonprofit organization
- Public, private, or for-profit educational institution
- Information technology consulting firm
- Financial services organization
- Retail organization
- Small business
- Manufacturing company
- Advertising or marketing agency
- Market research firm
- Government—local, state, and federal
- Health care organization
- Web development company
- Telecommunications organization
- Software development company

## RELATED JOB TITLES TO EXPLORE*

- Data analyst
- Data specialist
- Data developer
- Data management analyst
- Data management specialist
- Data management developer
- Information systems technologist
- Information systems analyst
- Quality assurance specialist
- Quality assurance analyst
- Consultant
- Database administrator
- Information manager
- Database architect
- Data warehouse architect
- Data modeler
- Data governance steward
- Project manager
- Functional manager
- ELT developer
- Application developer
- Database developer

## SPECIALIZATION OUTCOMES

- Communicate effectively in business environments
- Use IT tools for decision-making
- Collaborate using IT tools in an organization
- Understand ethical, legal, and policy issues associated with IT
- Solve loosely-defined problems with technology solutions
- Create IT solutions to solve organizational problems
- Plan strategically for global and domestic environments
- Design and model effective IT solutions for an organization

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*These are examples intended to serve as a general guide. Because many factors determine what position an individual may attain, Capella cannot guarantee that a graduate will secure any specific job title.

†Residents of Washington may receive credit for prior learning only in the bachelor’s and MBA programs.
Curriculum

- 45 general education quarter credits
- 54 core course quarter credits
- 24 minor course quarter credits
- 51 elective course quarter credits
- 6 capstone course quarter credits
- Total program credits: 180 quarter credits

GENERAL EDUCATION REQUIREMENTS
Choose 45 quarter credits with a minimum of 6 quarter credits from each of the following categories: communication, humanities, natural science and mathematics, and social science.

Required courses:
- MAT1050 College Algebra .................................. 6 quarter credits
- MAT2051* Discrete Mathematics .............................. 6 quarter credits

CORE COURSES
- IT1006 Information Technology Concepts and Practices ........................................ 6 quarter credits OR
- IT3006 Communication Strategies for the Information Technology Professional ........................................ 6 quarter credits
- IT2230 Introduction to Database Systems ........................................... 3 quarter credits
- IT2249 Introduction to Programming with Java ........................................... 6 quarter credits
- IT2250 Introduction to Network Technology ........................................... 3 quarter credits
- IT3165 Ethics for the Information Technology Professional ........................................... 3 quarter credits
- IT3212 Introduction to Web Development .................................................................. 3 quarter credits
- IT3215* Introduction to Javascript .................................................................. 3 quarter credits
- IT3225 Business Goals for the Information Technology Professional ........................................... 3 quarter credits
- IT3301* User Experience and Interaction Design ........................................... 3 quarter credits
- IT3315 Hardware and Operating Systems ........................................... 3 quarter credits
- IT3318 Systems Administration ........................................... 3 quarter credits
- IT3345* Software Architecture .................................................................. 3 quarter credits
- IT3349* Intermediate Java Programming .................................................................. 3 quarter credits
- IT3355* Network Architecture .................................................................. 3 quarter credits
- IT3358 Information Security Concepts for the Information Technology Professional ........................................... 3 quarter credits
- PM3000 Principles of Project Management ........................................... 3 quarter credits

MINOR COURSES
- IT4200* Data Governance and Stewardship ........................................... 3 quarter credits
- BUS4200* Identifying Core Business Processes and Master Data ........................................... 3 quarter credits
- IT4210* Data Architecture and Design ........................................... 3 quarter credits
- IT4220* Database Administration ........................................... 3 quarter credits
- IT4230* Managing Data Integration ........................................... 3 quarter credits
- IT4240* Data Quality Management ........................................... 3 quarter credits
- IT4450* Data Modeling Standards and Techniques ........................................... 3 quarter credits
- IT4460* Data Distribution and Virtualization ........................................... 3 quarter credits

ELECTIVE COURSES
Choose 51 quarter credits of additional undergraduate courses.

CAPSTONE COURSE
Taken during the learner's final quarter:
- IT4990 Information Technology Capstone Project ........................................... 6 quarter credits

*Denotes courses that have prerequisite(s). Refer to the course descriptions for further details.

The courses in this program may require live web conferencing activities and/or learner audio/video recordings. Learners who require assistive technology or alternative communication methods to participate in these activities should contact Disability Services to request accommodations.
Required General Education Course Descriptions

**MAT1050  College Algebra**  
6 QUARTER CREDITS
Learners in this course evaluate and perform linear, exponential, logarithmic, and other mathematical functions that include algebraic, graphic, and numeric properties. Learners then apply these concepts to the social and natural sciences, business, and everyday life.

**MAT2051  Discrete Mathematics**  
6 QUARTER CREDITS
This course presents an overview of mathematical analysis techniques. Learners apply number logic and set theory, functions and sequences, relations equivalence, partial order, digraphs, recurrence relations, counting techniques, logic and techniques of proof, graphs, and algorithms to the fields of business and information technology. *Prerequisite(s): MAT1050.*

Core Course Descriptions

**IT1006  Information Technology Concepts and Practices**  
6 QUARTER CREDITS
Learners in this course use terminology, concept analysis, and practical knowledge of the components of computing systems to develop their understanding of the information technology field. Throughout the course, learners also build, demonstrate, and apply skills needed for professional communication. *For BS in Information Technology learners only. Learners may only receive credit for IT1006 or IT3006. Must be taken during the learner’s first quarter. Cannot be fulfilled by transfer or prior learning assessment.*

**IT3006  Communication Strategies for the Information Technology Professional**  
6 QUARTER CREDITS
In this course, learners analyze contemporary topics from the field of information technology. Learners gain knowledge and experience in computing systems and systems requirements, options, and issues. Learners also strengthen and apply skills needed for professional communication. *For BS in Information Technology learners only. Learners may only receive credit for IT1006 or IT3006. Must be taken during the learner’s first quarter. Cannot be fulfilled by transfer or prior learning assessment.*

**IT2230  Introduction to Database Systems**  
3 QUARTER CREDITS
This course is an introduction to the fundamental concepts of databases and database management systems (DBMS). Learners demonstrate vocabulary, component requirements, sorting and querying, and maintenance of simple databases using the fundamentals of database manipulation. Learners also apply Structured Query Language (SQL) and MS Access.

**IT2249  Introduction to Programming with Java**  
6 QUARTER CREDITS
This course introduces learners to the programming discipline and prepares them to serve as Java programmers. Learners study and apply the fundamentals of the Java programming language such as data types, variables, expressions, statements, and methods. Learners also examine and practice the Java-object-oriented features of classes and objects. The course offers numerous opportunities for analyzing, designing, coding, testing, debugging, and evaluating Java programs in an authentic Java development environment.

**IT2250  Introduction to Network Technology**  
3 QUARTER CREDITS
In this course, an introduction to the basic concepts of network technology, learners manipulate the open systems interconnection (OSI) model, local area networks (LANs), metropolitan area networks (MANs), wide area networks (WANs), network devices, and network wiring standards. Learners also apply security architecture, construct network designs, build network operating systems, and validate ways networks function in order to support organizations.
IT3165  Ethics for the Information Technology Professional  3 QUARTER CREDITS
Learners in this course identify and apply their knowledge of inherent ethical concerns in the information technology profession to cultural and human interaction in global and domestic issues. Learners also show evidence of their understanding of ethical codes related to web technologies, intellectual property, and cybercrime.

IT3212  Introduction to Web Development  3 QUARTER CREDITS
This course focuses on the development of fundamental web design and development skills. Learners create web pages using HTML5 markup language and apply contemporary design principles to create a W3C compliant website. Learners format the page layout, structure, and visual design elements using CSS3, with emphasis placed on effective coding, visual design, and user experience.

IT3215  Introduction to JavaScript  3 QUARTER CREDITS
This course introduces JavaScript for interactive web pages. Learners in this course cover the JavaScript scripting language essentials, including flow control, form validation, animation, and Document Object Model (DOM) manipulation. Learners develop client-side, platform independent functionality using JavaScript to enhance user experience with HTML5 and CSS3. This course provides a foundation for other web technologies such as jQuery and AJAX.  
Prerequisite(s): Completion of or concurrent registration in IT3212.

IT3225  Business Goals for the Information Technology Professional  3 QUARTER CREDITS
This course focuses on core enterprise organizations, business processes, and information technology infrastructures. Learners display their understanding of the value of information technology in achieving organizational maturity. Learners in this course apply their knowledge of the relationship that exists between an enterprise organization's business and information technology goals with operational models.

IT3301  User Experience and Interaction Design  3 QUARTER CREDITS
In this course, learners explore the boundary between humans and technology with a focus on the human factors that influence the design of effective interfaces and engaging user experiences. Learners analyze designs for enterprise, mobile, and web interactive environments. Learners also define user characteristics, design for accessibility, and appraise usability.  
Prerequisite(s): IT2240 or IT2249.

IT3315  Hardware and Operating Systems  3 QUARTER CREDITS
In this course, learners demonstrate their knowledge of hardware and operating systems, focusing on peripherals and file management. Learners use modern operating systems, including Windows, Linux and MacOS to demonstrate their skill with hardware and operating systems.

IT3318  Systems Administration  3 QUARTER CREDITS
Learners demonstrate their knowledge and skills in system administration and synthesize their understanding of systems administration to plan for a division of administrative tasks typical of organizations of different sizes.

IT3345  Software Architecture  3 QUARTER CREDITS
Learners in this course demonstrate their knowledge and skills with the fundamentals of software and database architecture using UML diagrams. Learners synthesize this knowledge in order to conduct a requirements analysis and to design a network architecture. They also demonstrate the other steps in the software development life cycle (SDLC).  
Prerequisite(s): Completion of or concurrent registration in IT2230.

IT3349  Intermediate Java Programming  3 QUARTER CREDITS
This course focuses on beyond basic features and techniques of the Java programming language. Learners study and practice advanced object-oriented programming concepts like inheritance, polymorphism, interfaces, and abstract classes. Learners also cover programming Graphical User Interface (GUI) applications with Java and the Java rich library of data structures like lists, stacks, and queues. Learners apply these features and techniques to develop applications of moderate complexity.  
Prerequisite(s): IT2249.
IT3355  Network Architecture
Learners in this course demonstrate their knowledge and skills with the fundamentals of network architecture. Learners apply knowledge of network characteristics and network topologies to develop a scope document for a proposed network architecture. 
Prerequisite(s): Completion of or concurrent registration in IT2250.

IT3358  Information Security Concepts for the Information Technology Professional
Learners in this course demonstrate their knowledge of information security fundamentals. Learners apply their understanding of the concepts of confidentiality, integrity, and availability to the basics of access control and network security measures.

PM3000  Principles of Project Management
In this course, learners are introduced to the fundamental basics of project management and gain a broad overview of project management standards and their applicability to both business and IT projects. This course emphasizes management theories, concepts, tools and techniques defined by the Project Management Institute (PMI®) including the Process Groups and Knowledge Areas. This course also introduces other project management methodologies and frameworks, including Agile (Scrum, Lean, DSDM and XP), PRINCE2®, Waterfall, and Six Sigma. Finally, learners study project politics and ethics, collaboration and team building, and leadership.

Minor Course Descriptions

IT4200  Data Governance and Stewardship
This course covers legal and ethical issues pertaining to information security and privacy. Learners demonstrate an understanding of core organizational processes and workflows and how these factors impact core data processes. Prerequisite(s): BS in Information Technology learners must have completed IT2230.

BUS4200  Identifying Core Business Processes and Master Data
Learners in this course cover the role and importance of core business processes and corresponding databases used to create master data, which supports the development of effective data-related procedures for a decision support system. This course also explores tools and strategies for mapping core business processes and master data, and presents how data integrity, structure, and quality impact the ability to apply master data within a particular context. Finally, this course considers data manipulation using external and internal data in various formats. Prerequisite(s): BS in Information Technology Data Management learners must have completed IT2230.

IT4210  Data Architecture and Design
In this course learners identify the role data architects play in data and metadata design and management. Learners explore tools and strategies used by data architects and the importance of data storage solutions to the support of data management. Prerequisite(s): IT2230.

IT4220  Database Administration
This course focuses on the roles and responsibilities of database administrators and explores how they contribute to data management. Learners determine how database design, administration, regulations, and standards impact effective data management processes. Learners also explore the tools and strategies that allow a database administrator to support data management. Prerequisite(s): IT2230.

IT4230  Managing Data Integration
Learners in this course study data integration and the role it plays in data management. Topics include evaluation of legal and ethical environments that dictate the strategies and tools available for data integration within the data management context. Learners explore methodologies, tools, and strategies that enhance the ability for data integration to support data management. Prerequisite(s): IT2230.
IT4240  Data Quality Management
This course focuses on the role data quality plays in the creation of effective data management processes and workflows. Learners research and apply methodologies, strategies, and tools that play a role in measuring and applying data quality and data cleansing as part of an effective data management program. Prerequisite(s): IT2230.

IT4450  Data Modeling Standards and Techniques
In this course, learners evaluate the role data models, standards, and techniques play in an effective data management program. Topics include exploration of data structure options and how those options impact the creation of data models. Learners apply tools and techniques to demonstrate how they support data management. Prerequisite(s): IT2230.

IT4460  Data Distribution and Virtualization
Learners in this course explore the role that distributed, cloud-based, and virtualized environments play on processes and workflows related to the management and analysis of core data. The course focuses on the research and application of tools and strategies that allow effective data management and analysis of core data within the constraints of distributed and virtualized environments. Learners study the impact that subjects of core data projects have on security and privacy. Prerequisite(s): IT2230.

Capstone Course Description

IT4990  Information Technology Capstone Project
In this course, learners apply knowledge and skills from other courses as they develop a project that benefits an organization, community, or industry. Learners prepare a proposal that includes a project description, deliverables, completion dates, and associated learning. Upon approval from the instructor, learners execute the proposal, record their progress weekly using a project tracking website, and produce a final project report. For BS in Information Technology learners only. Must be taken during the learner’s final quarter. Cannot be fulfilled by transfer or prior learning assessment.
Financial Aid

Capella University offers assistance to learners who qualify and would like to secure educational funding to help finance their academic program. A number of options are available, given the diverse needs and backgrounds of prospective learners. Options include:

- Federal Direct Stafford Loan Program
- Federal Direct PLUS Loan Program
- Non-federal loans through preferred lenders and financial institutions
- Capella scholarships
- External scholarships
- Veterans’ educational benefits and U.S. armed forces discounts
- Corporate and higher education alliances
- Employer tuition reimbursement

Regarding loan programs, interest rates for Stafford student loans are low compared to other types of consumer loans, and repayment can be deferred until after graduation. In compliance with federal and state laws, Capella University has established policies for all learners regarding satisfactory academic progress, which is necessary for financial aid eligibility.
Academic Leadership

Rhonda Capron, EdD
Dean
Dr. Rhonda Capron is an accomplished leader with remarkable business acumen, extensive academic experience and professional relevance within the confluence of today’s transformative marketplace. She brings a unique blend of background and experience to Capella as a seasoned executive and higher education leader with more than 15 years of experience successfully leading strategic initiatives and operations within high-tech businesses. She also has 10 years in higher education, including extensive, hands-on experience teaching; faculty and staff leadership; academic programming; curriculum development; and strategic planning. Dr. Capron joined Capella in 2016. She was previously the academic dean of the School of Business at University of Phoenix. Prior to that position, she held a number of academic leadership roles at William Jessup University in Rocklin, California. In addition she has an extensive background in both the business sector and the military. Rhonda was vice president of support services and software as a service at Oracle Corporation, and she served as the deputy director for operations within the Departments of Army and Energy.

Bill Dafnis, PhD
Associate Dean
Dr. Bill Dafnis is the associate dean of technology in Capella University’s School of Business and Technology. Bill joined Capella in 2014 to serve as faculty chair in the ABET-accredited BS in IT program. Prior to joining Capella, Bill served in faculty and academic leadership roles at other academic institutions. Preceding his academic career, Bill traversed a distinguished 20-year profession with the Chicago-based media conglomerate Tribune Company in leadership roles inclusive of information technology, project management, and operations management. Bill holds a PhD in Information Systems from Nova Southeastern University, Master of Science in Information Technology with a security focus from Carnegie Mellon University, Master of Business Administration from Lake Forest College, and Bachelor of Arts from the University of Illinois and is certified as a Project Management Professional (PMP). His research interests include the intersection of disruptive change and innovation planning, cloud computing economic models, business process modeling, project management, and information security.

Brett Miller, PhD
Faculty Chair
Dr. Miller is the faculty chair for Capella’s Information Technology undergraduate program. In this role, Dr. Miller is responsible for overseeing the health and viability of the IT program and to ensure learners are able to meet their respective goals and objectives. Prior to assuming his current position, Dr. Miller was a full-time faculty member at Capella, focusing on graduate-level cyber-security courses. Dr. Miller spent 20+ years within the National Intelligence apparatus supporting mission-critical initiatives impacting national and international security. Additionally, Dr. Miller has spent 8+ years as an educator teaching college/university-level courses in the topics of national security, homeland security, intelligence, and cyber and information assurance. Dr. Miller holds a PhD in Business Administration, Master of Strategic Studies, Master of Science in Telecommunications and Computers, Master of Science in Information Technology Systems Management, and Bachelor of Science in Computer Science from Park University. He is a certified Intelligence Community Officer and a graduate of two of the Department of Defense’s most prestigious leadership programs: the United States Army War College and the Defense Leadership and Management Program (DLAMP). Additionally, Dr. Miller attended the National Defense University, completing the Advanced Management Program and the DoD CIO Certificate program.
Move Forward with Capella University

WORKING SCHOLARS
Capella provides an online, flexible learning environment for working adults who are also determined scholars. That connection between academic and professional work infuses the entire Capella experience—from the faculty we recruit to the course projects you complete. The theories discussed in the courseroom are designed to develop working knowledge for everyday situations.

AN ACCREDITED UNIVERSITY
Our accreditation* is an assurance to students, employers, and the public that Capella University meets established standards for quality of faculty, curriculum, and learner services. It is also an important factor in the ability to transfer credits among higher education institutions. Regional accreditation, the type held by Capella, is the most common type for major public, state, and private institutions in the United States.

VALUING YOUR KNOWLEDGE AND EXPERIENCE
Adults bring a wealth of experience and learning to their education. Capella courses are designed to bring out your perspectives just as you gain from others’ ideas. Your knowledge can also be worth time and money: An enrollment counselor can help you estimate how much of your prior learning may apply toward your Capella degree program.

Important Information about the educational debt, earnings, and completion rates of students who attended this program: http://capellaresults.com/assets/includes/gainfulemployment/cta/GE/GE15/bachelors/BS_IT_Data_Mgmt_Minor_gedt.html.