



# Middle Georgia State University

School of Computing  
Department of Information Technology

## SECTION 1 - GENERAL COURSE INFORMATION

<b>Course Title:</b>	Data Science and Analytics Strategy
<b>Course Prefix and Number:</b>	ITEC 8100
<b>Course CRN#:</b>	21661
<b>Semester &amp; Session:</b>	Spring 2022 – Term I
<b>Campus Location:</b>	Online
<b>Meeting Days:</b>	This course will be conducted completely online
<b>Meeting Time:</b>	This is a doctoral-level course and will be conducted completely online in an asynchronous format. Access via D2L Course Shell

## INSTRUCTOR'S INFORMATION

<b>Name:</b>	Dr. Myungjae Kwak, Professor
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<b>Office Hours:</b>	Available by Appointment

## COVID-19 STATEMENT

The University System of Georgia (USG) continues to recognize COVID-19 vaccines and boosters offer safe, effective protection and urges all students, faculty, staff and visitors to get vaccinated and/or boosted either on campus or with a local provider.

We encourage our MGA community to adopt a self-care and personal responsibility approach to wellness as positive actions to protect self and others; each of us doing our part to keep the MGA community healthy and campus academics and activities thriving. We ask you to complete the **self report form** if you have tested positive to COVID-19 and review the **Quarantine and Isolation Calculator** to determine the appropriate actions to take. Visit updated information at this website: <https://www.mga.edu/coronavirus/>.

Carefully review your syllabus, D2L announcements, or email for details.

## SECTION 2 - DETAILED COURSE INFORMATION

**Expected Characteristics:** *The ability to work and think independently is one of the fundamental requirements for studying in the DSc IT degree program. Being independent means that you are confident and highly motivated. You take initiatives and have the ability to take responsibility. You are committed to the program, have good time management and organizational skills. Other vital requirements are curiosity, creativity, discipline and productivity.*

**Course Prerequisite:** Admission to DSc in IT program

**Credit Hours:** 3

**Course Description:** This course will provide the students with an understanding of how organizations can leverage data science and analytics to gain competitive advantage.

**Course Philosophy:** The goal of this course is to provide a high-level overview of data science and analytics with some level of practical coding techniques to students. This is designed to have students think about how decision making based on data science and analytics can bring competitive advantages to organizations. Students will interact with one another for the final group project, but each student still completes all their own work. The course should provide new insights about data science to most students, and they use data science and analytics for strategic decision making within their organizations and/or even for academic research.

Every activity is equally important and thus are weighted as such in the grading. Missing a single activity drops the student from Excellent to Satisfactory. Each activity is required, and students are expected to put forth their best effort throughout.

**Student learning outcomes:**

*Upon completion of this course, students will be able to -*

- Describe the role of data science and analytics in organizational strategy.
- Describe how organizations can use data to obtain competitive advantage.
- Use data science and analytics tools for extracting intelligence from data.
- Analyze data to identify opportunities and challenges for organizations.

**Topics:**

*We will examine the following areas including, but not limited to:*

- Data science
- Big data analytics
- Strategic management
- Data strategy
- Effective organizational decision making
- Data science tools and techniques
- Emerging data science tools

**Required course materials:** **R in Action, Third Edition: Data analysis and graphics with R and Tidyverse 3rd Edition**, Robert I. Kabacoff, ISBN-13: 978-1617296055, Manning; 3rd edition (May 3, 2022)

Other resources will be available via GALILEO or open access materials.

**Technology Requirement:** *The following will be used in this course:*

- This course will use R and R Studio as main programming language and tool.
- R can be downloaded from this site. <https://www.r-project.org/>
- R Studio is available in <https://www.rstudio.com/products/rstudio/download/>
- Install instructions
  - Windows 10 - <https://www.youtube.com/watch?v=p9hJJWwzgs>
  - Windows 11 - <https://www.youtube.com/watch?v=jQgl8jCNIO4>
  - Mac - <https://www.youtube.com/watch?v=JqV-USGR6AA>

**Library/Learning Resources:** As a Middle Georgia State University student, you have complete access to GALILEO (Georgia Library Learning Online), a virtual library of licensed commercial databases. It provides access to over 100 databases indexing thousands of periodicals and scholarly journals. There are over 10,000 journal titles available in full text. Additional GALILEO resources include e-books, government documents, reference collections, and video databases. The Middle Georgia State University library also has a core collection with locally purchased resources to support this graduate course. Currently, the exclusive e-holdings for the M.S. in Information Technology graduate courses are as follows: e-Journals = 1,661 and e-books = 4,325. The following are examples of online databases that support this undergraduate course. They are available to you through GALILEO and/or institutionally funded subscriptions:

- ACM Digital Library
- Computer Source
- Computing (ProQuest)
- Academic Search Complete
- Research Library (ProQuest)
- Wilson Omnifile: Full-Text Mega Edition
- Google Scholar

### SECTION 3 – COURSE ASSESSMENT INFORMATION

#### Overview of Grading

**Excellent.** The quality of work meets the doctoral requirements in both originality and mastery of the material. This is equivalent to an A grade.

**Satisfactory.** The work meets the minimum requirements. The work is short of excellence, originality, and does not fully demonstrate mastery of the material. This is equivalent to a B grade.

**Unsatisfactory:** The work is deficient as the minimum requirements have not been. This is equivalent to an F grade. (An(Anything below a Satisfactory (B-level) is deemed to be a failing grade.)

**Your grade for the semester will be determined by the following assessment of completed assignments. The letter grade for this course is based on the total points earned on all assignments.**

## Grading Breakdown

The grading of the course breaks down as follows:

Assignments	Weight
Assignments	3 @ 10% each = 30%
Discussions	6 @ 5% each = 30%
Midterm Project	15%
Final Group Project	25%
<b>Total</b>	<b>100%</b>

Letter Grade	Percent
A	90% - 100%
B	80% - 89%
C	70% - 79%
D	60% - 69%
F	59% or less

## Overview of Course Assignments

### Graded Discussions

A discussion will have two or three topics related to module objectives. Students are required to discuss each topic with their own thoughts, and they will need to make at least one comments on peer's discussion.

### Assignments

Each assignment will be either Case Study or Coding. Case study will typically require students to analyze a given business case/problem and discuss two or three topics, and Coding is to analyze datasets using R and R Studio.

### Midterm Project

Each student will analyze datasets using a series of data analytics methods and interpret the results.

### Final Group Project

Three students will work together to analyze a dataset from an industry/organization to identify its opportunities and challenges using various data analysis techniques, write a comprehensive report, and make a 5 to 10-minute video presentation.

## SECTION 4 - INSTRUCTOR-SPECIFIC POLICIES

### General Guidance.

This syllabus is provided for general guidance on course activities and expectations. The instructor reserves the right to modify the syllabus in response to changing student needs or pedagogical circumstances. Changes are announced in class and posted in D2L/Brightspace.

## SECTION 5 – TENTATIVE COURSE SCHEDULE AND OUTLIN

Modules	Readings	Assessments
<b>Week 1 – Data Science and Analytics</b>	<p><b>Readings</b></p> <ul style="list-style-type: none"> <li>- Introduction to R</li> </ul> <p>Data science and its relationship to big data and data-driven decision making</p>	<ul style="list-style-type: none"> <li>• Each student must complete the “I am present” assignment before the deadline. This assignment has no points but will be a verification of attendance.</li> <li>• Discussion #1 – Concepts of Data Science and Analytics</li> </ul>
<b>Week 2 – Descriptive Analytics</b>	<p><b>Readings</b></p> <ul style="list-style-type: none"> <li>- Getting started with graphs</li> <li>- Creating a data set</li> </ul> <p>Nature of Data, Statistical Modeling, and Visualization</p>	<ul style="list-style-type: none"> <li>• Assignment #1 – R Coding for descriptive analytics (data management, shaping, and visualization)</li> <li>• Discussion #2</li> </ul>
<b>Week 3 – Predictive Analytics I</b>	<p><b>Readings</b></p> <ul style="list-style-type: none"> <li>- Data management</li> </ul> <p>Data Mining Process, Methods, and Algorithms</p>	<ul style="list-style-type: none"> <li>• Assignment #2 – R Coding</li> <li>• Discussion #3</li> </ul>
<b>Week 4 – Predictive Analytics II</b>	<p><b>Readings</b></p> <ul style="list-style-type: none"> <li>- Basic graphs</li> <li>- Regression</li> </ul>	<ul style="list-style-type: none"> <li>• Midterm Project</li> </ul>
<b>Week 5 – Text Mining</b>	<p><b>Readings</b></p> <p>Text, Web, and Social Media Analytics</p>	<ul style="list-style-type: none"> <li>• Discussion #4</li> </ul>
<b>Week 6 – Machine Learning I</b>	<p><b>Readings</b></p> <p>Supervised and Unsupervised Learning</p>	<ul style="list-style-type: none"> <li>• Assignment #3 – R Coding</li> <li>• Discussion #5</li> </ul>
<b>Week 7 – Machine Learning II</b>	<p><b>Readings</b></p> <p>Deep Learning</p>	<ul style="list-style-type: none"> <li>• Discussion #6</li> </ul>
<b>Week 8 – Strategic Data-Driven Decision Making</b>	<p><b>Wrap-up</b></p>	<ul style="list-style-type: none"> <li>• Final Group Project – Comprehensive data analysis to identify opportunities and challenges for organizations</li> </ul>

## SECTION 6 - COURSE EXPECTATIONS

### EXPECTATIONS

Online courses are not self-paced and regular participation in online courses is required and will be recorded by your instructor. Students are expected to complete all course assessments using D2L.

Online learning assumes a high level of maturity and professionalism. It is designed to make learning more convenient but no less rigorous. The lack of a formal meeting schedule in an online course can be liberating. It can also be demanding because you must determine when to make time for class. Self-discipline and good time management skills are necessary when taking an online course.

Please remember that you will spend as much or more time completing an online course as you would taking it in a traditional face-to-face/classroom format. The special circumstances of taking an online course demand regular and consistent participation. Be sure to pace yourself throughout the semester making sure your responses to communications and assignments are timely. If you are not able to participate in any assigned class activities, you must contact your instructor immediately.

The instructor is required to report “no-shows” or students who do not show up the first day of class. Therefore, all students enrolled in the course must verify their enrollment. This can affect financial aid and you may be dropped from the class. Your instructor will notify you as to how to verify your enrollment before the beginning of the term to ensure that you are not reported as a “no-show”.

### ATTENDANCE POLICY

Students whose number of absences is more than twice the number of class meetings per week may be assigned a failing grade for the course. Students who have more absences than the number of class meetings per week but less than twice the number of class meetings per week, will be penalized on the participation portion of the grade. Students who have absences which are less than or equal to the number of class meetings per week will not be penalized. This policy holds for face-to-face and hybrid courses.

Students that do not submit any work for more than 14 consecutive days in an online course or partially online course may be assigned a failing grade for the course.

The MGA policy on attendance is found in Section 5.04.05 of the Faculty Handbook and in the Academic Catalog (<https://mga.smartcatalogiq.com/2020-2021/Undergraduate-Catalog/Academic-Policy-and-Information/Course-Policies/Attendance-Policy>).

### CLASS BEHAVIOR EXPECTATIONS AND CONSEQUENCES FOR VIOLATIONS

Middle Georgia State University students are responsible for reading, understanding, and abiding by the MGA Student Code of Conduct.” Student Code of Conduct, Responsibilities, Procedures, and Rights are found at [http://www.mga.edu/student-affairs/docs/MGA\\_Student\\_Handbook.pdf#page=45](http://www.mga.edu/student-affairs/docs/MGA_Student_Handbook.pdf#page=45).

### STUDENT WITHDRAWAL POLICY

Students are encouraged to read the withdrawal policy found at <https://www.mga.edu/registrar/registration/drop-add.php> before dropping/withdrawing from the class.

Students who wish to withdraw from the University must complete the Withdrawal Form, obtaining the required signature from the advisor, and submitting it to the Office of the Registrar at the Macon campus or the administrative offices at other

campuses. Withdrawal is not complete until all withdrawal procedures have been properly executed.

<https://www.mga.edu/registrar/>

Students may withdraw from the course and earn a grade of “W” up to and including the midterm date, which occurs on **February 11<sup>th</sup>, 2023**. After this date students who withdraw will receive a grade of “WF.”

<https://www.mga.edu/academics/calendars/index.php>

### **POLICY ON ACADEMIC MISCONDUCT**

As a Middle Georgia State student and as a student in this class, you are responsible for reading, understanding, and abiding by [Middle Georgia State’s Student Code of Conduct](#).

Quoted directly from the Student Handbook, I believe it is important that you recognize and understand the following about plagiarism and cheating:

1. *Individuals will fulfill their academic responsibilities in an honest and forthright manner.*

Examples of prohibited behavior include but are not limited to: plagiarizing another's work (such as using another's phrasing, concepts or line of reasoning as your own without giving proper credit to the author or creator); submitting course assignments that are not your own; submitting the same paper in different classes without prior approval from both instructors; cheating (the use of any unauthorized means to gain academic advantage on assignments, laboratory reports or examinations); acquiring or using test materials without faculty knowledge; accessing any information, resource, and/or means of communication during an exam or assignment without specific authorization from the professor; failing to follow class policy; obtaining academic benefits through computer fraud or unauthorized access; engaging in academic fraud alone or with others; using material downloaded off Internet without proper citation; illicitly attempting to influence grading; failing to abide by test-taking procedures. The MGA Withdrawal Form, is available online or in the Office of the Registrar. The entire Student Code of Conduct is included in Middle Georgia State’s Student Handbook and is available online at <https://www.mga.edu/student-conduct/>

The penalty for academic misconduct is a grade of zero for the work involved and will be referred to the Dean of Students. Subsequent academic misconduct results in a failing grade for the course.

### **PLAGIARISM POLICY**

A plagiarism prevention service is used in evaluation of written work submitted for this course. As directed by the instructor, students are expected to submit or have their assignments submitted through the service in order to meet requirements for this course. The papers will be retained by the service for the sole purpose of checking for plagiarized content in future student submissions.

### **POLICY ON DISABILITY/ACCESSIBILITY ACCOMMODATIONS**

Students seeking ADA accommodations must contact Middle Georgia State University Office of Accessibility Services in Macon at (478) 471-2985 or in Cochran at (478) 934-3023. <https://www.mga.edu/accessibility-services/>

### **DELAYED OPENING OR CLOSING OF THE UNIVERSITY**

If class is unable to occur for an opening or closing of the university, go to the online webpage of the course for additional instructions. If there are no additional instructions provided on the course homepage news section, then just plan to meet at the normal next regularly scheduled meeting for the course. Knight Alert can be used to check or

<https://www.mga.edu/police/alert/index.php>

## ONLINE COURSE EXPECTATIONS

1. Students must immediately review the tentative course schedule (included as part of the syllabus) for the schedule of discussion activities, assignments, projects, and/or examinations.
2. Students are required to have access to a computer and the Internet.
3. All course materials (i.e., course syllabus, course content, the assignments and the schedule of activities, etc.) are posted in Brightspace D2L course/class web site.
4. Official institutional email (MGA or D2L) is used only for communication between the instructor and students. The instructor will endeavor to reply to your email queries within 12 hours and no more than 24 hours of their receipt, excluding weekends and holidays or during semester breaks. Private email accounts must not be used to communicate between the instructor and students.
5. Students must attend class if they are to be well prepared for the workplace. Online courses are no different from on-campus classroom courses in this regard. Therefore, online students are subject to the college's attendance policy. Please see the "Attendance Policy" in the college's catalog. For online classes, participation must be defined in a different manner. Student attendance in online courses is defined as active participation in the course as described in the course syllabus.
6. Online courses will, at a minimum, have weekly mechanisms for student participation, which can be documented using any or all the following methods: a graded discussion activity that is integral to student engagement and learning; a graded assignment/project/examination.

Your instructor will begin grading all assessments after the deadline and make the results available to you within one week after the due date for the assessment.

## ONLINE DISCUSSIONS AND POSTINGS

### ***Expectations for Achieving Responsible Online Discourse***

One value we must share is respect for individuals - their experience and their ideas or social positions. We also share a genuine desire to learn from one another. In order to demonstrate these shared values, you are encouraged to consider how your tone, word choice, and content may affect other readers. Some ways people achieve responsible public electronic discourse include

- a) calling each other by name on the screen,
- b) using smiley faces (=) to clarify meaning if a writer's tone might be ambiguous,
- c) clarifying with someone courteously before "flaming" back a quick response, and
- d) refraining from publishing or forwarding any questionable jokes or strong language that could offend various readers.

### ***Guidelines for Online Discussions***

Not only respond to your instructor's questions but carry on a dialogue with your classmates as well. This is a discussion, not just a question-and-answer session, and is one of the items that make a good online course and establishes community. If you only respond to your instructor's question it makes the discussion more of an "exam" rather than a dialogue.

Do not get caught up in "winning" the debate. We are here to learn the material, have fun, and to discuss matters of importance with others.



Read all postings from your classmates, not just those from the instructor. Sometimes future questions are based on the insights of your classmates.

When you reply to a post, do not just say "I agree". Give the person or person's name you are agreeing with and be sure to put the reply in the right thread. Also include a brief sentence or two summarizing what they said that you are agreeing with and then your views. You might also consider changing the subject line to reflect your posts. Make it easy for us to figure out who you are talking to and what you are talking about.

If you express an opinion, support it with material from our readings or other sources if applicable. When you quote, summarize, or paraphrase from the text, be sure to give the page number(s) -- This is important! **Count on checking the class website for assignments or discussions at least twice or more per week.**

### **HB 280 CAMPUS CARRY LEGISLATION**

<https://www.mga.edu/police/campus-carry.php>

### **END OF COURSE EVALUATIONS**

Student evaluations of faculty are administered online at the end of each term/session for all courses with five or more students. Students will receive an email containing a link to a survey for each course in which they are enrolled. All responses are anonymous.

### **STUDENT RESPONSIBILITIES**

*Students are responsible for reading, understanding, and adhering to all Middle Georgia State University student policies, including those linked on the [Syllabus Policy](#) page.*

### **ACADEMIC MINDSET BELIEFS**

The course activities/assignments in this course concerning the Academic Mindset shall contribute to your growth, self-efficacy, the relevancy of academic experience, and a sense of belonging. Throughout this course, growth mindset will be strengthened through activities/assignments by constant engagement. The following growth mindsets belief statements are the bedrock of this course and shall be acclaimed into mind by each student:

- I can strengthen my abilities through effort.
- The work in this course has value and purpose for me.
- I embrace new challenges.
- I will succeed if I put effort into my work.
- I will learn from success and failure to continue to improve.
- My effort and attitude are important to my future.