

Predictive Analytics CSDA-5430

S1 2024 Section 01 3 Credits 01/15/2024 to 03/15/2024 Modified 01/16/2024

Meeting Times

Thursday 5:30 PM to 9:30 PM, East Academic Building 152

Contact Information

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Description

This course introduces students to predictive modeling methods, approaches and tools. Students acquire skills in predictive analytics that allow them to develop and use advanced predictive analytics methods. They gain expertise in the use of popular tools and software for predictive analytics and learn how to develop predictive analytics questions, identify and select the most appropriate predictive analytics methods and tools, apply these methods to answer the respective questions, and prepare data-driven solutions.

Requisites

Prerequisites: CSDA 5320 and CSDA 5330.

Outcomes

- Develop and use predictive analytics models to identify relationships among variables and/ or for prediction.
- Use predictive analytics techniques to formulate business questions.
- Select the appropriate methods for predictive analysis, and build effective predictive models.
- Evaluate the soundness and validity of a predictive models, interpret, and report on results to a management audience.

Required Textbook

No Textbook Required

Author:

Publisher:

Edition:

ISBN:

Deliverables

Assignments

There will be weekly assignments during the class. Exams will be on week 5 and 9.

- The assignments will help you assess your understanding of the material.
- The assignments will help you keep up with the reading and activities in the class.
- The assignments will help you prepare for the exam questions.

You are required to submit all assignments in a timely manner. The assignments and exams will help me assess your understanding of the course material.

Classroom Participation

- Students will be expected to participate in class discussions each week, and will be graded on their consistent participation.
- Keep in mind the following for getting the most out of our discussions:
 - Ask questions of others
 - Respond to others' questions and comments
 - Share insights gained through your experiences and other course work.

Evaluation

Breakdown

Assignment	30%
Forum/Class Participation	5%
Midterm Exam	30%
Final Exam	35%
Total	100%

Criteria

A: 90 - 100%	B: 80 - 89%	C: 70 - 79%	F: Below 70
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(Pluses and Minuses may be given to indicate where in the range a grade falls.)

Schedule

Textbook online: Data Science and Predictive Analytics
(https://www.socr.umich.edu/people/dinov/courses/DSPA_Topics.html)

Week 1

- Ch 0. Introduction to Predictive Analytics
- Ch 8. Divide and Conquer - Classification Using Decision Trees

Week 2

- Ch 9. Forecasting Numeric Data - Regression Methods

Week 3

- Ch 6. Lazy Learning - Classification Using Nearest Neighbors
- Ch 7. Probabilistic Learning - Classification Using Naïve Bayes

Week 4

- Ch 10. Black Box Methods - Neural Networks and Support Vector Machines

Week 5

- Midterm

Week 6

- Ch 11. Apriori Algorithm for Association Rule Learning
- Ch 12. k-Means Clustering

Week 7

- Ch 13. Evaluating Model Performance
- Ch 14. Improving model Performance

Week 8

- Ch 16. Variable/Feature Selection
- Ch 19. Text Mining and Natural Language Processing

Week 9

- Final Exam

Course Policies

- Attendance and participation in each class meeting are required. After 2 absences the recommendation is to withdraw from the class.
- You will be responsible for all work done in class. If you are absent, notify me as soon as possible. You should make arrangements with other students for class notes and obtain any materials that were distributed in class.
- If Webster cancels classes for the university, a message about makeup classes and homework adjustments will be announced in WorldClassRoom.
- This syllabus may be revised at the discretion of the instructor without the prior notification or consent of the student.

Institutional Policies

Academic Policies

Academic policies provide students with important rights and responsibilities. Students are expected to familiarize themselves with all academic policies that apply to them. Academic policies for undergraduate students can be found in the Undergraduate Studies Catalog; graduate students should review the Graduate Studies Catalog.

Undergraduate Studies Catalog

The Undergraduate Studies Catalog contains academic policies that apply to all undergraduate students. The *academic policies and information* section of the catalog contains important information related to **attendance, conduct, academic honesty, grades, and more**. If you are an undergraduate student, please review the catalog each academic year. The current Undergraduate Studies Catalog is at:

<http://www.webster.edu/catalog/current/undergraduate-catalog/>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/>)

Graduate Studies Catalog

The Graduate Studies Catalog contains academic policies that apply to all graduate students. The *academic policies* section of the catalog contains important information related to **conduct, academic honesty, grades, and more**. If you are a graduate student, please review the catalog each academic year. The current Graduate Studies Catalog is at:

<http://www.webster.edu/catalog/current/graduate-catalog/>
(<http://www.webster.edu/catalog/current/graduate-catalog/>)

Grading

The Grades section of the academic catalog outlines the various grading systems courses may use, including the information about the final grade reported for this class.

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html#grading>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html#grading>).

Graduate

<https://webster.edu/catalog/current/graduate-catalog/academic-policies.html#gradingsystem>
(<https://webster.edu/catalog/current/graduate-catalog/academic-policies.html#gradingsystem>).

Incomplete

There are important policies that govern grades of Incomplete (I), including the circumstances under which Incomplete grades are granted, deadlines for completion, and consequences should the remaining course work not be completed. It is the responsibility of a student who requests an Incomplete to ensure that they understand and follow the policies.

Grade Appeals

Instructors are responsible for assigning grades, and student should discuss grade issues with the instructor. Policies and procedures for appealing grades are available in the appropriate catalog.

Academic Honesty Policy

Webster University is committed to academic excellence. As part of our Statement of Ethics, we strive to preserve academic honor and integrity by repudiating all forms of academic and intellectual dishonesty, including cheating, plagiarism and all other forms of academic dishonesty. Academic dishonesty is unacceptable and is subject to a disciplinary response. Students are encouraged to talk to instructors about any questions they may have regarding how to properly credit others' work, including paraphrasing, quoting, and citation formatting. The university reserves the right to utilize electronic databases, such as Turnitin.com, to assist faculty and students with their academic work.

The university's Academic Honesty Policy is published in academic catalogs:

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html>
(<http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html>).

As a part of the university commitment to academic excellence, the Reeg Academic Resource Center provides student resources to become better acquainted with academic honesty and the tools to prevent plagiarism in its many forms:

<https://websteru.sharepoint.com/sites/AcademicIntegrityAtWebster>
(<https://websteru.sharepoint.com/sites/AcademicIntegrityAtWebster>).

Statement of Ethics

Webster University strives to be a center of academic excellence. The university makes every effort to ensure the following:

- The opportunity for students to learn and inquire freely
- The protection of intellectual freedom and the rights of professors to teach
- The advancement of knowledge through scholarly pursuits and relevant dialogue

To review Webster University's statement of ethics, see the Undergraduate Studies Catalog and the Graduate and Studies Catalog:

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/overview.html#ethics>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/overview.html#ethics>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/ethics.html>
(<http://www.webster.edu/catalog/current/graduate-catalog/ethics.html>).

Contact Hours for this Course

It is essential that all classes meet for the full instructional time as scheduled. A class cannot be shortened in length. If a class session is cancelled for any reason, the content must be covered at another time.

Important Academic Resources

Academic Accommodations and Support

At Webster University, we understand that all students learn differently and may have specific, often differing, learning needs. Some examples are doing rather than watching, being active instead of sitting still and taking frequent breaks. For others, the professor needs to speak louder, give more clear instructions, and be understanding with health issues. Regardless of what makes learning easier for you, our goal is to provide the most accessible learning environment possible for each student. If there are any specific needs you'd like to make your instructors personally aware of, including any academic accommodations, please reach out to them directly.

Webster University supports students in several ways. Students with academic/learning, health, physical, and psychological disabilities and students who have accessibility concerns can reach out to Webster's Academic ADA Coordinator at disability@webster.edu. You can also reach out if you have any questions relating to accessibility.

Online resources through WorldClassRoom (Canvas) have a variety of accessibility tools, provided through a program called Ally, for both students and faculty. Ally is free and already incorporated into WorldClassRoom. It helps students who have visibility and attention challenges; who need easier

access to course materials from mobile phones, tablets, electronic readers, etc.; or who need or prefer file types different from the format uploaded by the instructor. You can find more information about Ally at <https://webster.edu/online/ally.php> (<https://webster.edu/online/ally.php>).

Life circumstances can make focusing on education, or anything else, difficult. For this reason, several additional resources and services are available to students at no cost:

1. Reeg Academic Resource Center (<https://websteru.sharepoint.com/sites/ReegARC> (<https://websteru.sharepoint.com/sites/ReegARC>))
 - Academic Counseling: academiccounseling@webster.edu
 - Assistive Technology: atacr@webster.edu
 - Disability Accommodations: disability@webster.edu
 - Testing Center: arc@webster.edu
 - Tutoring: tutoring@webster.edu
 - Writing services: writing@webster.edu
2. Counseling and Life Development (<https://www.webster.edu/student-counseling.php> (<https://www.webster.edu/student-counseling.php>)): 314-968–7030 or counselingld@webster.edu (these contact methods are non-confidential, but appointments are confidential)

Lastly, circumstances change. If, at any point throughout your education, you find that something is making learning difficult for you, please reach out to your instructor directly and/or to Webster's ADA team. It is never too late to ask for accommodations. We entirely support you and want you to have the best and most accessible education possible.

Student Success Portal

Webster University's Student Success Portal, powered by Starfish, is a communications tool to connect students with faculty members and campus support services. It allows faculty and staff members to communicate with you regarding academic achievements as well as areas where support may be helpful. You may use the portal to contact faculty and staff members for assistance and to arrange meetings. Activity in the portal will be communicated to your Webster University email account. The Student Success Portal is available via your course home page in WorldClassRoom or via Connections. Learn more about the Student Success Portal at <https://www.webster.edu/success/index.php> (<https://www.webster.edu/success/index.php>).

University Library

Webster University Library is dedicated to supporting the research needs and intellectual pursuits of students throughout the university's worldwide network. Resources include print and electronic books, journal articles, online databases, DVDs and streaming video, CDs and streaming music, datasets, and other specialized information. Services include providing materials at no cost and research help for basic questions to in-depth exploration of resources. The gateway to all of these resources and services is <http://library.webster.edu> (<http://library.webster.edu/>). For support navigating the library's resources, see <http://libanswers.webster.edu/> (<http://libanswers.webster.edu/>), for the many ways to contact library staff.

Drops and Withdrawals

Drop and withdrawal policies dictate processes for students who wish to unenroll from a course. Students must take proactive steps to unenroll; informing the instructor is not sufficient, nor is failing to attend. In the early days of the term or semester, students may DROP a course with no notation on their student record. After the DROP deadline, students may WITHDRAW from a course; in the case of a WITHDRAW, a grade of W appears on the student record. After the WITHDRAW deadline, students may not unenroll from a course. Policies and a calendar of deadlines for DROP and WITHDRAW are at:

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/enrollment.html>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/enrollment.html>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/enrollment.html>
(<http://www.webster.edu/catalog/current/graduate-catalog/enrollment.html>).

Academic Calendar - <http://www.webster.edu/academics/academic-calendar/>
(<http://www.webster.edu/academics/academic-calendar/>).

Current tuition rates, policies, and procedures, including details of pro-rated tuition refunds, are available in the "Tuition, Fees, and Refunds" section of Webster's Academic Catalogs:

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/tuition.html>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/tuition.html>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/tuition.html>
(<http://www.webster.edu/catalog/current/graduate-catalog/tuition.html>).

Student Handbook and Other Important Policies

Student handbook and other non-academic policies may apply to you and may impact your experience in this class. Such policies include the student code of conduct, privacy, technology and communications, and more. Please review the handbook each year and be aware of policies that apply to you. The handbook is available at:

<http://www.webster.edu/student-handbook/> (<http://www.webster.edu/student-handbook/>).

Sexual Assault, Harassment, and Other Sexual Offenses

Webster University makes every effort to educate the community to prevent sexual assault, harassment, and other sexual offenses from occurring, and is committed to providing support to those affected when this behavior does occur. To access information and resources or to review the Policy on Sexual Assault, Harassment, and Other Sexual Offenses, visit:

<https://webster.edu/titleix/policy.php> (<https://webster.edu/titleix/policy.php>).

Research on Human Subjects

The Webster University Institutional Review Committee (IRB) is responsible for the review of all research on human subjects. The IRB process applies to all Webster University faculty, staff, and students and must be completed prior to any contact with human subjects. For more information on the IRB, visit:

<https://websteru.sharepoint.com/sites/InstitutionalReviewBoard>
(<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwebsteru.sharepoint.com%2Fsites%2FInstitutionalReviewBoard&data=04%7C01%7Celvirm31%40webster.edu%7C3cc448f960d5427acd08d997d92f31%7Cf57ccca6fb064b328226baf224ff198d%7C0%7C0%7C637707781316471159%7CUnknown%7CTWFpbGZsb3d8eyJWljoiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTil6Ik1haWwiLCJXVCi6Mn0%3D%7C1000&sdata=YaeRiduWQUA9NOzcmOw4wbrKu46RKKNPd3dokHblcY%3D&reserved=0>).

Student Experience Feedback

At the end of this course, you will have the opportunity to provide feedback about your experience. Your input is extremely valuable to the university, your instructor, and the department that offers this course. Please provide your honest and thoughtful feedback, as it helps the university to provide the best experience possible for all of its students.

Important Technology Information

Connections Accounts

Webster University provides all students, faculty, and staff with a University email account through Connections. Students are expected to activate their Connections account and regularly check incoming university emails. Students may choose to have their University email forwarded to an alternate email address. Connections account holders can call the Help Desk (314-246-5995 or toll-free at 1-866-435-7270) for assistance with this setup. Instructions are also provided on the Information Technology website at:

<https://www.webster.edu/technology/index.php> (<https://www.webster.edu/technology/index.php>).

WorldClassRoom

WorldClassRoom is Webster's Learning Content Management System (LMS). Your instructor may use WorldClassRoom to deliver important information, hold class activities, communicate grades and feedback, and more. WorldClassRoom is available using your Connections ID at:

<https://worldclassroom.webster.edu/> (<https://worldclassroom.webster.edu/>).

Webster Alerts

Webster Alerts is the university's preferred emergency mass notification service, available free to current students, faculty, and staff at all US campuses. By registering a valid cell phone number and email address, you will receive urgent campus text, voice mail, and email communications. Valuable information concerning a range of incidents affecting you - from weather-related campus closures, class delays and cancellations, to more serious or life-threatening events - are immediately and simultaneously delivered through multiple communication channels. To register for Webster Alerts, visit (sign with your university-provided email and password:

<https://www.getrave.com/login/webster> (<https://www.getrave.com/login/webster>).

Campus Information

Webster University Home Campus, 470 E. Lockwood Ave., St. Louis, MO 63119, USA