



ADS4293F 570
Professional Analytics
Fall 2026

Instructor: Felipe Rodrigues, PhD
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Course Information

Mode of Instruction: In-Person

Calendar Description:

Practical analytics and software tools explored through case analyses. Linear programming, statistical analysis, decision analysis, game theory, inventory analysis, queuing theory, simulation, Markovian decision model, and forecasting will be applied in a variety of scenarios.

Pre-requisite(s): Analytics and Decision Sciences 3293A/B, 1.0 from Economics 2122A/B, Economics 2123A/B, Economics 2222A/B, Economics 2223A/B or Analytics and Decision Sciences 2036A/B, Statistical Sciences 2035, Statistical Sciences 2857A/B, Statistical Sciences 2858A/B. Co-requisite(s): Analytics and Decision Sciences 3864A/B.

Extra Information: 3 hours, 2 lab hours.

Course Weight: 0.50

Breadth: Category A

Subject Code: ADS

Notice: Unless you have either the requisites for this course (fulfilment of pre-requisites, no anti-requisite conflicts), or special permission from your Dean to enrol in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.



ADS 4293F – Professional Analytics Fall 2026 Course Description

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Office Hours:

Section 570: Tue 1:00pm – 2:00pm EDT/EST

Or by appointment.

COURSE DESCRIPTION

ADS 4293 is a capstone course in professional analytics focused on using analytical methods to support managerial decision-making across all functional areas of the firm. The course emphasizes the progression from descriptive, diagnostic, and predictive analytics to prescriptive analytics through problem framing, model formulation, optimization, uncertainty analysis, and managerial interpretation.

Students will develop and implement models using Excel/Analytic Solver and Python. Topics include linear programming, integer programming, mixed-integer programming, nonlinear optimization, goal programming, queueing models, stochastic and robust optimization, simulation optimization, and predict-then-optimize approaches. The course also incorporates the INFORMS Job Task Analysis framework, case analysis, simulations, corporate games, and other experiential learning activities, together with the development of an original teaching case and teaching note.

REQUIRED COURSE MATERIALS

Textbook: The textbook is required for this class, you will be using it frequently!

DO NOT BUY THE TEXTBOOK DIRECTLY FROM THE PUBLISHER. PLEASE USE THE UWO BOOKSTORE LINK THAT WILL BE PROVIDED ON THE FIRST DAY OF CLASS

As such, I've picked one that is relatively inexpensive. You can order the hard copy (print + e-text) or online (e-text) versions.

Paper based or Digital copy of Business Analytics – Communicating with Numbers, 2025 release, by Jaggi, Kelly, Lertwachara & Chen. McGraw-Hill (2025).

- **ADS4293F SEC570** <https://bookstore.uwo.ca/product/9781264568475>

All versions of the textbook are accompanied by:

- “Connect” access code (for Cachon) which is the online learning system that includes the e-text and where I’ll post the assignments and class materials,

I have also ordered a copy to be put on reserve at the King’s library for you to use.

Ivey Cases: As you can see below, we will be using the following Ivey cases in the course. As the online format seems to be the preference of most students, please purchase the following cases directly from www.iveycases.com or from the course owl page. **Full list of cases will be finalized with feedback from students in the first day of class.**

General Software: You are required to have access to a personal computer with internet access since we will use OWL for our class schedules and communication as well as McGraw-Hill’s Connect ® platform for assignments, quizzes and tests. Your computer should also have MS Excel ® software (with Solver engine installed), Analytic Solver for Excel and preferably running in MS Windows ®. The Excel add-ins as well as the discrete-event simulator (Simul8 ®) are known to either run only in Windows or be more stable in the Windows environment than in other systems, please be aware of that. Throughout the course we will have many opportunities to create analytics/optimization models in Excel. Examples include simple Linear Programming, Integer Programming, queuing, Monte Carlo and discrete-event simulation, statistical distributions, regressions and machine learning algorithms. Expert knowledge of Excel is a differentiator in the job market, so students will be encouraged to develop their own upgraded models for extra credits.

Simul8®: In the first day of class, you will receive a product key to download the student version of a discrete-event simulator (DES) software called Simul8®. You will also receive two tutorial guides: The first is called “An Introduction to simulation in the manufacturing industry using Simul8 ®” by Shalliker & Ricketts, and the second is called “An Introduction to simulation in the service industry using Simul8 ®” by Shalliker. The two versions have similar content but you may be more familiar with one of either industry, which may help you have a better understanding of the software and its applications. I recommend reading both as it would broaden students’ expertise, but for earlier simulations, pick one and carry on. We will use DES as an experiential learning tool to enrich our understanding, analysis and decision-making of processes and queuing systems in general. Again, expert knowledge of DES software is a differentiator in the job market, so students will be encouraged to develop their own upgraded models for extra credits.

OWL: I will post grades, questions, comments, notes, and so forth on OWL Brightspace. I will also post the latest version of the syllabus, should it change. It is your responsibility to ensure that you have the most up-to-date version of the syllabus and all other information necessary for the course by visiting OWL on a regular basis. **We will also use Microsoft Teams for our shared notebook, as well as Microsoft Studio for our coding assignments.**

METHODS OF EVALUATION

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Course component	Events	Site	Total
Participation	daily	In person	15%
Mid term	1x	In person	15%
LAB	10x	In person	20%
Videos	1x	Studio	10%
Group Case Project	8 events	In person	40%
Total			100%

In-Class Participation (15%)

Participation is an important part of ADS 4293 because much of the learning happens through discussion, case analysis, problem-solving, and defending your argument. **Participation is not attendance.** Simply being present does not earn participation marks. Meaningful participation means contributing in ways that advance the discussion and help the class learn.

Strong contributions may include:

- linking comments to readings, cases, models, or prior course material;
- making clear cause-and-effect arguments;
- questioning assumptions or identifying missing information;
- interpreting analytical results;
- building on or respectfully challenging another student's point;
- explaining a difficult concept;
- providing a relevant real-world example;
- asking a question that moves the discussion forward.

Not every contribution needs to be correct. Thoughtful questions, alternative perspectives, and well-reasoned disagreement are all valuable. Participation will be assessed based on the quality, consistency, preparation, and usefulness of your contributions. Periodic updates will be provided so that you know how you are doing. A useful starting point is: connect to the material, make a cause-and-effect argument, and provide evidence or an example.

- Participation Levels
 - Outstanding (90–100%): Consistently makes insightful, well-prepared contributions that advance discussion, connect concepts, explain difficult ideas, and build strong arguments.
 - Excellent (80–89%): Contributes frequently and thoughtfully, demonstrates strong preparation, and regularly adds useful analysis or questions.
 - Good (70–79%): Contributes regularly, shows consistent preparation, and provides relevant comments or questions.
 - Fair (60–69%): Contributes occasionally, shows some preparation, but contributions are often brief or descriptive.
 - Poor (50–59%): Rarely contributes meaningfully and shows limited preparation.
 - Unsatisfactory (0–49%): Almost never contributes meaningfully, shows minimal preparation, or misses enough class time that participation cannot reasonably be demonstrated.

Quizzes and Midterms (15%):

- The course may include up to four quizzes, one or two midterm examinations, or an equivalent combination of individual assessments. Assessments may be open-book or closed-book, depending on the nature of the material being evaluated. The format and permitted resources for each assessment will be communicated in advance.
- Where online proctoring is required, the course may use Proctorio+ or another institutionally authorized proctoring service available through the textbook learning-management system or the University.
- Unless expressly authorized by the instructor, all quizzes and examinations must be completed independently and without external assistance. Prohibited assistance includes, but is not limited to, consulting unauthorized notes or sources, communicating with classmates or other individuals, receiving help from another person, using Generative AI tools, smartwatches, mobile devices, smart glasses, or any other electronic, communication, or artificial-intelligence-enabled device or service.
- Any use of unauthorized assistance, materials, devices, or technologies during an individual assessment may constitute an academic offence. Suspected violations will be documented and referred through the

applicable departmental, faculty, and University academic-integrity procedures. Penalties may include a grade of zero on the assessment and any additional sanctions permitted under University policy, up to and including failure in the course where authorized.

Laboratory Exercises (20%)

There will be **10 laboratory exercises** throughout the course. Each lab will require students to complete and submit a Python-based exercise related to the analytical methods covered in class.

Unless otherwise specified, lab work is **individual, GenAI-free**, and will be graded accordingly. The same GenAI rules mentioned for the case assignment apply to the lab assignments.

Model Tutorial Videos (10%)

Students will prepare a short set of tutorial videos explaining an analytical model covered in the course.

The videos will include:

- a brief **theoretical explanation** of the model;
- an **Excel / Analytic Solver demonstration**; and
- a **Python demonstration** using the same problem.

The emphasis is on correct modelling, clear explanation, and managerial interpretation. Detailed instructions and evaluation criteria will be provided separately.

Group Case Project (40%): Students will work in teams of 2–3 to develop an original business teaching case based on a managerial problem related to one of the course topics. Cases should preferably be grounded in a real organization, industry, or decision context and should incorporate appropriate analytical methods to support a managerial recommendation. The project will be developed progressively throughout the term and will include both a student-facing case and an accompanying teaching note. Detailed project requirements, templates, analytical expectations, and evaluation criteria will be provided separately.

Stage	Deliverable	Timing	Weight
1. Case Plan & JTA	Initial project plan and analytical framing	Week 4	2%
2. Case Draft	First complete case draft	Week 6	3%
3. Teaching Note Draft	Draft teaching note and analytical solution	Week 9	5%
4. Final Case Package	Complete case, teaching note, analytical model, and supporting materials	Week 12	20%
5. Presentation	Team and individual presentation	Week 12	10%
	Total		40%

The final project will be evaluated on the quality of the case, analytical rigour, managerial relevance, clarity of communication, and the team's ability to explain and defend its work.

Selected projects may, where appropriate, be further developed for submission to a teaching-case publisher.

Use of Generative AI: Permitted and prohibited uses of Generative AI for the Group Case Project will be defined in the detailed assignment instructions. Students are responsible for following those requirements exactly. Any unauthorized use of Generative AI will result in a grade of zero on the affected project component and failure for the course. will be reported through the applicable academic integrity procedures. Additional academic sanctions may be imposed in accordance with University policy.

A NOTE ON ABSENCES

You will note below that I have outlined how I plan to handle absences and grading for the various components of the course. You will find additional, more general information relating to absences further down in the syllabus, under the section heading "Course Policies & Procedures".

If you miss either the mid-term or the final exam/evaluations for a medical reason, you will complete an alternate make-up exam instead. This exam will be scheduled at a mutually convenient future date, but not later than the King's make-up test day scheduled during the final exam period.

If you know you have to miss a class, and it happens to be a day we are doing a case, please let me know ahead of time (consult the schedule early).

COURSE POLICIES AND PROCEDURES

Examinations and Projects Assigned for Grades

Students who have any problems that may hinder their academic performance are encouraged to discuss these issues with the Professor or the appropriate College official *well before* exams and projects are due. It is much more difficult to justify giving special consideration after the fact.

Students are expected to complete all required evaluation components in order to receive a grade in this course. Students with course conflicts and approved inter-university athletic conflicts, or students unable to write an exam or test based on medical or compassionate grounds, may apply to be excused.

Academic consideration for absences, missed in-semester assessments:

A new Policy on Academic Consideration came into effect on September 1, 2025: [Policy on Academic Consideration – Undergraduate Students in First Entry Programs](#). The ADO policy page will explain academic considerations and link to the Western Senate policy.

Attendance

This course will adhere to the following, as stated in the Academic Calendar: "Any student who, in the opinion of the instructor, is absent too frequently* from class or laboratory periods in any course, will be reported to the dean (after due warning has been given). On the recommendation of the department concerned, and with the permission of the dean, the student will be debarred from taking the regular examination in the course".

* Missing over one quarter of scheduled classes is considered to be too frequent → this means that you should not miss more than three classes!

Punctuality

Students whose schedules dictate arriving at class late or leaving early are asked to advise the professor of the situation, and to select a seat and a doorway that will minimize any disruption to the rest of the class.

Tardiness at exams, for classroom presentations or with project hand-ins is unacceptable for any reasons other than medical or compassionate grounds similar to those that excuse you from writing an exam. Students who are unacceptably late to an exam or test will not be given extra time beyond the scheduled

conclusion time. **Late hand-ins will be penalized at a minimum of 5% of the possible grade.**

Plagiarism and Cheating

Plagiarism and cheating are serious scholastic offences.

All required papers (including your case presentations/reports!) may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Full and proper citations are required in each and every case where you have utilized another person's work or ideas in your papers or projects. Citations for this course require the MLA style format, which is detailed in almost any grammar book, including books on reserve at the King's library.

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

My position on laptop use: Personally, I prefer that you do not use laptops during class discussions. For class exercises where we work on excel files, laptops will be required. I will also make the In addition, during case discussions laptops are expected to be closed, unless explicitly stated otherwise.

Use of electronic devices: Cell phones (and other smartphones) are to be kept off during class. Likewise, texting is not permitted in class. If there is an important reason why you need your phone in one class, please let me know ahead of class and keep your phone on vibrate to minimize any disruption. You are not allowed to have a cell phone, or any other electronic device, with you during tests or examinations.

Course Schedule: The basic information for the course schedule is provided below. Any changes due to unforeseen difficulties or to accommodate learning will be posted in OWL. For the full details of the course schedule, please check OWL. **IMPORTANT:** it is up to students to familiarize with the class schedule and plan accordingly.

TENTATIVE Course Schedule – Subject to Updating – Check OWL for Latest

Week	Date	Week name / managerial use	Method
1	15-Sep	The Art of Modelling and JTA/CAP	Spreadsheet modelling, data tables, what-if analysis, scenario analysis
2	22-Sep	Allocating Scarce Resources and Planning Across Time	Linear Programming, Duality, Sensitivity Analysis, Advanced LP
3	29-Sep	Choosing and Scheduling	Integer Programming
4	06-Oct	Designing Capacity and Networks	Mixed-Integer Linear Programming
	13-Oct	Reading Week	
5	20-Oct	Balancing Capacity and Customer Waiting	Queueing and Optimization
6	27-Oct	Balancing Risk and Return	Nonlinear / Quadratic Optimization
7	03-Nov	Midterm Examination	Weeks 1–6
8	10-Nov	Balancing Competing Goals	Goal Programming and Multiobjective Optimization
9	17-Nov	Making Decisions Under Uncertainty	Stochastic and Robust Optimization
10	24-Nov	Optimizing When Outcomes Must Be Simulated	Simulation Optimization
11	01-Dec	Turning Predictions into Decisions	Predict-then-Optimize
12	08-Dec	Defending an Analytics Recommendation	Integrated Prescriptive Analytics

KING'S UNIVERSITY COLLEGE

GENERAL COURSE POLICIES

2026-2027

1. Academic Accommodations, Consideration for Absences

Academic Accommodation (Accessibility)

Accessibility Services works to ensure that academic programs are accessible to all students, and supports students who may have a condition related to, but not limited to, vision, hearing, mobility, different ways of learning, mental health, chronic illnesses, chronic pain, autism spectrum disorder, ADD/ADHD, and temporary conditions (beyond short-term academic consideration). Accessibility Services provides recommendations for accommodation based on medical documentation or psychological and cognitive assessment. The accommodation policy can be found [here](#) Academic Accommodation for Students with Disabilities. Information on Accessibility Services at King's can be found [here](#).

Academic Consideration for Student Absence

If a student is unable to meet a course requirement due to substantial but temporary extenuating circumstances (medical or compassionate), they should follow the procedures below.

In some cases, where instructors have built flexibility into their assessments, this flexibility will already address consideration needs.

Requests for academic consideration should be directed to the Academic Advising Office of your faculty/college of registration. Requests must be made as soon as possible and no later than 48 hours after the missed assessment.

As a rule, documentation is required for academic consideration. For academic consideration requests on medical grounds, the Student Medical Certificate is available at <https://registrar.uwo.ca/academics/pdfs/student-medical-certificate.pdf>

Students are permitted one academic consideration request without supporting documentation per term per course.

Instructors may designate one assessment per half-course weight as requiring formal supporting documentation. Please refer to the course outline for each course.

For further information, please see:

https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf

Absences from Final Examinations

If you miss the Final Exam, contact the Academic Advising Office of your faculty/college of registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, or more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give notice in writing to the instructor and Academic Advising Office if a course requirement will be affected by a religious holiday/observance. Notice must be given as early as possible, and no later than two weeks prior to an examination, and one week prior to a midterm test date. It is the responsibility of such students to inform themselves concerning the work done in classes from which they are absent and to take appropriate action.

2. Support Services

Accessibility, Counselling and Student Development at King's University College:

<https://kings.uwo.ca/community/library/services/accessibility/>

Students experiencing emotional or mental health distress can access services at King's University College: <https://kings.uwo.ca/campus-life/student-supports/>

Good2talk is a good online and phone 24/7 resource for students and is available in English, Mandarin, and French: <https://good2talk.ca>, 1-866-925-5454

MentalHealth@Western provides a complete list of options about how to obtain help:

<https://www.uwo.ca/health/mental-health/index.html>

Academic Support Services at King's University College:

<https://www.kings.uwo.ca/current-students/academic-resources/>

GBSV Support:

King's (Western) is committed to reducing incidents of gender-based sexual violence (GBSV) and providing compassionate support to anyone who is going through or has gone through these traumatic events. If you are experiencing or have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts at the following website:

Mental Health and Wellness at King's - King's University College

You can reach someone supports at Kings by emailing Care@kings.uwo.ca or calling 519-930-4640 to reach a social worker who can offer help.

You can also reach Western's Gender-Based Violence & Survivor Support Case Manager by email or by calling 519-661-3568.

You can reach someone supports at Kings by emailing Care@kings.uwo.ca or calling 519-930-4640 to reach a social worker who can offer help.

3. Statement on Use of Electronic Devices

Use of Electronic Devices: Unless explicitly stated otherwise, you are not allowed to have a cell phone, or any other electronic device, with you during tests or examinations. Unauthorized possession of such a device during a test or examination constitutes an academic offence.

Use of Laptops, Tablets, and Smartphones in the Classroom: King's University College at Western University acknowledges the integration of new technologies and learning methods into the curriculum. The use of electronic devices such as laptop computers, tablets, or smartphones can contribute to student engagement and effective learning. At the same time, King's recognizes that instructors and students share jointly the responsibility to establish and maintain a respectful classroom environment conducive to learning.

The use of electronic devices by students during lectures, seminars, labs, etc., shall be for matters related to the course at hand only. Students found to be using electronic devices for purposes not directly related to the class may be subject to sanctions under the Student Code of Conduct; see https://kings.uwo.ca/sites/2025/assets/files/about/governance/policies/board/Board%20Policy%203_1%20Code%20of%20Student%20Responsibilities%20and%20Conduct.pdf

Inappropriate use of electronics (e.g., laptops, tablets, smartphones) during lectures, seminars, labs, etc., creates a significant disruption. As a consequence, instructors may choose to limit the use of electronic devices in these settings. In addition, in order to provide a safe classroom environment, students attending in-person class sessions are strongly advised to operate laptops with batteries rather than power cords.

4. Statement on Academic Offences

King's is committed to academic integrity. Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, is posted at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

It is expected that students will submit work that is truly their own, completed without external assistance (human or artificial) except as explicitly permitted by the course instructor. Check with your instructor on what tools, including generative AI (ChatGPT, translation tools, grammar-checking tools) are permitted in the course. Because a tool is permitted in one course, that does not mean it is permitted in other courses.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system; see <https://elearningtoolkit.uwo.ca/tools/Originality Reports - TurnItIn.html>.

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

5. Copyright of Course Material

Lectures and course materials, including PowerPoint presentations, tests, outlines, and similar materials are protected by copyright. Faculty members are the exclusive owner of copyright in those materials they create. Students may take notes and make copies for their own use. Students may not allow others to reproduce or distribute lecture notes and course materials publicly (whether or not a fee is charged) without the express written consent of a faculty member. Unauthorized sharing of class content is subject to academic discipline.

Similarly, students own copyright in their own original papers and exam essays. If a faculty member wishes to post a student's answers or papers on the course website, they should ask for the student's written permission.

6. Use of Recordings

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation and/or the participant has the prior written permission of the instructor. Unauthorized recording and/or sharing of class content is subject to academic discipline.

7. Policy on Attendance

Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean of the Faculty offering the course, after due warning has been given. On the recommendation of the department concerned, and with the permission of the Dean of that Faculty, the student will be debarred from taking the regular examination in the course.