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study guide
business data science

joint degree
Erasmus University Rotterdam
University of Amsterdam
Vrije Universiteit Amsterdam

Study guide 2025-2026

Research Master Business Data Science

July 2025

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GRADUATE PROGRAM

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Research Master Business Data Science

July, 2025

Introduction

The Research Master Business Data Science prepares talented and motivated students to enter high quality PhD programs in Business. It is a joint initiative of the Erasmus School of Economics of the Erasmus University Rotterdam (EUR), the Faculty of Economics and Business of the University of Amsterdam (UvA), and the School of Business and Economics of the Vrije Universiteit Amsterdam (VU).

The Research Master Business Data Science is a multidisciplinary research master program in which course instruction is provided by top scholars from the three participating Schools with a central focus on the performance of academic research within business disciplines, such as entrepreneurship and innovation, finance, human resources and organization, marketing, and operation research analytics.

The Business Data Science program distinguishes itself based on the following unique features:

- It is a two-year research master (120 EC) aiming to train future PhD students who will start their doctorate at one of the Schools in business and economics of the three partner universities.
- It has a strong focus on data science, presented to the students at a higher theoretical level than in a traditional master program.
- It ties the foundations of data science directly to different business fields. The availability of big data from a growing range of interconnected, interactive, and interoperable devices and the concurrent development of powerful quantitative techniques are giving rise to new perspectives and paradigms in scientific practice. This is particularly true in the field of business. As data collection has transformed from a tedious, expensive, and time-consuming practice into a continuous and, often, unobtrusive side-effect of day-to-day practices, behaviors and actions of people within and across organizations can be studied far more closely. Moreover, computing power and storage are not the limiting factors they once were.

To leverage these opportunities, there is an increasing demand for highly trained specialists who can extract insights out of big data to solve business-related problems.

- It is a small-scale program, where students work in close collaboration with faculty. The class-size limit of 30 students guarantees a high level of interaction in the classroom, detailed feedback from faculty, and the support of a strong cohort. Individual field courses will generally have fewer students due to their concentration in the various tracks.
- It is embedded in the fervid research culture of three leading universities, benefitting from the expertise and research network of top-notch faculty. Not only are the rich variety of topics and methodological approaches covered in this program unique, the broad network employed/drawn on by participating faculty (with connections at MIT, NYU, LBS, and JADS, to name a few) is a valuable asset for future scholars. The Research Master Business Data Science will create and take advantage of the same excellent educational and research environment and facilities as the Tinbergen Institute Research Master program in Economics (henceforth referred to as TI), including existing practices with regard to student recruitment and placement support. The cooperation between the three Schools guarantees first-rate education provided by highly qualified scholars, embedded in an excellent infrastructure.
- In addition, the program helps students to jumpstart their PhD trajectory not only through solid training, but also with direct experience in research (provided during the seminars, research clinic, research hackathons, skill workshops, thesis, interaction with faculty, research assistantships opportunities), and teaching (e.g., teaching assistantships opportunities).

The Research Master Business Data Science is therefore highly distinctive from existing training in the field of data science: it is a Research Master's program that primarily focuses on training academic researchers who apply data science techniques in the discipline of business.

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General information

The Research Master Business Data Science (BDS) is a joint program of Erasmus University Rotterdam (EUR), University of Amsterdam (UvA) and Vrije Universiteit Amsterdam (VU).

Students are registered at three universities (EUR, UvA and VU). Erasmus University is the host university for the BDS program and charges the tuition fee. The students' grades are registered at EUR. The degree awarded after the final examination is a joint degree (MSc) by the three partners.

Tuition fees are due until the final examination, the thesis, has been passed. The tuition fees are determined annually by the Dutch government and the universities.

Tinbergen Institute supports both the Tinbergen Institute Research Master program and the Research Master program Business Data Science with an Examination Board and an Educational Board. The Director of Graduate Studies (DGS) oversees the curriculum of the program, and for admissions is assisted by an admissions board specific to the program.

Intended learning outcomes

Students who successfully complete the Joint Research Master Business Data Science will:

Knowledge and understanding

I. have advanced knowledge and broad understanding of data science research methodology and its applications in business and management; this covers methods in statistics, econometrics, machine learning, and management science;
II. have advanced knowledge and understanding of key research areas in business data science, for example in entrepreneurship, finance, human resources, marketing, and operation research analytics;

Application of knowledge and understanding

III. be able to define research questions in business and management and answer these questions by specifying relevant theories, collecting relevant data, and applying advanced data science methods;
IV. be able to apply/develop new data science approaches in order to solve relevant research questions in business and management;
V. be able to design and specify models that tackle managerially-relevant research questions;
VI. be able to design and implement approaches to validate model specifications and algorithms (e.g., formal proofs, analytical demonstrations, or empirical proof-of-concept in field or lab settings) in line with academic standards;

Making judgement

VII. can critically evaluate research outcomes, and reflect on the ethical and social implications of the outcome of their analysis;

Communication

VIII. be able to write research papers that are well structured, reflecting academic editorial standards;
IX. be able to present and defend their research to an audience of academic researchers;

Learning skills

X. to contribute original research to this field, under academic supervision;
XI. respect and practice all current standard principles of scientific integrity, ethics, responsible data management and privacy;
XII. have developed an attitude to independently keep track of the developments in one field of specialization and to embark on independent research in this field;
XIII. work well in a team and reflect on own role and contribution within teams.

Practicalities

The following practical points are relevant for all students.

Course Calendar 2025-2026

The courses are taught in blocks of eight weeks, with lectures during the first six (core courses) or seven weeks (field courses); the eighth week of each block typically serves as an exam week. To accommodate all field courses and the two lecture series, Block V is extended by approximately two weeks.

Block	Dates	
Block 0	August 25-August 29	Introduction and refresher courses in Programming and Mathematics
Block I	September 1-October 17	Lectures
	October 20-October 24	Exams
Block II	October 27-December 12	Lectures
	December 15-December 19	Exams
	December 20-January 4	Christmas Holidays
Block III	January 5-February 20	Lectures
	February 23-February 27	Exams
Block IV	March 2-April 17	Lectures
	April 20-April 24	Exams
Block V	April 27-July 10	Lectures and Exams

First-year (core) courses have weekly one-hour tutorials, taught by a teaching assistant, in which students work on and discuss homework assignments. For core courses, no graded homework may be assigned in the week prior to the exam. For all courses, no work-related deadline can be set after the end of the block in which the course takes place.

Course attendance is mandatory; this applies to all lectures of core and field courses, the skills workshops, the research hackathon and to Business Foundations (including the visits to/seminars of the research departments). Attendance is registered.

The course schedule is available on Erasmus University's timetable (login with ERNA account) or via the Erasmus University's course guide (select current academic year).

Osiris and Canvas

Study results are registered in Osiris. Students are encouraged to regularly check if all results in Osiris are up to date and correct. This is important for progressing into the second year and ensuring that all required grades are registered in time for the pre-defense and graduation.

Osiris is also used by students to register for courses, to submit individual requests to the Examination Board and to apply for their assigned scholarship among other functions.

Canvas is the digital learning environment for all courses in the curriculum. Teachers use Canvas for announcements, to publish course material, assignments and grades. Students upload their homework in Canvas. All assignments uploaded by students are automatically checked for plagiarism.

Students use their @student.eur.nl account to access Osiris and Canvas.

Registration for and withdrawal from courses

Except for Block I year 1 courses, students register for their courses in Osiris at least three weeks before the block starts. Registration is through Osiris student and is linked to the Canvas page for the course.

Registration for first and second year courses from Block III onwards is dependent on the track students select. For the second year, students decide in June of the first year on a full program of (mandatory) field courses and electives, internships and external courses. If applicable, students need to register for retakes on top of their second-year courses. Changes to course selection or withdrawal from courses[1] can only be processed through the Education Office. In cases related to choice of electives, changes to course choices must be registered through the *Change of Course* form on the Student Sharepoint - Academic Matters. Approval for the revised study plan needs to be granted by the DGS.

Important note: field courses may be cancelled or turned into a reading group if fewer than seven students register. If a course is cancelled, affected students must select an alternative course.

Assessment, grading, credits, and retakes

All courses are graded on a 1.0-10.0 scale, where 1.0 indicates very poor performance, 6.0 is the lowest passing grade, and 10.0 refers to outstanding performance. The final grade for a course block is rounded to the nearest multiple of .0 or .5, with the exception of a grade between 5.0 and 6.0. Any grade between 5.0 and 5.5 (excluded) is rounded to a 5; any grade between 5.5 and 6.0 is rounded to a 6. The lowest possible grade is 1.0. Grades for homework or midterm examinations do not need to be rounded before computing a student's final grade. The exceptions are the Business Foundation, Research Hackathon, the Research Internship and the skills courses which are marked with a pass or fail.

All courses will be concluded by an individual sit-in, take-home, or essay-based examination. Apart from the final examination, results of homework assignments form part of the examination and contribute to the final grade for a course. The final grade for most core courses is composed of the average grade for the homework assignments (25%) and the grade for the sit-in examination (75%). In other courses, including field courses, class participation and presentations in class are integral part of the assessment. The assessment format for each course is specified online and in Canvas.

The Business Data Science program does not schedule retakes. Failed exams in the first year cannot be retaken in the same academic year (in individual cases the Examination Board can decide otherwise). Instead, students must retake failed first-year courses in their second year in the program. If a student does not take a required course (exam), a grade of 1.0 will be recorded for GPA calculations towards scholarship decisions.

[1] Including during the course.

Students cannot re-sit examinations for which they have earned credits.
A failed field course in the second year must be replaced by a different field course. For a failed mandatory field course a resit can be requested with the examination board.

Right of inspection

As soon as possible and within 28 days of the announcement of the results of a written examination, the student can, on request, inspect their assessed work, the questions and assignments set, as well as the standards applied for marking. Inspection of the assessed work can only take place while the student is supervised by the examiner or an employee of the TI Education Office.
A student may lodge an appeal against the result within six weeks of the announcement of the result; see details below.

Transition to the second year of the program

To enter the second year and gain access to second-year field courses, students must have passed at least 48 EC from the first-year courses with a grade of 6.0 or higher, and have completed the Business Foundations course.

Students who have accumulated 40-48 EC of first-year courses with a grade of 6.0 or higher can discuss a personal study plan with the DGS. This plan allows them to take designated second-year courses. Additionally, specific entrance requirements may apply to individual field courses.

Compensation rule

A compensation rule applies to students who have earned at least 48 EC for first-year courses with a grade of at least a 6.0 and who have completed the Business Foundations course (1 EC) in the first year of enrollment. Eligible students may compensate at most one 5.0 with a 7.5 or higher within the same core course sequence. This holds for both course sequences. The compensation rule applies across academic years. Core course sequences are:

- **Course sequence A**: (Advanced) Mathematics/Statistics/Asymptotic Theory/(Advanced) Econometrics I-III;
- **Course sequence B**: (Advanced) Machine Learning I/ Machine Learning II or Reinforcement Learning /Deep Learning/Natural Language Processing/Decision Theory for Business/Simulation Analysis & Optimization.

Any compensated grade still counts as a five (5.0) in the computation of the student's GPA.

Plagiarism and (academic) misconduct

BDS has a stringent opinion on misconduct, including, but not limited to plagiarism. Suspicion of plagiarism (including unethical use of AI tools) is registered by the lecturer and reported to both the DGS and the Examination Board. The Examination Board verifies the claim and determines the sanction. Similar action is taken when other misconduct is suspected.

More information can be found in the Academic and Examination Regulations.

Maintaining a healthy work-life balance

A research master program is very demanding, especially in combination with a change of country and (study) culture. Our Sharepoint pages refer to university student counsellors and to workshops that are offered by the universities for students looking for personal support.

Curriculum

The Research Master in Business Data Science is a two-year program consisting of 120 EC. It is tailored to prepare recent Bachelor's and Master's degree graduates for PhD research and an academic career in one of the sub-disciplines in Business. The program is connected to PhD research positions in the three participating faculties in Economics and Business but also prepares for research positions or a PhD at highly ranked universities elsewhere.

The learning objectives of the program are achieved through a curriculum designed around a Data Science foundation, a Business foundation and Research practice.

Data Science Foundation - Acquiring skills. In year 1, the primary objective is to build a solid data science foundation and expose students to a variety of methodological approaches. These skills are applied to various business disciplines in the field courses. From block III onward students start their focus on a given business subdiscipline, 1) quantitative finance, 2) management science, or 3) operation research analytics.

Business Foundation - Building knowledge. In year 2, the focus on the chosen track intensifies. The courses assigned for each of these sub-disciplines have been carefully selected by a team of experts with the aim of ensuring the perfect learning trajectory that will lead to substantive contributions in the fields of each particular sub-discipline.

Research Practice - Aligning skills and knowledge. The program starts with an overview of the business problems that data science can address, which also exposes students to fundamental components of the different business fields. This early exposure helps students to absorb and process materials presented later in courses on methodology, with respect to the various business perspectives. Students become further acquainted with the different business fields during visits to the research departments of the partner schools throughout the first year, for which they will have to write a research proposal. The Research Hackathon focusses on problem solving and the Research Internships allows students to get acquainted with actual research projects and apply their knowledge. Finally, the thesis will showcase the student's ability to identify relevant problems and address them using cutting-edge techniques to make a substantive contribution to the field.

To further ensure a high research mindset, the lecturers of the program are selected experts from the three Schools and are top researchers in their field. Since classes are in small groups, teachers can be easily addressed by students. Students are stimulated to engage in research seminars and other activities and to make contact with the various research groups and individual researchers to explore research options.

FIRST YEAR OF THE PROGRAM

In case of any difference between the first-year requirements in this study guide and the first-year requirements as stipulated in the Academic and Examination Regulations for 2025-2026 (AER), the AER prevails.

For course descriptions we refer to the Erasmus course catalogue

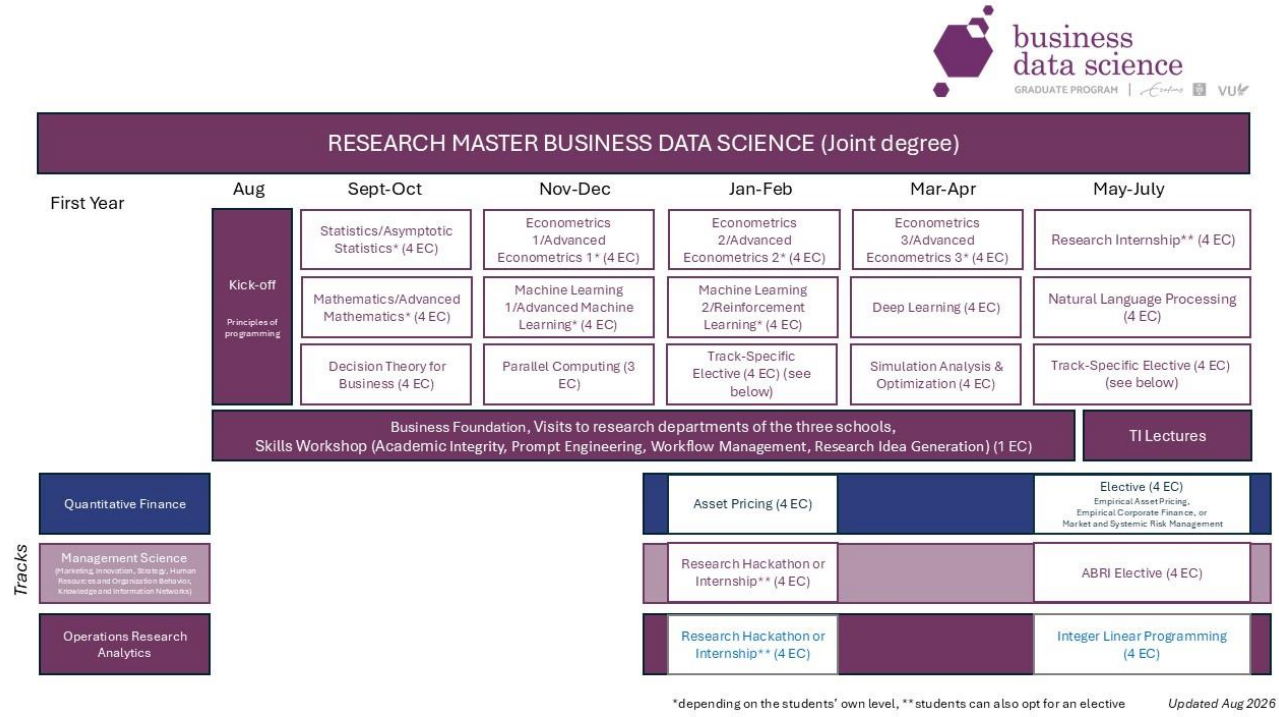
In the first year of the Research Master's program, students have to complete 60 EC:

- 11 core courses (44 EC)
- Parallel Computing and Big Data (3 EC)
- 1 track-specific field course (4 EC) in block III
- Business Foundations (1 EC)

The remaining 8 EC for block V vary for each track (see below).

Students with a sufficient quantitative background replace Mathematics, Statistics and Econometrics I, II, III with advanced courses. Students with sufficient background in Machine Learning replace Machine Learning I and II with Advanced Machine Learning I and Advanced Machine Learning II (Reinforcement Learning).

Please find an overview of the first-year curriculum below.



At predetermined times throughout the first year, the DGS interviews students to discuss their progress in the program.

Study schedule for year one, 2025-2026

Period	Course code	Course name	Credits
0	TIC10001	Introduction Day	0
0	TIC10002 TIC10003	Refresher Course Linear Algebra (Wagener) Refresher Course Principles of Programming in Econometrics (Bos)	0 0
1-5	TIC10005	Business Foundations (Van Angeren, Berends, Boon, Dekker, Dullaert, Menkveld, Sotgiu, Stam)	1
1-5	TIC20011	Scientific Integrity (credit awarded in the second year)	1
1	TIC10011	Scientific Ethics for students	0
1	TIC10050 TIC10051	*One of the following courses:* Fundamental Mathematics (Wagener) Advanced Mathematics (Wagener)	4
1	TIC10052 TIC10053	*One of the following courses:* Statistics (Cai) Asymptotic Statistics (Khismatullina)	4
1	TIC10300	Decision Theory for Business (Van den Brink/Estevez-Fernandez)	4
2	TIC10040 TIC10041	*One of the following courses:* Econometrics I (Artemova) Advanced Econometrics I (Bos/Koning)	4
2	TIC10200 TIC10201	*One of the following courses:* Machine Learning I (Groenen/Schoonees) Advanced Machine Learning (Quaini)	4
2	TIC10202	Parallel Computing and Big data (Bos)	3
2		*Choose track:* Quantitative Finance Track Management Science Track Operation Research Analytics track	
3	TIC10042 TIC10043	*One of the following courses:* Econometrics II (Bloemen/Van der Klaauw) Advanced Econometrics II (Juodis/Kleibergen)	4
3	TIC10203 TIC10204	*One of the following courses:* Machine Learning II (Groenen/Schoonees) Reinforcement Learning (Liberali)	4
3		Track specific elective: see below	4

4	TIC10044 TIC10045	*One of the following courses:* Econometrics III (Van Brummelen/Koopman) Advanced Econometrics III (Boswijk/Koopman)	4
4	TIC10207	Simulation Analysis & Optimization (Heidergott/Xiao)	4
4	TIC10208	Deep Learning (Raviv)	4
5	TIC10210	Natural Language Processing (Donkers/Morren)	4
5		Two track-specific field courses: see below	8

Track specifics Year 1

Track-specific field courses year 1 Quantitative Finance

Period	Course code	Course name	Credits
3	TIC10301	Asset Pricing (Laeven/Vellekoop)	4
5		*Two of the following courses:*	8
	TIF10009	Empirical Asset Pricing (Andonov/Eiling)	
	TIF10011	Empirical Corporate Finance Obernberger/Verwijmeren)	
	TIF10010	Market and Systemic Risk Management (Cai/Zhou)	
	TIF10405	Research Internship	

Track-specific field courses year 1 Management Science track

Period	Course code	Course name	Credits
3		*One of the following courses:*	4
	TIF10205	Experimental Research (ABRI)* (Van Horen)	
	TIF10400	Research Hackathon (Lindner)	
	TIF10403	Research Internship	
5		*Two of the following courses:*	8
	TIF10206	Marketing Research with Purpose (ABRI)* (Verlegh)	
	TIF10320	Theoretical Foundations of Entrepreneurship and Strategy (ABRI)* (Stam)	
	TIF10209	Research on Digital Innovation (ABRI)* (Huysman/Tuertscher)	
	TIF10321	Contemporary Issues in Organizational Behavior and Human Resource Management (ABRI)* (Khapova/ Stollberger)	
	TIF10405	Research Internship	

* The Amsterdam Business Research Institute of the Vrije Universiteit Amsterdam (ABRI), offers PhD education in Business and Management. **The schedule for ABRI courses differs from the schedule used in the Business Data Science curriculum.** Please check the ABRI webpage for the schedule for 2025-26 and to register for the courses.

Track-specific field courses year 1 Operation Research Analytics track

Period	Course code	Course name	Credits
3		*One of the following courses:*	4
	TIF10400	Research Hackathon (Lindner)	
	TIF10403	Research Internship [2]	
5		*Both of the following courses*:	8
	TIF10211	Integer Linear Programming (Leitner)	
	TIF10405	Research Internship[2]	

[2] Can be replaced with an elective (e.g., ABRI Elective, a Finance elective, a TI course).

Business Foundations and visits to the research departments of the partner schools

Throughout the first year, students join organized visits to the research departments of the partner schools. During these visits, students are introduced to all research groups connected to the program, meet with scholars, and learn about the ongoing research projects. After having visited all research departments, students select a research topic and address a professor who is not teaching in the first year of the program. Students write a research proposal (2-3 pages) and discuss the proposal with the researcher.

The visits to the departments facilitate the matching process between students and prospective supervisors and introduce researchers to students who they did not (yet) encounter in the classroom.

Active participation during all visits is mandatory and will be checked by means of attendance sheets or in Canvas. Signing off for fellow students is considered fraud and will disqualify both students for the 1 EC for this module. Further penalties may be imposed by the examination board.

Research Hackathon

This course (4 EC) allows students to put their methodological knowledge to the test and to address business research questions that are of high academic and managerial relevance. It offers an important meta-learning experience, connecting all the teachings preceding the course and thought simultaneously.

For this course, students are expected to have prior experience with one or more high-level programming languages, such as R, Python, C++, and MATLAB and to work with LISA. Students are expected to bring their own laptop to the classes.

The Hackathon is counted as a Year 1 Research Internship credit. This means that should the Hackathon be completed, then the student may only take one other Research Internship in Year 1.

Research Internships

For both the first year (4 EC), and/or the second year (3 EC) of the research master Business Data Science, students have the option to pursue an individual research practice internship (supervised by a researcher at EUR, UvA, or VU). The main purpose of the research internship is that students understand and experience how researchers conduct research and acquire additional knowledge in a specific area. In this way, the research internship can be used to either broaden the student's scope or allows the student to further specialize in a particular subfield or discipline. The timing of the internships is not limited to Block III and V of the first year or Block I and II of the second year.

Be aware that for the EC to count towards the 48 EC needed to pass directly into the second year, your EC need to be registered at the end of block V of the first year.

Projects for the research internship need to be approved by the internship coordinator before the start of the research internship period. Please carefully check the requirements for the internship by reading the course manual in Canvas.

Checklist year 1

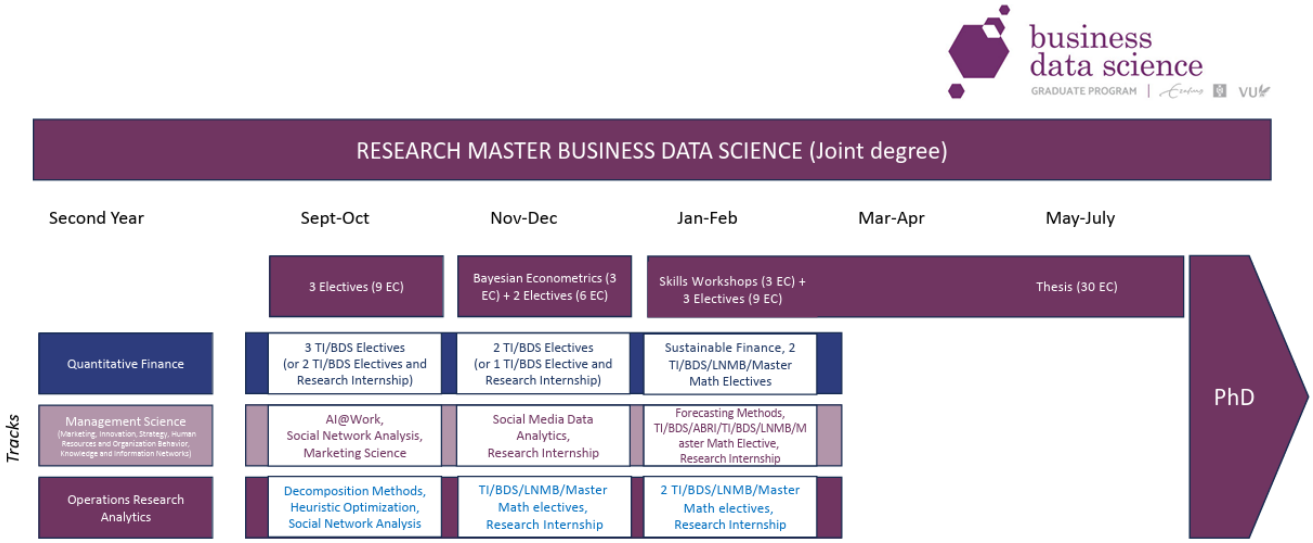
- Year 1 consists of 60 EC
- Course attendance is mandatory
- Registration for courses after block I is at least 3 weeks before the start of the course
- Selection of track during block II
- No retakes are scheduled in the same academic year
- Access to year 2 courses is dependent on acquired EC in year 1

SECOND YEAR OF THE PROGRAM

The requirements in this section apply to the 2024 cohort of Research Master students.

In case of any difference between the second-year requirements in this study guide and the second-year requirements as stipulated in the Academic and Examination Regulations for 2025-2026 (AER), the AER prevails.

The transition regulations published on the Sharepoint pages form an integral part of the Academic and Examination Regulations.



Study schedule for year two, 2025-2026

The requirements for the second year are that students complete the course Bayesian Econometrics (3 EC); 24 EC consisting of the mandatory field courses that are specific for their track (listed below), electives and research internships (at most 6 EC of internships in year two); skills courses (3 EC, including 1EC from Scientific Integrity, year 1) and a thesis (30 EC).

Period	Course code	Course name	Credits
1+2+3		Track-specific field courses, electives and research internships (internships max 6 EC)	24
2	TIF20117	Bayesian Econometrics	3
1+2+3	TIC20012	Academic Writing	1
3+4+5	TIC20013	Presenting in Academia	1
3+4+5	TIC20899	Research Master Thesis	30

Quantitative Finance track (field-specific courses Y2)

Period	Course code	Course name	Credits
1+2+3		Electives and Research Internships	21
2	TIF20117	Bayesian Econometrics	3
3	TIF20124	Sustainable Finance	3
1+2+3	TIC20012	Academic Writing	1
3+4+5	TIC20013	Presenting in Academia	1
3+4+5	TIC20899	Research Master Thesis	30

In order to qualify for the Quantitative Finance track, at least 9 EC must be selected from this electives list:

Period	Course code	Course name	Credits
1	TIF20102	Banking	3
1	TIF20107	Continuous Time Asset Pricing	3
1	TIF20100	Public Finance	3
1	TIF20101	Dynamic Corporate Finance	3
2	TIF20137	Quantitative Investing II (VU course, code E_FIN_QINV2)	3
2	TIF20121	Law, Economics and Organizations	3
2	TIF20111	Computational Finance (UvA course, code 6314M0350Y)	3
3	TIF20129	Behavioural Finance	3
4	TIF20302	Corporate Finance Theory	3
5	TIF10007	Financial Frictions in Macroeconomics	3

Additional electives available in 2025:

Period	Course code	Course name	Credits
1	TIF20106	Applied Microeconometrics	3
1	TIF20213	AI@Work	3
1	TIF20212	Marketing Science	3
1	TIF20401	Research Internship I	3
1	TIF20215	Social Network Analysis	3
1	TIF20041	Advanced Econometrics I	3
1	TIF20051	Advanced Mathematics	3
1	TIF10053	Asymptotic Statistics	3
2	TIF20126	Econometrics of Networks	3
2	TIF20403	Research Internship II	3
2	TIF20112	Social Media Data Analytics	3
2	TIF20201	Advanced Machine Learning	3
2	TIF20120	Advanced Microeconometrics	3
2	TIF20043	Advanced Econometrics II	3
3	TIF20126	Advanced Time Series Econometrics	3
3	TIF20123	Forecasting Methods	3
3	TIF20125	Reinforcement Learning	3
3	TIF20045	Advanced Econometrics III	3
5	TIF20797	BDS Lecture (not in 2025-26)	3
5	TIF20404	Field Paper	3
4 or 5	TIF20795	TI Economics Lectures 2026 (Esteban Rossi-Hansberg, Chicago University)	3
4 or 5	TIF20796	TI Econometrics Lectures 2026 (Alberto Abadie, MIT)	3

Management Science track (mandatory field-specific courses Y2)

Period	Course code	Course name	Credits
1+2+3		Electives and research internships (internships 6 EC)	9
1	TIF20212	Marketing Science	3
1	TIF20213	AI@Work	3
1	TIF20303	Social Network Analysis	3
2	TIF20117	Bayesian Econometrics	3
2	TIF20112	Social Media Data Analytics	3
3	TIF20123	Forecasting Methods	3
1+2+3	TIC20012	Academic Writing	1
3+4+5	TIC20013	Presenting in Academia	1
3+4+5	TIC20899	Research Master Thesis	30

Additional electives available in 2025:

Period	Course code	Course name	Credits
1	TIF20106	Applied Microeconometrics	3
1	TIF20401	Research Internship I	3
1	TIF20102	Banking	3
1	TIF20107	Continuous Time Asset Pricing	3
1	TIF20041	Advanced Econometrics I	3
1	TIF20051	Advanced Mathematics	3
1	TIF10053	Asymptotic Statistics	3
2	TIF20126	Econometrics of Networks	3
2	TIF20111	Computational Finance (UvA, code 6314M0350Y)	3
2	TIF20201	Advanced Machine Learning	3
2	TIF20120	Advanced Microeconometrics	3
2	TIF20403	Research Internship II	3
2	TIF20043	Advanced Econometrics II	3
3	TIF20126	Advanced Time Series Econometrics	3
3	TIF20125	Reinforcement Learning	3
3	TIF20129	Behavioural Finance	3
3	TIF20045	Advanced Econometrics III	3
3	TIF20124	Sustainable Finance	3
4	TIF20302	Corporate Finance Theory	3
5	TIF20797	BDS Lecture (not in 2025-26)	3
5	TIF20404	Field Paper	3
4 or 5	TIF20795	TI Economics Lectures 2026 (Esteban Rossi-Hansberg, Chicago University)	3
4 or 5	TIF20796	TI Econometrics Lectures 2026 (Alberto Abadie, MIT)	3

Operation Research Analytics track (mandatory field-specific courses Y2)

Period	Course code	Course name	Credits
1+2+3		Electives and research internships (internships max 6 EC)	15
1	TIF20304	Decomposition Methods	3
1	TIF20305	Heuristic Optimization Methods	3
1	TIF20303	Social Network Analysis	3
2	TIF20117	Bayesian Econometrics	3
1+2+3	TIC20012	Academic Writing	1
3+4+5	TIC20013	Presenting in Academia	1
3+4+5	TIC20899	Research Master Thesis	30

Electives available in 2025:

Period	Course code	Course name	Credits
1	TIF20106	Applied Microeconometrics	3
1	TIF20213	AI@Work	3
1	TIF20212	Marketing Science	3
1	TIF20401	Research Internship I	3
1	TIF20102	Banking	3
1	TIF20107	Continuous Time Asset Pricing	3
1	TIF20041	Advanced Econometrics I	3
1	TIF20051	Advanced Mathematics	3
1	TIF10053	Asymptotic Statistics	3
2	TIF20112	Social Media Data Analytics	3
2	TIF20126	Econometrics of Networks	3
2	TIF20111	Computational Finance (UvA, code 6314M0350Y)	3
2	TIF20403	Research Internship II	3
2	TIF20201	Advanced Machine Learning	3
2	TIF20120	Advanced Microeconometrics	3
2	TIF20043	Advanced Econometrics II	3
3	TIF20126	Advanced Time Series Econometrics	3
3	TIF20123	Forecasting Methods	3
3	TIF20125	Reinforcement Learning	3
3	TIF20129	Behavioural Finance	3
3	TIF20045	Advanced Econometrics III	3
3	TIF20124	Sustainable Finance	3
4	TIF20302	Corporate Finance Theory	3
5	TIF20797	BDS Lecture (not in 2025-26)	3
5	TIF20404	Field Paper	3
4 or 5	TIF20795	TI Economics Lectures 2026 (Esteban Rossi-Hansberg, Chicago University)	3
4 or 5	TIF20796	TI Econometrics Lectures 2026 (Alberto Abadie, MIT)	3

General provisions for course selection

Non-track specific electives can be selected among our list of field courses as provided per track (3 EC). The Economics, Econometrics and BDS Lectures (3EC) can be taken for credits in both year one and year two. The credits count towards the curriculum of year 2 and are maximized at 6EC total.

External courses up to a maximum of 9 EC can be selected from the external courses offered by LNMB, ABRI, ERIM or MasterMath, or from the TI curriculum. Courses that are not specified as optional electives, even if they are a TI or BDS course, must also be requested from the Examination Board.

Please be aware that these external courses need written approval from the Examination Board in advance. Field courses with less than 7 registered students may be cancelled.

External courses

Taking external courses for credits needs to be approved by the examination board. The university may charge a tuition fee for the course and additional requirements for participants may apply. Carefully check the university deadlines. Before June 15, students submit their study plan for the second year, including external courses, and apply for approval from the Examination Board to take these external courses for credit. Costs are only reimbursed if the DGS has advised to take the course. The program allocates typically 3 credits to any field course, including external courses, irrespective of the number of credits allocated to the same course elsewhere (an exception is made for MasterMath courses). External courses can contribute a maximum of 9 EC towards the credits in the curriculum.

- Courses at Erasmus University Rotterdam: check here.
- Courses at Vrije Universiteit: check here.
- Courses at University of Amsterdam: check here.
- Courses of the national MasterMath program: check here.
- PhD courses of the Dutch Network on the Mathematics of Operations Research: check here.
- ABRI courses: check here.

Skills Workshops (3 EC in total)

In the second year, practical aspects related to how to handle the review process, and grant applications will be discussed. In the Academic Writing workshops, composition and positioning skills are emphasized (1 EC). The series closes with the Presenting in Academia workshops that addresses skills for research talks and conference presentations (1 EC). Note that the Skills Workshops also include the Scientific Integrity course from the first year (1 EC).

Thesis writing and matching to a supervisor

The Research Master thesis represents the students' final proof of integrating business and data science, and will showcase their ability to identify relevant problems and address them using cutting-edge techniques to make a substantive contribution to the field. In the first year of the program, students are encouraged to select a research topic for the final thesis and to actively explore potential supervisors. The matching of students and supervisors, while largely the results of individual communication between the two parties, is supported by the DGS. .

Thesis supervisors must be BDS/TI research fellows. Under exceptional conditions and with permission of the DGS, students may be allowed to work with a thesis supervisor that is not a BDS/TI research fellow. The committee of the thesis must be faculty members of one of the three partners in the BDS research master's program, preferably BDS/TI research fellows.

Timeline for the thesis:

- Spring year 1: meeting with DGS on research topic and potential supervisor
- Summer year 1/December year 2: active matching with (potential) supervisor[3]
- January year 2: official start of the thesis trajectory
- Block IV year 2: search for committee
- Block V year 2: pre-defense (80% of the research done)
- Before August 15: deadline for submitting the final thesis.

Students who need more time to finalize the thesis and cannot defend or submit by the deadlines, have to re-enroll for the third year in the program and have to pay (part of) the tuition fee.

The thesis manual published in Canvas gives details on requirements and assessment, the student's and supervisor's responsibilities, and procedures. Students match up with a master thesis supervisor between block V in the first year of the program, and December of the second year.

Grading of the thesis:

- Weight pre-defense: 20%
- Weight Final Thesis: 80%

The pre-defense and subsequent submission of the thesis can only take place if the student has earned the credits for all other study units.

A graduation ceremony is organized each year, usually in November.

Seminars

Faculty members organize a wide variety of seminar series and conferences. Student participation in seminars is highly recommended. However, no course credits are allocated. Seminar schedules can be found here.

Checklist year 2

- Students complete 60 EC in year 2
- Course attendance is mandatory
- Course program decided at end year 2
- External courses require formal approval of the Examination Board in advance
- No retakes are scheduled within the same academic year
- The thesis is the final examination. All other credits must be obtained

[3] If students have difficulty with their matching, please reach out to dgs@businessdatascience.nl for assistance.

USEFUL INFORMATION

The Academic and Examination Regulations

The Academic and Examination Regulations (AER) for the BDS research master program are published on the student sharepoint pages. The AER lists the requirements for the program, rules for cum laude, has an extensive chapter on plagiarism and misbehavior and defines the rights of the students.

Communication with the students

On the student sharepoint pages students can find all kinds of information: how to apply for reimbursement of travel costs, annual reports of the Educational and Examination Board, the AER and transition regulations that apply and how to contact study advisers and student counsellors.

Teams will be used by the DGS and the support staff for formal and informal announcements.

The @student.eur email addresses is used for correspondence in Canvas and Osiris. All students will also get access to a formal @businessdatscience email address which can be used for correspondence with potential supervisors or for communication with external persons.

The Examination Board

The Examination Board serves two research master programs: the Tinbergen Institute research master program and the Business Data Science research master program. The Examination Board is responsible for the quality of examinations and diplomas.

The Examination Board consists of four members, one of each faculty participating in the research master programs and one external member. The responsibilities and tasks of the Examination Board are explained in the Academic and Examination Regulations and in the Rules and Regulations for the Examination Board (both available on Sharepoint). The Annual Report of the Examination Board is available upon request.

Students may contact the Examination Board for the following reasons:

- The Examination Board decides on deviations from the curriculum that may have a bearing on the diploma. Therefore, any requests for items such as taking courses provided by third parties for credits and exemptions from mandatory courses in the curriculum must be approved by the Examination Board.
- Students who miss an examination due to e.g. illness may ask for a re-sit in the same academic year.
- The Examination Board will rule on requests for adaptations with regard to examinations for students with a disability.

Individual requests are submitted via Osiris. The students sharepoint pages provide details on how to start a request and the documentation you need to provide to support your request. Contact address for the examination board is examinationboard@tinbergen.nl.

The Examination Board may take measures against a student in case of fraud, plagiarism or misbehavior.

Lodging an appeal

An appeal may be lodged against the way in which the result for an examination was reached or against any Examination Board decision. A detailed notice of appeal should be submitted to the Examination Appeals Board (CBE) of the Erasmus University. The procedures of the Appeal Board need to be followed carefully. Please read the instructions and deadlines on Sharepoint. In general, the appeal must be lodged within six weeks after the decision which is appealed has been made.

The Educational Board

The Educational Board serves the same two research master programs as the Examination Board.

The Educational Board consists of six members. Three members are from the programs' teaching staff and/or research fellows; three members are research master students in one of the programs.

Student members are nominated by the students after elections and are appointed by the Faculty Board of Erasmus University. Student members are appointed for 2 years. Members are listed on the website. The rules and regulations as well as the annual report of the Educational Board are available upon request.

The Educational Board issues advice, both solicited and unsolicited, to the Director of Graduate Studies on all matters concerning the educational program, with the objective to maintain or improve the quality of the program. The Educational Board's advice may concern all aspects of the program including composition of the curriculum, student facilities and teacher quality.

The student members organize an annual comprehensive program evaluation the outcome of which is discussed in the Educational Board meeting.

Students are free to contact Educational Board members with any concerns they may have about the program.

The Student Council

The Student Council is an independent student body that both informs and advises students, and organizes regular social events. For composition and agenda see the website.

Facilities

The program supports students with various facilities, such as office space and reimbursement of travel expenses between Amsterdam and Rotterdam for coursework.

Admission

The BDS research master program is a selective program. Selection of students is done in a careful selection process. Admission requirements are listed on the website.

PhD Trajectory

Subsequent PhD positions: The three faculties participating in the Business Data Science Research Master Program have PhD positions available for students who have completed the program. In many cases, the thesis supervisor will fulfill the role of PhD thesis supervisor. The DGS updates the students

towards the end of the first year about the number of expected PhD positions at the three universities. Students are advised to check with their thesis supervisor under what conditions they can transfer to a paid PhD position with that same supervisor. Students are also encouraged to investigate externally funded PhD opportunities available at the Schools. To facilitate this, potential supervisors present to students externally funded PhD projects.

Note that PhD positions are given by the faculties and that the DGS has no influence over the number of positions or the distribution of positions to specific supervisors. In a typical year, all students who perform well and pass the research master program can transfer to a PhD position. However, as the faculties and not the DGS provide PhD positions, the DGS cannot guarantee a PhD position for all students.

Funding

The program awards scholarships to selected students based on merit. Scholarships are granted by the Admission Board. Students who accept a scholarship are obliged to sign and thereby accept the scholarship regulations. Second year scholarships are merit based and only available for students who have earned 48 EC of first year credits, within the first year of admission with a grade of at least 6.0.

For second-year students, additional funding is offered by the faculties through research and/or teaching assistantships. These jobs offer valuable teaching and research experience. Students are encouraged to check job openings at the three faculties. Open positions are also advertised on the website.

Student advisors/counselors

Students can ask the assistance of the study advisors, counselors, or psychologists at Erasmus University (https://www.eur.nl/en/education/practical-matters/advice-counselling)

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