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*Note: The modules offered and their timing are conditional upon the availability of faculty and may be subject to change.*

## Operations and Technology Management PhD pathway: Course outline

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The PhD pathway in Operations and Technology Management (OTM) runs over a period of 5 years. It includes a foundation year when you will be registered as a masters student - either on **the MPhil in Strategy, Marketing and Operations** or on the **Master of Research (MRes)** - followed by 4 years as a PhD student.

The programme is specifically designed to prepare you for a successful academic career in the OTM field in a business school.

During your PhD you have 3 learning goals:

- (i) to master the knowledge base of the OTM field and be able to contribute to and shape the academic debates in the field
- (ii) to become fluent in the 3 main research methodologies of the field - mathematical modelling, econometrics, and laboratory and field experimentation, and to become a real expert in one of these methodologies, which you may choose
- (iii) to become an expert in a practical business or societal context where OTM matters, such as healthcare management, innovation management, or risk management. You will learn how to contribute to your chosen context by studying its challenges from an OTM perspective, drawing on the literature and on your engagement with organisations that wrestle with these challenges, and produce interesting and impactful research that expands our academic knowledge base and contributes to the solution of important problems.

The OTM PhD programme comprises a coursework component and a research component.

### Coursework

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The coursework component comprises of a suite of foundational and methodological courses, complemented by research seminars, which introduce you to current debates and research streams in the field and teach you how to evaluate research papers and how to write research proposals. The coursework component will be completed during the Foundation Year (finishing with a masters degree) and the first year of your PhD. Typical coursework for the PhD pathway in Operations and Technology Management includes the following **9 modules**, spread over 2 years.

#### THREE CORE OTM MODULES

- Introduction to Operations & Technology Management Research
- Classics of Operations & Technology Management Research
- Advanced Topics in Operations & Technology Management (biennial)

#### FIVE CORE FOUNDATIONAL AND METHODOLOGICAL MODULES

- Fundamentals of Competitive Markets
- Game Theory & Information Economics (biennial)
- Organisational Research Methods (biennial) (Part 1 or Part 2)
- Econometrics I
- Econometrics II

MODULES FROM A WIDE RANGE OF RESEARCH MODULES, SUCH AS

- Individual Research Projects (MPhil SMO)
- Qualitative Research Methods
- Further Econometrics: Time Series
- Quantitative Marketing (biennial)
- Organisational Research Methods (Part 1 or Part 2)
- Marketing Strategy
- Organisational Behaviour
- Consumer Behaviour (biennial)
- Seminar in Strategy Process (biennial)
- Masters-level modules offered elsewhere in Cambridge (eg the Cambridge Master of Mathematics, [www.maths.cam.ac.uk/postgrad/mathiii/](http://www.maths.cam.ac.uk/postgrad/mathiii/))

Your individual coursework requirement may deviate from this list as we consider your prior training and research proposal. We will determine a final list of coursework modules during your masters year.

The trademark of an academic career is continuous, lifelong learning. During your PhD we will therefore expect you to expand your field knowledge and methodological skill set further by participating in relevant courses offered by CJBS or cognate departments at Cambridge, as well as by attending appropriate courses or workshops in other business schools.

#### Research component

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The research component of the PhD will build on your coursework and will normally consist of two or three research projects, typically connected by a common theme and carried out in collaboration with faculty. These projects will lead to co-authored papers for publication in leading operations journals and constitute the core of your PhD thesis. While you will be encouraged to work with different faculty members on your PhD projects, an experienced faculty member will be nominated as your principal supervisor and will assume responsibility for mentoring and guiding you through the PhD, socialising you into the global academic OTM community, and working with you on the development of your academic job market package.

#### **Foundation year: research masters (MPhil or MRes)**

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During the Foundation Year, you are registered for a masters programme, either the MPhil in Strategy, Marketing and Operations, or the Master of Research (MRes).

If you are registered as an MPhil student you will take 9 of the recommended 12 PhD coursework modules.

If you are registered for the MRes, you will take 5 coursework modules during the MRes year (the choice depends on your prior training and research plan) and write a masters dissertation. Your MRes dissertation counts for 5 modules.

You will take any remaining coursework modules for the OTM pathway during the subsequent first PhD year, to make a total of 12 modules.

## Preparatory Maths & Stats (September)

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The MPhil in Strategy, Marketing and Operations and MRes programmes offer a pre-term mathematics refresher course, which starts in mid-September. Its aim is to review the mathematical and statistical methods required for the mathematical modelling and econometrics modules. Students with strong mathematics training may apply for exemption from this pre-course, which is otherwise mandatory.

## Individual research project

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If you are registered for the MPhil in your foundation year, you may undertake a supervised individual research project (IRP). This project will provide first-hand research experience and will prepare you for the individual research activity during the first year of the PhD. You are encouraged to propose a theme for your IRP. Alternatively, you can contact faculty and discuss possible IRP themes with them. If you intend to do an IRP, you will agree its theme with the MPhil director and a supervising faculty member at the beginning of Lent Term. The IRP is equivalent in weighting and workload to one course and may be included as part of the first year report at the end of the first year of the PhD (see below).

## Dissertation

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MRes students write an MRes dissertation, supervised by a faculty member, which counts for 50% of the overall mark for the MRes degree.

## PhD continuation requirement

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We strongly encourage MPhil students to apply for continuation to our PhD programme. Availability of specific PhD Principal Supervisors will vary from year to year because each typically works with a maximum of two PhD students at any given time. The PhD programme aims to admit between 6 and 10 students (PhD and MRes) per year, depending on the strength of applications, among other factors.

If you wish to apply for continuation to the PhD at CJBS, you will need to develop an initial research proposal during the first term of your MPhil year, talk to faculty about the fit of your research interests and then apply for admission to the PhD in January. Faculty will assist with the development of this proposal. Applications are assessed by the PhD Admissions committee in January on the basis of:

- quality of the research proposal and strength of references
- module performance during the first term
- performance in the admissions interview
- fit between the proposed research and the research expertise in the subject group, resulting in a recommended supervision arrangement from PhD pathway faculty
- ranking compared to other applicants, which includes prior academic performance

An admissions offer would be conditional on your overall performance in the MPhil or parts thereof. The usual condition is a mark of 70% overall (and 70% in any dissertation or project).

Due to the competitive nature of our programme, an offer of admission to the PhD is not guaranteed and we also encourage and support MPhil students in making applications to other leading PhD programmes.

If you are an MRes student, you will proceed to PhD registration without a further application process, if you achieve a mark of 70% in your dissertation and an overall average of 70% in your MRes.

## Summer (July–September)

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Your masters year ends formally in June, while your PhD only commences formally in October. As a continuing student you will be strongly advised to discuss with your faculty supervisors how to continue your research over the summer prior to the start of the first PhD year. This ensures that you don't lose valuable time towards completing your PhD. You may continue the work on your masters dissertation or individual research project or may do fieldwork or take a placement in an organisation related to your research proposal. We prefer students to remain in Cambridge over this period if possible. If this is not practicable (eg for visa reasons), faculty will be happy to supervise you remotely via video call and email.

## First year of the PhD

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The first year of the PhD is still probationary. Its purpose is to complete your coursework requirements and to develop a convincing final research proposal and execution plan for the PhD. Students will typically take three to four coursework modules, accounting for roughly one third of the time, with the remainder dedicated to individual research. A senior faculty member (your principal supervisor) will work with you on the development of your PhD research programme during the year and you may work with your principal supervisor or another faculty member on a specific research project, possibly but not necessarily as a continuation of any individual research (IRP or dissertation) you may have done during the masters year.

### First year report

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You will work with a faculty supervisor to produce a research report. This first year report can take one of 2 forms:

- a draft of a scientific paper targeted for publication which will become your first PhD paper. The paper will normally be co-authored with a faculty member, in which case your report will clarify your specific contribution to the paper
- an extended research proposal on the broader theme that you wish to address with your PhD research, including a thorough literature review and/or an in-depth case study based on your experience in an organisation, and a clear proposal and execution plan for a first research paper during the second PhD year

The report will demonstrate that you are able to produce your first research paper (typically co-authored with faculty) during the following academic year and provides evidence of your ability to formulate focused research questions, summarise relevant academic debates, critically assess the extant literature, and choose and execute appropriate research methods. You may (but do not have to) incorporate parts of your MPhil work into the first year report, such as module essays, individual research project, dissertation or a summer project (where applicable).

### Second year continuation requirements

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To proceed to the second year of the PhD, you must gain a mark of 70% for your first-year report and must pass all required courses (60% pass mark).

While we will continue to monitor your progress closely after the first year of your PhD, there will not be any more formal continuation assessment until the final PhD assessment.

## **Second year of the PhD**

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During the second year, you will focus on the production of your first research paper. Many students do this by 'learning on the job': you may join a project proposed by one of your faculty advisors or develop a project of joint interest with a faculty member and work in close collaboration with the advisor, who will normally be a co-author on the paper. You will present progress frequently, formally and informally, to all faculty and PhD students in the Operations and Technology Management subject group. You are expected to submit an abstract of the paper in spring for presentation at the INFORMS conference in the fall of the coming year. You will aim to submit the paper by the end of the second year of the PhD.

## **Third year of the PhD**

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During the third year, following submission of your first paper, you will focus on a second paper. You may continue to work with your co-author(s), choose other co-authors, or work independently on a paper. While your advisors will still play a significant role in shaping the idea for the second paper, you are expected to take more of a lead in the formulation and execution of this second paper and be the lead author on this paper. This second paper will normally become your 'job market paper' (your designated 'master piece' when you apply for your first faculty position). You are expected to submit an abstract of the paper in spring for presentation at the INFORMS conference in the fall of the coming year, expected to submit an abstract of the paper for presentation at the MSOM conference, and expected to submit the paper by the end of the academic year. In parallel with the development of this second paper, you and your co-authors will revise your first paper, following feedback from the journal, and will continue to present both papers at seminars and conferences.

## **Fourth year of the PhD**

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The fourth year is your job market year. We aim for you to go on the job market with one accepted paper and one revise and resubmit invitation from leading journals in the operations field. Achieving this is the focus of the fourth year.

You will present your 2 papers at the INFORMS job market conference and continue to revise and polish them. In addition, you may begin to work on a third paper. This third paper should further demonstrate your independence as a researcher - the idea, while born out of and honed-in discussion with your advisors and other academics, should be substantially your own and the execution should be driven by you, including assembling a suitable team of co-authors. You will submit your PhD thesis, based on your papers, during your fourth year.

We will encourage you to spend part of your third or fourth year as a visitor in an operations department of another university, typically in the USA, to build closer ties with potential collaborators and the global operations community.

## **Optional further study year (postdoc)**

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Good research requires you to take risks, to explore avenues and tackle issues that are new and original. Research may therefore not unfold as planned and your work may require substantial revision. In fact, many of the most influential research projects ended up taking considerably longer than anticipated. We encourage students to be aspirational and take risks – and we work with them to manage these risks.

To accommodate early 'wrong turns' and unforeseen delays, we sometimes recommend that a student delays entering the job market by a year and spend an additional year at CJBS (and possibly another university) to work on paper revisions with faculty and strengthen their portfolio of research paper before applying for a junior faculty position.

An optional further year at CJBS would be typically funded by:

- a CJBS post-doctoral grant (2 grants available by competition each year)
- paid teaching opportunities, which further strengthen a student's job market prospects