

OIST PhD Graduate Attributes

Harry Wilson, August 2023

OIST Grad School Curriculum and Programs

The OIST PhD Program is a full-time program of study leading to a doctoral research degree in science and technology, with the aim of graduating outstanding scientists well prepared for leadership roles in academia, industry, and other professional careers. The PhD program and the university are structured without departments, required course progressions, or majors, giving students the freedom to pursue study and research without restrictions imposed by traditional disciplinary boundaries.

Students who show evidence of outstanding potential for conducting creative and independent research are admitted with either an advanced Bachelor's or Master's degree. Students gain a broad range of exposure to science through research rotations and courses in the first two years and must develop and demonstrate competencies within and beyond their specific research topic. Students are facilitated to develop an independent research question, and are given the support, resources, and funds to carry out that research over the following years. Beyond the laboratory, there is a continued emphasis on professional development, including the mastery of relevant computation, communication, collaboration and leadership skills.

The OIST PhD Program is designed to generate graduates who can take advantage of the new frontiers of modern science by virtue of their adaptability, creativity, and confidence in their ability to thrive and lead in new disciplines and new techniques as they arise.

As a consequence of our program design, student selection, and academic and research support, our graduates excel in some or all of the following skills and attributes:

Understanding, analyzing, and integrating

Understanding the current state of knowledge and the literature of their own field of research;

Critically analyzing current research questions, techniques, and results in their own and adjacent fields of research;

Applying the best and most relevant theories and techniques from their own and allied fields to their research question;

Applying appropriate statistical analyses to draw fair and appropriate conclusions from data;

Understanding ethical, societal, and legal constraints and imperatives in their research and the practice of science in general;

Using appropriate language to clearly, concisely, and logically present results and arguments.

Thinking, creating, and synthesizing

Independently developing research questions to address current and future problems;

Confidently asking questions with self-direction, creativity and originality;

Advancing their specific field of study through original research by developing a substantial body of work worthy of international refereed publication;

Bringing together disparate views and different data to develop a bigger picture, and extending the frontiers of knowledge in new and innovative ways.

Mastering skills and techniques

Understanding the research methods, techniques, and problem-solving approaches used in their field, and choosing the appropriate ones for their needs;

Mastering the most suitable and efficient techniques to answer their research questions;

Using and developing appropriate software tools to find, analyze and present data;

Coding and scientific programming at appropriate level and in relevant environments for their research;

Planning, conducting, and completing a unique and independent program of world-class research.

Communicating and collaborating

Communicating their science and its relevance and impact to a wide range of audiences, including scholarly writing for journals and books, oral and poster presentations at conferences and seminars, submissions and reports to funding agencies, and science communication to a general audience;

Confidently and cordially discussing and arguing scientific questions with peers and colleagues;

Demonstrating leadership within their chosen community, including giving and receiving continuing professional education and mentoring;

Successfully participating in institution-wide, domestic, and international collaborations, and engaging across disciplines and cultures;

Understanding issues and opportunities in intellectual property, entrepreneurship, and the commercial and societal aspects of research and their results.

It is increasingly acknowledged that doctoral education should prepare graduates for a wider range of employment possibilities and that, indeed, such graduates are central to the business and public sectors of modern advanced knowledge economies (Maheu et al., 2014; Shin et al., 2018). As rationales for doctoral education have come to include a much wider range of economic and societal needs, so the putative roles of PhD students have shifted: from steward of the discipline, to thought leader in knowledge-intensive sectors beyond academia (Balaban, 2016), to individuals who can ‘address the planet’s and our society’s most urgent needs with greater courage, imagination, humility and wisdom’ (Porter, 2021). This has led to the creation of doctoral training programmes that include variously preparation for multi- and interdisciplinary research, cross-sectoral collaborations, entrepreneurship skills, internships or secondments and/or supervision in nonacademic organisations.

Nerad, M. et al (eds). 2022. *Towards a Global Core Value System in Doctoral Education*. London: UCL Press. <https://doi.org/10.14324/111.9781800080188>