**COURSE DESCRIPTIONS**

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| Code of course: **BMI-LOTD-613E.01,** BMA-LOTD-613.01 |
| Title of course: **Realist interpretations of quantum mechanics** |
| Lecturer: **Márton Gömöri** |
| **General aim of the course:** **The course provides an introduction to the foundations of quantum mechanics, focusing on the prospects of a realistic physical account of quantum phenomena.** **Content of the course:*** **Eight quantum experiments and the phenomenon of quantum non-locality**
* **The quantum recipe**
* **The wavefunction, the quantum state and the** Pusey-Barrett-Rudolph theorem
* **Collapse theories and the problem of local beables**
* **Pilot wave theories**
* **Many worlds**
* **Relativistic quantum field theory**

**Grading criteria, specific requirements:** Oral exam.Prerequisites: knowledge of basic physics as well as calculus and linear algebra is presupposed, but no knowledge of quantum theory is required.**Required reading:** **Tim Maudlin, Philosophy of Physics: Quantum Theory. Princeton University Press, 2019** **Suggested further reading:** **David Albert, *Quantum Mechanics and Experience,* Cambridge, MA: Harvard University Press, 1992.****Adam Becker, *What Is Real?* New York: Basic Books, 2018.****John Stewart Bell, *Speakable and Unspeakable in Quantum Mechanics*, second edition, Cambridge: Cambridge University Press, 2004.****Jean Bricmont, *Making Sense of Quantum Mechanics,* Cham, Switzerland: Springer International, 2016.****Travis Norsen, *Foundations of Quantum Mechanics: An Exploration of the Physical Meaning of Quantum Theory,* Cham, Switzerland: Springer International, 2017.** |