# Study Plan (AIMS)

**Specialisation: Spectroscopy and Imaging**

Technische Universität Braunschweig

Name:_____ Year of Enrollment:_____

Matricle Number:_____ Mentor:_____

## 1st Semester (winter semester) — 30 CP

| | | CP | |
|---|---|---|---|
| Compulsory | Introduction to AIMS | 5 | x |
| | Mathematics for Engineers A | 8 | x |
| | Programming in Python and Python Lab | 8 | x |
| Compulsory Elective (16-20 CP) | Biophysical Chemistry | 8 | |
| | Modern Optical Methods and Imaging | 8 | |
| | *Solar and Chemical Energy Conversion** | 8 | |
| | Physical Biology of the Cell | 10 | |
| | Chemometrics | 6 | |
| | Theoretical Spectroscopy | 8 | |
| | Machine Learning in Computational Chemistry | 8 | |
| | A) Sum of achieved CP for Specialisation | | |
| Compulsory | Ethics and Epistemology | 5 | x |

**Foundations**
1.-2. Semester
**26 CP (total)**

Specialisation
**Spectroscopy and Imaging**
1.-3. Semester
**37 CP (total)**

**Key Qualifications**
1.-3. Semester
**12 CP (total)**

*Frequency of courses: lectures: irregularly; practical course: every semester

## 2nd Semester (summer semester) — 30 CP

| | | CP | |
|---|---|---|---|
| Compulsory | Scientific Software Engineering – Lab | 5 | x |
| Compulsory Elective | Machine Learning for Data Science | 5 | |
| | Pattern Recognition | 5 | |
| | Computer Lab Pattern Recognition | 5 | |
| | Deep Learning Lab | 5 | |
| | Methods of Uncertainty Analysis and Quantification | 5 | |
| Basic Module (5 CP) | Molecular Spectroscopy | 5 | x |
| Compulsory Elective (16-20 CP) | *Solar and Chemical Energy Conversion** | 8 | |
| | Sophisticated Imaging | 10 | |
| | B) Sum of achieved CP for Specialisation | | |
| Compulsory Elective | Elective Modules | 7 | |

**Foundations**
1.-2. Semester
**26 CP (total)**

**Advanced Machine Learning and AI**
2.-3. Semester
**15 CP (total)**

Specialisation
**Spectroscopy and Imaging**
1.-3. Semester
**37 CP (total)**

**Key Qualifications**
1.-3. Semester
**12 CP (total)**

*Frequency of courses: lectures: irregularly; practical course: every semester

| 3rd Semester (winter semester) | | CP | | 30 CP |
|---|---|---|---|---|
| Compulsory Elective | *Pattern Recognition (offered in German in winter term)* | 5 | | **Advanced Machine Learning and AI** 2.-3. Semester **15 CP (total)** |
| | Computer Lab Pattern Recognition | 5 | | |
| Compulsory Elective (16-20 CP) | Biophysical Chemistry | 8 | | Specialisation **Spectroscopy and Imaging** 1.-3. Semester **37 CP (total)** |
| | Modern Optical Methods and Imaging | 8 | | |
| | *Solar and Chemical Energy Conversion** | 8 | | |
| | Physical Biology of the Cell | 10 | | |
| | Chemometrics | 6 | | |
| | Theoretical Spectroscopy | 8 | | |
| | Machine Learning in Computational Chemistry | 8 | | |
| | C) Sum of achieved CP for Specialisation | | | |
| | 37 CP - (A + B + C) = CP Research Lab (12-16 CP) | | | |
| | Research Lab | 12-16 | x | |
| | planned CP Research Lab | | | |
| Compulsory Elective | Ethics and Epistemology | 5 | x | **Key Qualifications** 1.-3. Semester **12 CP (total)** |
| | Elective Modules | 7 | | |

*Frequency of courses: lectures: irregularly; practical course: every semester

| 4th Semester (summer semester) | | CP | | 30 CP |
|---|---|---|---|---|
| Compulsory | Master Thesis | 30 | x | **Master Thesis** 4. Semester **30 CP** |

Date:_____ Signature Student:_____

Signature Mentor:_____