**Recommended Course Package for Computer Science Students**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Block 1** | **Block 2** | **Block 3** | **Block 4** |
| **Year 1** | AP(AdvancedProgramming) | ML(MachineLearning) | Q-INFMAT | Q-INFFYS |
| AADS(AdvancedAlgorithmsand DataStructures) | FYS/MAT | CS(ComputerSystems) | CS (ComputerSystems) |
| Crypto (C) |  | DifFun (C) | Adv MathNBI (C) |
|  |  |  |  |  |
| **Year 2** | CRYPTO | ACS(AdvancedComputerSystems) | Thesis (30 ECTS) |
| CS(ComputerSystems) | CS(ComputerSystems) |  |

**Recommended Course Package for Physics Students**

Physics students should register for the specialization in Quantum Science

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Block 1** | **Block 2** | **Block 3** | **Block 4** |
| **Year 1** | QM3(QuantumMechanics 3) | Begrænsetvalgfag | IDS(Introductionto DataScience) | Advanced MathPhys |
| Begrænsetvalgfag | ML(MachineLearning) | Q-INFMAT | Q-INFFYS |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Block 1** | **Block 2** | **Block 3** | **Block 4** |
| **Year 2** | Thesis (60 ECTS) |
|  |  |  |  |  |

AADS: Advanced Algorithms and Data Structures

ATML: Advanced Topics Machine Learning

ML: Machine Learning

ATIA: Advanced Topics Image Analysis

SIP: Signal Image Processing

LSDA: Large Scale Data Analysis

BDA: Big Data Analysis (Offered by NBI)

RA: Randomized Algorithms

IDS: Introduction to Data Science

**Recommended Study Plans for MATH Students**

1. For MATH students with a background in Quantum Mechanics:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Block 1** | **Block 2** | **Block 3** | **Block 4** |
| **Year 1** | [Advanced Quantum Mechanics](https://kurser.ku.dk/course/nfyk15003u) (A) | FunkAn (A) |  |  |
| PDE (B)or | Geom 2 (B) | QIT (B) | QI (B) |
| Crypto (C) |  | DifFun (C) | Adv MathNBI (C) |
|  |  |  |  |  |
| **Year 2** | QuOp (A) |  | Thesis (30 ECTS) |
|  | ExpMath (B) |
| Adv Algo (C) | MachineLearning (C) |

2. For MATH students with no background in Quantum Mechanics:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Block 1** | **Block 2** | **Block 3** | **Block 4** |
| **Year 1** | [Advanced Quantum Mechanics](https://kurser.ku.dk/course/nfyk15003u) (A) | FunkAn (A) |  |  |
|  | QuantumMechanics 1 (B) | QIT (B) | QI (B) |
| Crypto (C) |  | DifFun (C) | Adv MathNBI (C) |
|  |  |  |  |  |
| **Year 2** |  |  | Thesis (30 ECTS) |
| PDE (B)  | Geom2 (B) |
| Adv Algo (C) | MachineLearning (C) |

*One block equals nine weeks and 15 ECTS*

|  |  |  |
| --- | --- | --- |
|      |  | Compulsory course |
|      |  | Long restricted elective course (minimum 3 courses) |
|  |  | Short restricted elective course (minimum 4 courses) |
|      |  | Elective course |
|  |  | Physics course (bachelor or master level) |
|  |  | Computer Science course (bachelor or master level) |

**Courses relevant for MATH students offered at the two other departments are:**

From DIKU:

BA Courses:

Algorithms and Data Structures (overlaps with DifFun in MATH)

MA Courses:

Advanced Algorithms

Machine Learning

From NBI:

BA Courses

Quantum Mechanics 1

MA Courses

Quantum Optics

Quantum Information

**MATH courses relevant for DIKU and NBI students are:**

BA Courses:

Mathematical Physics

Introduction to Quantum Computing

MA Courses:

Quantum Information Theory

Advanced Mathematical Physics

Riemannian Geometry and General Relativity