**Recommended Course Package for Computer Science Students**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Block 1** | **Block 2** | **Block 3** | **Block 4** | |
| **Year 1** | AP  (Advanced  Programming) | ML  (Machine  Learning) | Q-INF  MAT | Q-INF  FYS | |
| AADS  (Advanced  Algorithms  and Data  Structures) | FYS/MAT | CS  (Computer  Systems) | | CS (Computer  Systems) |
| Crypto (C) |  | DifFun (C) | | Adv MathNBI (C) |
|  |  |  |  |  | |
| **Year 2** | CRYPTO | ACS  (Advanced  Computer  Systems) | Thesis (30 ECTS) | | |
| CS  (Computer  Systems) | CS  (Computer  Systems) |  | | |

**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  (Quantum  Mechanics 3) | Begrænset  valgfag | IDS  (Introduction  to Data  Science) | Advanced Math  Phys | |
| Begrænset  valgfag | ML  (Machine  Learning) | Q-INF  MAT | | Q-INF  FYS |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **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) | Machine  Learning (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) |  |  | |
|  | Quantum  Mechanics 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) | Machine  Learning (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