

Master's Programme in Applied and Engineering Mathematics (N5TeAM)

Programme Curriculum for intake 2015

AALTO:

Computational Mechanics

Track: Aalto – Chalmers

First autumn courses

Code	Course	CR	Period
MS-E2139	Nonlinear Programming	5	II
MS-E1651	Numerical Matrix Computations	5	I
MS-E1652	Computational Methods for Differential Equations	5	II
MS-E1460	Functional Analysis	5	I
	Other MS-EXXXX courses to be agreed with the professor of major	10	I/II
	TOTAL	30	

First spring courses

Code	Course	CR	Period
Kie-98.xxxx	English course: compulsory degree requirement, both oral and written requirements	3	I-V
MS-E1653	Finite Element Method	5	III-IV
MS-E1600	Probability Theory	5	III
MS-E1654	Computational Inverse Problems	5	IV
	Other MS-EXXXX courses to be agreed with the professor of major	12	III/IV/V
	TOTAL	30	

Cryptology and Coding Theory

Track: Aalto – DTU

First autumn courses

Code	Course	CR	Period
MS-E2139	Nonlinear Programming	5	II
T-79.4502	Cryptography and Data Security	5	I-II
MS-E1051	Combinatorics	5	II
MS-E1651	Numerical Matrix Computations	5	I
MS-E1110	Number Theory	5	II
MS-E1993	Introduction to Abstract Algebra II	5	I
	TOTAL	30	

First spring courses

Code	Course	CR	Period
Kie-98.xxxx	English course: compulsory degree requirement, both oral and written requirements	3	III-IV
MS-E1600	Probability Theory	5	III
T-79.5501	Cryptology P	5	III-IV

MS-E1995	Mathematical Tools for Coding Theory and Data Storage	5	III
MS-E1111	Galois Theory	5	IV
	Other MS-EXXXX courses to be agreed with the professor of major	7	III,IV,V
	TOTAL	30	

High Performance and Scientific Computing

Tracks: KTH – Aalto, Chalmers – Aalto

Second autumn courses at Aalto

Code	Course	CR	Period
Kie-98.xxxx	English course: compulsory degree requirement, both oral and written requirements	3	I-II
MS-E1981	Individual Studies in mathematics (N5TeAM Summer School)	3	I-II
24 cr of the following			
MS-E1659	Seminar on applied mathematics	0-5	I-V
MS-E1740	Continuum mechanics 1	5	I
MS-E1741	Continuum mechanics 2	5	II
	Other MS-EXXXX courses to be agreed with the professor of major	9-14	I/II
	TOTAL	30	

CHALMERS:

Chalmers - NTNU

First autumn courses

Code	Course	CR
TMA401	Functional Analysis	7,5
MVE140	Foundations of Probability	7,5
MVE185	Computer Intensive Statistical Methods (track S)	7,5
MVE190	Linear Statistical Models (track S)	7,5
TMA947	Optimization (track CM)	7,5
TMA265	Numerical Linear Algebra (track CM)	7,5
	TOTAL	30

First spring courses

Code	Course	CR
MVE160	Mathematical Modelling	7,5
MVE150	Algebra	7,5
TMA881	High-Performance Computing	7,5
MVE155	Statistical Inference (track S)	7,5
TMA322	Partial Differential Equations (track CM)	7,5
	TOTAL	30

Chalmers - Aalto

First autumn courses

Code	Course	CR
MVE140	Foundations of Probability (II)	7,5
TMA401	Functional Analysis (I)	7,5
TMA947	Optimization (II)	7,5

TMA265	Num. Lin. Alg. (I)	7,5
	TOTAL	30

First spring courses

Code	Course	CR
TMA372	PDE (III)	7,5
TMA881	High Perf. Comp. (IV)	7,5
MVE150	Algebra (III)	7,5
	Elective course	7,5
	TOTAL	30

Aalto - Chalmers

Second autumn courses

Code	Course	CR
	Choose four of the following courses:	
TMA401	Functional Analysis	7,5
TMA265	Numerical Linear algebra A	7,5
TMA632	Partial Differential Equations, project course	7,5
MVE080	Scientific Visualization	7,5
TMA462	Wavelet Analysis	7,5
KMG060	Systems Biology	7,5
FFR110	Computational Biology 1	7,5
TME225	Mechanics of Fluids	7,5
TME235	Mechanics of Solids	7,5
	TOTAL	30

NTNU - Chalmers

Second autumn courses

Code	Course	CR
	Choose four of the following courses:	
TMS165	Stochastic Calculus	7,5
MVE140	Foundations of Probability	7,5
TMA401	Functional Analysis	7,5
FFR110	Computational Biology	7,5
MVE190	Linear Statistical Models	7,5
MVE220	Financial Risk	7,5
	TOTAL	30

DTU:

DTU - KTH

First autumn courses

Code	Course	CR
02409	Multivariate Statistics E1A	5
02610	Optimization and Datafitting E2A	5
01415	Computational Discr. Mathematics E3A	5
01418	Introduction to PDE E5A	5
02393	Programming in C++	5
02614	High-performance Computing	5
	TOTAL	30

First spring courses

Code	Course	CR
02685	Scientific Computing for Differential Equations F1	10
02616	Large-scale Modeling F3A	5
42490	Technology, Economy, Management and Organization, F5	10
02417	Time Series Analysis F2B	5
	TOTAL	30

DTU - NTNU**First autumn courses**

Code	Course	CR
02409	Multivariate Statistics E1A	5
02610	Optimization and Data Fitting E2A	5
01617	Dynamical Systems 1 E4A	5
01418	Introduction to PDE E5A	5
01715	Functional Analysis E4B	5
02623	The Finite Element Method for PDEs	5
	TOTAL	30

First spring courses

Code	Course	CR
01410	Cryptology 1 F2A 5	5
01618	Dynamical Systems 2 F4A 5	5
42490	Technology, Economy, Management and Organization, F5	10
01227	Graph Theory F1B	5
01234	Differential Geometry with Applications F2B	5
	TOTAL	30

Aalto - DTU**Second autumn courses**

Code	Course	CR
	N5TeAM Summer School in Applied and Engineering Mathematics with follow-up	5
42490	Technology, Economy, Management and Organization E5	10
	Three of the following courses:	
01235	Manifolds and Tensor Analysis E1A	5
01617	Dynamical Systems 1 E4A	5
01257	Advance Modelling	5
xxxxx	Light Weight Cryptology	5
	TOTAL	30

NTNU - DTU**Second autumn courses**

Code	Course	CR
	N5TeAM Summer School in Applied and Engineering Mathematics with follow-up	5
42490	Technology, Economy, Management and Organization E5	10
	Three of the following four courses:	
01235	Manifolds and Tensor Analysis	5
10336	Fundamental Problems in Fluid Dynamics E1B	5

01715	Functional Analysis E4B	5
xxxxx	Light Weight Cryptology	5
	TOTAL	30

KTH:

KTH - NTNU

First autumn courses

Code	Course	CR
SF2561	Finite Element Methods	7,5
SF2736	Discrete Mathematics	7,5
DA2205	Philosophy of Science (equivalent)	3
SF2713	Foundations of analysis	7,5
SF2743	Advanced real Analysis I	7,5
	TOTAL	33

First spring courses

Code	Course	CR
SF2568	Parallel Computations for Large-Scale Problems	7,5
SF2950	Applied Mathematical Statistics	7,5
DA2205	Philosophy of Science (equivalent)	4,5
SF2744	Advanced real Analysis II	7,5
	TOTAL	27

KTH - Aalto

First autumn courses

Code	Course	CR
SF2736	Discrete Mathematics	7,5
SF2940	Probability Theory	7,5
DA2205	Philosophy of Science (equivalent)	3
SF2713	Foundations of Analysis	7,5
SF2743	Advanced real analysis I	7,5
	TOTAL	33

First spring courses

Code	Course	CR
SF2568	Parallel Computations for Large-Scale Problems	7,5
SF2822	Applied Nonlinear Optimization	7,5
DA2205	Philosophy of Science (equivalent)	4,5
SF2744	Advanced real analysis II	7,5
	TOTAL	27

Second autumn courses at KTH

Code	Course	CR
Compulsory		
DA2205	Philosophy of Science	7,5
DN240X	Master Thesis project (second spring)	30
Recommended		
SK2530	Introduction to Biomedicine	6
DD2435	Mathematical Modelling of Biological Systems	9

Elective		
DD2404	Applied Bioinformatics	7,5
DD2431	Machine Learning	6
BB2300	Computational Chemistry	7,5
BB2440	Bioinformatics and Biostatistics	7
BB2280	Molecular Modeling	7,5
DN2230	Fast Numerical Algorithms for Large-Scale Problems	7,5
DN2295	Project Course in Scientific Computing	7,5
	TOTAL	60

NTNU:

NTNU - KTH

First autumn courses

Code	Course	CR
TMA4245	Linear Methods	7,5
TMA4195	Mathematical Modeling	7,5
TMA4205	Numerical Linear Algebra	7,5
TMA4220	Num Part Diff Elem	7,5
	TOTAL	30

First spring courses

Code	Course	CR
TMA4180	Optimization Theory	7,5
TMA4280	Supercomputers, Introduction	7,5
TMA4150	Algebra and Number Theory	7,5
TMA4267	Linear Statistical Models	7,5
	TOTAL	30

NTNU - Chalmers

First autumn courses

Code	Course	CR
TMA4145	Linear Methods	7,5
TMA4305	Partial Differential Equations (track 1)	7,5
TMA4295	Statistical Inference	7,5
TMA4195	Mathematical Modeling	7,5
TMA4265	Stochastic Processes (track 2)	7,5
	TOTAL	30

First spring courses

Code	Course	CR
TMA4170	Fourier Analysis	7,5
TMA4180	Optimization	7,5
TMA4150	Algebra and Number Theory	7,5
	One elective course	7,5
	TOTAL	30

NTNU - DTU

First autumn courses

Code	Course	CR
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TMA4195	Mathematical Modeling	7,5
TMA4145	Linear Methods	7,5
TMA4305	Partial Differential Equations	7,5
TMA4265	Stochastic Processes	7,5
	TOTAL	30

First spring courses

Code	Course	CR
TMA4150	Algebra and Number Theory	7,5
TMA4185	Coding Theory	7,5
TMA4165	Diff Eq. And Dynamical Systems	7,5
TMA4180	Optimization Theory	7,5
	TOTAL	30

Second autumn courses at NTNU

Code	Course	CR
TMA 4500	Written Project	15
	Electives (choose 15 credits)	
TMA4195	Mathematical Modeling	7,5
TMA4205	Numerical Linear Algebra	7,5
TMA4220	Finite Element Methods	7,5
TMA4225	Analysis	7,5
TMA4305	Partial Differential Equations	7,5
TMA4285	Time Series Analysis	7,5
TMA4295	Statistical Inference	7,5
TMA4315	General Linear Models	7,5
	TOTAL	30