

数理工学専攻カリキュラム

博士(情報学)						
3 年 2 年 1 年	博士論文					
	専攻開設科目(セミナー4単位を含む計6単位) 数理工学特別セミナーA,B E (各2単位) 応用数学特別セミナーE システム数理特別セミナーE 数理物理学特別セミナーE (各2単位)			研究指導		
修士(情報学)						
2 年 1 年	修士論文					
	専攻開設科目(他専攻開設の推奨科目を含む選択12単位以上、 ただし、専攻開設科目・研究科共通科目「計算科学入門」を計8単位以上を含む)				研究指導科目 (必修10単位)	
	専攻専門科目 数理解析特論 離散数理特論 制御システム特論 最適化数理特論 物理統計学特論 力学系理論特論 数理ファイナンス通論 (以上各2単位) 金融工学 応用数理工学特論A 応用数理工学特論B (以上各1単位)		他専攻開設の推奨科目 (知)パターン認識特論E (先端)応用解析学通論A、B 非線形物理学通論A、B (シス)学習機械論 統計的システム論 情報論的システム論 スーパーコンピューティング特論 (通)離散アルゴリズム理論 並列計算機アーキテクチャ 情報通信技術のデザイン		数理工学特別研究2E (修士2年、5単位) 数理工学特別研究1E (修士1年、5単位)	
	専攻基礎科目 (各2単位) 計画数学通論 数理物理学通論 システム解析通論		研究科共通科目 研究科共通展望科目(選択必修2単位) 情報学展望1 情報学展望2 情報学展望3E 情報学展望4E 情報学展望5E (各2単位)		デザイン 学科目	
		計算科学入門(2単位) 情報と知財(2単位) 計算科学演習A(1単位) イノベーションと情報(2単位) 情報分析・管理論(2単位) 情報分析・管理演習(1単位) 情報学による社会貢献E(1単位) 情報学におけるインターンシップE(1単位)		研究科が 提供する その他 科目		
入学前	基礎数学 微積分学、線形代数学など		右のいずれかの 基礎事項を修得 している	応用数学 複素関数、フーリエ解析、 数値解析、グラフ理論など	システム数理 線型計画、最適化、 制御理論など	数理物理学 古典力学、微分方程式、 統計力学など

※Eと記された科目は英語だけでも修得可

Curriculum of Department of Applied Mathematics and Physics

Doctoral Program (Informatics)

3rd	Doctoral Thesis	
2nd	Courses provided by the Department (total 6 credits including 4 credits from seminars) Seminar on Applied Mathematics and Physics, Adv. A, B, E (2 credits) Seminar on Applied Mathematics, Adv. E, Seminar on Applied Mathematical systems, Adv. E Seminar on Mathematical Physics, Adv. E, Seminar on Mathematical Finance E (2 credits each)	Research Guidance
1st		

Master's Program (Informatics)

Master's Thesis											
2nd	<div style="background-color: #e0f2f1; padding: 5px;"> <p>Courses provided by the Department (Optional 12 credits or more from the recommended courses provided by the other departments. 8 or more credits are required from the courses provided by the department and "<u>Computational Science, Introduction</u>" of the general courses provided by the School.)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e0f2f1; padding: 5px;"> <p>Advanced courses Mathematical Analysis, Adv., Discrete Mathematics, Adv., Control System Theory, Adv., Optimization Theory, Adv., Physical Statistics, Adv., Dynamical Systems, Adv. Introduction to Mathematical Finance (2 credits each) Financial Engineering, Topics in Applied Mathematics and Physics A Topics in Applied Mathematics and Physics B (1 credit each)</p> </td> <td style="background-color: #e0f2f1; padding: 5px;"> <p>Recommended courses provided by other departments (2 credits each) Pattern Recognition Adv. E (IST) Applied Analysis A, B, Nonlinear Physics A, B (AMS) Theory of Learning Machines, Statistical Systems Theory, Information-theoretic systems theory, Supercomputing, Adv. (SS) Theory of Discrete Algorithms, Parallel Computer Architecture, Design in ICT (CCE)</p> </td> </tr> <tr> <td style="background-color: #e0f2f1; padding: 5px;"> <p>Advanced courses (2 credits each) Operations Research Adv., Mathematical Physics, Adv., Systems Analysis, Adv.</p> </td> <td></td> </tr> </table> </div>	<p>Advanced courses Mathematical Analysis, Adv., Discrete Mathematics, Adv., Control System Theory, Adv., Optimization Theory, Adv., Physical Statistics, Adv., Dynamical Systems, Adv. Introduction to Mathematical Finance (2 credits each) Financial Engineering, Topics in Applied Mathematics and Physics A Topics in Applied Mathematics and Physics B (1 credit each)</p>	<p>Recommended courses provided by other departments (2 credits each) Pattern Recognition Adv. E (IST) Applied Analysis A, B, Nonlinear Physics A, B (AMS) Theory of Learning Machines, Statistical Systems Theory, Information-theoretic systems theory, Supercomputing, Adv. (SS) Theory of Discrete Algorithms, Parallel Computer Architecture, Design in ICT (CCE)</p>	<p>Advanced courses (2 credits each) Operations Research Adv., Mathematical Physics, Adv., Systems Analysis, Adv.</p>		<p>Seminars and exercises for Master's Thesis (Mandatory 10 credits)</p> <p>Advanced Study in Social Informatics 2E (Assigned to M2, 5 credits)</p> <p>Advanced Study in Social Informatics 1E (Assigned to M1, 5 credits)</p>					
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Prior to admission	Basic Mathematics Calculus, Linear algebra, etc.	Preferred to understand the subjects on the right	Applied Mathematics Complex functions, Fourier analysis, Numerical analysis, Graph theory, etc.	Mathematical Systems Linear programming, Optimization, Control theory, etc.	Mathematical Physics Classical dynamics, Differential equation, Statistical mechanics, etc.
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※Courses marked with the letter "E" will be provided in English.