

UNIVERSITY OF DEBRECEN
Doctoral School of Informatics

Doctoral Program	Theoretical foundation and applications of information technology and stochastic systems
Director of Doctoral Program	István Fazekas
Objectives of Doctoral Program	The students get acquainted with the theoretical foundation of information technology and stochastic systems, get insight to the applications of the theory, and they achieve competency to develop the theory. Those topics are preferred which improve the quality of information communication technology, therefore meet the requirements of the information society.
Academic and Research Fields	<p>Modelling complex systems: stochastic and computer models. Modelling evolution of networks by random graphs and computer experiments. Scientific calculations: applying supercomputer and parallel programming to solve problems in statistics, numeric analysis and operational research, their applications in natural and social sciences (physics, meteorology, economics,...). Study of methods of operational research and their applications in science and industry. Description of temporal and spatial processes by stochastic models. Studying statistical models by mathematical methods and computer simulations. Stochastic financial, insurance and other econometric models and their statistical aspects. Machine learning. Statistical, mathematical and software tools of business intelligence.</p> <p>Library informatics, applications of multimedia and Web, virtual reality. History of information, cognitive science. Libraries and digital archives. Didactics of informatics and electronic (e-learning) teaching frameworks.</p>
Participant Supervisors	Sándor Baran, Ágnes Baran, Anett Rác, Miklós Bényei, István Boda, Gyöngyi Bujdosó, Erzsébet Dani Bujdosóné, Mária Borbély Eszenyiné, István Fazekas, József Gáll, Erzsébet Tóth, Tamás Vertse, Márta Virágos
Participant Tutors	Bernadett Aradi, Ágnes Baran, Sándor Baran, Mátyás Barczy, Anett Rác, Miklós Bényei, István Boda, Gyöngyi Bujdosó, Erzsébet Dani Bujdosóné, Pál Burai, Mária Borbély Eszenyiné, István Fazekas, József Gáll, Margit Némethi-Takács, Gyula Pap, Kinga Sikolya-Kertész, Patricia Szokol, Erzsébet Tóth, Tamás Vertse, Márta Virágos

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Courses

Codes	Courses	Credits	Type of Exam.	Lecture	Practice	Lab	Tutor	Scient. Grad.
	Compulsory courses							
	Foundation of machine Learning	2	O	+	-	+	István Fazekas	DsC, habil
	Library Management	2	O	+	-	-	Márta Virágos	PhD
	Compulsorily eligible courses							
	Scientific computing	2	W	+	-	+	Ágnes Baran	PhD
	Topics in the theory of stochastic processes	2	O	+	-	-	Sándor Baran	DSc, habil
	Selected topics in probability	2	O	+	-	-	Mátyás Barczy	PhD, habil
	Random graphs and networks	2	O	+	-	-	István Fazekas	DsC, habil
	History of information	2	O	+	-	-	Miklós Bényei	DsC, habil
	The narratives of digital reading, electronic literature	2	O	+	-	-	Erzsébet Dani Bujdosóné	PhD, habil
	Optional courses							
	Finite element methods	2	W	+	-	+	Ágnes Baran	PhD
	Stochastic algorithms	2	O	+	+	-	Sándor Baran	DSc, habil
	Multivariable statistical methods	2	O	+	+	-	Sándor Baran	DSc, habil
	Applications of virtual reality	2	W	+	-	+	Anett Rácz	PhD
	Implementation techniques of simplex method	2	W	+	-	+	Anett Rácz	PhD
	Integer programming	2	W	+	-	+	Anett Rácz	PhD
	Nonlinear Optimization	2	W	+	+	-	Pál Burai	PhD, habil
	Convex analysis and optimization	2	W	+	+	-	Pál Burai	PhD, habil
	Convergence of Probability Measures	2	O	+	-	-	István Fazekas	DsC, habil
	Statistical analysis with SAS	2	W	+	-	+	Patrícia Szokol	PhD
	Financial mathematics	2	O	+	-	-	József Gáll	PhD
	Insurance mathematics	2	O	+	-	-	József Gáll	PhD
	Computer statistics	2	W	+	-	+	Kinga Sikolya-Kertész	PhD
	Numerical analysis for engineers	2	W	+	-	+	Vertse Tamás	DsC, habil
	Cognitive Science	2	O	+	-	-	István Boda	PhD, habil
	Software quality	2	O	+	-	-	Mária Borbély, Eszenyiné	PhD

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Metadata of digital collections	2	O	+	+	-	Margit Némethi-Takács	PhD
Web information retrieval	2	O	+	-	+	Erzsébet Tóth	PhD
Basic Questions of the Copyright in the Digital Age	2	O	+	-	-	Márta Virágos	PhD
Questions of knowledge transfer	2	O	+	-	-	Márta Virágos	PhD

Students of the doctoral program have to get 2 credits by taking compulsory courses. After this they have to collect 10 credits by taking 2 compulsorily eligible and 3 optional courses. The last 4 credits can be get by taking further courses of the doctoral school or other doctoral schools. Before taking subjects students have to consult with their supervisor about the order and time of taking them.