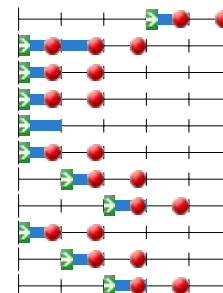


Program overview

21-Sep-2011 15:19

Year 2011/2012
Organization Werktuigbouwkunde, Maritieme Techniek & Technische Materiaalwetenschappen
Education Pre-Master Systems and Control

Code	Omschrijving	ECTS	p1	p2	p3	p4	p5
Pre-Master SC 2011	Pre-Master Systems and Control 2011						
SC3011TN	Stochastic Signal Analysis	3					
TN2545	Systems and Signals	6					
WB2207-07	Systems and Control Engineering	3					
<i>WB2207-07 D1</i>	<i>Systems and Control Engineering - Exam</i>	2,5					
<i>WB2207-07 D2</i>	<i>Systems and Control Engineering - Practical</i>	0,5					
WI1708TH1	Analysis 1	3					
WI1708TH2	Analysis 2	3					
WI1708TH3	Analysis 3	3					
WI1807TH1	Linear Algebra 1	3					
WI1909TH	Differential Equations	3					
WI3104TN	Probability and Statistics	3					



Year 2011/2012
Organization Werktuigbouwkunde, Maritieme Techniek & Technische Materiaalwetenschappen
Education Pre-Master Systems and Control

Pre-Master SC 2011

Program Coordinator	Dr. P.S.C. Heuberger
Contact for Students	Drs. Ton Valk, e-mail: b.a.valk@tudelft.nl tel. +31 15 278 84923
Introduction 1	<p>Bachelor's degree from Dutch institute of higher education (TH)</p> <p>Candidates holding a BSc degree from a Dutch institute of higher education (TH) programme in Electrical Engineering, Mechanical Engineering, Applied Mathematics, Applied Physics or Aerospace Engineering may be admitted to the MSc subject to selection by the Board of Examiners (intake coordinator) and completion of a pre-Master's programme (bridging programme). The TH Bachelor's programme must have been completed within the past four years, with good results. After September 1, 2011 it is no longer allowed to participate in MSc courses before the Pre-Master's programme is completed. Final admission to the MSc is granted after completing the Pre-Master's programme.</p> <p>The courses of the Pre-Master's programme are taught in Dutch.</p> <p>By agreement with the MSc Co-ordinator, other courses may be selected according to the student's individual profile and the course schedule. Any such proposed personal conversion programme has to be approved by the Board of Examiners. The TH student can be exempted from the internship (15 EC) in the MSc programme, keeping in mind the earlier study program.</p> <p>The structure of the programme is as follows:</p>

SC3011TN	Stochastic Signal Analysis	3
Responsible Instructor	Dr.ir. A.J. den Dekker	
Responsible Instructor	Prof.dr.ir. P.M.J. Van den Hof	
Contact Hours / Week x/x/x/x	0/0/0/6	
Education Period	4	
Start Education	4	
Exam Period	4 5	
Course Language	Dutch	
Department	3mE Department Delft Center for Systems and Control	

TN2545	Systems and Signals	6
Responsible Instructor	Dr. B. Rieger	
Instructor	Prof.dr. I.T. Young	
Contact Hours / Week x/x/x/x	4/4/0/0	
Education Period	1 2	
Start Education	1	
Exam Period	1 2 3	
Course Language	Dutch	
Expected prior knowledge	Complex numbers, elementary calculus: derivatives & integrals, geometric series, trigonometric & exponential functions.	
Course Contents	Systemen en signalen in continue en discrete tijd. Basis deterministische signalen. Convolutie en eigenschappen van LTI systemen. Fourier reeks en Fourier transformatie met eigenschappen. Filters in theorie en praktijk: eerste en tweede orde DV, Butterworth, Gaussische afgeleide filters. Het schatten van spectra in een tijdvenster en de bijbehorende onzekerheidsrelatie. De DFT en FFT als praktische gereedschappen. Introductie 2-D Fourier transformatie. Modulatie en demodulatie technieken, analytic signal en Hilbert transform. Bemonstering (Nyquist-theorema), aliasing en reconstructie. Laplace- en Z-transformaties met ROC en eigenschappen. Teruggekoppelde systemen en stabiliteitsbepaling.	
Study Goals	Het analyseren, ontwerpen en doorrekenen van Lineaire Tijd-Invariante (LTI) systemen in zowel de continue- als discrete-tijd. Representatie van signalen in frequentiecomponenten met behulp van de Fourier transformatie (of Fourier reeks). Het kunnen doorrekenen van LTI systemen door middel van convolutie of door gebruik te maken van de Fourier/Laplace/Z-transformatie en zijn eigenschappen. Het kunnen filteren van signalen en een beschrijving hiervan kunnen geven in termen van impulsresponsie, overdrachtsfunctie en differentiaal/differentie-vergelijking. Het kunnen relateren van corresponderende systemen in continue- en discrete tijd. Het kunnen schatten van spectra in een willekeurig tijdvenster. Het kunnen toepassen van de discrete Fourier transformatie (DFT). Het toepassen van amplitude modulatie (enkele- en dubbele-zijband, quadratuur). Het bemonsteren van bandbreedte begrensde signalen volgens het Nyquist criterium en het reconstrueren van een continue signaal uit discrete monsters. Het kunnen doorrekenen van lineaire teruggekoppelde systemen door gebruik te maken van Laplace and z-transformatie en stabiliteitsanalyse.	
Education Method	Hoorcollege 4/4/0/0 en huiswerk.	
Literature and Study Materials	A. V. Oppenheim and A.S.Willsky, with S.H.Nawab, Signals and Systems, Prentice-Hall, 2nd edition, Ch. 1 t/m. 11 (verkrijgbaar bij de boekhandel). Reader met aanvullende stof en collegesheets.	
Assessment	1) Required homework sets (weight 30%); 2) A written mid-term exam at the end of the first quarter (weight 20%) covering the material from the first quarter, and; 3) A written final exam (weight 50%) covering the material from all 14 weeks and given at the end of the second quarter. 4) A "herkansing" final exam will be given between the third and fourth quarter. 5) Homework from previous years is not taken into account.	

WB2207-07	Systems and Control Engineering	3
Responsible Instructor	Prof.dr. R. Babuska	
Instructor	Ir. I. Grondman	
Contact Hours / Week x/x/x/x	4/0/0/0	
Education Period	1	
Start Education	1	
Exam Period	1 2	
Course Language	Dutch	
Required for	wb2420	
Expected prior knowledge	wb2104 (Systeem- en regeltechniek 1),WB101-05 (Cluster Wiskunde)	
Course Contents	<p>The course deals with the representation, analysis and control of linear time-invariant dynamic systems. Both the transfer function and state-space models are covered.</p> <p>A strong focus will be on the drawing and interpretation of bode, root-locus and nyquist plots for system stability analysis and feedback control design. In this perspective, the concepts of gain, phase margin, static and dynamic compensation will be taught. Different compensations that get attention are: PD-compensation, lead compensation, PI compensation, Lag compensation and PID compensation.</p> <p>Other control theoretical aspects of sensitivity functions, robustness, time delay, state-space control design and pole placement will also be treated.</p>	
Study Goals	<p>The student is able to:</p> <ul style="list-style-type: none"> - Represent a dynamic system as a transfer function and a state-space model. - Analyze the influence of a given controller on the closed-loop dynamics by using the root-locus method. - Sketch a root-locus for simple dynamic systems. - Sketch a Nyquist plot for simple dynamic systems. - Sketch a Bode plot for a given dynamic system. - Analyze the properties of a dynamic system in the frequency domain. - Given requirements on stability margins, design a controller in frequency domain. - Analyze the influence of time delay on the closed-loop performance. - Design a state-feedback controller by pole placement. - Use effectively Matlab and Simulink for control design purposes. 	
Education Method	<ul style="list-style-type: none"> - Lectures (4 hours per week) including several instructions. - Practical work (2 hours per week for 3 weeks) consisting of Matlab/ Simulink control design and simulation and the implementation of a controller for a DC motor. 	
Computer Use	MATLAB and SIMULINK will be used in the instruction lectures and the practical work. It will be stimulated to check examples from the book and lectures yourself in MATLAB.	
Literature and Study Materials	<p>Course material: G.F.Franklin, J.D.Powell, A.Emami-Naeini ,Feedback Control of Dynamic Systems, Addison & Wesley, 2006, 4th or 5th edition</p> <p>References from literature: J.C.Cool, F.J.Schijff, T.J.Viersma ,Regeltechniek, Delta Press, 1985, 7-e druk. R.C.Dorf, R.H.Bishop A Modern Control Systems, Addison & Wesley, 1998, 8th edition John van de Vegte "Feedback Control Systems" Prentice Hall, 1994, 3rd edition.</p>	
Assessment	See Dutch description	
Enrolment / Application	Students need to enroll for this course in BlackBoard in order to participate!	
Remarks	Participation and successful completion of the practical work is required to obtain a mark for the course. The students are strongly advised to prepare well for the instruction lectures as it is strongly connected to the practical work. During the lectures, instructions and practical work, there will be the possibility of interaction.	
Percentage of Design	25%	
Design Content	Designing control systems and evaluation of performance of the designed systems.	
Department	3mE Department Delft Center for Systems and Control	

WB2207-07 D1	Systems and Control Engineering - Exam	2.5
Responsible Instructor	Prof.dr. R. Babuska	
Contact Hours / Week x/x/x/x	4/0/0/0	
Education Period	1	
Start Education	1	
Exam Period	1 2	
Course Language	Dutch	
Course Contents	See wb2207-07	
Study Goals	See wb2207-07	
Education Method	See wb2207-07	
Assessment	See wb2207-07	
Department	3mE Department Delft Center for Systems and Control	

WB2207-07 D2	Systems and Control Engineering - Practical	.5
Responsible Instructor	Prof.dr. R. Babuska	
Contact Hours / Week x/x/x/x	x/0/0/0	
Education Period	1	
Start Education	1	
Exam Period	none	
Course Language	Dutch	
Course Contents	See wb2207-07	
Study Goals	See wb2207-07	
Education Method	See wb2207-07	
Assessment	See wb2207-07	
Department	3mE Department Delft Center for Systems and Control	

WI1708TH1	Analysis 1	3
Responsible Instructor	Dr. P.M. Visser	
Contact Hours / Week x/x/x/x	4/0/0/0	
Education Period	1	
Start Education	1	
Exam Period	1 2	
Course Language	Dutch	

WI1708TH2	Analysis 2	3
Responsible Instructor	Dr. P.M. Visser	
Contact Hours / Week x/x/x/x	0/4/0/0	
Education Period	2	
Start Education	2	
Exam Period	2 3	
Course Language	Dutch	

WI1708TH3	Analysis 3	3
Responsible Instructor	Dr. P.M. Visser	
Contact Hours / Week x/x/x/x	0/0/4/0	
Education Period	3	
Start Education	3	
Exam Period	3 4	
Course Language	Dutch	

WI1807TH1	Linear Algebra 1	3
Responsible Instructor	Dr. B.J. Meulenbroek	
Contact Hours / Week x/x/x/x	4/0/0/0	
Education Period	1	
Start Education	1	
Exam Period	1 2	
Course Language	Dutch	

WI1909TH	Differential Equations	3
Responsible Instructor	Drs. I.A.M. Goddijn	
Contact Hours / Week x/x/x/x	0/4/0/0	
Education Period	2	
Start Education	2	
Exam Period	2 3	
Course Language	Dutch	

WI3104TN	Probability and Statistics	3
Responsible Instructor	Dr. G. Hooghiemstra	
Contact Hours / Week x/x/x/x	0/0/4/0	
Education Period	3	
Start Education	3	
Exam Period	3	
	4	
Course Language	Dutch	

Prof.dr. R. Babuska

Unit	Mech, Maritime & Materials Eng
Department	Intelligent Control & Robotics
E-mail	R.Babuska@tudelft.nl
Telephone	+31 (0)15 27 85117
Room	8C-3-18

Dr.ir. A.J. den Dekker

Unit	Mech, Maritime & Materials Eng
Department	Model-based Measurem & Contr
E-mail	A.J.denDekker@tudelft.nl
Telephone	+31 (0)15 27 81823
Room	8C-2-10

Drs. I.A.M. Goddijn

Unit	Elektrotechn., Wisk. & Inform.
Department	Analyse
Telephone	+31 (0)15 27 86408
Room	HB 04.240

Ir. I. Grondman

Unit	Mech, Maritime & Materials Eng
Department	Intelligent Control & Robotics
Telephone	+31 (0)15 27 83371
Room	8C-3-17

Dr. G. Hooghiemstra

Unit	Elektrotechn., Wisk. & Inform.
Department	Kansrekening
E-mail	G.Hooghiemstra@tudelft.nl
Telephone	+31 (0)15 27 82589
Room	HB 06.090

Dr. B.J. Meulenbroek

Unit	Elektrotechn., Wisk. & Inform.
Department	Mathematische Fysica
Telephone	+31 (0)15 27 89069
Room	HB 05.300

Dr. B. Rieger

Unit	Technische Natuurwetenschappen
Department	IST/Quantitative Imaging
Telephone	+31 (0)15 27 88574
Room	F 230

Prof.dr.ir. P.M.J. Van den Hof

Unit	Mech, Maritime & Materials Eng
Department	Model-based Measurem & Contr
Room	-

Unit	Technische Natuurwetenschappen
Department	IST/Algemeen
Telephone	+31 (0)15 27 84509
Room	-

Dr. P.M. Visser

Unit	Elektrotechn., Wisk. & Inform.
Department	Mathematische Fysica
Telephone	+31 (0)15 27 89071
Room	HB 05.120

Prof.dr. I.T. Young

Unit	Technische Natuurwetenschappen
Department	IST/Quantitative Imaging
Telephone	+31 (0)15 27 85390
Room	F 229

ontbreekt

Dr. P.S.C. Heuberger