Study Plan

**Advanced Signal Processing &
Communications Engineering (ASC)**

Study Plan for the Elite Master's Degree Programme
Advanced Signal Processing & Communications Engineering (ASC)

In each of the first three semesters before the start of the lecture period, students shall submit a study plan for the coming semester to the ASC office. It has to be approved by their mentor and contain all signatures. Before the first and second semester the mandatory elective and elective modules must be chosen and included into the study plan.

In each semester the additions will be supplemented while the former items must remain! Changes to a student's study plan have to be recommended by the mentor and subsequently receive the final approval from the Admission Committee.

Before the third semester the topics and supervisors of the research projects must be chosen and added to the study plan. Each project and later on the Master's thesis have to be described with at least 200 words.

Please note that this concept is a binding version and later alterations require the consent of the Admission Committee.

Current Semester	Semester Start of Studies	# Sem	Matriculation Number

Last Name	First Name	Graduated from

Signatures

Date: _____

Date: _____

Signature: _____

Signature: _____

Full
Name: _____

Full
Name: _____

Function: STUDENT _____

Function: MENTOR _____

Study Plan

Course Plan

Type of Module	Standard Semester Sem-x (WS/SS)	Module Name	ECTS	Planned Semester Sem-x (WS/SS)	Course Passed MM-YYYY
Mandatory Modules (35 ECTS)	Sem-1 (WS)	Mathematical Optimization for Communications and Signal Processing	5		
	Sem-1 (WS)	Information Theory and Coding	5		
	Sem-1 (WS)	Statistical Signal Processing	5		
	Sem-1 (WS)	Game Theory with Applications to Information Engineering	5		
	Sem-1 (WS)	Machine Learning in Signal Processing	5		
	Sem-2 (SS)	Selected Topics in ASC	5		
	Sem-1 (WS) Sem-2 (SS)	Kick-off Seminar, Winter School & Summer School	5		
Research Projects (25 ECTS)	Sem-3 (WS)	Major Research Project	15		
	Sem3 (WS)	Minor Research Project	10		
Technical Mandatory-Elective Courses (15 ECTS)					
Technical Lab Courses (5 ECTS)					
Nontechnical Elective Courses (5 ECTS)					
Technical Elective Courses (5 ECTS)					
Master's Thesis	Sem-4 (SS)		30		

Study Plan

Research Project(s)

Module	Supervisor and Topic *
Research Project (Minor)	
Research Project (Major)	

* Use this table to state your plans at the beginning of the 3rd semester at the latest. Fill in the additional "Project Form" with the final title and other details to state your final plans BEFORE you actually start your project work.

Study Plan Comments

Table I – Module Plan / General Course Plan – for ASC Batch 2019/20

Type of Module	ECTS	Module (Course Name or Module Class)	ECTS in Semester			
			1st	2nd	3rd	4th
Mandatory Modules (60 ECTS)	5	Mathematical Optimization for Communications and Signal Processing	5			
	5	Information Theory and Coding	5			
	5	Statistical Signal Processing	5			
	5	Game Theory with Applications to Information Engineering	5			
	5	Machine Learning in Signal Processing	5			
	5	Selected Topics in ASC		5		
	5	Kick-off Seminar (Winter School, Summer School)	2.5	2.5		
	15	Research Project (Major)			15	
	10	Research Project (Minor)			10	
Mandatory-Elective Modules (20 ECTS)	15	From "Technical Mandatory-Elective Courses" (Table II)		15		
	5	From "Technical Lab Courses" (Table II)	2.5	2.5		
Elective Modules (10 ECTS)	5	From "Nontechnical Elective Courses" (Table II)		5		
	5	From "Technical Elective Courses" (Table II)			5	
Master's Thesis	30					30
TOTAL SUM	120		30	30	30	30

Table II

Module Class	Course Name	ECTS in Winter Semester	ECTS in Summer Semester
Technical Mandatory-Elective Courses (binding list, NOT extendible)	Communications Systems Design	5	
	Convex Optimization in Communications and Signal Processing	5	
	Embedded Systems	5	
	Introduction to Modern Cryptography	5	
	Mobile Communications		5
	Image and Video Compression		5
	MIMO Communication Systems		5
	Speech and Audio Signal Processing		5
	Advanced Communication Networks		5
	Quality-of-Service in Communications		5
	Channel Coding on Graphs		5
	Human Computer Interaction		5
	Radar, RFID and Wireless Sensor Systems		5
	Research Project (Minor) (*)		10
Technical Lab Courses (extendible list)	Statistical Signal Processing	2.5	
	Audio Processing	2.5	
	Image and Video Signal Processing on Embedded Systems	2.5	
	Machine Learning in Signal Processing	2.5	2.5
	Image and Video Compression		2.5
	Mobile Communications		2.5

(*) not for students of Batch WS 19/20   (**) currently not offered

Module Class	Course Name	ECTS in Winter Semester	ECTS in Summer Semester
Nontechnical Elective Courses (extendible list)	Entrepreneurship	2.5	
	Energy Markets	5	
	Scientific Writing in Engineering and Science	2.5	2.5
	Innovation Management		5
	Language courses (for international students)		
Technical Elective Courses (extendible list)	Advanced Optical Communication Systems	5	
	Pattern Recognition	5	
	Image, Video, and Multidimensional Signal Processing	5	
	Molecular Communications	5	
	Multiuser Information and Communications Theory	5	
	Advanced Audio Processing	5	
	Music Processing	5	
	Concurrent Systems	5	
	Reconfigurable Computing	5	
	Theory of Communication in Parallel Systems (**)	5	
	Advanced Networking	5	
	Equalization and Adaptive Systems for Digital Communications	2.5	
	Signal Analysis	2.5	
	Machine Learning in Communications	5	
	Random Matrices in Communications and Signal Processing	5	
	Machine Learning for Time Series	5	
	Virtual Vision	2.5	
	Linear and non-linear Fibre Optics		5
	Transmission and Detection for Advanced Mobile Communications		2.5
	Transforms in Signal Processing		2.5
	Channel Coding		5
	Pattern Analysis		5
	Human-Machine-Interfaces		2.5
	Approximate Computing		5
	CryptoCurrencies		5
	Reinforcement Learning		5
	Audio Processing for the Internet of Things		2.5
	Selected Topics of Deep Learning for Audio, Speech, and Music Processing		2.5
	Compressive Sensing		5

(*) not for students of Batch WS 19/20   (**) currently not offered