

Statistics for Researchers in Engineering Sciences					AR-223
Rota annually SS	Duration 1 Semester	Semester 2nd (Semester)	SWS 3 SWS	Credit Points 5	Workload 150 h
1	Modul Structure				
	Course (Abbreviation)	Type/ SWS	Presence	Self Study	Credit Points
	a) Statistics for Researchers in Engineering Sciences (STAT)	Lecture/ 2 SWS	25 h	65 h	3
	b) Statistics for Researchers in Engineering Sciences (STAT)	Tutorial/ 1 SWS	15 h	45 h	2
2	Language English				
3	Content				
	<ol style="list-style-type: none"> <u>Empirical distributions and explanatory data analysis</u>: frequency tables, bar charts, histograms, distribution characteristics <u>Probability theory</u>: conditional probability, independence <u>Random variables and their distributions</u>: discrete distributions (Uniform, Bernoulli, Binomial, Poisson), continuous distributions (Uniform, Normal), expectation and variance, sampling distribution theory, joint distributions, covariance and correlation <u>Estimation</u>: properties of estimators, confidence intervals <u>Test of statistical hypotheses</u>: Binomial test, Gaussian test, t-test, power, p-value <u>Regression</u>: simple / multiple regression, tests concerning regression <u>Time series analysis</u>: stochastic processes, stationarity, autocorrelation, filtering 				
	Literature: Slides				
4	Competencies				
	This course gives an introduction to statistical concepts that are useful for research projects in various fields of application and areas of science. Furthermore the students should get a good grasp of the application of these concepts to engineering problems like prediction, optimal testing and estimation.				
5	Examination Requirements				
	All students are requested to solve four take home problems. The final exam will be an oral or a written exam, depending on the number of participants (form will be announced second week of course).				
6	Formality of Examination				
	<input checked="" type="checkbox"/> Module Finals		<input type="checkbox"/> Accumulated Grade		
7	Module Requirements (Prerequisites)				
8	Allocation to Curriculum:				
	Program: Automation & Robotics, Field of study: Robotics, Process Automation, Cognitive Systems				
9	Responsibility/ Lecturer				
	Dr. T. Mildenberger/ Dr. T. Mildenberger				