

Advanced Engineering Mathematics					AR-101
Rota	Duration	Semester	SWS	Credit Points	Workload
annually WS	1 Semester	1 st (Semester)	5 SWS	6	180 h
1	Modul Structure				
	Course (Abbreviation)	Type/ SWS	Presence	Self Study	Credit Points
	a) Advanced Engineering Mathematics (AEM)	Lecture/ 3 SWS	35 h	85 h	4
	b) Advanced Engineering Mathematics (AEM)	Tutorial/ 2 SWS	25 h	35 h	2
2	Language English				
3	Content The subjects are chosen from <ol style="list-style-type: none"> 1. Linear Algebra: Vector spaces, matrices and equation systems, linear maps, Jordan-, LU-, QR-, and singular value decomposition, numerical aspects. 2. Differential Equation: Linear systems, differential equations with constant coefficients. 3. Laplace-Transform and Fourier Series 4. Differential Calculus with several variables: Derivatives, inverse and implicit functions, Taylor expansion and extreme values. 5. Stability of Differential Equations: Theorems of Ljapunov and Poincaré-Ljapunov. 6. Variational Calculus Literature: <ul style="list-style-type: none"> • Bajpai, Avinash C. , Mathematics for engineers and scientists • Meyer, R.M., Essential mathematics for applied fields • Lancaster, P., Tismenetsky, M., The theory of matrices • Lang, S., Linear algebra • Slides 				
4	Competencies The course gives an introduction to fundamental mathematical techniques used in almost every course. Attention is given to the underlying mathematical structure.				
5	Examination Requirements The final exam will be a written (2 hours) exam.				
6	Formality of Examination <input checked="" type="checkbox"/> Module Finals <input type="checkbox"/> Accumulated Grade				
7	Module Requirements (Prerequisites)				
8	Allocation to Curriculum: Mandatory Course Program: Automation & Robotics				
9	Responsibility/ Lecturer <i>Dean of the Mathematics department/ Lecturers of the Mathematics department</i>				