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Module EIT-NAT-305-M-4

Communications Engineering (M, 5.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
EIT-NAT-305-M-4	<i>Communications Engineering</i>	5.0 CP (150 h)

Basedata

CP, Effort	5.0 CP = 150 h
Position of the semester	1 Sem. in SuSe
Level	[4] Bachelor (Specialization)
Language	[DE] German
Module Manager	Urbansky, Ralph, Prof. Dr.-Ing. (PROF DEPT: EIT) (/staff/348/)
Lecturers	Urbansky, Ralph, Prof. Dr.-Ing. (PROF DEPT: EIT) (/staff/348/)
Area of study	[EIT-NAT] Communications Engineering
Reference course of study	[EIT-82.781-SG#2019] B.Sc. Electrical and Computer Engineering [2019] (/mhb/FB-EIT/cos-523/)
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
3V+1U	EIT-NAT-305-K-4 (/mhb/courses/EIT-NAT-305-K-4/)	P	-	PL1	5.0	SuSe

- About [EIT-NAT-305-K-4]: Title: "Communications Engineering"; Presence-Time: 56 h; Self-Study: 94 h

Examination achievement PL1

- Form of examination: **written exam (Klausur) (90 Min.)**
- Examination Frequency: each semester
- Examination number: 20305 ("Communications Engineering")

Evaluation of grades

The grade of the module examination is also the module grade.

Contents

From [EIT-NAT-305-K-4] **Communications Engineering** (/mhb/courses/EIT-NAT-305-K-4/):

- Signale - mathematische Grundlagen: Energie, Energiedichtespektrum, mittlere Leistung, Leistungsdichtespektrum, Korrelationsfunktionen
- Signalwandler: Wandlerprinzipien für Sprache bzw. Schall, für Bilder, Sensoren und Aktoren
- Signaltheorie: Signalarten, Signalabtastung, Analog-Digital-Umsetzung, PCM, zufällige Signale, Mittelwert, Varianz, Zufallsprozesse
- Übertragung - Basisbandübertragung: Leitungstheorie, Übertragungswegmodelle, Störabstand, Leitungsverstärker, Übertragung digitaler Signale: Interferenz, Nyquist-Systeme, Bitfehlerwahrscheinlichkeit
- Übertragung - frequenzversetzte Übertragung: Antennen, Strahlungsdiagramme, Gewinn, Freiraumübertragung, Strahlungsdiagramm. Allgemeine Modulationstheorie, elementare Verfahren zur Modulation und Demodulation, Einseitenbandmodulation, Übertragung modulierter Schwingungen, digitale Modulation, Funkkanal
- Einführung in die Informationstheorie: Quellen, Entropie, Quellencodierungssatz, Informationsübertragung, Kanalkapazität, diskrete und kontinuierliche Informationstheorie, Austausch von Bandbreite und Störabstand

Competencies / intended learning achievements

- Grundkenntnisse zu Aufgaben, Verfahren und Methoden im Gebiet der Nachrichtentechnik
- Fertigkeit, Lösungsansätze für einfache Aufgaben aus dem Gebiet der Nachrichtentechnik zu skizzieren und Berechnungen durchzuführen

Requirements for attendance (informal)

Modules:

- [EIT-NAT-315-M-2] Fundamentals of Signals and Systems (M, 5.0 LP) (/mhb/modules/EIT-NAT-315-M-2/)

Requirements for attendance (formal)

None

References to Module / Module Number [EIT-NAT-305-M-4]

Course of Study	Section	Choice/Obligation
[EIT-82.781-SG#2019] B.Sc. Electrical and Computer Engineering [2019] (/mhb/FB-EIT/cos-523/)	Major-Specific Advanced Subjects	[P] Compulsory
[EIT-82.781-SG#2019] B.Sc. Electrical and Computer Engineering [2019] (/mhb/FB-EIT/cos-523/)	Major-Specific Advanced Subjects	[P] Compulsory
[EIT-82.781-SG#2019] B.Sc. Electrical and Computer Engineering [2019] (/mhb/FB-EIT/cos-523/)	Major-Specific Advanced Subjects	[P] Compulsory
[EIT-88.781-SG#2010] M.Sc. Electrical and Computer Engineering [2010] (/mhb/FB-EIT/cos-556/)	Theoretical Part	[P] Compulsory
[EIT-88.781-SG#2010] M.Sc. Electrical and Computer Engineering [2010] (/mhb/FB-EIT/cos-556/)	Theoretical Part	[P] Compulsory
[EIT-82.A44-SG#2018] B.Sc. Media and Communication Technology [2018] (/mhb/FB-EIT/cos-527/)	Core Subjects	[P] Compulsory
[EIT-82.?-SG#2021] B.Sc. Electrical and Computer Engineering [2021] (/mhb/FB-EIT/cos-685/)	Major-Specific Advanced Subjects	[P] Compulsory
[EIT-82.?-SG#2021] B.Sc. Electrical and Computer Engineering [2021] (/mhb/FB-EIT/cos-685/)	Major-Specific Advanced Subjects	[P] Compulsory
[EIT-88.?-SG#2021] M.Sc. Electrical and Computer Engineering [2021] (/mhb/FB-EIT/cos-686/)	Major Power Engineering (ENT)	[P] Compulsory
[EIT-88.?-SG#2021] M.Sc. Electrical and Computer Engineering [2021] (/mhb/FB-EIT/cos-686/)	Major Mechatronics (MET)	[P] Compulsory
[EIT-82.?-SG#2021] B.Sc. Media and Communication Technology [2021] (/mhb/FB-EIT/cos-681/)	Advanced Subjects	[P] Compulsory
[EIT-88.A20-SG#2021] M.Sc. European Master in Embedded Computing Systems (EMECS) [2021] (/mhb/FB-EIT/cos-566/)	Elective Subjects	[W] Elective Module
[EIT-88.?-SG#2021] M.Sc. Embedded Computing Systems (ESY) [2021] (/mhb/FB-EIT/cos-677/)	Elective Subjects	[W] Elective Module