Name of programme: International Semester Information Technology / System Engineering

Title of Module	**Specialty fibers, fiber-optic and sensor applications Lab**
Responsible person	Prof. Dr. Karl-Friedrich Klein
Teacher	Prof. Dr. Karl-Friedrich Klein
Module Code	E2F268 Lab
Type of Module	O obligatory module (Pflichtmodul), x elective module (Wahlpflichtmodul)
Level (BA / MA)	Bachelor
Language	English (German on demand)
Related Degree Programme/s	General Electrical Engineering, Communications Engineering and Computer Networks
Department	IEM
Location	O Gießen, x Friedberg
Availability/frequency of module	O every semester, O anually in the Winter Semester, x anually in the Summer Semester,
Hours per Week / Workload	2 HpW (contact hours per week) 60 H in total
Number of CrP/ECTS	2 ECTS/CrP
Forms of instruction	O lecture O seminar O supervised training x Laboratory Practical Course
Qualifications and Goals	**Learning outcomes:** Knowledge: Practical aspects of special fibers for use outside the telecom / data transmission, for example in industrial and medical applications, by selected practical experiments.For fiber optic sensors and measurement instrumentation the associated basics of fiber optic sensors and measurement instrumentations will be understood (intrinsic and extrinsic) Skills: Design and dimensioning, implementation and evaluation of practical experiments to specialty fibers, fiber-optic applications and sensor systems, and related measurement techniques. Competences: Design and construction of simple optical and fiber optic systems for special applications and sensor systems including the needed components, and reflections & discussion of the results.
Short Description of Contents	Content: Experimental work based on the module "special fibers, fiber optic applications and sensor E2F268" 6 different experiments from: • Lighting in singlemode and multimode fibers • Joining and OTDR (Optical Time Domain Reflektrometry) • Optical characteristics of transmitter (LED & laser diodes) or • Receivers (photodiodes, CCD) with measurement programs • Fiber optic spectroscopy in the area ofchemical analytics and process control • Application test "transmission of laser light" • Application test at "controlling semiconductor elements" • Fiber Bragg Grating and applications as "modern" strain gauges • Evanescent field sensor

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Prerequisites	Participation in “Specialty fibers, fiber-optic and sensor applications (E2F268)“ (Lecture) before or parallel
Assessment	O oral (O examination of xx minutes, O presentation), O written (O examination of xx minutes, O term paper), other: Successful completion of the module "special fibers, fiber optic applications and Sensors” E2F268. The laboratory experiments must be successfully processed. This is confirmed by certificate.
Literature/Textbooks	F.Mitschke: “Glasfasern: Physik und Technologie“, VDE-Verlag W.Bludau: “Lichtwellenleiter in Sensorik und optischer Nachrichtentechnik“, Springer (1998) M.Löffler-Mang: “Optische Sensorik”, Vieweg (2008) E.Udd, B.Spillman: “Fiber-optic sensors: an introduction for engineers and scientists“, John Wiley & Sons; 2. Auflage (2011), ISBN-10: 0470126841 W. Glaser: “Photonik für Ingenieure“, Verlag Technik GmbH (1997) W.Bludau: “Lichtwellenleiter in Sensorik und optischer Nachrichtentechnik“, Springer (1998) D. Derickson (ed.): “Fiber Optic Test und Measurements ”, Prentice Hall (1998) Wrobel, C.P.: Optische Übertragungstechnik in der Praxis , VDE-Verlag, 2004
Other	