

Certificate Digital Transformation - Template

Step 1: Module selection – please download and fill in the template

Step 2: Take your chosen classes - pass related exams

Step 3: Confirmation of passing the modules – please request it at the examination office (Prüfungsamt) via email¹

Step 4: Application for certificate – please request it at SIAK via info@science-alliance.de

- Finally, you will receive the certificate signed by TUK Vice President Dr. Lührke and SIAK CEO Prof. Dr. Dr. h.c. Rombach by email and / or pick it up at the SIAK office (TUK, building 32, room 419).

A. Allgemeine Information/ General information

Please fill in the fields below

Name, Vorname/ Name, first name:

Fachbereich/ Department:

Matrikel Nr./ Matriculation number:

B. Modulauswahl/ Module selection

Please select your modules below and pay attention to the requirements:

- at least 3 competence areas out of 4:
 - **Engineering (physical world)**
 - **Computer Science & IT (digital world)**
 - **AI & Machine learning (analyzing and interpreting masses of data)**
 - **Economics & Social Sciences (establishing new business models/ethics)**
- 3-8 CP per module area
- min. 20 CP in total

B.1 Department of Electrical and Computer Engineering

Dr.-Ing. Christian De Schryver, schryver@eit.uni-kl.de

	Module ID number	Modulname	CP	WS/SS	Type KIS	Module coordinator	Module area
<input type="checkbox"/>	EIT-EIS-571-V-4	Architektur digitaler Systeme/Architecture of Digital Systems I	4	WS	V	Kunz	Computer Science & IT
<input type="checkbox"/>	EIT-EIS-573-V-4	Architektur digitaler Systeme/Architecture of Digital Systems II	4	WS	VÜ	Stoffel	Computer Science & IT
<input type="checkbox"/>	EIT-RTS-545-V-4	Betriebssysteme/Operating Systems	4	WS	VÜ	Fohler	Computer Science & IT
<input type="checkbox"/>	EIT-RTS-540-V-4	Echtzeitsysteme I/Real-Time Systems I	4	SS	VÜ	Fohler	Computer Science & IT
<input type="checkbox"/>	EIT-RTS-541-V-7	Echtzeitsysteme II/Real-Time Systems II	4	WS	VÜ	Fohler	Computer Science & IT
<input type="checkbox"/>	EIT-EMS-653-V-6	Enterprise Data Science	3	SS	V	Kienle	AI & Machine learning

¹ Please find the person in charge [here](#)

<input type="checkbox"/>	EIT-ISE-105-V-2	Elektrische Messtechnik I/Electrical Measurement Technique I	4	SS	V	König	Engineering
<input type="checkbox"/>	EIT-ISE-106-V-4	Elektrische Messtechnik II/Electrical Measurement Technique II	3	WS	V	König	Engineering
<input type="checkbox"/>	EIT-ISE-701-V-2	Elektronik I/Electronics I	6	SS	VÜ	König	Engineering
<input type="checkbox"/>	EIT-ISE-702-V-3	Elektronik II/Electronics II	4	WS	VÜ	König	Engineering
<input type="checkbox"/>	EIT-EMS-654-V-4	Entwurf mikroelektronischer Schaltungen und Systeme/Microelectronic Circuit and System Design I	4	WS	VÜ	Wehn	Engineering
<input type="checkbox"/>	EIT-EMS-655-V-7	Entwurf mikroelektronischer Schaltungen und Systeme/Microelectronic Circuit and System Design II	5	SS	VÜ	Wehn	Engineering
<input type="checkbox"/>	EIT-ISE-115-S-7	Seminar Evolvable Hardware and Evolvable Sensors	3	WS	S	König	Engineering
<input type="checkbox"/>	EIT-AUT-460-V-7	Fehlerdiagnose und fehlertolerante Systeme/Fault Diagnosis and Fault Tolerant Systems	3	SS	V	Zhang	Engineering
<input type="checkbox"/>	EIT-EMS-732-V-7	FPGA-Based Hardware Accelerators and Hybrid Systems	4	SS	VÜ	De Schryver	Engineering
<input type="checkbox"/>	EIT-FUN-402-V-4	Wireless Communications	5	SS	VÜ	Schotten	Computer Science & IT
<input type="checkbox"/>	EIT-ISE-650-V-7	Herstellungsverfahren und Entwurf integrierter Sensorsysteme/Manufacturing and Design of Integrated Sensors Systems (HEIS)	5	WS	VÜ	König	Engineering
<input type="checkbox"/>	EIT-EIS-521-L-7	Embedded Systems Laboratory	5	WS	PT	Stoffel	Engineering
<input type="checkbox"/>	EIT-EMS-546-L-4	Embedded Processor Lab	3	SS	PTT	Wasenmüller	Computer Science & IT
<input type="checkbox"/>	EIT-JEM-515-V-7	Model Predictive Control	4	WS	V	Görges	Engineering
<input type="checkbox"/>	EIT-ISE-110-V-7	Neurocomputing	4	WS	V	König	Engineering
<input type="checkbox"/>	EIT-EIS-566-V-7	Robust Digital Systems	3	SS	V	Stoffel	Engineering
<input type="checkbox"/>	EIT-EIS-565-S-7	Seminar Entwurf informationstechnischer Systeme/Seminar Embedded Systems	3	WS + SS	ST	Kunz	Computer Science & IT
<input type="checkbox"/>	EIT-FUN-425-S-7	Seminar 5 G Mobile Communications	3	WS	ST	Schotten	Computer Science & IT
<input type="checkbox"/>	EIT-NAT-308-V-4	Seminar Videosignalverarbeitung II/Seminar Video Signal Processing II	3	WS	S	Urbansky	Engineering
<input type="checkbox"/>	EIT-ISE-112-V-7	Sensorsignalverarbeitung/Sensor Signal Processing	5	WS	VÜ	König	Engineering
<input type="checkbox"/>	EIT-EMS-657-V-7	Synthese und Optimierung mikroelektronischer Systeme/Synthesis and Optimization of Microelectronic Systems	4	WS	VÜ	Wehn	Engineering
<input type="checkbox"/>	EIT-EIS-660-V-7	Synthese und Optimierung mikroelektronischer Systeme /Synthesis and Optimization of Microelectronic Systems II	3	SS	V	Kunz	Engineering
<input type="checkbox"/>	EIT-EMS-659-V-7	SystemC and Virtual Prototyping	4	WS	V	Jung	Engineering
<input type="checkbox"/>	EIT-ISE-704-S-7	Technische Kognitionssysteme und ihre mikrosystemtechnische Implementierung/Technical Cognition Systems and their MEMS-Based Implementation	3	SS	S	König	Engineering
<input type="checkbox"/>	EIT-ISE-651-V-4	Technologie und Entwurf integrierter gemischt analog-digitaler Schaltungen und Systeme/Technology and Design of Integrated Mixed-Signal Circuits and Systems (TESYS)	5	SS	VÜ	König	Engineering
<input type="checkbox"/>	EIT-EIS-560-V-4	Verification of Digital Systems	5	WS	V	Kunz	Computer Science & IT
<input type="checkbox"/>	EIT-FUN-405-V-4	Wireless and Multimedia Systems	3	WS	V	Schotten	Computer Science & IT
<input type="checkbox"/>	EIT-EMS-733-W-3	Netzwerk und Bustechnik/Network and bus technology	8	SS	TT	De Schryver	Computer Science & IT
<input type="checkbox"/>	EIT-FUN-422-S-7	Advanced Topics in Mobile and Industrial Communications	3	SS	ST	Schotten	Computer Science & IT
<input type="checkbox"/>	EIT-FUN-423-S-7	Advanced Topics in Network Security	3	SS	ST	Schotten	Computer Science & IT
<input type="checkbox"/>	EIT-FUN-413-V-7	Information Security Assessment and Operations	8	SS	VÜT	Schotten	Computer Science & IT

B.2 Department of Computer Science

Dr.-Ing. Bernd Schürmann, schuerma@informatik.uni-kl.de

	Module ID number	Modulname	CP	WS/SS	Type KIS	Module coordinator	Module area
<input type="checkbox"/>	INF -19-31-V-6	Data Visualization	4	WS	VÜ	Leitte	Computer Science & IT
<input type="checkbox"/>	INF-19-51-V-6	Visual Analytics	4	SS	VÜT	Leitte	Computer Science & IT
<input type="checkbox"/>	INF-22-02-V-6	Middleware for Heterogeneous and Distributed Information Systems	8	WS	VÜ	Deßloch	Computer Science & IT
<input type="checkbox"/>	INF-24-52-V-7	Information Retrieval and Data Mining (every second	4	SS	VÜ	Michel	Computer Science & IT

		summer semester)					
<input type="checkbox"/>	INF-30-02-M-3	Foundations of SW Engineering	4	SS	VÜ	Liggemeyer	Computer Science & IT
<input type="checkbox"/>	INF-31-31-V-6	SW Project and Process Management	4	SS	VÜ	Liggemeyer	Computer Science & IT
<input type="checkbox"/>	INF-31-51-V-7	Process Modelling	4	SS	VÜ	Liggemeyer	Computer Science & IT
<input type="checkbox"/>	INF-31-52-V-7	Product Line Engineering	4	WS	VÜ	Liggemeyer	Computer Science & IT
<input type="checkbox"/>	INF-31-55-V-6	Requirements Engineering	4	WS	VÜ	Liggemeyer	Computer Science & IT
<input type="checkbox"/>	INF-33-31-V-6	Safety and Reliability of Embedded Systems	4	WS	VÜ	Liggemeyer	Computer Science & IT
<input type="checkbox"/>	INF-33-52-V-7	Quality Management of Software and Systems (every second winter semester)	4	WS	VÜ	Liggemeyer	Computer Science & IT
<input type="checkbox"/>	INF-33-55-V-7	Software Quality Assurance (every second winter semester)	4	WS	VÜ	Liggemeyer	Computer Science & IT
<input type="checkbox"/>	INF-40-01-V-6	Networked Systems	4	WS	VÜ	Gotzhein	Computer Science & IT
<input type="checkbox"/>	INF-42-01-V-3	Fundamentals of (Internet) Security	4	WS	VÜ	Schmitt	Computer Science & IT
<input type="checkbox"/>	INF-57-51-V-6	Continuous models of complex systems	4	WS	VÜ	Lukowicz	Engineering
<input type="checkbox"/>	INF-61-33-V-6	Autonomous Mobile Robots	8	SS	VÜ	Berns	Engineering
<input type="checkbox"/>	INF-64-52-V-6	Automotive Software Engineering	4	SS	VÜ	Grimm	Engineering
<input type="checkbox"/>	INF-65-51-V-7	Power-Aware Embedded Systems	4	WS	VÜ	Grimm	Engineering
<input type="checkbox"/>	INF-71-56-V-7	Applications of Machine Learning and Data Science	4	WS	VÜ	Dengel	AI & Machine learning
<input type="checkbox"/>	INF-71-57-V-7	Very Deep Learning - Recent Methods and Technologies	4	WS	VÜ	Dengel	AI & Machine learning
<input type="checkbox"/>	INF-71-58-V-7	Collaborative Intelligence	4	WS	VÜ	Dengel	AI & Machine learning
<input type="checkbox"/>	INF-73-51-V-6	3D Computer Vision	4	WS	VÜ	Stricker	AI & Machine learning
<input type="checkbox"/>	INF-75-50-V-6	Machine Learning I - Foundations	8	SS	VÜ	Kloft	AI & Machine learning
<input type="checkbox"/>	INF -19-31-V-6	Data Visualization	4	WS	VÜ	Leitte	Computer Science & IT

B.3 Department of Mechanical and Process Engineering

Dr.-Ing. Marcus Ripp, ripp@mv.uni-kl.de

	Module ID number	Modulname	CP	WS/SS	Type KIS	Module Coordinator	Module area
<input type="checkbox"/>	MV-MEC-M193-M-7	Maschinelles Lernen/Machine Learning	5	SS	VÜ	Bajcinca	AI & Machine learning
<input type="checkbox"/>	MV-MTS-88-M-4	Angewandte Regelungstechnik/Applied Control Theory	5	WS	VÜ	Seewig	Engineering
<input type="checkbox"/>	MV-PAK-27-M-4	Automatisierungstechnik I/System Design and Modelling I	3	SS	VÜ	Ruskowski	Engineering
<input type="checkbox"/>	MV-PAK-242-M-44	Automatisierungstechnik II/System Design and Modelling II	3	WS	VÜ	Ruskowski	Engineering
<input type="checkbox"/>	MV-FBK-33-M-4	Automotive Production	4	WS	VÜ	Aurich	Engineering
<input type="checkbox"/>	MV-IVW-235-M-7	Berechnung und Konstruktion von Verbundwerkstoffen/Design and Analysis of Composite Materials	3	WS	V	Hausmann	Engineering
<input type="checkbox"/>	MV-IVW-M148-M-4	Biomimetik in der Werkstoffwissenschaft/Biomimetics in Materials Science	3	WS	V	Wetzel	Engineering
<input type="checkbox"/>	MV-IVW-M201-M-7	CAE mit Verbundwerkstoffen/CAE with composite materials	3	WS	L	Hausmann	Engineering
<input type="checkbox"/>	MV-FBK-201-M-4	Digitale Werkzeuge der Produktionsgestaltung I/Digital tools for Factory Planing I	3	WS	V	Aurich	Engineering
<input type="checkbox"/>	MV-FBK-M147-M-4	Digitale Werkzeuge der Produktionsgestaltung I/II Digital tools for Factory Planing I/II	6	WS + SS	VÜ	Aurich	Engineering
<input type="checkbox"/>	MV-FBK-202-M-4	Digitale Werkzeuge der Produktionsgestaltung II/Digital tools for Factory Planing II	3	SS	VÜ	Aurich	Engineering
<input type="checkbox"/>	MV-VKM-105-M-4	Energietechnik I/Energy Technology I	3	WS	V	Günthner	Engineering
<input type="checkbox"/>	MV-SAM-106-M-4	Energietechnik II/Energy Technology II	3	SS	V	Reviol	Engineering
<input type="checkbox"/>	MV-IVW-183-M-7	Ermüdung und Lebensdauer/Fatigue and Life Cycles	3	SS	V	Magin	Engineering
<input type="checkbox"/>	MV-MEC-163-M-7	Fahrdynamikregelung/Chassis Control Systems	5	SS	VÜ	Bajcinca	Engineering
<input type="checkbox"/>	MV-PAK-M153-M-4	Handhabungstechnik und Industrieroboter/Industrial Handling and Robots	3	SS	VÜ	Ruskowski	Engineering
<input type="checkbox"/>	MV-SAM-M137-M-4	Konventionelle Energietechnik/Conventional Energy Technology	5	WS	VÜ	Reviol	Engineering
<input type="checkbox"/>	MV-MEC-229-M-4	Mechatronik/Mechatronics	5	SS	VÜ	Bajcinca	Engineering
<input type="checkbox"/>	MV-FBK-M202-M-7	Methoden der modernen	3	WS	VÜ	Aurich	Engineering

		Produktionsplanung/Advanced Industrial Engineering					
<input type="checkbox"/>	MV-TM-M135-M-7	Optimierung für Ingenieure/Engineering Optimization	3	SS	V	Sator	Engineering
<input type="checkbox"/>	MV-VPE-301-M-4	Product Lifecycle Management	4	SS	VÜ	Göbel	Engineering
<input type="checkbox"/>	MV-MEC-M155-M-7	Regelungstheorie/Systems and Control Theory	5	SS	VÜ	Bajcinca	Engineering
<input type="checkbox"/>	MV-VPE-M166-M-4	Smart Systems Engineering	3	WS	V	Göbel	Engineering
<input type="checkbox"/>	MV-VPE-116-M-4	Virtuelle Produktentwicklung II/Virtual Product Engineering II	3	SS	V	Göbel	Engineering
<input type="checkbox"/>	MV-SAM-M123-M-4	Algorithmen und Programmieren/Algorithms and Programming	6	WS	VÜ	Böhle	Computer Science & IT
<input type="checkbox"/>	MV-MEC-M169-M-4	Hybride und ereignisdiskrete dynamische Systeme /Hybrid and discrete-event dynamical systems	5	WS	VÜ	Bajcinca	Computer Science & IT

B.4 Department of Business Studies and Economics

Dr. Jürgen E. Blank, jblank@wiwi.uni-kl.de; Dr. Stefan Puderbach, puderbach@wiwi.uni-kl.de

	Module ID number	Modulname english	CP	WS/SS	Type KIS	Module coordinator	Module area
<input type="checkbox"/>	WIW-EPS-PESE-M-7	Entrepreneurship Exercise	3	SS	Ü	N.N.	Business Studies and Economics
<input type="checkbox"/>	WIW-EPS-PT-S-7	Practice Track	4	SS	S	N.N.	Business Studies and Economics
<input type="checkbox"/>	WIW-EPS-BD-V-7	Business Developing Lecture	2	SS	V	N.N.	Business Studies and Economics
<input type="checkbox"/>	WIW-EPS-BD-U-7	Business Developing Exercise	4	SS	Ü	N.N.	Business Studies and Economics
<input type="checkbox"/>	WIW-EPS-GP-W-7	Gründungsprojekt/Entrepreneurial Project	3	SS	V	Fassott	Business Studies and Economics
<input type="checkbox"/>	WIW-BWL-RES-U-1	Excercise Entrepreneurship and Digital Management	3	SS	Ü	N.N.	Business Studies and Economics
<input type="checkbox"/>	WIW-BWL-RES-V-1	Lecture Series Entrepreneurship and Digital Management	3	SS	V	Fassott	Business Studies and Economics

Students of the Department of Business Studies and Economics have to select modules out of these following competence areas to collect the necessary credit points:

- Engineering (physical world)
- Computer Science & IT (digital world)
- AI & Machine learning (analyzing and interpreting masses of data)

plus, one of three major subjects of the Department of Business Studies and Economics:

- Entrepreneurship
- Management of Digital Transformation
- Business Information Systems

B.5 Department of Social Science

Prof. Dr. Karen Joisten, joisten@sowi.uni-kl.de

	Module ID number	Modulname (German/ English)	CP	WS/SS	Type KIS	Module coordinator	Module area
<input type="checkbox"/>	SO-04-8.112-V-6	Informatik und Ethik (in German)	4	WS	V	Joisten	Social Sciences

Website

<https://www.uni-kl.de/zg/studierende/>

<https://www.science-alliance.de/karriere/studiengaenge/digitale-transformation/zertifikat/>

Requirements

In addition to their Masters area of study, students choose classes (between 3 and 8 credits) from at least two more competence areas:

- Engineering (physical world): **min. 3 to max. 8 CP**

- Computer Science & IT (digital world): **min. 3 to max. 8 CP**
- AI & Machine learning (analyzing and interpreting masses of data): **min. 3 to max. 8 CP**
- Economics & Social Sciences (establishing new business models): **min. 3 to max. 8 CP**

A total of 20 Credit Points must be obtained with classes from at least three of these four areas. Each selected area must be covered with at least 3 Credit Points. A single class may not exceed the maximum amount of 8 Credit Points.

All participating departments offer classes, which can be viewed in our course catalogue. Currently, there are more than 80 classes offered.

One of three courses in the Business Studies and Economics Department or in the Social Sciences Department are **compulsory for all participants**.

You have to choose one of these modules:

- “Exercise Entrepreneurship and Digital Management” (Wiwi) or
- “Lecture Series Entrepreneurship and Digital Management” Wiwi) or
- “Computer Science and Ethics” (Sowi).

The Credit Points of passed classes can be used to fulfil the requirements of your Master’s programme and can – at the same time – contribute to the required amount of Credit Points for the certificate “Digital Transformation”. The certificate is obtained upon completion of the Master’s degree and issued separately.

Fees

Issuing of the certificate does not incur any costs or fees.