HSBI

Hochschule Bielefeld

University of Applied Sciences and Arts



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Introduction to the module and its content

FTS-01 · Future Technologies and Sustainability

Prof. Dr. Thorsten Jungmann

GUIDING QUESTIONS

- What awaits you in this module, and how will you show at the end what you can do?
- How do you arrive at a well-founded answer to a question such as ‘Does hydrogen make steel production climate-neutral?’
- Which systems and tools do you need for your studies, and where do you find them?



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INTENDED LEARNING OUTCOMES

- You know how the module is organized and what is expected of you.
- You find the systems of the university and the tools that you need for this module.
- You understand the didactic concept of five steps in three phases and know what to do in all of them.
- You name the topics of the module and assign them to the three phases.



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AGENDA

1. Studying successfully
2. Systems and tools for your studies
3. How do I teach?
4. The examination
5. The semester at a glance: overview of the topics
6. What have you learnt today?



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1 Studying successfully

- What does ‘studying’ mean?
- Rules for our sessions
- How to reach me
- E-mail communication: a negative example
- E-mail communication: a positive example

WHAT DOES ‘STUDYING’ MEAN?

- Success comes from your behaviour during your studies
- *Studere* (Latin): to strive for something, to devote oneself to it
- Take an active part: listen, take notes, ask, discuss, join in
- Prepare and follow up; practise the five steps
- At the end: your degree – and an academic way of thinking and working



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RULES FOR OUR SESSIONS

- A large group in one room: a few rules for everybody
- Be on time
- Ask – any question is allowed
- Prepare and follow up
- No photos, no audio or video recordings
- This script and the slides in the Portable Document Format (PDF) contain everything

HOW TO REACH ME

- Quickest: ask in the session
- First choice for everything else: the Q&A forum in the ILIAS course
- E-mail: thorsten.jungmann@hsbi.de
- Consultation hours via Zoom, booked in the ILIAS course
- Telephone: 0521 106-70367
- Professional, complete, clear – no text ‘between the lines’

E-MAIL COMMUNICATION (NEGATIVE EXAMPLE)



Hello,

I'd like to know what group I am in and when the lecture starts.

Kind regards
Steve

E-MAIL COMMUNICATION (POSITIVE EXAMPLE)



Dear Prof. Jungmann, / Good afternoon, Prof. Jungmann,

My name is <first name> <surname> and I am studying MAU in my first semester. I am writing to you regarding the lecture in the FTS module that I am taking with you this semester.

Unfortunately, I was unable to find an answer to my question in either the ILIAS course or the lecture materials, and I hope you can help me:

<Question/request>

Kind regards / Best regards

<First name> <Surname> (pronouns)

2 Ready to start?

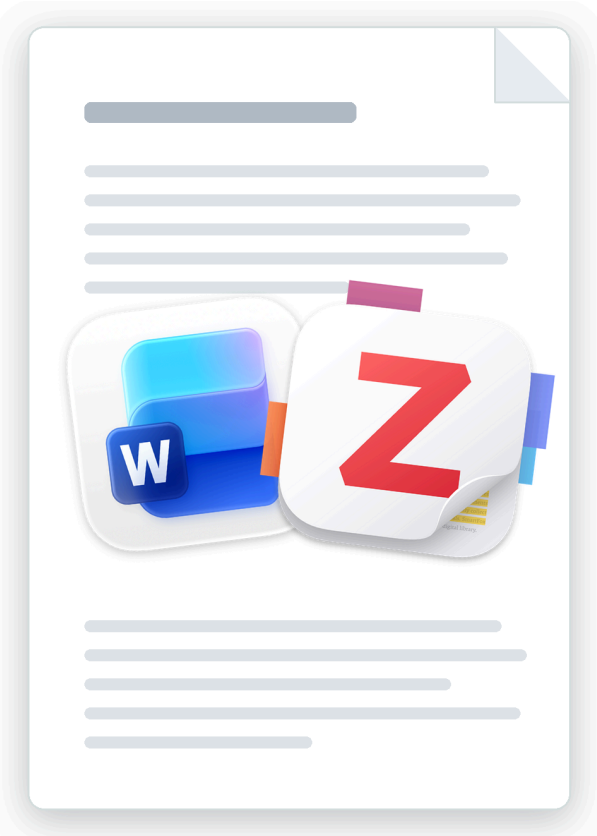
- Your computer
- Systems of the university
- Word and Zotero
- This script online

YOUR COMPUTER AND THE SYSTEMS OF HSBI

- A computer of your own – best from now on
- ILIAS: learning platform and hub of the module
- Chat service with artificial intelligence (AI) of HSBI (HSBIKI)
- Software portal: software, including the client for the virtual private network (VPN)
- Library: e-books and journals – from home only via VPN
- Two-factor authentication for VPN and Microsoft 365

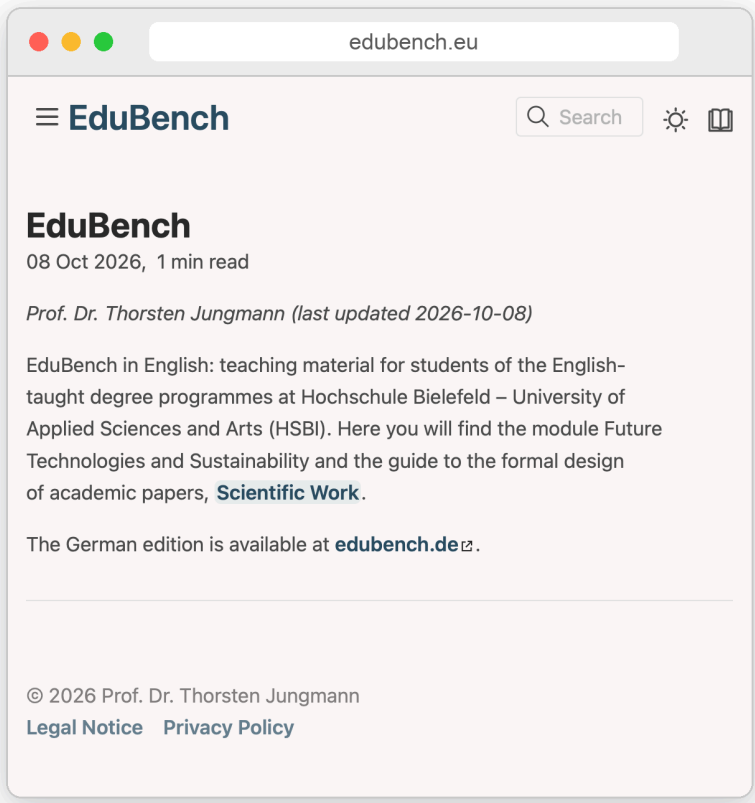
WORD AND ZOTERO

- Word and PowerPoint free of charge via Microsoft 365 – install them first
- Zotero: reference manager for your sources
- Word plugin and the citation style of the International Organization for Standardization (ISO): ‘ISO-690 (author-date, English)’
- Source packages in the Zotero groups FTS-resources-1 and FTS-resources-2
- Install both before FTS-02



THIS SCRIPT ONLINE

- edubench.eu: this script – lessons appear one by one during the semester
- wattsinside.eu: scripts on electrical engineering and digital electronics
- Open to everyone; mistakes to me in the session or by e-mail



3 How do I teach?

- How a session works
- Like at a buffet
- The didactic concept in five steps
- The poster
- The guide to Scientific Work

HOW A SESSION WORKS

- Eleven sessions, Fridays from 14:15 to 17:30, room E4 (Interaktion 1), Bielefeld campus
- First the input, then the exercise time
- In every session, a topic of the module meets a step of scientific work
- The script contains everything – ideally, read it beforehand
- You take responsibility for your own learning

LIKE AT A BUFFET

- ‘Learning takes place through the active behavior of the student; it is what he does that he learns, not what the teacher does.’ – Ralph W. Tyler (1949, p. 63)
- I cook tasty dishes from fresh ingredients and arrange them as appealingly as I can
- You take the right dishes in the right amount and order, so that you can digest them – your responsibility
- Choose, combine – and ask when something is unclear



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THE DIDACTIC CONCEPT IN FIVE STEPS

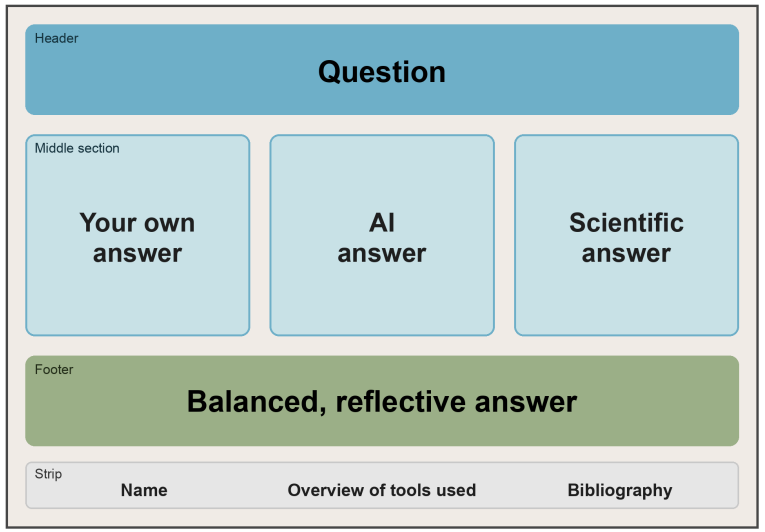
1. Question
2. Your own answer – to the best of your knowledge
3. AI answer – question it, check its sources, treat it as a quotation
4. Scientific answer – from scientific sources
5. Weighing up – a balanced, reflective answer

Two example questions

- ‘Does hydrogen make steel production climate-neutral?’
- ‘Does AI consume more energy than its use saves?’

The AI is an object of investigation, not a source of facts.

THE POSTER



- One slide in landscape format
- Reads from top to bottom like the five steps
- Short references; AI output as a quotation with long reference and note
- PowerPoint, exported as PDF
- Uploaded in ILIAS
- Your resource for the term paper

THE GUIDE TO SCIENTIFIC WORK

- Binding for your term paper
- Name-year system: a short reference such as (Tyler 1949, p. 63) in the text, the long reference in the bibliography
- This script follows the guide itself
- 13 criteria of scientific work (Jungmann 2025, pp. 11–24) – in FTS-02

The guide to Scientific Work on edubench.eu

4 The examination – your stage

- The term paper
- Submission and registration

THE TERM PAPER

- Your stage: a term paper, written on your own
- 3 000 to 4 500 words, structured along the five steps
- A company with a case study, in the context of VUCA (volatility, uncertainty, complexity, ambiguity) or BANI (brittle, anxious, nonlinear, incomprehensible)
- Linked to your Sustainable Development Goal (SDG) or your future trend
- Every source uploaded with the paper in one single PDF document



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SUBMISSION AND REGISTRATION

- Submission in ILIAS: Friday 8 January 2027 at 23:55
- Plan with buffer and prepare for Murphy's Law
- As one single PDF, including all your sources
- Formal design according to the guide to Scientific Work
- Registration for the examination: your responsibility – the rules differ between degree programmes
- Questions: course sessions, Q&A forum, consultation in FTS-10/11

The guide to Scientific Work on edubench.eu

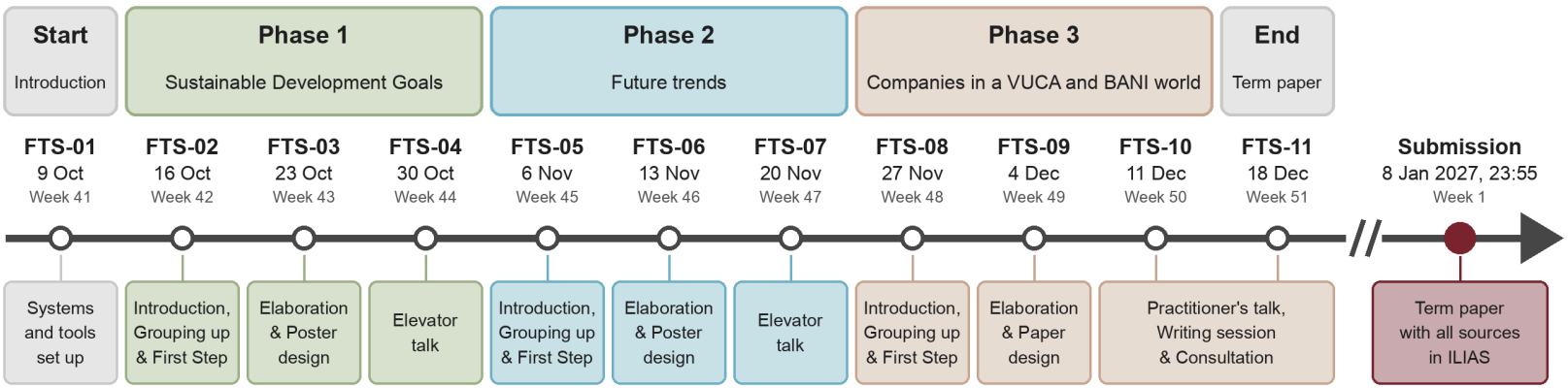
5 What awaits you?

- The semester in three phases
- The semester as a timeline
- Phase 1: Sustainable Development Goals
- Phase 2: Future trends
- Phase 3: Companies in a VUCA and BANI world

THE SEMESTER IN THREE PHASES

Phase	Sessions	Topic	Milestones
Start	FTS-01 · 9 October	Introduction to the module	Systems and tools set up
1	FTS-02 to FTS-04 · 16 to 30 October	Sustainable Development Goals	Question and your own answer; poster; elevator talk
2	FTS-05 to FTS-07 · 6 to 20 November	Future trends in technology and society	Question and your own answer; poster; elevator talk
3	FTS-08 to FTS-10 · 27 November to 11 December	Companies in a VUCA and BANI world	Company with case study and question; practitioner's talk; writing session
End	FTS-11 · 18 December	Term paper	Consultation on your term paper, in FTS-10 or FTS-11
Submission	Examination period · 8 January 2027 at 23:55	Term paper	Term paper with all its sources uploaded in ILIAS

THE MODULE'S TIMELINE



PHASE 1: THE SDGS

Sustainable Development Goals · FTS-02 to FTS-04

- 17 goals, 169 targets, adopted by the United Nations in 2015 (United Nations 2015)
- Aim by 2030: no poverty, a protected planet, prosperity for all (ibid.)
- One SDG per person: question and your own answer
- Poster and elevator talk

Scientific work

- The 13 criteria in an overview
- Asking a good question; questioning the AI
- Reading a scientific text
- Weighing up; a good poster



Icons: United Nations (United Nations 2023, p. 40)

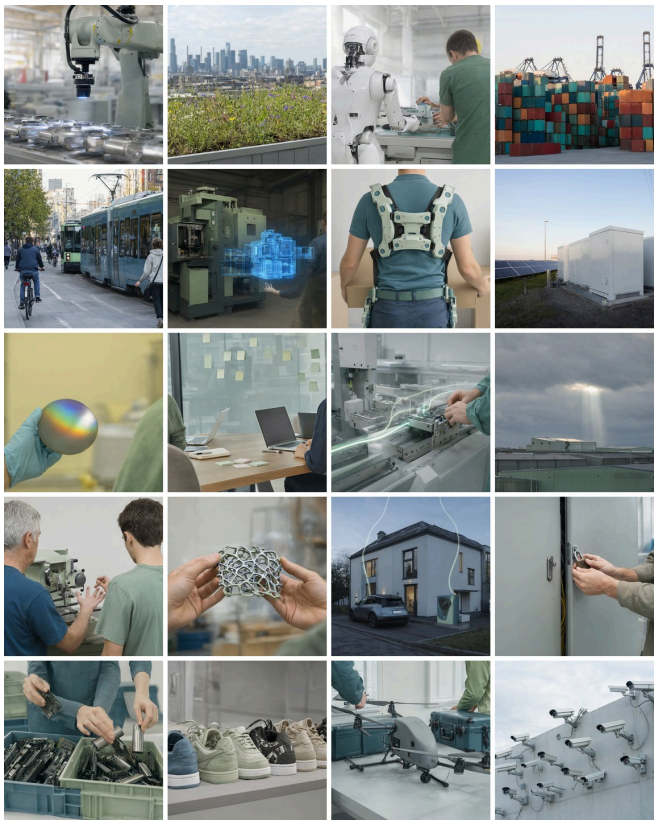
PHASE 2: FUTURE TRENDS

Future trends · FTS-05 to FTS-07

- 20 trends: 9 technological, 11 social
- One trend per person: question and your own answer
- Exchange in the trend group; poster; elevator talk

Scientific work

- Evaluating sources
- Asking the AI the same question twice
- Presenting an opposing position fairly; feedback
- Paraphrasing; bibliography with Zotero



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PHASE 3: COMPANIES

VUCA and BANI · FTS-08 to FTS-10

- VUCA since the late 1980s; BANI as its counterpart (Cascio 2020)
- One company with a case study: your term paper
- Writing session; consultation in FTS-10/11

Scientific work

- Structure of the term paper; good scientific practice
- A model as a grid for analysis; research
- Writing academically in English with Word and Zotero

Practitioner's talk

- Sustainable industries – Dr Ralf Kelle

VUCA – ORIGIN AND DIMENSIONS

ORIGIN

- Crystallized in the curriculum of the United States Army War College in the late 1980s and early 1990s as a way to describe the strategic environment after the Cold War.
- Migrated into management discourse.
- Each dimension requires distinct responses.

DIMENSIONS

- **Volatility:** designates the speed and magnitude of change.
- **Uncertainty:** reflects limited predictability and incomplete information.
- **Complexity:** refers to many interdependent variables and interactions.
- **Ambiguity:** captures unclear meanings and indistinct cause–effect relations.



BANI – ORIGIN AND DIMENSIONS

ORIGIN

- Futurist Jamais Cascio, published prominently in 2020
- Proposed as an update to VUCA to better fit a world marked by sudden
  - breaks,
  - psychological strain,
  - nonlinear cascades, and
  - cognitive overload.



DIMENSIONS

- **Brittle:** systems look stable yet can fracture abruptly under stress.
- **Anxious:** highlights widespread fear and paralysis facing overload and loss of control.
- **Nonlinear:** indicates disproportionate, tipping-point dynamics where small inputs have outsized effects.
- **Incomprehensible:** reflects limits to understanding even with abundant data and analytics.

6 What have you learnt today?

- The building blocks of knowledge
- Answers to the guiding questions

WHAT YOU HAVE LEARNT

- Studying at university
- Communication in the module
- Systems and tools for your studies
- Structure and organization of the module
- The didactic concept in five steps
- Form of assessment
- Phase 1: Sustainable Development Goals
- Phase 2: Future trends
- Phase 3: Companies in a VUCA and BANI world

ANSWERS TO THE GUIDING QUESTIONS

- What awaits you? Eleven sessions in three phases – and a term paper at the end
- A well-founded answer? Five steps: question, your own answer, AI answer, scientific answer, weighing up
- Which systems and tools? Your computer, ILIAS, HSBIKI, software portal, library, Word and Zotero



Image by Qwen-Image 2.1

Your turn: set up your systems and tools, step by step.

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