The Executive Board of Eindhoven University of Technology, TU/e,

Considering the overall revision of the TU/e Bachelor College, effective September 1, 2023,

resolves to adopt on April 26, 2023, the

TU/e Bachelor College Directive,

which comes into force on September 1, 2023.

Preamble

The 2030 Strategy and educational vision of the Dean Bachelor College and Dean Graduate School guide the provisions of this directive.[1] In these documents the concepts mentioned below have been further elaborated.

TU/e Bachelor College seeks to accomplish the following goals:

1. To design and implement a systematic and coherent educational approach focused on rigorous, multidisciplinary, and flexible engineering education. This collaborative approach is aimed at improving the quality of TU/e Bachelor's programs.
2. To educate 'future-proof' engineers who can operate effectively and professionally across borders and disciplines and are equipped to tackle the complex challenges of the 21st century.
3. To provide inclusive education that is supportive, flexible, and responsive to the individual needs and priorities of each TU/e student.
4. To continue to broaden the appeal of TU/e to new groups of prospective students.

TU/e Bachelor College operates based on the following ambitions:

(1) To offer students a community that respects, appreciates, and fosters diversity and an inclusive learning environment with the aim to support all students to take ownership of their development and shape their own personalized learning path. This means that it should be easy for students with various backgrounds, circumstances and learning needs to find their way around TU/e. To this end, all Bachelor's programs will:

a. Contain a Challenge-Based Learning (CBL) curriculum line with attention for inclusive behavior in group activities.
b. Consider diversity and inclusion aspects in the design of study component materials and learning activities (providing an inclusive classroom).
c. Provide such an outreach of (information) activities that these appeal to prospective students.

(2) To provide education that is flexible and responsive to individual needs and ambitions: the student in the lead. Modular education and the free choice of electives offer more possibilities for students to set their own pace of study and design their own learning path.
Therefore, Bachelor's programs will:

[1] https://tuenl.sharepoint.com/sites/intranet-education/SitePages/Bachelor-College-Redesign.aspx.

a. Provide students with ample space to design their elective space without restrictions; this includes following study components at other universities. The distribution of elective space and of level 1-3 study components in the curriculum is such that it facilitates free choice.
b. Organize the schedule in timeslots to enable free elective choice.
c. Enable free elective choice by offering prior knowledge in modules[2].

(3) To take the next step in the transition from teaching to learning. Therefore, Bachelor's programs will:

a. Foster active learning. A paradigm shift from teaching to learning becomes relevant to transfer the responsibility to students (learner-centered) in charge of their own learning.
b. Offer Blended Learning[3] as a vehicle to reach a goal, support interaction, promote attention to individual needs, enhance efficiency, and facilitate learning regardless of time and space, providing more flexibility in education.
c. Enhance assessment for learning to ensure there are sufficient measurement moments that track, report, and provide feedback on the student's progress in their individual learning objectives. Assessment refers to the wide variety of methods or tools that teachers use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students. Assessments at the TU/e serve multiple purposes. On the institution's side, the data from assessments can provide a basis for the decision about whether a student has acquired the rigorous body of knowledge, skills, and attitudes needed to be awarded a diploma. On the student's side, assessments can act as guides to inform the students of their level of mastery of certain subjects and whether they have acquired the rigorous body of knowledge, skills, and attitudes necessary in the continuation of their academic path. Assessment is designed such that:
    i. Students gain insight into and receive feedback on their progress during the study component.
    ii. Students are encouraged to make an active contribution.
    iii. Procrastination is counteracted.
    iv. It is integral part of the educational design and aligned with the learning goals (constructive alignment).

(4) To train TU/e engineers to have a distinct profile. Therefore, Bachelor's programs will:

a. Offer a CBL curriculum line that fosters a common engineering language in terms of key abilities, such as for example: design thinking, systems thinking, research methodology, complex problem solving, collaboration & communication skills, etc.
b. Promote the Sustainable Development Goals as a theme within its education.
c. Offer opportunities for multi- and interdisciplinary learning for all students providing the grounds for effective and meaningful collaboration and learning in student groups of different disciplines.
d. Have a comparable design of Professional & Personal Development (P&PD), including objectives and delivery time within the programs, to facilitate student collaboration in multidisciplinary (elective) study components.

[2] Module: a part of a study component. Typically, 5 credits study components can be split into 5 to 10 modules.
[3] ERIC - Thesaurus - Blended Learning: Variable construct describing approaches to teaching and learning that integrate, in a significant and meaningful way, more than one technique for delivering instruction. Widely associated with combinations of face-to-face and e-learning teaching methods, blended learning may also refer to other mixtures (e.g., individual and group instruction; self-paced instruction and lecture method).

The rules of the design of TU/e Bachelor's programs are established as follows:

(1) Scope of the Directive

This directive applies only to students who started their TU/e Bachelor's program on or after September 1, 2023. Transitional arrangements for students who started their TU/e Bachelor's program at an earlier date are incorporated into the TU/e Program and Examination Regulations applicable to students who started a TU/e Bachelor's program before September 1, 2023.

(2) The overall curriculum design of Bachelor's degree programs

1. All TU/e Bachelor's programs consists of 180 credits with the following components:
   a. A core program of 125 credits, including a Bachelor's Final project (BEP) of 10, 15 or 20 credits.
   b. An elective space of 45 credits.
   c. An Impact of Technology (ITEC) program of 10 credits.
   d. A Professional & Personal Development Learning Line defined in terms of learning outcomes, integrated as part of the different study components.
2. TU/e Bachelor's programs have an even distribution of study load. All Bachelor's programs:
   a. have study components with a standard size of 5 credits. However, study components of 5 or a multiple of 5 to a maximum of 30 credits are possible provided that:
      i. it does not lead to an increase of the examination load, i.e., maximum of 3 final tests per quarter,
      ii. the study progress of the students is not hampered,
      iii. the free choice of elective study components is maintained as much as possible.
   b. have a maximum of 3 study components scheduled in parallel.
3. Bachelor's programs are programmed in quarters. A quarter nominally consists of three study components worth 5 credits, which is equivalent to a nominal study load of 15 credits per quarter.
4. A quarter consists of ten weeks. Within each quarter, eight weeks are reserved for teaching and project work, and two weeks for final tests.
5. The timetabling principles for Bachelor's programs require the approval of the Dean Bachelor College.
6. A study guide for each study component is available to students. This study guide is made available two weeks before the study component in question starts.
7. In exceptional cases a capacity limit for the number of students allowed to participate in a study component may be fixed. The Program Director may impose a maximum for specific reasons, for example, because of a specific educational concept or if the teacher wants to try an innovative approach. The maximum is in any case set to a number that allows participation for all students for whom the study component is a compulsory study component in their program of examinations. The Dean Bachelor College will verify that the freedom of choice that students have is sufficiently guaranteed.
8. Level 1, 2, or 3 is allocated to all study components within the Bachelor College, except the Bachelor's Final Project (BEP). Rules of thumb for the allocation of levels are drawn up by the Program Directors together with the Dean Bachelor College. Program Directors shall allocate levels in accordance with the agreed rules of thumb.
9. Program Directors will ensure that Examination Committees find the allocated levels acceptable. The rule of thumb may be departed from if there are specific grounds and only after consultation with the Dean Bachelor College.
10. At least 45 credits of the total Bachelor's program must be at Level 3. These study components may be divided across a core program and elective study components. The intention is to have a balanced distribution of Level 1, 2 and 3 study components across core program and electives: the minimum of 45 credits level 3 study components is

envisaged as 30 credits level 3 in the core program and 15 credits level 3 in the elective space.

11. Within the part of the program reserved for electives minimally 30 credits must be at Level 2 or 3.

(3) The core program

1. The core program within each Bachelor's program serves to provide the Bachelor's student with rigorous knowledge in a particular field. To this end, the core program comprises a range of study components as well as the Bachelor Final project, reaching a total of 125 credits. All core programs should provide all the required knowledge for at least one TU/e Master's program (a so-called "direct- access" master's) independently from the choices the student makes in the 45 credits electives. Moreover, core programs refrain from making it obligatory (directly or indirectly) for students to follow specific study components within the elective space.
2. In derogation of Article 2 paragraph 1 under a and b of these regulations, core programs may provide additional elective space within their study program. Which means that a study program has a core program with less than 125 credits and an elective with more than 45 credits. The Program Director determines which content obligations are applied.
3. Each core program contains one of a total of 3 variants of the university-wide study component in Calculus.

(4) The Bachelor's Final Project (BEP)

1. The Bachelor's program is concluded with a Bachelor's Final project (BEP), which is part of the core program.
2. The BEP can be either 10, 15 or 20 credits. The Program Director decides on the size of the BEP.
3. The BEP can be done in one quarter or in two consecutive quarters, at the discretion of the Program Director.
4. Students can freely choose to do an Interdisciplinary Bachelor's Final project (ISBEP) of 15 credits.
5. Students can choose to do a BEP within a (international) company or organization (e.g. university), in accordance with the study program requirements.

(5) Electives

1. Bachelor's students have the freedom to develop a personal profile as an engineering professional. For instance, students can choose to acquire in-depth knowledge within a single field, or they can develop a broader profile, combining several academic disciplines – and everything in between. This freedom materializes in the form of a large space for electives, comprising a total of 45 credits within each Bachelor's program.
2. Students are completely free to choose study components (in the sense that no restrictions are imposed by the core program) in the completion of their elective space, as long as the requirement that at least 15 credits in the elective space is spent in Level 3 study components has been met and approval has been granted by the Examination Committee, in agreement with the appropriate regulations.
3. TU/e departments contribute to an attractive and flexible offer of electives including interdepartmental and/or jointly defined thematic (coherent) learning areas open to all TU/e Bachelor's students. Within the space for electives, students are free to choose for the Educative Minor offered by the Eindhoven School of Education.

(6) Assessment

1. An assessment plan is available:
   a. At the program level for the Bachelor's program: the assessment plan contains at least the assessment plans of the individual study components. As a general rule, this plan is approved by the Program Director before the start of the academic year. The Program Director ensures an

acceptable assessment pressure within a quarter.
   b. At the study component level: the assessment plan includes information about what is assessed, the criteria for the feedback that is given, what formats the feedback/test moments have, when they are planned and how the feedback and results are provided in a meaningful way. The assessment plan is developed by the examiner and is ready and available to students before the start of the study component.
2. All Bachelor's study components contain at least two interim assessment moments (feedback and/or tests including feedback). These moments may be conditional for the successful completion of a study component and/or count as part of the final grade for the study component.
3. The interim assessment moments (feedback and/or test moments):
   a. should take place within the (digital) facilities made available (e.g. in the designated timeslot, at the timetabled location) unless otherwise decided in consultation with the Dean Bachelor College.
   b. that count towards part of the study component grade cannot be retaken during the academic year in which the study component is taken unless the Program Director decides otherwise upon prior request by the teacher of the course. An exception applies to the first interim assessment of Calculus. This assessment can be retaken in the first quarter.
4. Depending on the assessment plan, timeslots of 1, 2 or 3 hours are available for the final assessment.
5. There are two opportunities per year for participation in a final test.
6. Each (multidisciplinary) project in the Bachelor College in which students work together contains at least one individual assessment component. Multidisciplinary (group) work is assessed by a multidisciplinary committee.
7. Information about study components includes pre-requisites on the topic level, with appropriate references to available modules or to study materials. Entry self-assessment can be available to give students advance feedback on whether they have sufficient prior knowledge.
8. The Program Director and the Dean Bachelor College jointly ensure that the assessment plans within a study component and the Bachelor's program as a whole are in accordance with these regulations and are in line with the TU/e vision on education, the TU/e assessment framework and the departmental assessment policy.

(7) Challenge-Based Learning (CBL)

All students learn to work across borders and disciplines, and collaborate and communicate in multi- or interdisciplinary teams. This is to be achieved through the concept of Challenge-Based Learning (CBL). As part of their core program, all students follow a CBL curriculum line consisting of at least one challenge per semester in years 1 and 2, with the following characteristics:

1. All students participate in a CBL curriculum line of increasing complexity throughout the curriculum.
2. One of the challenges in semesters 1 to 3 includes 'Engineering Design' learning outcomes as determined by the Bachelor's Program Directors and the Dean Bachelor College.
3. A multi/inter-disciplinary component of 5 credits is planned in year 2 (at a fixed slot in Q4). Students can choose from a number of challenges offered by combinations of at least two different departments (including the department offering their core program, unless the core program decides to allow free choice). The learning outcomes are defined by the Bachelor's Program Directors. Challenges are offered in a joint organization structure with an interdepartmental coordinating team, with an overarching theme.

4. Professional and personal development (P&PD) learning outcomes related to collaboration, communication, planning and organizing are integrated in the challenges, with a common alignment and a basic level for all students. The P&PD learning outcomes in Year 1 and 2 must contain at least the following:

Baseline entry requirements CBL component Y2Q4 for Collaboration, Communication and Planning & Organizing

Level	Collaborating	Communicating	Planning & Organizing
a.	The student is able to work with peers towards achieving a common goal within a set period. Accordingly, the student together with the team can come to a division of assigned tasks across the team members. The student can, under supervision, identify how individual competences are used within the team and support the development of competences of team members. The student is able to appropriately give and receive constructive feedback in a group setting. Note: The student is aware that addressing many complex challenges may require collaboration between multiple disciplines.	The student can present their work and discuss ideas orally, in writing and visually. The student can adjust their communication towards interacting with specific target audiences. The student is able to proficiently communicate in English.	The student can, under supervision, translate a common goal into tasks and activities. Accordingly, the student is able to organize their own activities in the context of a team, given constraints (resources, timing, scope). The student is aware of (discipline-specific) tools and methods that support planning.

5. Programs can choose to continue the CBL curriculum line with engineering and/or research projects in year 3 that may be monodisciplinary (e.g. BEP – Bachelor's Final Project)
6. Students can choose to continue the CBL curriculum line in their elective space by participating in interdisciplinary CBL projects in year 3.

(8) Professional & Personal Development (P&PD)

1. Students should be able to develop their professional identity by developing academic knowledge and field-related competences, professional skills, self and social awareness and adaptability. To this end, the core program of a Bachelor's program contain a P&PD learning line that is expressed in terms of learning outcomes and integrated in the study programs. The learning line consists of three components:
    a. basic level,
    b. differentiation in study programs, and
    c. free choice of students.
2. The Bachelor's programs support self-directed learning and the professional identity development of students. Self-reflection is incorporated in the curriculum and supported (by peers, mentors, tutors, coaches, study advisors, etc.), customized according to the specific situation

at each department. A monitoring system is developed and tailored to the specific needs and educational activities within the study program, that helps students to set personal development goals, track their progress and plan activities to meet their goals.

3. "MyFuture Activities" are career orientational activities that students can participate in. These range from lunch lectures to case contests to company visits and are aimed at giving students a clear idea of where they can work and what they can do when they are finished with their studies. This component consists of activities approved by the Dean Bachelor College, to which so-called values are attached. These activities can be part of the P&PD basic level. Students must choose MyFuture activities with a total value of at least seven points.

(9) Coaching and guidance

1. Throughout the Bachelor's program students receive individual coaching from study coaches concerning their Professional & Personal Development (P&PD) needs and the elective space, for example the choice of elective study components totaling 45 credits and choice in the Master's program.
2. The role of study coach can be fulfilled by a member of the teaching staff (including hybrid teachers), an alumnus or a senior student.
3. The role of study coach cannot be combined with that of academic advisor.
4. A student is entitled to four coaching sessions per year, in which the study program shall actively offer this to students in the first year.
5. The hours that a teacher devotes to coaching shall count as teaching hours.
6. First-year student shall in any case receive supplementary guidance from a student mentor during the first semester of the study program, next to coaching. A student mentor is a senior student from a higher year of the same study program.
7. Responsibility for the quality of coaching shall rest with the department.
8. The Dean Bachelor College is responsible for monitoring the quality of coaching.

(10) Impact of Technology program (ITEC)

1. During graduation Bachelor's students are aware of and have learned how to rigorously assess the impact of technology on people and society, and integrate user, society, and enterprise considerations in the engineering design and/or research process, with an ethical attitude. To achieve this, Bachelor's programs contain an Impact of Technology program (ITEC) including:
    a. A 5-credit Engineering Ethics study component where core program-specific content is integrated.
    b. A 5-credit Engineering for Society study component where students preferably can choose from a range of topics relevant for their core program.
    c. A *Studium Generale* component to promote the social, intellectual, and cultural basis of the students. No credits are assigned to this component. It comprises a minimum of 5 *Studium Generale* activities.
2. Programs can choose to expand the Impact of Technology program within ITEC study components in the core program.
3. Students can choose to expand the Impact of Technology program by following ITEC learning trajectories and/or ITEC study components in their elective space.

(11) The overall study component package

1. Students must, in accordance with the procedure established for this purpose, submit the chosen study component package for approval to the Examination Committee of the study program in which the student is enrolled.
2. Students can take study components at other national and international universities (e.g. partner institutions within the EWUU Alliance or EuroTeQ Alliance), provided the Examination Committee of the study program in which the student is enrolled has granted approval, in agreement with the appropriate regulations.

(12) Distribution of Bachelor's program components

The overview below shows the distribution of study components that applies to all Bachelor's programs. Note that ITEC Engineering Ethics can be scheduled in Q2 *or* Q4 and ITEC Engineering for Society in Q1 *or* Q3:

	Q1	Q2	Q3	Q4	
CBL Line	Core	ITEC Eng Ethics/Core	Core	ITEC Eng Ethics/Core	Year 1
	Core	Core	Core	Core	
	Core	Core	Core	Core	
CBL Line	Core	ITEC Eng Ethics/Core	Core	Multi-d CBL	Year 2
	Core	Core	Core	Core	
	Elective	Elective	Elective	Elective/Core	
	Elective	Elective	Elective	BEP/Core/Elective	Year 3
CBL Line	Elective/ITEC Eng for Society	Elective	Elective/core/ITEC Eng for Society	BEP/Core/Elective	
	Core	Core	BEP/Core/Elective	BEP	

Explanatory notes to the table:

- ITEC Engineering Ethics can be scheduled in Y1Q2 or in Y1Q4 or in Y2Q2.
- ITEC Engineering for Society can be scheduled in Y3Q1 or Y3Q3.
- The CBL curriculum line is integrated within study components of study programs as indicated in Article 6.
- The BEP can be spread over two quarters or completed as one block in Q4.
- The scheduling of the Elective space is fixed for 35 of the 45 credits:
    - 15 credits Elective space is planned in Y2Q1-Q3.
    - 20 credits Elective space is planned in Y3Q1-Q3.
- Majors/programs have the freedom to exchange core/elective study components in Y2/Q4, Y3/Q3 and Y3/Q4.
- In Y3/Q3 it is possible to have an ITEC/elective/core study component (having the option to plan an elective in Y3/Q4).

(13) Timetabling in timeslots

1. A timeslot is designated to each study component (except for the BEP). For practical components, the study programs can combine timeslots from the core program, i.e. some flexibility is possible always keeping the schedule of the student in mind.
2. The timeslots are fixed and apply to all study components.
3. Of the 10 hours in a timeslot, no more than 8 hours per week can be scheduled. Scheduling outside the designated timeslot is not possible.
4. If teaching sessions are missed due to public holidays and open days, these can only be rescheduled within the relevant timeslot.

The distribution of timeslots is shown below:

	Monday	Tuesday	Wednesday	Thursday	Friday
1+2	A	C	B	E	D
3+4	A	C	B	E	D
5+6	B	E	D	A	C
7+8	B	E	D	A	C
9+10	E	D	A	B	

All timeslots will be 4 (2x2) + 4 (2x2) + 2 hours, in which the final two hours shall in each case be the 9th and 10th hours. These timeslots will be allocated to the study components per quarter, and distributed in the following way:

	1.1.	**1.2**	**1.3**	**1.4**
A	Core	Core	Core	ITEC ethics/core
B	Core	Core	Core	Core
C	Core	Core	Core	Core
D	Core	Core	Core	Core
E	Core	ITEC ethics/ Core	Core	Core
	2.1	**2.2**	**2.3**	**2.4**
A	Elective	Elective	Elective	Elective
B	Elective	Elective	Elective	Elective
C	Core	Core	Core	CBL
D	Core	Core	Core	CBL
E	Core	ITEC ethics/ Core	Core	Core
	3.1	**3.2**	**3.3**	**3.4**
A	Elective	Elective	Elective	Elective
B	Elective/ITEC Engineering for Society (Advanced)	Elective	Elective/ITEC Engineering for Society (Advanced)	Elective

C	Elective	Elective	Elective	Elective/Core
D	Core	Core	Core	Core
E	Core	Core	Core	Core

(14) Study choice check

Rules concerning the study choice check shall be laid down in the Regulations for Registration, Program Choice Check, Enrollment and Termination of Enrollment.

(15) Honors program in the Bachelor's phase

The Dean of the TU/e Honors Academy, in consultation with the Dean Bachelor College, decides on the design and contents of the Bachelor's Honors tracks. The regulations pertaining to the Honors tracks are set down in the TU/e Honors Academy Regulations for Bachelor's Honors Tracks.

(16) Procedural agreements relating to the Center for Student Administration

1. The deadlines for the timetabling process are as follows:
    a. Academic agenda approved (Executive Board): December 1.
    b. Curricula ready (Program Directors): February 1.
    c. Allocation of timeslots (core timetabling group): March 1.
    d. Course catalogue complete (departmental CSA): April 1 for Q1 and Q2 and October 1 for Q3 and Q4. Note: completion of the Course Catalogue includes the weighting of parts of a study component.
    e. Information on study components complete: April 1.
    f. Timetables ready semester A (departmental timetable coordinator): June 1
    g. Room schedule ready (ESA) semester A: August 1
    h. Timetable ready semester B (departmental timetable coordinator): November 1.
    i. Room schedule ready (ESA) semester B: January 1
2. The deadlines for submitting timetabling information must be strictly observed. The timetabling process begins when the deadline has passed.
3. If more than one timeslot is requested for a study component, this shall be carefully considered and submitted to the Dean Bachelor College, who will then decide. This must not restrict the student's freedom of choice.
4. For each 2 consecutive hours within a timeslot, the teacher can indicate what type of room is required for a study component.
5. No extra facilities, such as a room or an invigilator, are provided for interim tests.

(17) Pilots

1. A proposal for a pilot must be submitted to the Dean Bachelor College for approval. To this end, the Program Director submits a nomination that is accompanied by advice from the Examination Committee, the Program Committee, and the departmental ESA Manager. If several degree programs from different majors/programs are involved, the nomination must be accompanied by advice from the AEB and the JPC.
2. An approved pilot that deviates from one or more provisions of the PER must be laid down in the Appendix to the PER, listing the relevant articles of the PER.
3. The nomination of the pilot shall not be made until a feasibility test has been carried out, under the responsibility of the departmental ESA manager.
4. During the pilot, students who do not participate in the pilot cannot derive any rights from it.

(18) Final provision

Deviation from the above rules is subject to the approval of the Dean Bachelor College. The rules have been elaborated further in the PER Model for Bachelor's degree programs, the Joint Regulations for supra-departmental educational activities in the Bachelor College, the Regulations for Registration, the Study Choice Check, Enrollment, and Termination of Enrollment and the Regulations for the TU/e Honors Academy for honors tracks in the Bachelor's programs.