

SZENT ISTVÁN UNIVERSITY

DOCTORAL SCHOOL OF MECHANICAL ENGINEERING

Head of School:
Dr. István Farkas
University Professor, Doctor of the HAS

TRAINING PLAN

GÖDÖLLŐ
2020

General guidelines

The educational work of the DS is organized and directed by the TEC (Training and Evaluation Committee) with the contribution of the research group leaders based on the Credit-based Uniform Study and Examination Regulations of the Doctoral Schools of SZIU.

Full-time and correspondence students continue their studies for four semesters, and must complete a total of 120 credits. The model curriculum fixed in Annex 2 can be deviated from by 10% annually in justified cases.

The student is obliged to register for and enroll in the subjects by September 30 in the autumn semester, and by February 28 in the spring semester.

Students are required to attend the classes according to the curriculum agreed upon with the subject lecturer. The course material must be accounted for in the form prescribed in the curriculum. The exam takes place before the subject lecturer.

The autumn semester must be completed by February 15, and the spring semester by September 15.

The DIT (Doctoral School Council) decides on partial training abroad upon the recommendation of the supervisor and the TEC.

The curriculum of the research groups of the Doctoral School of Mechanical Engineering is contained in Annex 2, and its subjects in Annex 3. The DIT is entitled to change this based on the proposal of the Head of the DS.

Structure of the educational-research program of the Doctoral School

Of the 120 credit points prescribed for doctoral students during the training period, they can obtain 41 points by fulfilling examination obligations, 8 points by teaching activities, and the rest can be completed by research work carried out during the training period. The various activities that can be continued during the training period have been divided by the DS into course units as follows. The minimum required points can be obtained based on these.

Course unit marked 'I.' means the completion of the prescribed subjects. This includes the registration of subjects, their attendance in contact hours, and the fulfillment of the examination obligation.

The 'A' subjects of the Doctoral School of Mechanical Engineering are those that cover the general disciplines of research, and technical research – essential for the students of both research groups. These subjects are mandatory for all state-funded and correspondence students belonging to the DS.

The 'B' subjects, building on the previous 'A' subjects, provide help in answering the theoretical and methodological questions of the research going on in the given research group. These subjects are mandatory for the students of the given research group.

The 'C' topic-specific subjects are primarily related to the specific research topic. Students of both research groups can choose freely from these, but the minimum number of subjects to be taken is

prescribed. The 'C' subjects can be taken with the agreement of the supervisor. Subjects can also be taken from other doctoral schools, which – after prior consultation – can replace the 'C' subjects of the DS. Possibly, a 'B' subject of one research group can be taken as a 'C' subject by a student of the other research group.

Course unit marked 'II.' means the teaching work of the student during the training period, which is university or college teaching activity (classroom or laboratory practices) related to the doctoral student's research topic. The DS expects a minimum of two hours per week per semester, for which two credit points are awarded (see the model curriculum in Annex 2). The DS accepts this with the joint certification of the institute director and the supervisor (form 7), based on which the president of the TEC certifies it in the Neptun system. If the doctoral student performs the teaching activity at another university or college, the completion of the subject is certified by the dean of the institution and the supervisor.

Course unit marked 'III.' means the research work during the training period, which consists of research work evaluated as described in chapter 5.

Course unit marked 'IV.' refers to the student's publication activity. The point system for evaluating the publication activity is contained in Annex 4. The credit point that can be accounted for it is four times the points calculated on this basis in the training phase, and twice the points in the dissertation phase.

Table 1 summarizes the prescribed obtainable and compulsorily obtainable credit points.

Table 1 Credit points belonging to the course units

Course unit sign	MTDI required limits (credit point) minimum	MTDI required limits (credit point) maximum
I. Completion of subjects	41	
II. Teaching work	0	8
III. Research work		43
IV. Publication activity	28	50

A doctoral student who does not have the opportunity to carry out teaching activity in a higher education institution may present their work to the audience within the framework of the teaching activity of the supervisor's institute, for which they can receive teaching credit points, otherwise they can only replace the points obtainable by completing course unit II with the work done in course unit IV. Those who cannot complete the research work according to course unit III to 100% can also make up for their lost scores with their work done in course unit IV.

The previously presented subject structure of the DS and its curricula are contained in Annex 2. A short, five-line description and detailed syllabus of the taught subjects are available on the website of the Doctoral School (mtdi.szie.hu).

Complex exam

The training phase is closed by a two-part complex exam, the successful completion of which is a condition for entering the Research and dissertation phase. The student initiates the complex exam procedure by submitting the application form according to EDSZ and its annexes.

A condition for admission to the complex exam is at least a basic level 'C' type language exam in a second foreign language, or an equivalent document, or a language exam in one of the world languages (English, German, French, Russian, Spanish, and Italian are considered world languages). If the intermediate 'C' type state language exam verified upon admission is not in English, then the second language exam must definitely be an English basic level 'C' type state language exam. Applicants for individual training must also prove upon application for the complex exam that they have an intermediate 'C' type state language exam corresponding to the first language exam requirement in one of the world languages (English, German, French, Russian, Spanish, and Italian are considered world languages).

The publication condition for admission to the complex exam is the publication of at least two publications from the research topic, of which at least one was in a journal.

For the theoretical part of the complex exam, the Doctoral School Council determines two subjects (topics) fitting the research topic for the examinee upon admission to the exam.

In the dissertation part of the complex exam, the examinee gives an account of their literature knowledge in the form of a presentation, reports on their research results, outlines their research plan for the second phase of the doctoral training, and the scheduling of the preparation of the dissertation and the publication of the results.

The examination board evaluates the theoretical and dissertation parts of the exam separately. A record containing a textual evaluation is prepared of the complex exam. The result of the exam must be announced on the day of the oral exam. The complex exam is successful if the majority of the board members consider both parts of the exam successful. In case of an unsuccessful theoretical exam part, the examinee may repeat the exam one more time in the given examination period from the uncompleted subject(s). In case of failure, the dissertation part of the exam cannot be repeated in the given examination period.

The absolutorium
The prerequisite for obtaining the absolutorium is to obtain all prescribed credits.

RESEARCH ORGANIZATION TASKS OF THE DOCTORAL SCHOOL

Checking the doctoral student's research work
The DS generally contributes to the successful elaboration of the research topic as follows:

- provides professional support in specific methodological questions of the research,

- supports the publication of research results and their presentation at conferences,

- helps organize partial training opportunities abroad, taking into account the topic and the language skills of the doctoral student.

The specific assistance of the research work is the task of the supervisor. The DS helps the research work with continuous accountability and reporting.

Accordingly, doctoral students must fulfill the following tasks:

- By the end of November of the first academic year, a Work Plan signed by the supervisor must be submitted according to form 4. The DS assigns the submitted work plan to a reviewer, who presents their review at the February meeting of the DIT. Here the doctoral student must defend their ideas. A work plan modified taking into account what has been said enters into force, the implementation of which changes is checked by the supervisor, and possibly countersigned by the reviewer;

- By February 28 of the first academic year, a Literature Summary (see form 8), must be submitted in writing by the doctoral student, which is qualified by the head of the DS or their assignee. This can happen by returning it for correction or giving 10-18 points depending on the value of the work. The literature summary must contain a critical analysis of the publications related to the topic, revealing those areas where there are contradictions, or unclear questions as described in form 8;

- By December 15 of the second academic year, a Research Report containing the doctoral student's research results up to that point, consolidated into a uniform structure (see form 9), must be submitted in writing, which must be presented and defended at an in-house conference before the TEC, fellow doctoral students, and possibly invitees from other doctoral schools. The annex to the report is a list of the doctoral student's publications related to the topic. The committee evaluates the submitted material (which has already been reviewed by a reviewer appointed by the DIT), the presentation, and the professional debate conducted, and awards points for it. If the doctoral student does not receive 50% of the obtainable score, they must submit a new report at a suitable time, and defend it again. The presentations given at the in-house conference are published in print by the DS, but these do not count as publications. Those who do not submit the research report on time can make up for it next year at the latest.

- By the end of the second academic year, the results achieved so far must be submitted in writing in the form of a Final Research Report, consolidated into a uniform structure. The written material must contain a list of the doctoral student's publications related to the topic in an annex. The material must also contain further specific tasks to be performed until the preparation of the dissertation, as well as the planned thesis points of the dissertation. The preparation of the Final Research Report at an appropriate level (which is reviewed by the Quality Control Subcommittee) is a criterion condition for admission to the complex exam.

Publication practice of the Doctoral School

The evaluation of the doctoral student's publication activity is carried out as follows.

A publication can be considered to be of scientific value if it appears in a professional/scientific journal covering the research areas of the Doctoral School, or in another authoritative journal (they have an editorial board and the authors also attach an English summary), and in which there are demonstrably substantive own result(s) characteristic of the given field of science.

The DIT does not accept a publication published in a daily or weekly newspaper as a publication of scientific value, however, it has a place in the listing of literary activity – in the other category, since it also refers to professional public life activity and habitus.

Accountability system of the Doctoral School
Training (Maximum obtainable score: 49 credits)

In order to fulfill the training conditions, the registered subjects (41 credits) must be completed by March 1 (at the latest), respectively September 10 (at the latest).

- every semester is closed by March 10, and September 20 respectively,

- anyone who does not complete a registered subject is deleted, and takes the subject again.

The teaching activity (4 x 2 = 8 credits) must also be certified by March 1, and Sept. 1 respectively.

The certificate is provided by: internally the head of department, at an external institution the director general (dean),

Those who do not work in an educational institution do not need a certificate,

The teaching activity is entered in the index by the educational head of the DS,

Anyone who does not complete or certify the teaching activity can only make up for their missing credits with publications.

Research (Maximum score: 43 credits)

The reports (literature summary, research report, final report) must be completed within the prescribed time.

Literature summary (18 credits, minimum 10 credits to be achieved)

- its submission is a condition for issuing the absolutorium;

- its qualification is given as a percentage by the quality manager of the DS, and the score is determined based on this;

- the qualifier can return the work for correction – in case of performance below 50%; in this case its maximum qualification can be 60%.

- those who do not submit it by the deadline can get a one-month extension with a deduction of 5 credit points;

- after this, it can be submitted with a deduction of 10 credit points;

- lost points can be made up with extra publications.

Research report (in-house conference) (25 credits, minimum 13 credits to be achieved)

- its material is published in an internal publication by the time of the conference, before which the leadership of the DS judges its acceptability, or returns it for correction if necessary;

- the committee established for this purpose qualifies it by scoring;

- lost points can be made up with extra publications.

Final research report

- its submission is a condition for admission to the complex exam, and the issuing of the absolutorium;

- its qualification is carried out by the quality manager of the DS with a "passed", or "failed" rating, in the latter case the candidate gets the work back for correction.

Research activity in the dissertation phase

In the dissertation phase, 10 credits can be awarded per semester for Research activity, which is evaluated and certified by the supervisor (in the last semester by the Research Control Committee).

Publications

- anyone who does not complete the publication activity in the prescribed semester can make it up by the end of the training research phase;

- the credit value of the publication score in the training phase is four times the publication score, a minimum of 28, a maximum of 50 credits can be completed;

- in the dissertation phase the credit value of the publication score is twice the publication score, from which an average of 20 credits is to be completed per semester;

- its qualification is submitted by the head of the TEC for decision to the leadership of the DS.

- the candidate must also present the achieved results in at least three domestic and two foreign scientific peer-reviewed journal articles within the minimum publication score (of the five, one must be published in a journal with an impact factor, or at least two in a Q1 or Q2 rated journal).

ANNEX 2
Curriculum of the Doctoral School

Curriculum of the Doctoral School of Mechanical Engineering

Curriculum of the Agricultural Energetics and Environmental Technology research group

Year I. Semester 1			Year I. Semester 2		
Subject	Hour	Credit	Subject	Hour	Credit
Research ethics (A)	30	5	General research methodology (A)	30	5
Modeling and	30	5	Theory and	30	5

simulation (A)			practice of technical research (A)		
Material and energy transport processes (B)	30	4	Measurement technology (B)	30	4
Compulsorily chosen C subject	30	3	Compulsorily chosen C subject	30	3
Teaching activity	30	2	Literature summary	-	18
			Teaching activity	30	2
Total credits:		19	Total credits:		37
Year II. Semester 3			Year II. Semester 4		
Subject	Hour	Credit	Subject	Hour	Credit
Environmental technology (B)	30	4	Research report	-	25
Compulsorily chosen C subject	30	3	Teaching activity	30	2
Teaching activity	30	2	Publication		8
Publication	-	20			
Total credits:		29	Total credits:		35

Course units:

Training:	41		
Teaching activity:	8		
Research:	43		
Publication:	28		
Total credits during the training phase:	120		
Year III. Semester 5		Year III. Semester 6	
Research activity	10	Research activity	10
Publication	20	Publication	20
Total	30	Total	30
Year IV. Semester 7		Year IV. Semester 8	
Research activity	10	Research activity (final)	10
Publication	20	Publication	20
Total	30	Total	30
Total in dissertation phase	120		
Grand total	240		

Curriculum of the Agricultural machinery basics research group

Year I. Semester 1			Year I. Semester 2		
Subject	Hour	Credit	Subject	Hour	Credit
Research ethics (A)	30	5	General research methodology (A)	30	5
Modeling and simulation (A)	30	5	Theory and practice of technical research (A)	30	5
Agricultural machinery structures (B)	30	4	Differential equations (B)	30	4
Compulsorily chosen C subject	30	3	Compulsorily chosen C subject	30	3
Teaching activity	30	2	Literature summary	-	18
			Teaching activity	30	2
Total credits:		19	Total credits:		37
Year II. Semester 3			Year II. Semester 4		
Subject	Hour	Credit	Subject	Hour	Credit
Materials science (B)	30	4	Research report	-	25
Compulsorily chosen C subject	30	3	Teaching activity	30	2
Teaching activity	30	2	Publication		8
Publication	-	20			
Total credits:		29	Total credits:		35

Course units:

Training:	41		
Teaching activity:	8		
Research:	43		
Publication:	28		
Total credits during the training phase:	120		
Year III. Semester 5		Year III. Semester 6	
Research activity	10	Research activity	10
Publication	20	Publication	20
Total	30	Total	30
Year IV. Semester 7		Year IV. Semester 8	
Research activity	10	Research activity (final)	10
Publication	20	Publication	20

Total	30	Total	30
Total in dissertation phase	120		
Grand total	240		

ANNEX 3

Subjects of the Doctoral School

Subject structure of the Doctoral School of Mechanical Engineering (from 2016)

No.	Subject	Lecturer
"A" subject group (5 credits)		
1.	Modeling and simulation	Dr. István Farkas, DSc, Univ. Prof.
2.	Theory and practice of technical research	Dr. Rita Kiss, DSc, Univ. Prof.
3.	Research ethics	Dr. István Szabó, PhD, Univ. Prof.
4.	General research methodology	Dr. Péter Szendrő, DSc, Prof. Emeritus
"B" subject group (4 credits)		
Agricultural energetics and environmental technology		
1.	Environmental technology	Dr. István Barótfi, CSc, Prof. Emeritus
2.	Material and energy transport processes	Dr. János Beke, DSc, Univ. Prof.
3.	Measurement technology	Dr. István Seres, PhD, Univ. Docent
Agricultural machinery basics		
1.	Materials science	Dr. Gábor Kalácska, DSc, Univ. Prof.
2.	Agricultural machinery structures	Dr. László Kátai, PhD, Univ. Docent
3.	Differential equations	Dr. Zoltán Varga, CSc, Prof. Emeritus
"C" subject group (3 credits)		
1.	Renewable energy sources	Dr. István Barótfi, CSc, Prof. Emeritus
2.	Drying theory	Dr. János Beke, DSc, Univ. Prof.
3.	Design of field experiments	Dr. László Bense, PhD, Univ. Docent
4.	Artificial intelligence	Dr. István Farkas, DSc, Univ. Prof.
5.	Economics of developments	Dr. István Husti, DSc, Prof. Emeritus
6.	Mechatronic systems	Dr. László Jánosi, CSc, Prof. Emeritus
7.	Drive theory	Dr. László Kátai, PhD, Univ.

		Docent
8.	Classical mechanics	Dr. István Keppler, PhD, Univ. Prof.
9.	Food industry processes	Dr. Gábor Keszthelyi-Szabó, DSc, Univ. Prof.
10.	Terrain vehicle theory, vehicle dynamics	Dr. Péter Kiss, PhD, Univ. Prof.
11.	Solid-state physics	Dr. Csaba Mészáros, PhD, Univ. Docent
12.	Chapters from informatics	Dr. Sándor Molnár, DSc, Univ. Prof.
13.	CFD modeling	Dr. István Oldal, PhD, Univ. Docent
14.	Design of experiments	Dr. István Oldal, PhD, Univ. Docent
15.	Electric power management	Dr. Péter Sembery, CSc, Prof. Emeritus
16.	Data acquisition and processing in agriculture	Dr. István Szabó, PhD, Univ. Prof.
17.	Biotechnique	Dr. András Szász, CSc, Univ. Private Docent
18.	Comminution theory	Dr. Péter Szendrő, DSc, Prof. Emeritus
19.	Wind and geothermal energy utilization	Dr. László Tóth, DSc, Prof. Emeritus

The C subjects, and the B subjects of the other research group as C subjects, as well as courses of other doctoral schools, in each case with the C subject credit value determined by the Doctoral School of Mechanical Engineering, can only be chosen by the doctoral students with the agreement of the supervisor and the prior permission of the doctoral school management.