

MSc in Vehicle Engineering

Name of degree programme: MSc in Vehicle Engineering

Academic level of degree: Master

Qualification obtained: Vehicle Engineer

Duration of degree programme: 4 semesters

Necessary no. credits for degree: 120 credits

Obligatory 4-week industrial internship. Can be fulfilled in home country or in Hungary.

Curriculum (beginning in **Autumn** semester) *(For description of courses please click course code)*

Compulsory courses:

	Neptun code of course	Name of course	lessons /	seminars /	Laboratory /	assessment	credit points	semester
1.	AJNM_BMTA019	Internal Combustion Engines I.	3	0	0	v	5	1
2.	AJNM_BMTA041	Project Autumn	0	2	0	f	5	1
3.	AJNM_JFTA001	Core Elements of Whole Vehicle Engineering	2	0	0	f	5	1
4.	KGNM_VKTA005	Management Competencies	2	2	0	f	5	1
5.	AJNM_ATTAA011	Materials Science	2	2	0	v	5	2
6.	AJNM_JFTA004	Project Spring	0	2	0	f	5	2
7.	GKNM_AMTA011	CAE methods	2	1	0	v	5	2
8.	GKNM_AUTA011	Automatic Controls	2	0	0	v	5	2
9.	GKNM_MSTA003	Numerical Analysis	2	2	0	v	5	2
10.	KGNM_VKTA003	Leadership and Organizational Communication	2	2	0	v	5	2
11.	AJNM_BMTA037	Engine, Motor and Vehicle testing	2	0	2	v	5	3
Összes kreditpontszám:							55	

Hungarian Language (compulsory)

Nr.	Neptun code of course	Name of course	lessons / week	seminars / week	assessment type *	credit points
1.	KGNB_NOKA036	Hungarian Language and Culture 1.	0	3	a	0
2.	KGNB_NOKA037	Hungarian Language and Culture 2.	0	3	a	0

Free optional courses

Optional subject II.

Nr.	Neptun code of course	Name of course	lessons / week	seminars / week	assessment	credit
1.	AJNM_BMTA020	Internal Combustion Engines II.	2	0 2	v	5
2.	AJNM_BMTA026	Controlled storage devices	2	1 0	v	5
3.	AJNM_BMTA033	Unmanned vehicles	2	0 2	v	5
4.	AJNM_BMTA034	Hybrid Electric Vehicles	2	2 0	v	5
5.	AJNM_BMTA035	Internal Combustion Engine Control	2	0 2	v	5
6.	AJNM_BMTA036	Development of Internal Combustion Engines	2	0 2	v	5
7.	AJNM_JFTA005	Computational fluid dynamics in vehicle engineering	0	2 0	f	5
8.	AJNM_JFTA006	Vehicle properties and conceptual design	2	2 0	f	5
9.	AJNM_JFTA009	Vehicle Acoustics II.	2	2 0	f	5
10.	AJNM_JFTA010	Durability and fatigue in vehicle engineering	2	2 0	f	5
11.	AJNM_JFTA014	Sustainable quality management	2	0 0	v	5
12.	GKNM_AMTA008	Dynamics of Machines	2	2 0	v	5
13.	KGNB_NOKM024	Exchange Course 4.	0	0 0	f	5
14.	KGNM_VKTA021	Innovation and Research Communication II.	0	0 0	f	5

20 credit points should be obtained from this group of courses.

Optional subject I.

Nr.	Neptun code of course	Name of course	lessons / week	seminars / week	assessment	credit points
1.	AJNM_ATT016	Manufacturing Technologies of Modern Vehicles	2	0 0	v	5
2.	AJNM_BMTA027	Internal Combustion Engines III	2	0 2	v	5
3.	AJNM_BMTA028	Drivetrain development for racing applications	2	0 0	v	5
4.	AJNM_BMTA032	Tribology + Failure analysis	2	0 2	v	5
5.	AJNM_BMTA045	Simulation of Internal Combustion Engines	0	2 0	v	5
6.	AJNM_JFTA008	Vehicle Acoustics I.	2	1 0	f	5
7.	GKNM_AUTA025	Electric Machines	2	1 0	v	5
8.	GKNM_AUTA027	Electric drive systems	2	1 0	v	5
9.	GKNM_MSTA004	Mathematical Models and Methods	2	2 0	v	5
10.	KGNM_VKTA020	Innovation and Research Communication I.	0	0 0	f	5

15 credit points should be obtained from this group of courses.

Optional subject IV.

Nr.	Neptun code of course	Name of course	lessons / week	seminars / week	assessment type *	credit points
1.	AJNM_BMTA043	Final year project II.	0	4 0	f	15
2.	AJNM_JFTA003	Final year project II.	0	4 0	f	15

15 credit points should be obtained from this group of courses.

Optional subject III.

Nr.	Neptun code of course	Name of course	lessons / week		seminars / week	assessment type *	credit points
1.	AJNM_BMTA042	Final year project I.	0	4	0	f	15
2.	AJNM_JFTA002	Final year project I.	0	4	0	f	15

15 credit points should be obtained from this group of courses.

* type of assessment

f - evaluation based on student's performance and work during the semester

v - evaluation based on student's exam grade in a 5-grade system:

excellent (5) – good (4) – satisfactory (3) – passed (2) – fail (1)

Programme supervisor: Prof. Dr. Lakatos István



CV: https://admissions.sze.hu/images/cv/Europass_LI_prof_eng_2023%20v2.pdf

Information about **admission procedure:** <http://admissions.sze.hu/>

Please find details of **thesis** and **final exams** on:

Rules and Procedures for preparing an MSc Thesis and for the Final Examination

1. Nomenclature

SZE: Széchenyi István University

AHJK: SZE Audi Hungaria Faculty of Automotive Engineering

BMT: SZE Department of Internal Combustion Engines

JFT: SZE Department of Whole Vehicle Engineering

MSc VE-EN: MSc in Vehicle Engineering – English program

TDK: Scientific student activity resulting an essay that is presented at a dedicated event

TVSZ: Education and Exam Regulations of SZE

Regulations of Final Exam (RFE): Set of rules for Final Exams, issued by AHJK in compliance with TVSZ

Process of Graduation (PG): Issued by the Department, in compliance with RFE and TVSZ

Final Exam: organized by the assigned Department, consist of a *Complex Exam* (from the taught courses) and the *Thesis Defense*. An accepted MSc Thesis is the prerequisite for entering the *Final Exam*.

FEB: Final exam board

2. Introduction

2.1. General considerations

The general process of graduation is regulated by the University rules (SZE TVSZ) and the Faculty rules (AHJK RFE). However, for each MSc or BSc study program the university Departments responsible for issuing the degree are obliged to provide a detailed but the most detailed Process of Graduation (PG). In the case of the English program in MSc in Vehicle Engineering, there are two departments empowered to issue the degree (BMT, JFT)

Both BMT and JFT departments are assigned by the AHJK faculty to organize an *Final exam* in MSc VE-EN program. The graduating students should be distributed between BMT and JFT based on their orientation e.g. the optional subjects selected during their studies, their history of prior departmental cooperation, and most important, their chosen topic of MSc thesis.

2.2. Assignment of students

Each student has to choose either BMT or JFT as the host department for their MSc Thesis no later than the start of the registration period preceding the semester, in which he/she must register for the first time for the *Final year project* subject. A student shall be assigned to a department based upon any of the following aspects:

- The student had a (prior) cooperation with one of the two departments, and both the student and the department approve this work as the topic of the thesis.
- The student has a specific topic for his/her thesis (e.g. industrial topic), which is clearly related to either department's expertise and the related department approves this as the topic of the thesis.
- The student chooses one of the thesis topics announced by either of the departments. This means an automatic allocation of the student to the department announcing this topic.
- If the student's topic is such, that it requires expertise from a third party department and therefore the University Supervisor of the student comes from neither BMT or JFT, then the student shall be assigned to either BMT or JFT based on individual agreement and his/her thesis topic has to be approved by either the BMT or JFT department, accordingly.

If none of the above conditions is fulfilled than it is the responsibility of the student to choose a home department. The choice of the thesis topic and the appropriate department has to be approved by the chosen home department.

2.3. Timelines

Table 1 shows the timelines associated with the definition of the Diploma Thesis, as well as the Final Exam itself. Students, Internal Supervisors and External Supervisors should adhere to these timelines. All rules listed in this document are associated with the timelines in Tab. 1, even if it is not stated specifically.

3. Topic definition

3.1. Topic selection

Topic selection has to be done until the start of registration period preceding the semester in which the student registers for the first time for the *Final year project* subject (I or II, depending on the semester, in accordance with TVSZ 75§). As the ratification of the topic selection, a *Thesis Assignment Form* has to be prepared and approved (signed) by the Head of BMT or JFT (depending on which department the topic belongs to, according to Sec. 2.2) until the above deadline.

Taking into account the transit time of the process, students have to get into contact with the BMT or JFT department and **start the thesis topic definition process no later than three month before the first registration to the Final Year Project course.**

3.1.1. Topic defined by the departments

Students can choose one from the diploma thesis topics announced by BMT and JFT departments. In this case it is the student's responsibility to inform the related department about his/her choice within the above stated deadline, and agree on the detailed content of the work and the *Thesis Assignment Form*.

3.1.2. Topic proposed by a student

The topic of a thesis can also originate from either the industry (internship or full-time job), university activity (student teams, TDK work, activity at other departments etc.) or individual interest. The student has to propose the topic to one of the selected departments within the above stated deadline. The Department decides thereafter about the acceptance or rejection of the topic. In case of rejection, it is the student's responsibility to find a topic which is accepted by the Department as soon as possible – even by modification of the proposed topic or by finding a new one.

3.2. University Supervisor, External Consultant

Each student must have a **University Supervisor**. This person should be an employee or PhD student of BMT or JFT, except if the approved topic is strictly related to another entity of SZE – in this case from that department, obviously. The student can propose a University Supervisor, but the approval – made by the Head of BMT or JFT, depending on which department the student and the topic belongs to – will be subject to the availability and competence of that person. The task of the *University Supervisor* is to ensure that:

- the Thesis fulfills the formal, quantitative and qualitative requirements for an MSc Thesis,
- deadlines and requirements are met,
- assessment of the thesis is arranged.

The student is assigned to the *University Supervisor* in the NEPTUN online system, thus he/she is responsible for the NEPTUN administration of the *Final Year Project* subjects as well.

It is preferred for all graduating students to have an **External Consultant**, who ensures the industrial relevance of the thesis. This person should have an MSc degree in a specialization related to the topic of the thesis. The *External Consultant* provides guidance related to the technical contents of the thesis and gives advises to the student how to achieve the required standards of the thesis from technical point of view. If the candidate does not have an External Consultant, the University Supervisor is dedicated to perform these duties as well.

3.3. Thesis Assignment Form

A *Master's Thesis Assignment Form* has to be approved by the hosting department until the registration week of the semester, in which the student registers for the first time for the *Final Year Project* subject. Approval of the *Thesis Assignment Form* is ready only if all related persons (University Supervisor, External Consultant, Head of Department) have signed the document. A sample *Thesis Assignment Form* can be found in the Appendix.

3.4. Topic modification

Starting a completely new topic after registering for the Final Year Project course can be approved only if there are inevitable circumstances that makes the thesis writing impossible in the original topic or there is a special circumstance necessitating a change in the topic. Typically, minor modifications (slight change in title, task description etc.) can be accepted. Topic modification is possible no later than the registration to the second *Final Year Project* course and can be approved only if the host department (of the new topic) considers the remaining time to be enough for completing the Thesis in an appropriate quality. In this case, the same administrative steps have to be done as during the first topic selection and approval.

4. Regulations for the Thesis

4.1. General expectations

The Thesis must deal with relevant professional questions in a professional manner. It must contain the motivation (task description), the presentation of the required scientific/professional background, the method of solution, the achievements and their critical evaluation. The own professional work of the candidate has to be clearly stated. The content, as well as the appearance of the thesis should prove that the candidate is ready for independent, high quality engineering work.

4.2. Confidential thesis

The diploma project owner may request the thesis to be confidential for a maximum of 5 years period after the Thesis Defense date. In this case a *Request of Confidentiality* has to be submitted together with the *Assignment Form*, which has to be fitted to the beginning of the thesis as well. Furthermore, all persons, who get in contact with the Thesis (University Supervisor, External, Reviewer, FEB members etc.) must sign a *Confidentiality Agreement*. Both the *Request of Confidentiality* form as well as the *Confidentiality Agreement* form can be the form of the thesis project owner or that found in the Appendix. The management of this form is the responsibility of the candidate during the semester. The *Confidentiality Agreement* form has to be handed to the Secretary of the *Final Exam*.

4.3. University / Faculty / Department regulations

The MSc thesis must have 60-80 pages (without Appendices). Detailed description of the formatting guidelines can be downloaded from the Departmental Website. In any case not specified otherwise, the regulations of the SZE (TVSZ) and the AHJK (RFE) are relevant.

5. Thesis assessment

5.1. Reviewer selection

Upon completion, the Thesis has to be assessed by a Reviewer. According to university regulations, the Reviewer (or external examiner) should not have legal relation with SZE (TVSZ 78§). Either the candidate or the External Consultant can propose a reviewer. If not, the University Supervisor has to propose one. Based on the suggestion of the University Supervisor, the Reviewer's person must be approved by the Head of the host department, who also asks him formally to perform the review of the Thesis.

5.2. Expectations, assessment form

The assessment of the Thesis should be performed according the *Criteria for Assessment* document, while the manifestation of the reviewer's opinion is communicated via the *Assessment Form*. The Reviewer should prepare a written evaluation and to assign points for the given aspects of the thesis, as well as to propose a grade and at least 3 questions, which are to be answered by the candidate during the Thesis Defense. The *Assessment Form* has to be returned to the University Supervisor, who also gives a proposed overall mark to the thesis and brings the document to the Departmental Administration before the *Final exam*.

The student has to be informed about the assessment of his/her thesis and the remarks and questions of the reviewer no later than 12 am at the day before the defense.

6. Final exam

6.1. Regulations

Students have to register to the *Final Exam* via the NEPTUN system in accordance with the current university regulations.

The Final Exam consist of two parts: the *Complex Exam* (or State Exam) and the *Thesis Defense*.

Final Exam dates and schedules are announced by the organizing department no later than two weeks before the exam. *Final Exams* are always within the *Final Exam Period* defined by SZE.

The Final Exam Board (FEB) is proposed by the Head of Department and appointed by the Dean. The FEB has a Chairperson and at least 2 members. At least one member of the FEB shall be external (i.e. not employed by SZE). The work of the FEB is supported by a Secretary and by Examining Lecturer(s).

6.2. Process

The *Final Exam* event consists of the following parts:

- Opening ceremony – compulsory for FEB and the candidates, open for interested persons
- Individual examinations of the candidates one by one:
 - o *Complex Exam* of the candidate (cca. 30 minutes) – behind closed doors (only FEB, Secretary, Examining Lecturer(s) and the candidate)
 - o *Thesis Defense* of the candidate (cca. 15-30 minutes) – open for visitors (except for confidential theses)
- Evaluation of the candidates – behind closed doors (only FEB, Secretary, Examining Lecturer(s))
- Announcement of results, closing ceremony – compulsory for FEB and the candidates, open for interested persons

6.2.1. Thesis Defense

The candidate has to present his/her thesis work in 15-20 minutes in an appropriate form, followed by a discussion, which may include questions from the Reviewer, questions from the FEB members, and questions from any other person. The final rating of the thesis is given by the FEB taking into account the opinions of the University Supervisor, the External Consultant and the Reviewer, and considering the thesis defense process.

6.2.2. Complex Exam

All graduating students are examined from the following subjects/topics:

- 1: Core Elements of Whole Vehicle Engineering
- 2: Internal Combustion Engines I.
- 3: Optional topic – one from the following topics, chosen by the candidate:

JFT-related topics:

- Vehicle Acoustics
- Vehicle Properties and Conceptual Design
- Durability and Fatigue in Vehicle Engineering
- Computational Fluid Dynamics in Vehicle Engineering

BMT-related topics:

- Tribology and Failure Analysis
- Alternative drive systems
- Operation of Internal Combustion Engines
- Design of Internal Combustion Engines

The departmental administration has to be informed about the selection of *Optional topic* until the deadline of the Thesis work submission. Students can get information about the subject requirements from the Subject Coordinators (of the related subjects).

On the Complex Exam the candidate gets questions from the 3 topics, given by the *Examining Lecturer(s)*. Thereafter, he/she has minimum 30 minutes for preparation before the oral exam starts. The subjects are examined one after another. The *Examining Lecturer* or any member of FEB can pose additional questions to the candidate. The final grade of each subject is proposed by the related *Examining Lecturer(s)* and agreed upon by the FEB.

The result of the *Complex Exam* is calculated as the arithmetic mean of the results from the individual subjects.

6.3. Final rating

The result of the *Final Exam* (classification of the diploma) is calculated as the arithmetic mean of (regulated by TVSZ Appendix no. 10):

- the final mark of the Thesis Defense and
- the final mark of *Complex Exam*.

Result:

- 0,00 - 1,99 : Fail
- 2,00 - 2,5 : Pass
- 2,51 - 3,5 : Satisfactory
- 3,51 - 4,5 : Good
- 4,51 - 5,0 : Excellent

A final examination has to be regarded as unsuccessful if either the Thesis, the Thesis Defense or any of the subject-specific/complex final examinations were unsuccessful (TVSZ 83§). A repeated *Final Exam* can be taken no earlier than in the subsequent Final Exam Period.

7. Process summary, deadlines

7.1. Tasks of the student

Registration to the *Final Exam* is possible in the given semester only if the student is registered to (or has absolved earlier) the second Final Year Project course (i.e. if he/she will have both Final Year Project I. and II. subjects absolved at the end of the given semester).

7.2. Deadlines

The tasks and related deadlines are summarized in Table 1. APPENDIX A

<i>Table 1. Deadlines for the MSc Thesis definition, submission and Final Exam</i>	Deadline
Student applies at the JFT or BMT department with the intended thesis topic	3 months before the Registration Week*
Submission of agreed Master's Thesis Assignment Form (signed by the University Consultant and the External Supervisor)	2 months before the Registration Week*
<i>Assignment Form is approved by the Department (signed by the Head of Department)</i>	<i>No later than the start of Registration Week*</i>
Registration for the Final Year Project course for the first time	Registration Week*
Submission of Request of Confidentiality (if secrecy is required)	End of Registration Week*

Sign the Confidentiality Agreement (if secrecy is required)	Each person who officially has to meet the professional content of the Thesis has to sign a Confidentiality Agreement first. These documents are collected by the Candidate and handled together with the Thesis.
Registration for the Final Exam	At around the start of the Exam Period** (guidelines are sent by mail via the Neptun system)
Digital uploading of Thesis	First week of the Exam Period**, Thursday, 12:00
Submission of Thesis (printed)	First week of the Exam Period**, Friday, 12:00
Submission of Consultation Sheet	
Inform the Department about the selected examination subject (Subject 3).	
<i>The schedule of the Final Exam is published by the Department</i>	<i>2 weeks before the start of the Final Exam Period***</i>
Submission of the Thesis Assessment Form	1 week before the start of the Final Exam Period ***
MSc Final Exam	In the Final Exam Period (exact date is published at least two weeks before).